

Hood Canal Integrated Watershed Plan

Five-year Strategic Priorities – 2017 Update



Hood Canal Coordinating Council



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Introduction

Hood Canal Coordinating Council

The Hood Canal Coordinating Council (HCCC) is a council of governments with a mission to work in partnership advancing a shared regional vision to recover and protect Hood Canal's environment and community wellbeing. HCCC was originally formed in 1985 as the management Board for aquatic rehabilitation in Hood Canal (RCW 90.88.030(1)) to address water quality concerns and related natural resource issues in the Hood Canal watershed. The Washington Legislature has since designated the HCCC as the **Regional Recovery Organization** (RCW 90.88.030(1)(a)) responsible for implementation of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan. HCCC became the **Local Integrating Organization (LIO)** for the Hood Canal Action Area in 2010, under the Puget Sound Partnership's (Partnership) Action Agenda structure to restore the health of Puget Sound and is recognized in the Partnership's founding legislation (RCW 90.71.230) as a local watershed based organization with which the Leadership Council must work collaboratively on issues related to Hood Canal aquatic rehabilitation. The Hood Canal region is also a Puget Sound Salmon Recovery Region for Chinook and steelhead and HCCC works with salmon recovery partners to develop and implement salmon recovery strategies. HCCC is the **Lead Entity** (RCW 77.85.050 - 77.85.070) responsible for the coordination of salmon restoration and protection projects in the Hood Canal action area. Additionally, HCCC sponsors and operates an **In-Lieu Fee Mitigation Program** for compensatory mitigation of impacts to aquatic resources and their buffers in the region. HCCC is also a Washington State non-profit public benefit corporation with 501(c)(3) IRS status and a registered charitable organization.

HCCC's members include the surrounding counties (Jefferson, Kitsap, Mason) and tribal governments (Port Gamble S'Klallam Tribe, and Skokomish Tribe). The HCCC Board of Directors includes county commissioners from each member county, and tribal council chairs from each member tribe. Ex-officio members of the board of directors include the Department of Ecology, the U.S. Navy, and the Puget Sound Partnership (PSP). The Integrated Watershed Plan (IWP) Steering Committee is a sub-committee of the board and includes board members and other partners to lead the direction of HCCC's foundational strategic plan.

HCCC utilizes multiple tools to put its shared regional strategies into action. As the **Regional Recovery Organization for Hood Canal and Eastern Juan de Fuca Summer Chum**, and the **Lead Entity for Salmon Recovery** in Hood Canal, HCCC aligns salmon recovery projects and regional recovery actions with the integrated strategies found in the IWP. As the salmon recovery Lead Entity, HCCC facilitates a process for prioritizing acquisition, protection and restoration actions and targets funding to the highest priority salmon recovery actions, aligned with the guidance provided for implementation of the salmon recovery plans. HCCC's **In-Lieu Fee (ILF) Mitigation Program** provides mitigation for unavoidable adverse impacts from development projects within the program's service area as an additional mechanism for habitat restoration and protection projects in the Hood Canal watershed. The ILF program is a tool that can support priority salmon recovery projects and progress toward other ecosystem component goals. As

the LIO, HCCC participates in regional Puget Sound Action Agenda planning, and facilitates a Near Term Action process to develop, evaluate, and fund ecosystem recovery actions aligned with IWP goals.

As a council of governments with multiple roles integrated under a shared regional vision, HCCC's members work together in a forum to advance strategic regional priorities, leveraging political support and a variety of funding opportunities to protect Hood Canal's natural resources and community values in a way that individual jurisdictions cannot.

The Hood Canal Integrated Watershed Plan

In 2010, the Hood Canal Coordinating Council (HCCC) partnered with a diverse array of organizations, agencies, and individuals to initiate the development of the Hood Canal [Integrated Watershed Plan](#) (IWP) to achieve a shared vision that **a healthy ecosystem is essential for thriving Hood Canal communities**. The IWP planning process was a mechanism through which HCCC and its partners identified key ecological and social aspects of the watershed valued by Hood Canal communities, established an initial understanding of the status of these components, identified the pressures impacting them, and developed a suite of strategies intended to improve their status and benefit the Hood Canal ecosystem and human communities. Over the course of four years, partners deliberated over selecting areas of focus, pressures to address, indicators to monitor, and strategies to prioritize.

The IWP is a comprehensive strategic framework for advancing a shared regional vision. It integrates existing and future natural resource management efforts across all relevant Hood Canal jurisdictions.

The 2014 IWP established:

- Five-year strategic priorities to guide regional actions towards the vision
- A framework for accountability of strategy implementation, identification of strategic gaps, and continuous evaluation and adaptive management

This immense effort resulted in an IWP with region-wide support, improved collaborative relationships, and a coordinated approach to its implementation. The success of the IWP will be demonstrated in its adaptive management. Future iterations must adapt with improved planning tools, changing ecosystem conditions and political climates, and new scientific information. By articulating a strategic vision for Hood Canal ecosystem protection and recovery, the IWP advances partnerships around Hood Canal to identify opportunities for coordination and maximize the effectiveness of our collective efforts to reach our goals.

Hood Canal Ecosystem Recovery Plan Development and IWP Update

HCCC is the Local Integrating Organization (LIO) for the Hood Canal Action Area under the Puget Sound Action Agenda structure. HCCC's 2014 IWP formed the basis for Hood Canal LIO Ecosystem Recovery Plan (LIO Plan) development in 2016. Given the significant monetary and social capital expended in the development of HCCC's preceding foundational strategic

document, HCCC elected to develop the LIO Plan first as a translation of the IWP into the Action Agenda planning framework, while utilizing the opportunity to update elements and fill gaps.

HCCC conducted its own Hood Canal pressure assessment using expert elicitation in 2013. This assessment prioritized the sources of environmental stresses in the region for the development, focusing, and prioritizing of the IWP. Those results were compared to the Puget Sound Pressure Assessment for consistency. During the development of this plan, the re-organization of ecosystem focal component required that the pressure assessment ratings be re-analyzed to align our understanding of the identified pressures and their linkages to the new focal components.

The development of the LIO Plan provided an opportunity to further build our watershed-based approach to ecosystem recovery. HCCC built on the IWP's initial effort at integrating across geographies, fields of practice, and ecosystem components, to further integrate elements of HCCC's work, notably, salmon recovery planning and implementation. To that end, strategies from the Chinook Salmon Recovery Plan Mid-Hood Canal chapter, as well as the Hood Canal Summer Chum Recovery Plan guidance materials, and the Hood Canal Lead Entity workplan were integrated with IWP strategies and actions. Salmon recovery projects were combined with Near Term Actions to create a truly integrated implementation plan that captures current Hood Canal projects advanced for implementation and highlights implementation priorities.

Revisions to the IWP in the development of the LIO ERP were guided by the IWP Steering Committee, a sub-committee of the HCCC Board of Directors. A team of local experts and practitioners provided input on new elements, before the draft plan was recommended by the IWP Steering Committee to the HCCC Board of Directors for adoption. In the interim before the plan was finalized, the IWP Steering Committee and technical workgroup participated in strategic prioritization workshops to rate strategies as an initial step of a priority setting process. The HCCC Board of Directors reviewed and approved the prioritization rating results for inclusion in the final LIO Ecosystem Recovery Plan. Final adoption was completed by the majority approval of the HCCC Board of Directors.

This 2016 IWP update combines and integrates the content revised in the LIO Plan development process with the structure and content of the original IWP. Updated sections are noted throughout the document.

Hood Canal's Ecosystem

The Hood Canal consists of many watersheds that drain into a narrow fjord roughly 65 miles long, around the Great Bend at its southern end, and averages 1.5 mi wide (Figure A). The many rivers and streams emanate from the Olympic and Kitsap Peninsulas and south Puget Sound, and flow into Hood Canal. The Hood Canal watershed's freshwaters mix with marine waters in the canal before exiting the fjord at the northern end, where it opens into the Strait of Juan de Fuca on the western edge of Puget Sound.

The Hood Canal watershed is home to many species and a complex ecosystem that extends from glaciated mountains, through temperate forests, down rivers and streams that fan out

into estuaries as freshwaters mix with the salt waters brought in from the Pacific Ocean. The saltwater fjord is shallow in places but reaches depths as much as 400-500ft. These bathymetric variations create unique deep water habitat, but also impede water circulation. At the shallow southern end of the fjord, low dissolved oxygen content in the water column can create hypoxic conditions at certain times of the year, resulting in fish kill events. Hood Canal's rivers support the eight salmon and trout species that use freshwater and marine systems throughout the Pacific Northwest. Hood Canal Summer Chum salmon, Chinook salmon, steelhead trout, and bull trout are all *listed as threatened under the Endangered Species Act*. Shellfish thrive in Hood Canal, supporting a popular recreational fishery, for many species of clams, oysters, shrimp, and crab. Commercial shellfish growers also utilize Hood Canal's prime conditions for their production. Much of Hood Canal's uplands are publicly owned forests that make up the Olympic National Park and state managed timberlands.

Hood Canal is home to a natural resource-based community that has long thrived on its rivers and forests, and abundant marine life. The Port Gamble S'Klallam and Skokomish Tribes have lived in the area since time immemorial, and still call it home. Subsistence gathering of fish, shellfish, and forest products continues as a staple food source and cultural tradition for the tribe. Early European settlers established natural resource-based industries, building thriving timber and fisheries. Currently, Hood Canal is still home to an active timber history, and well known for its iconic shellfish growers. The Hood Canal landscape has seen changes throughout its history of natural resource use, but Hood Canal community members remain close to the environment. Tourism is now a steady driver of the seasonal economy, as recreationalists and vacationers seek out Hood Canal's ample nature opportunities, including county, state, and national parks. The area's population is a mix of year-round residents, and seasonal visitors. The summer months bring a large influx of tourists and visitors to the seasonally-occupied vacation homes and campgrounds to experience Hood Canal's peaceful surroundings, recreation, and food gathering opportunities.

Hood Canal residential areas are mostly spread across the shoreline and rural landscape. Population centers include the City of Port Townsend, and the communities of Port Ludlow and Port Hadlock in the north, and Hoodsport and Belfair in the South.

IWP Framework

The Hood Canal IWP was originally developed and updated according to the Conservation Measures Partnership's *Open Standards for the Practice of Conservation* framework (Open Standards). The original IWP took a narrowed approach, to allow HCCC to strategically focus its work on a sub-set of focal components, pressures, and strategies. The scope of the IWP has since expanded. To incorporate a broader set of ecosystem components representing an integrated social-ecological system, and an expanded suite of ecosystem pressures to better represent the conditions and threats facing Hood Canal.

A glossary of terms utilized in the Open Standards framework is available in Appendix 1.

Ecosystem Components

Ecosystem Components are the focus of the recovery effort. The strategies and actions comprising the IWP are designed to improve or protect the health of ecosystem components either through restoration strategies or protection or mitigation strategies that reduce pressures on the ecosystem. Goals were identified for ecosystem components and, where possible and appropriate, the contribution toward the regional recovery targets are identified.

The scope of the initial IWP (2014) planning process was narrowed to allow the HCCC to strategically focus its work on a sub-set of ecosystem **focal components, pressures, and strategies**. These priority focal components were selected because of their importance to local communities, their emphasis in numerous management and conservation plans, and their links to other focal components.

Selection of ecosystem components also included identification of indicators for ongoing monitoring of ecosystem conditions and HCCC's progress toward the goals outlined in the IWP (Appendix 2).

During the 2016 update for the LIO Ecosystem Recovery Plan, the ecosystem focal components were re-organized to better align with our integrated priorities, including the process conducted to adopt focal components and indicators of human wellbeing, and better represent the entire Hood Canal ecosystem. The new set of ecosystem components are summarized in Table 1 below, with the corresponding old IWP focal components (including the early 2013 ecosystem focal components, and the final set of 2014 IWP focal components), and the human wellbeing elements added in 2015. Additional attributes of each ecosystem component, including species, ecological and biophysical properties, and ecosystem services, are described in below.

Human Wellbeing Components

In 2013, HCCC participated in a [pilot social science study](#) (Biedenweg 2013), to develop indicators of human wellbeing for the Hood Canal watershed. This pilot study went on to inform the recommendation of new human wellbeing Vital Sign indicators for the Puget Sound Partnership's Action Agenda.

Ecosystems benefit people in many ways, providing clean water, food, recreation, and have cultural, spiritual and psychological significance. Natural resources are also a significant contributor to the local economy. It is important to demonstrate and measure the connection between human wellbeing and Hood Canal's forests, beaches, and water, to capture local values in order to achieve long-term recovery and preservation of those resources.

Six domains define human wellbeing:

- Psychological Wellbeing
- Physical Health
- Social Wellbeing

- Cultural Wellbeing
- Governance
- Economic Wellbeing

Table 1: Hood Canal IWP Ecosystem Components. Updated Ecosystem Components are shown, with corresponding focal components from previous versions of the IWP.

Hood Canal Ecosystem Components			
Biophysical - Habitats and Species		Social – Human Wellbeing	
Updated Ecosystem Components	Old IWP Focal Components	Updated Ecosystem Components	Old IWP Focal Components & New Human Wellbeing Indicators
Forests	Forests ^{^*}	Physical Health	Availability of local food Water for human health and prosperity [^]
Beaches and Nearshore	Beaches [^] Salmon ^{^*} Shellfish ^{^*}	Psychological Wellbeing	Positive emotions
Deltas and Estuaries	Estuaries [^] Shellfish ^{^*} Salmon ^{^*}	Cultural Wellbeing	Traditional resources practices Recreation Cultural heritage [^]
Rivers and Floodplains	Rivers [^] Riparian Areas [^] Salmon ^{^*}	Governance	Communications
Marine Deepwater	Bottomfish [^] Salmon ^{^*}	Social Wellbeing	Strong communities
		Economic Wellbeing	Industry <ul style="list-style-type: none"> - Forestry^{^*} - Commercial shellfishing^{^*} - Commercial fishing[^] - Agriculture[^] - Recreation/Tourism[^]

[^]2013 IWP Focal Component (15)

^{*}2014 IWP Focal Component (5)

The HCCC Board of Directors considered the resulting recommendations from the Hood Canal pilot study and formally adopted nine indicators under new ecosystem focal components for

Human Wellbeing. The adoption of indicators to monitor the human wellbeing condition of Hood Canal was the result of HCCC’s Board of Director’s ongoing discussion regarding the need to better address the strong connection between Hood Canal communities, and its natural resources. HCCC’s vision explicitly identifies humans as the ultimate benefactor of a healthy Hood Canal. Human wellbeing indicators provide a mechanism to actively explore and monitor those connections, in order to sustain them into the future.

The theory and methodology behind human wellbeing indicators is an evolving field of science. HCCC continues to participate with regional social scientists to advance our efforts and improve monitoring protocols. HCCC began monitoring one indicator for each human wellbeing component in 2014 using both quantitative and qualitative data collection methods (Scott et al. 2014). These indicators are not meant to comprehensively capture all aspects of complex ecosystem relationships. Rather, human wellbeing indicators complement our environmental indicators to provide a snapshot of the social-ecological health of Hood Canal.

Our human wellbeing and environmental indicators will be refined and expanded in the future. Indicator assessments will help inform and evaluate IWP strategies for social and ecological benefits, and will better tell the story of people and our values related to the natural environment in Hood Canal.

In 2015, HCCC launched [Our Hood Canal](#), a web-based “living report” of an initial sub-set of indicators – one for each ecosystem focal component – shown in the figure below, where current indicator status and supporting information is available.

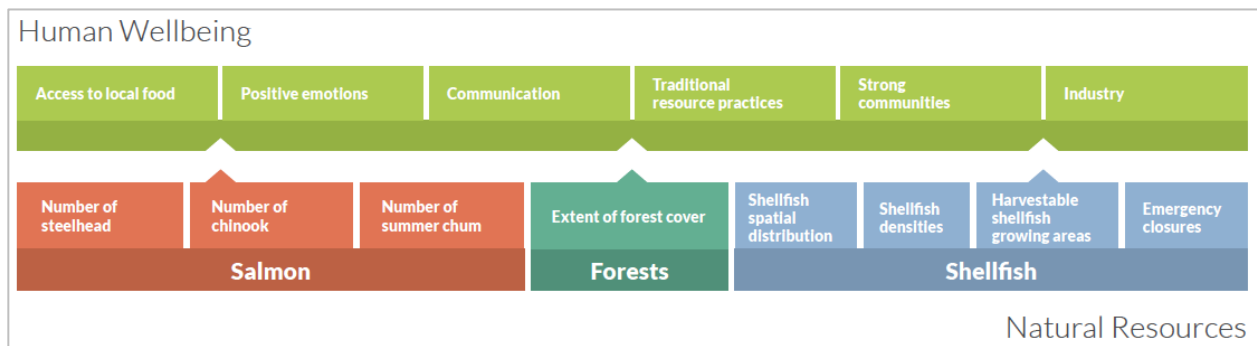


Figure 1: 2015 HCCC IWP indicators, reported on [OurHoodCanal.org](#)

Beaches and Nearshore

Shoreline zones of usually gently sloping, unconsolidated sediments/sand moved by waves, wind and tidal current. Beaches include associated tidal wetlands and lagoons formed by longshore processes, backshore areas beyond the reach of normal tides and waves, associated shoreline and marine riparian vegetation and eelgrass beds, steep bluffs that are often contributing sediments to beach areas, and barrier beaches and spits created by wave action

and sediment deposition seaward of the original coastline. This includes all habitats (e.g., forage fish spawning habitat) and ecological processes associated with beaches and bluffs. Beaches and nearshore areas provide important habitat and ecosystem services for out-migrating juvenile and returning adult salmonids, as well as numerous shellfish species. Healthy salmon and shellfish populations will result in increased recreational, ceremonial, and subsistence harvest after meeting sustainable escapement rates for both natural and hatchery populations.

Healthy shoreline zones require the following attributes: increased quantity of sediment feeder bluffs, connected drift cells, healthy eel grass populations, and sufficient quantity and quality of adjacent riparian areas. Hood Canal's shoreline zones are managed according to tribal, federal, state, and local regulations for uses including: Shellfishing, recreational access, and ecosystem restoration projects and programs. The Washington Shellfish Initiative includes a series of measures that apply to Hood Canal's beaches.

Goals and Ecosystem Contributions

- Support the increase in abundance, escapement, productivity, and diversity of salmonids to delist endangered populations and enable harvest
- Protect and restore priority nearshore and beaches and their formative processes to ensure sufficient supply and quality of intertidal and tidally influenced habitat, to maintain drift cell connectivity
- Maintain harvestable bivalve populations throughout Hood Canal public and private tidelands
- Establish Hood Canal salmon habitat goals for nearshore areas
- Remove more shoreline armoring or install more soft armoring, than the amount of new hard armoring added to Hood Canal shorelines
- Prioritize nearshore and shoreline areas for restoration
- Restore/protect nearshore habitat (including feeder bluffs and sediment processes, and vegetation) in priority areas
- Increase native oyster populations
- Decrease rate of annual beach closures due to poor water quality
- Maintain 100% of shellfish beds open for harvesting throughout Hood Canal
- Investigate and correct all pollution hotspots from freshwater runoff in priority shoreline areas

Deltas and Estuaries

River deltas are formed at the mouths of streams and rivers where the slowing of water flow results in sediment deposition. Estuaries are partially enclosed water bodies where salt water from Hood Canal and freshwater from terrestrial drainage are exchanged freely. This includes tidal wetlands, tidal channels, mudflats, salt marsh and fringing vegetation communities, eelgrass beds, and ecological processes associated with deltas and estuaries.

Hood Canal’s estuaries and river deltas support a diversity of aquatic and terrestrial species. Anthropogenic inputs of sediment, storm water, wastewater, and nearby development can impair the ecological processes necessary to sustain healthy estuaries and river deltas. Estuarine health requires sufficient supply of tidally influenced wetlands, unobstructed tidal channels, mudflats and salt marshes, adjacent riparian areas, and healthy eelgrass beds.

Hood Canal deltas and estuaries provide important habitat and ecosystem services for salmonids and many native shellfish species and support our local shellfish industries, as well as provide places that support our wellbeing.

Estuaries and river deltas are managed through the implementation of tribal, federal, state and local environmental regulations. Salmon recovery plans have prioritized the protection and restoration of Hood Canal’s estuaries and river deltas, while the Washington State Shellfish Initiative (WSI) includes a series of measures that will also apply to estuary and river deltas of Hood Canal.

Goals and Ecosystem Contributions

- Increase tidal and freshwater connectivity, wetland extent, channel complexity in priority areas
- Support the increase in abundance, escapement, productivity, and diversity of salmonids to delist endangered populations and enable harvest
- Establish Hood Canal salmon habitat goals for deltas and estuaries
- Increase eelgrass populations

Forests

Upland and coastal forests that support a range of forest types, age classes and species and are managed for public and private protected lands, working lands and residential ownership. Healthy functioning forests require an optimum balance of forest management objectives to achieve benefits for all aspects of ecological and human wellbeing.

Comprehensive forest practice laws and regulations govern forestry activities on Federal, State and private timberlands in the Hood Canal watershed and throughout Washington State. These laws and regulations, including Federal and State Habitat Conservation Plans as well as the Washington Forests and Fish Law, have been approved by the Federal agencies and are designed to meet Federal Endangered Species Act requirements as well as compliance with the Clean Water Act on working forest lands in Washington State.

Goals and Ecosystem Contributions

Restore and maintain healthy functioning forests and the ecosystem services they provide in order to protect aquatic and terrestrial resources.

1. Increase forest diversity
2. Maintain the area and productivity of managed timber lands
3. Maintain forest cover in residential areas

Marine Deepwater

Marine deep waters provide ecosystem services that support a variety of bottom-dwelling species, including fish and shellfish. Bottom fish can be categorized into two groups by their habitat preferences: soft-bottom, and rocky-bottom habitats. Soft-bottom habitats support flatfishes (i.e., English sole, sanddab, halibut, starry flounder), ratfish, and some codfishes, as well as shellfish (i.e., geoduck, Dungeness crab, spot shrimp). Rocky-bottom habitats support rockfishes, ling cod, and wolf eels giant pacific and octopus. Some bottom fish, such as rockfish (*Sebastes* spp.) are long-lived and slow to mature and reproduce. Marine deepwaters also support migrating salmonids during [life stage]. Marine deepwaters of Hood Canal play a significant role in the canal's water quality due to biophysical factors, such as variable bathymetry, that can lead to low dissolved oxygen conditions at the surface. These areas contribute to our wellbeing by supporting recreational fisheries and diving industries, and supporting the ecosystem processes that keep the Hood Canal ecosystem flourishing.

Goals and Ecosystem Contributions

- Support the increase in abundance, escapement, productivity, and diversity of salmonids to delist endangered populations and enable harvest
- Decrease human influence on low dissolved oxygen conditions in Hood Canal:
 - Research Hood Canal Bridge impacts on water circulation
 - Investigate and correct all pollution hotspots from freshwater runoff in priority shoreline areas
- Increase the abundance, productivity, and diverse age structure for bottomfish and shellfish, including English sole, rockfish, ling cod, spot shrimp, Dungeness crab, geoduck clams

Rivers and Floodplains

Riparian areas are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. They include those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine–marine shorelines. (Brennan and Culverwell 2004 (adapted from NRC 2002). "Riparian habitat" means land adjacent to water bodies, as well as submerged land such as streambeds, which can provide functional habitat for salmonids and other fish and wildlife species. Riparian habitat includes, but is not limited to, shorelines and nearshore marine habitat, estuaries, lakes, wetlands, streams, and rivers. (Washington State definition of riparian habitat, from ESB 5396 (2005)). The health of these vitally important transition zones requires:

- Maintained connections between ground water and surface water hydrology
- Functioning riparian areas that support mature canopy cover and diverse biotic communities

- Sufficient connectivity within and between riparian areas to support exchanges of energy and matter with aquatic systems.

Rivers and streams provide ecosystem services for rearing and migrating salmonids, transport freshwater to Hood Canal’s marine areas, and enable opportunities to enhance many aspects of human wellbeing. The health of Hood Canal’s riparian areas is managed through the implementation of tribal, federal, state and local regulations, functional plans, and restoration/protection projects. Riparian areas are protected, maintained or restored through the implementation of local critical areas ordinances, shoreline management programs, comprehensive flood plans, salmon recovery plans, federal Habitat Conservation Plans, Washington State forest practices law/rules and a diverse set of conservation district programs, private property stewardship practices, and other collaborative public/private programs.

Goals and Ecosystem Contributions

- Maintain water quantity and quality to improve all aspects of freshwater salmonid habitat
- Support the increase in abundance, escapement, productivity, and diversity of salmonids to delist endangered populations and enable harvest
 - Restore priority river and floodplain habitats
 - Establish Hood Canal habitat goals for rivers and floodplains
- Monitor pollution sources in freshwater systems in order to correct and prevent pollutants from entering Hood Canal waterways
- Limit water withdrawals to maintain normative flows
- Work with forest landowners to implement forest management plans in order to maintain normal rates of sediment transport
- Increase connectivity between streams and floodplains
- Increase the integrity of riparian areas that support mature, continuous, and connective vegetation communities and biodiversity

Cultural Wellbeing

Many harvesting traditions center around natural resources in Hood Canal, including fishing, clam digging and clam bakes, hunting, mushroom and plant gathering, and carving, and includes tribal and non-tribal traditional resource practices.

Goal: Hood Canal residents and visitors who gather or hunt wild local food resources are able to access and sufficiently harvest the resource as much as needed.

Indicator: Traditional Resource Practices

Status: Good

Results are mixed; the majority of respondents reported that they harvest at sufficient rates, however barriers exist to different income levels, indicating that local food resources are not necessarily a key ecosystem good for all Hood Canal residents. (Scott et al. 2014)

Economic Wellbeing

Major industries, including forestry, commercial shellfishing, agriculture, and recreation-based tourism, rely on natural resources to provide employment and economic contributions to Hood Canal community wellbeing.

Goal: Provide opportunities throughout the area for natural resource based industries to sustainably co-exist on their working lands with a healthy ecosystem and contribute significantly to the economic wellbeing of Hood Canal communities.

- Increase and maintain open shellfish growing areas
- Protect the provisioning of ecosystem services on timberlands
- Protect agricultural lands from conversion to development

Indicator: Natural Resource Industries

Status: Good

Natural resource industries remain a significant element of the Hood Canal economy, in terms of tradition and culture, as well as revenue, and jobs. Each industry has fluctuated at different rates over time. As more data becomes available, the analysis of these economic contributions will continue. (Data sources: U.S. Bureau of Economic Analysis, WA Department of Commerce, U.S. Department of Agriculture Census Data, Northern Economics, Inc.)

Governance

Good communication and understanding of natural resource issues requires information availability from a trusted source.

Goal: Hood Canal residents and visitors can easily and consistently access trustworthy natural resource information sources.

Indicator: Communication

Status: Fair

Residents learn the most from other residents, followed by traditional news sources (Scott et al. 2014)

Physical Health

Access to clean water and natural places where local wild food can be harvested (e.g., hardshell clams, crabs, shrimp, salmon, deer, elk, mushrooms, rose hips, willow, cedar, other plants or animals), and recreation can occur is important for physical health. In addition, harvesting local food maintains cultural traditions, and typically involves physical activity outdoors.

Goal: Natural places are accessible, and clean water and wild local food resources are sufficiently available for harvest and consumption.

Indicator: Access to Local Wild Food

Status: Good

Participation and harvest rates for fishing, shellfishing, and hunting have remained steady over the past decade. (Data source: Washington Department of Fish and Wildlife)

Psychological Wellbeing

People often have a connection to a specific place within Hood Canal, from a favorite hike or lookout for reflection to a secret harvesting site or beach for family gatherings. Many also experience feelings associated with the area in general.

Goal: 90% of Hood Canal residents and visitors frequently feel positive emotions from their experiences in the natural environment.

Indicator: Positive Emotions

Status: Very Good

Hood Canal residents regularly experience positive emotions from experiencing the outdoors. (Scott et al. 2014)

Social Wellbeing

Communities are connected and strengthened by their participation in natural resource activities, such as their management and harvesting. Community trust is both necessary for community collaboration and is built by working together.

Goal: Hood Canal community members feel connected to their communities through natural resource activities, and participate in such activities at least three to four times a year.

Indicator: Strong Communities

Status: Good

Many residents reported participating in community activities a few times a year, representing a healthy community with capacity to become more engaged in the future. (Scott et al. 2014)

Ecosystem Pressures

Pressures are the human actions or natural processes that give rise to stress on the ecosystem, but also may provide benefits to humans. By understanding the pressures and the underlying sources and stressors, HCCC can better define the context we are working within and where we need to intervene to make progress on recovery.

Under the initial scope of the IWP, planning participants identified up to 26 pressures that were impacting one or more of the 15 original ecosystem focal components. The pressures were

rated for each ecosystem focal component-pressure relationship according to expert opinion of three aspects of the relationship:

- **Scope:** The spatial proportion of the ecosystem focal component that is affected by the pressure
- **Severity:** Within the scope, the level of damage to the ecosystem focal component from the pressure given the current circumstances and trends
- **Irreversibility:** The degree to which the effects of a pressure can be reversed, and the impact restored

The three criteria ratings were combined into a summary rating for each pressure.

In the 2014 IWP, the HCCC IWP Steering Committee selected only the pressures with a “very high” summary rating as priorities. For the 2016 update, the pressures ratings were re-evaluated for their relationships with the new ecosystem components. The original set of “very high” rated pressures was rated similarly

for 2016, with some additional pressures selected as priorities due to their impacts on many different focal components. The HCCC pressure results play an important role in developing priority strategies and identifying beneficial outcomes. Table 2 shows Hood Canal’s highest rated pressures. The HCCC pressure ratings are linked to ecosystem components in Table 3.

Appendix 3 contains a list of all pressure sources and stressors of concern in Hood Canal.

Table 2: Hood Canal’s highest rated pressures

HCCC Pressure Assessment (2016)	
Priority Pressures	Summary Rating
Climate change	Very High
Transportation & service corridors	Very High
Ground water withdrawal	High
Domestic & commercial wastewater to on-site septic	High
Livestock farming & ranching	Medium
Surface water withdrawal	Medium
Freshwater shoreline infrastructure	Medium
Marine shoreline infrastructure	Medium
Residential & commercial development	Medium
Runoff from residential & commercial lands	Medium

Table 3. Pressures and their relationship to Vital Signs and components in Hood Canal

Pressure	Standard Classification	Beaches & Nearshore	Deltas & Estuaries	Forests	Marine Deep-water	Rivers & Flood-plains	Summary Threat Value
Residential & Commercial Development	T10.10: Housing & Urban Areas	Medium	Medium	Medium		Medium	Medium
Livestock Farming & Ranching	T20.40: Livestock Farming & Ranching		Low			High	Medium
Transportation & Service Corridors	T40.30: Shipping Lanes	Very High	High	Medium	High	High	Very High
Surface Water Withdrawal	T70.20: Dams & Water Management/Use		Medium		Low	Medium	Medium
Ground Water Withdrawal	T70.20: Dams & Water Management/Use		High		Low	High	High
Freshwater shoreline infrastructure	T70.30: Other Ecosystem Modifications		Medium			Medium	Medium
Marine shoreline infrastructure	T70.30: Other Ecosystem Modifications	Medium	High				Medium
Domestic and Commercial Wastewater to Onsite Septic	T91.10: Household Sewage & Urban Wastewater	High	High		High	High	High
Runoff from residential and commercial lands	T91.10: Household Sewage & Urban Wastewater	Medium	Medium		Medium	Medium	Medium
Climate Change	T91.50: Air-Borne Pollutants	Very High	Very High	Very High	Very High	Very High	Very High

Ecosystem Context

Conceptual models were developed for the IWP’s priority ecosystem pressures illustrating the relationships between ecosystem components, pressures and their associated impacts, and strategies to address those impacts and pressure sources. As the conceptual model was built out for each priority pressure, interrelationships were identified between other pressures and the multiple strategies, sub-strategies, or actions that play a role in addressing the contributing factors of that pressure. These connections started to reveal themes and major strategies

began to develop. As those strategies were identified, The IWP Core Team built out draft versions of each conceptual model in order to inform strategy development. The conceptual models were combined where appropriate in areas with significant overlapping pressures and pressure sources. They are listed below with descriptions for each major recovery strategy. Conceptual model diagrams can be viewed at [this link](#).

Shoreline, Estuaries, and Nearshore

This conceptual model displays the primary pressures (and underlying contributing factors) that are directly or indirectly influencing the status and condition of Beaches and Nearshore, Deltas and Estuaries, and Rivers and Floodplains. Pressures include the legacy of past marine and freshwater shoreline infrastructure development, transportation infrastructure, and residential and commercial development. Marine and shoreline infrastructure can shade shallow water habitat (an issue in marine systems), harden shorelines and disrupt natural sediment and hydrological dynamics that create and maintain shoreline and nearshore habitats. Transportation and service corridor infrastructure can lead to these same impacts as well as impede movement of migrating species, reducing access to important spawning and rearing habitats.

A legacy of past shoreline development activities in Hood Canal occurring prior to a full understanding of the implication these actions have on ecological system is a significant contributor to direct and indirect pressures. Presently, challenges related to a complex array of land use policies and regulatory frameworks that are sometimes inconsistent or unevenly applied across jurisdictional boundaries add to potential impacts to shoreline, nearshore, and estuarine habitats. These issues lead to development patterns that do not adequately protect ecological values.

This conceptual model also illustrates how human wellbeing components are supported by ecosystem services delivered by ecological components. It highlights the social benefits produced by stewarding ecological systems in Hood Canal.

Strategies intending to reduce the impact of these pressures focus on protecting less altered shorelines, restoring structure and function of shoreline habitats in areas that are expected to produce the greatest ecological outcomes, improving planning and regulatory frameworks to ensure they are applied consistently and appropriately across jurisdictional boundaries, and raising awareness and understanding among shoreline landowners to promote actions that restore or better protect shoreline ecological values. Additionally, salmon recovery efforts will include a focus on shoreline and nearshore areas that provide critical habitat for native salmonid species.

Water Quality

This conceptual model illustrates how direct and indirect pressures related to water quality impact the status and conditions of all of Hood Canal's ecological components – Forest, Beaches and Nearshore, Deltas and Estuaries, Rivers and Floodplains, and Marine Deepwater. Pressures that have the greatest impact on water quality conditions include domestic and

commercial on-site septic (OSS), and stormwater runoff from the built environment, including commercial and residential development and transportation and service corridors. These pressures increase rates of nutrient and pathogen loading into Hood Canal's aquatic ecosystems that then promote an increase in the frequency and magnitude of algal blooms. Elevated primary productivity is associated with dissolved oxygen depletion issues in Hood Canal marine waters – often resulting in fish kills. Other impacts include the introduction and spread of human pathogens and toxic chemicals that result in the closure of shellfish harvesting areas.

Chief contributing factors to water quality related pressures include incidences of failing or underperforming septic systems due to age or inadequate maintenance practices, the expansion of impervious surfaces associated with increased development occurring outside designated urban growth areas (resulting in increased stormwater runoff), and stormwater runoff from working agricultural lands.

Interventions intending to improve water quality in Hood Canal focus on preventing pollution from entering Hood Canal waters at their sources through implementation of the Hood Canal Regional PIC Program, improving planning and regulatory frameworks that are designed to protect water quality, implementation of the Hood Canal Regional Stormwater Retrofit Plan to promote onsite treatment of stormwater runoff, and implementation of agricultural best management practices also aimed at reducing agricultural runoff.

Forests and Freshwater

This conceptual model focuses on the context of efforts to protect and restore forests and associated freshwater systems in Hood Canal. Pressures influencing the status and condition of Forests and Rivers and Floodplains are linked to the status and condition of all downstream components including Deltas and Estuaries, Beaches and Nearshore, and Marine Deepwater. Direct and indirect pressures include the legacy of historic land management strategies, climate change, the existing built environment and supporting infrastructure along with continued development pressure converting forestland to other uses.

There is a particular emphasis on strategic interventions that seek to restore the structure and function (habitat forming and maintaining processes) necessary to recovery self-sustaining and resilient populations of native salmonids. Strategies include continued planning and development of knowledge regarding salmon needs and factors limiting productivity and the identification and prioritization of the type and location of recovery actions.

In addition, there are strategies that focus on the identification of areas that retain high ecological values but are at risk of conversation to other uses – and the investigation of protection strategies including land use policies, conservation easements, or outright acquisition.

Shellfish Culture

The shellfish conceptual model outlines strategies designed to improve all aspects of Hood Canal's shellfish culture including subsistence and recreational harvest, commercial growing, and reintroduction of native species into areas where they have been extirpated. The overarching strategy is to convene an inclusive and collaborative partnership to develop and implement a plan that addresses barriers for enhancing Hood Canal's culture of shellfish and focuses on reducing primary pressures - climate change, OSS management, and contaminated stormwater runoff.

Climate Change

This conceptual model maps out the potential implications of climate change on the ecological and human wellbeing components of Hood Canal. The model identifies biophysical implications of a changing climate and conceptualizes the linkages between the impacts and Hood Canal's ecological components – Forests, Rivers and Floodplains, Deltas and Estuaries, Beaches and Nearshore, and Marine Deepwater. All human wellbeing components will also be directly or indirectly impacted. Interventions include a full assessment of climate change impacts and associated risks to ecological and social values and the development of climate change adaptation strategies that seek to reduce impacts to the relevant biophysical factors and ultimately all ecological components.

Communications and Outreach

This conceptual model illustrates the role that strategic communications plays in reducing all primary pressures and advancing successful stewardship of all of the plan's ecological components - Forests, Rivers and Floodplains, Deltas and Estuaries, Beaches and Nearshore, and Marine Deepwater, and human wellbeing components. Strategies include development of a communications plan that defines HCCC's role, external communications priorities for the organization as well as for each of HCCC's program areas. Strategies also define HCCC's desired role as the central information source for ecosystem recovery serving project partners, local decision makers and the general public.

Strategies

HCCC developed "theories of change" associated with specific strategies or suites of strategies in the form of results chain diagrams to document and test assumptions about how specific strategies and actions are intended to effect change in the ecosystem. Results chain diagrams help to build shared understanding of the context within which ecosystem recovery occurs. They help explain the logic behind recovery strategies to determine if recovery efforts are likely to achieve near-term objectives and longer-term goals. Results chains also provide a structure for assessing the effectiveness of specific actions and for redirecting efforts if a specific action is determined to be ineffective.

The IWP strategies and sub-strategies address the priority pressures identified for the Hood Canal ecosystem. Strategies are outlined below, and full strategy descriptions and associated theories of change are available in Appendix 4 with more detailed descriptions of the strategic logic that leads to ecosystem outcomes for select strategies. Implementation projects associated with the strategies are listed in Appendix 5. The strategies do not include every action necessary for ecosystem recovery, but are focused around key approaches and within the purview of the HCCC and its partners. Definitions of common terms are available in Appendix 1.

1.0 Protect and restore Hood Canal shoreline

Prevent future impacts from shoreline modifications, mitigate unavoidable impacts, restore shoreline habitat in priority areas, and protect intact habitats, especially feeder bluffs and priority shellfish and eelgrass beds. These protections require a suite of approaches, including land use policy and regulatory improvements, public outreach and behavior change strategies, and acquisition and restoration actions.

1.1 Remove/soften/prevent shoreline armoring

1.1.1 Outreach and education on shoreline protection and stewardship

1.1.1.1 Outreach and education on shoreline protection and stewardship to shoreline property owners

1.1.1.2 Outreach and education on shoreline protection and stewardship to real estate developers

1.1.1.3 Outreach and education on shoreline protection and stewardship to contractors

1.1.1.4 Outreach and education on shoreline protection and stewardship to political leaders

1.1.2 Improve shoreline planning and regulatory frameworks

1.1.2.1 Identify opportunities to improve and align shoreline protections across Hood Canal

1.1.2.2 Develop incentives for landowners to protect shoreline habitats

1.2 Protect and restore priority estuarine salmonid habitat

1.2.1 Adaptively manage salmon recovery plans for Hood Canal watersheds (estuarine habitats)

1.2.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal

1.2.1.2 Develop and update Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan

1.2.1.3 Develop and update Skokomish Chinook Recovery Plan chapter

1.2.1.4 Develop and update Mid-Hood Canal Chinook Recovery Plan chapter

- 1.2.1.5 Develop and update Hood Canal Steelhead Recovery Plan
- 1.2.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (estuarine habitats)
- 1.2.3 Implement priority salmon recovery projects (estuarine habitats)
 - 1.2.3.1 Hood Canal and Eastern Strait of Juan de Fuca Summer Chum estuarine habitat actions
 - 1.2.3.2 Skokomish Chinook estuarine habitat actions
 - 1.2.3.3 Mid-Hood Canal Chinook estuarine habitat actions
 - 1.2.3.4 Hood Canal Steelhead estuarine habitat actions

1.3 Protect and restore priority nearshore and marine salmonid habitat

- 1.3.1 Adaptively manage salmon recovery plans for Hood Canal (nearshore and marine habitats)
 - 1.3.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal
 - 1.3.1.2 Develop and update Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan
 - 1.3.1.3 Develop and update Skokomish Chinook Recovery Plan chapter
 - 1.3.1.4 Develop and update Mid-Hood Canal Chinook Recovery Plan chapter
 - 1.3.1.5 Develop and update Hood Canal Steelhead Recovery Plan
- 1.3.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (nearshore and marine habitats)
- 1.3.3 Implement priority salmon recovery projects (nearshore and marine habitats)
 - 1.3.3.1 Hood Canal and Eastern Strait of Juan de Fuca Summer Chum nearshore and marine habitat actions
 - 1.3.3.2 Skokomish Chinook nearshore and marine habitat actions
 - 1.3.3.3 Mid-Hood Canal Chinook nearshore and marine habitat actions
 - 1.3.3.4 Hood Canal Steelhead nearshore and marine habitat actions

2.0 Protect and improve Hood Canal water quality

Ensure that Hood Canal water quality supports the species and our activities that rely on it. Pollution sources are often from on-site septic systems (OSS) but can also be related to wildlife activity. Continue to advance the state of knowledge around best practices for water quality monitoring and conduct outreach to ensure homeowners are properly maintaining their OSS.

2.1 Prevent pollution sources from entering Hood Canal marine and fresh waters

- 2.1.1 Monitor priority shoreline areas and streams for pollution and contaminants
 - 2.1.1.1 Implement Hood Canal Regional PIC Program
- 2.1.2 Improve planning and regulatory frameworks for water quality protection
 - 2.1.2.1 Identify opportunities to align and improve water quality protections
- 2.1.3 Reduce impacts from stormwater runoff
 - 2.1.3.1 Reduce impacts of stormwater runoff from transportation and service corridors, and urbanized areas
 - 2.1.3.2 Reduce impacts of stormwater runoff from agricultural lands
- 2.1.4 Water quality outreach and education
 - 2.1.4.1 Landowner outreach and education on private property water quality protections
 - 2.1.4.2 Decision-maker outreach on water quality protections in policy
 - 2.1.4.3 Public outreach and education on water-based activities

2.2 Investigate low dissolved oxygen content in Hood Canal marine waters

- 2.2.1 Assess impacts of water circulation impediments in Hood Canal
- 2.2.2 Form research agenda to investigate knowledge gaps related to low-dissolved oxygen in Hood Canal

3.0 Protect and restore Hood Canal forests and freshwater salmonid habitat

Apply a variety of tools to identify, restore, and protect ecologically important forested areas and their associated freshwater systems (rivers, streams, and wetlands). Aim to reduce the impacts of historic land management activities, climate, and ongoing permanent conversion of forestlands to other uses.

Outline interventions to gather and process information that informs and adaptively manages river and stream habitat restoration actions designed to contribute to the recovery of viable self-sustaining populations of native salmonids.

3.1 Hood Canal forests and Open Space Strategy

- 3.1.1 Prioritize forest lands for protection based on ecological value and risk of conversion
- 3.1.2 Promote land use policies that support ecological protections
 - 3.1.2.1 Identify opportunities to align and improve land use protections
 - 3.1.2.2 Outreach to small and large forest landowners

3.2 Protect and restore priority freshwater salmonid habitat

- 3.2.1 Adaptively manage salmon recovery plans for Hood Canal watersheds (freshwater habitats)

- 3.2.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal
- 3.2.1.2 Develop and update Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan
- 3.2.1.3 Develop and update Skokomish Chinook Recovery Plan chapter
- 3.2.1.4 Develop and update Mid-Hood Canal Chinook Recovery Plan chapter
- 3.2.1.5 Develop and update Hood Canal Steelhead Recovery Plan
- 3.2.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (freshwater habitats)
- 3.2.3 Implement priority salmon recovery projects (freshwater habitats)
 - 3.2.3.1 Hood Canal and Eastern Strait of Juan de Fuca Summer Chum freshwater habitat actions
 - 3.2.3.2 Skokomish Chinook freshwater habitat actions
 - 3.2.3.3 Mid-Hood Canal Chinook freshwater habitat actions
 - 3.2.3.4 Hood Canal Steelhead freshwater habitat actions

4.0 Hood Canal Shellfish Initiative

Develop the Hood Canal Shellfish Initiative. The initiative will seek innovative solutions to address the barriers to achieving balance between recreational, subsistence, and commercial shellfish harvest, native species restoration, water quality protection, and relative land use issues. This will result in an action plan that outlines the necessary steps that HCCC and its partners can take to collaboratively achieve desired outcomes, to enhance Hood Canal shellfish resources and the industry and cultural values it supports.

4.1 Develop and implement Hood Canal Shellfish Initiative Action Plan

4.2 Support ecological sustainable commercial shellfish operations in Hood Canal

4.3 Protect and restore Hood Canal shellfish populations

- 4.3.1. Restore native shellfish populations

4.4 Increase non-commercial shellfish harvest activities in Hood Canal

- 4.4.1 Enhance public access to shellfish harvesting areas
- 4.4.2 Enhance tribal shellfish subsistence harvest

5.0 Proactively prepare for climate change Impacts across Hood Canal

Improve understanding of biophysical (or ecological) impacts resulting from a changing climate. Hood Canal is already seeing the impacts of a changing climate. As air and water temperatures rise, species migrate, seasonal patterns and sea chemistry changes, and sea levels rise, HCCC

must be proactive, anticipating potential impacts and developing interventions to meet these changes with smart adaptive measures. This more complete knowledgebase will result in the identification and implementation of adaptation strategies designed to mitigate or reduce the impacts influencing the status and condition of all ecological components (Forests, Beaches and Nearshore, Deltas and Estuaries, Rivers and Floodplains, and Marine Deepwater), associated ecosystem services, and all human wellbeing components.

5.1 Develop Hood Canal Climate Adaptation Plan

5.2 Integrate climate adaptation interventions throughout HCCC and member jurisdiction planning and programs

5.3 Improve climate resilience of salmon habitat

5.3.1 Consider climate resilience in all salmon recovery project design

5.3.2 Implement salmon recovery actions identified to benefit climate resilience

6.0 Outreach on IWP implementation effectiveness and ecosystem improvements

Develop and deliver communications to organizational partners, decision makers, and community members to inform them of the circumstances and context of ecosystem recovery efforts, actions that are being taken to achieve recovery objectives and goals, and progress toward implementing actions and reaching long term desired outcomes.

6.1 Develop and implement HCCC Strategic Communications Plan

6.1.1 Clarify messaging around HCCC's role in the region and how to engage with partners and the public

6.1.2 Identify external communications priorities

6.2 Maintain role as central information source on Hood Canal ecosystem recovery

6.2.1 Maintain HCCC website as information resource for project partners and local decision makers

6.2.2 Maintain ecosystem status reports on OurHoodCanal.org website

A list of all IWP projects (including Near Term Actions and Salmon Recovery Projects), organized by strategy and sub-strategy, is included in Appendix 5.

Prioritizing Hood Canal Recovery

Introduction

Comprehensive and simultaneous implementation of the full suite of strategies contained in the Hood Canal IWP is constrained by limitations in time, available funding, organizational capacity, and other challenges. Considering these constraints, the IWP Steering Committee sought to actuate the IWP's strategic framework, to make it a guiding framework that puts

words into action and directs where efforts should be prioritized. A prioritization framework was developed to help inform the selection of a sub-set of strategies that would be the focus of HCCC's efforts over the next five (or more) years. Prioritization of the IWP strategies provides a compass for Hood Canal ecosystem recovery.

HCCC used the "*Guidance for Development of LIO Ecosystem Recovery Plans* (Puget Sound Partnership, April 25, 2106)" and guidance associated with the Conservation Measures Partnership's *Open Standards for the Practice of Conservation* to create a customized prioritization framework that would meet the specific needs and circumstances of the Plan and HCCC.

A key objective of this process was to engage the participation of as many members of the IWP Steering Committee, IWP Technical Committee, and HCCC staff as possible to ensure that all relevant perspectives would be reflected in the results. These groups include decision makers, elected officials, resource managers, subject area experts, and staff with direct practical experience and responsibility in strategy implementation.

Prioritization Framework and Process

The prioritization focused on third tier (three digit) sub-strategies, selected because they provided enough detail to distinguish comparable attributes between sub-strategies, but were high-level enough to encompass a variety of implementation approaches. Exceptions to the third-tier sub-strategies include strategies *4.0-Hood Canal Shellfish Initiative* and *5.0-Proactively Prepare for Climate Change Impacts Across Hood Canal*. In these cases, second tier (two digit) sub-strategies were scored because the approaches call for focused planning efforts before more specific sub-strategies could be identified and developed. It is important to emphasize that underlying this prioritization effort is the understanding that all strategies included in the Plan have already been elevated by a collective sense of priority among the IWP Steering Committee and HCCC Board of Directors. This prioritization effort was not conducted with the intention of eliminating low-scoring strategies, but to obtain a relative sense of priorities to inform the direction of Hood Canal recovery.

The prioritization framework was designed so that participants would score each sub-strategy against a set of three main criteria:

- Potential impact
- Feasibility
- Readiness

The criteria were further broken down by specific attributes (Table 3).

Table 3: HCCC Strategic Prioritization Rating Criteria

Criteria	Example Rating
Potential Impact	
Given the current state of knowledge regarding the strategy's effectiveness what is the likelihood that it will successfully reduce or mitigate pressures and achieve stated goals of ecosystem components?	Very High: There is a very high degree of certainty (>75% probability) that the strategy, if fully implemented, will reduce or mitigate associated pressures and achieve the stated goals of each related ecosystem component.
	High: There is a reasonable degree of certainty (50-75% probability) that the strategy, if fully implemented, will reduce or mitigate associated pressures and achieve the stated goals of each related ecosystem component.
	Medium: There is a modest degree of certainty (25-50% probability) that the strategy, if fully implemented, will reduce or mitigate associated pressures and achieve the stated goals of each related ecosystem component.
	Low: There is a low degree of certainty (<25% probability) that the strategy will reduce associated pressures and achieve the stated goals of each related ecosystem component.
Feasibility	
Technical Feasibility To what degree are established and proven methods and technologies available to fully implement the strategy within the timeframe identified in the implementation objectives?	Very High: Established methods and technologies currently exist and are readily available to fully implement the strategy within identified timeframes.
	High: Established methods and technologies are currently available and have a mostly successful record of effectiveness.
	Medium: Methods and technologies currently exist but have a mixed or varied success rate.
	Low: Methods and technologies to implement the strategy are conceptual or not yet developed or proven.
Funding Availability To what degree are relevant funding programs available to support the strategy's implementation	Very High: Accessible and sufficient (relative to cost) funding programs currently exist to fully implement the strategy. Application success rates are typically high.
	High: Relevant programs exist but are only partially sufficient to implement the strategy. Application success rates are moderately high.
	Medium: Funding programs exist but are competitive or have relatively low success rates for applicants.
	Low: Specifically-relevant funding programs have not been identified and may not currently exist.
Organizational Capacity To what degree does HCCC and/or its partners have the capacity (staff time and expertise) to	Very High: HCCC and/or partners currently have the capacity (staff time and expertise) required to successfully implement the strategy
	High: HCCC and/or partners have the requisite expertise but limited time to implement the strategy. Qualified consultants are readily available to support implementation of the strategy.
	Medium: HCCC and/or partners have sufficient capacity to manage a consultant but do not have the time or sufficient expertise to participate in completing related activities.

implement the strategy?	Low: HCCC and/or partners do not have the expertise or time to implement the strategy or manage a consultant.
Readiness for Implementation	
Political Opportunity To what degree does the strategy have political support from local, state, federal decision-makers?	Very High: HCCC board members have unanimously designated the strategy as a clear priority and are prepared to actively support its implementation. Other elected officials or decision-makers are also supportive. A policy opportunity to leverage the effort exists the near term.
	High: HCCC board members are unanimously supportive or neutral (will not oppose) of the strategy. Other elected officials or decisions-makers are also supportive or non-oppositional. A policy opportunity can be generated to leverage the effort in the near future.
	Medium: HCCC board member support is mixed but the majority is supportive or neutral. A policy opportunity is not readily clear, but may be possible in the future.
	Low: HCCC board members have not designated the strategy as a priority and/or are actively in opposition. A policy opportunity does not exist at this time.
Social Context To what degree does the community support the strategy? Are the relative stakeholders engaged?	Very High: The majority of impacted Hood Canal communities is actively supportive of the strategy and views it as a priority. Little if any active opposition exists.
	High: Hood Canal communities are moderately supportive of the strategy or unconcerned by its implementation.
	Medium: Hood Canal communities are generally indifferent about the strategy with relatively low levels of support or opposition.
	Low: There is significant community opposition of the strategy in Hood Canal communities and little if any active support.

Scoring

Possible scores for each criterion ranged on a relative scale between 1 (Low), 2 (Medium), 3 (High), and 4 (Very High), Table 3 shows HCCC’s detailed criteria and scoring guidance. This guidance for each possible score was provided to help ensure that scoring rationale was consistent for all scorers. Criterion scores were weighted to represent HCCC’s perspective on their relative importance in determining overall priorities. Participants were not required to score all sub-strategies and could omit scores in cases where they lacked sufficient knowledge or experience.

It is important to acknowledge that scoring strategies in this way is a subjective exercise and can be influenced by a variety of factors that define the unique perspective of each participant. For example, scoring judgment can be influenced by their official positions (who they represent), experience, understanding of relevant issues, and values. Diverse participants and broad expertise were recruited in this process to ensure that final scores reflected the diversity of perspectives across Hood Canal.

The strategies were ranked by their total score, to present an ordered list of relative priority. **Final scores are not meant to be viewed as precise measures but to offer a general sense of**

relative importance based on the criteria. The results of this framework are intended to be used as one of several inputs to inform discussions and deliberations for selecting strategies that will be integrated into HCCC's workplan.

Workshops

Two prioritization workshops were scheduled to maximize participation and ensure representation from all HCCC member jurisdictions. Guidance materials and ranking worksheets were provided prior to the workshops to allow participants with time to review information, identify emerging questions, and begin formulating their scores.

The workshop format promoted discussion and dialog between HCCC staff, board members, and technical advisors to allow participants to share their scores, ask questions, and gain a more complete and consistent understanding of the strategies, their implications, and the varied perspectives represented. Most of the discussion focused around strategies with a wide range in scoring results. Participants were given the opportunity to explain their rationale and, if desired, alter their scores if their understanding or perceptions changed.

Prioritization Results

Fourteen individuals participated in the workshops and up to 12 scores were submitted for each sub-strategy/criterion pairing. Participants representing the same organization and attending the same workshop submitted a single score. Diverse participation was sufficiently achieved as all HCCC member jurisdictions were represented by a board member, jurisdictional staff, technical advisors, or some combination of positions/roles.

Average scores were calculated for each sub-strategy/criterion, weightings applied, and total scores calculated by summing all scored criteria for each sub-strategy (Table 4). The highest possible score was 19.6 (all 4s) and the lowest possible score was 4.9 (all 1s). Actual scores for the Plan's sub-strategies fell between 11.0 to 15.8, with over half (18) scoring above 14.5. The generally-high scores of the majority of strategies reflect the high degree of importance and relevance of all sub-strategies in the Plan. Overall rankings are listed in parentheses after each sub-strategy title in Table 4.

Again, given the subjectivity inherent in the scoring process these numerical results are not intended to be interpreted as precise measures of priority. They are intended to offer guidance and insights into a decision-making process that considers a variety of factors important to select which strategies will be the focus of HCCC's efforts over the next several years. For example, strategies that are important for establishing the enabling conditions necessary for successful implementation, such as planning or communications and outreach, may rank low on potential impact but are still critical in advancing the long-term goals of the Plan.

Table 4: HCCC Strategic Prioritization Rating Results, Organized by Strategy

Sub-Strategy (overall ranking, by total score)	Potential Impact	Feasibility	Readiness	Total Score
1.0 Protect and restore Hood Canal shoreline				
1.1.1 Outreach and education on shoreline protection and stewardship (19)	4.3	5.0	4.9	14.2
1.1.2 Improve shoreline planning and regulatory frameworks (29)	5.0	4.4	3.3	12.7
1.2.1 Adaptively manage salmon recovery plans for Hood Canal watersheds (estuarine habitats) (9)	5.3	4.9	4.9	15.1
1.2.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (estuarine habitats) (20)	4.6	4.9	4.6	14.1
1.2.3 Implement priority salmon recovery projects (estuarine habitats) (6)	5.3	4.9	5.1	15.3
1.3.1 Adaptively manage salmon recovery plans for Hood Canal (nearshore and marine habitats) (15)	4.9	5.0	4.9	14.7
1.3.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (nearshore and marine habitats) (22)	4.2	5.0	4.8	14.0
1.3.3 Implement priority salmon recovery projects (nearshore and marine habitats) (17)	5.0	4.9	4.7	14.6
2.0 Protect and improve Hood Canal water quality				
2.1.1 Monitor priority shoreline areas and streams for pollution and contaminants (5)	5.4	4.9	5.1	15.4
2.1.2 Improve planning and regulatory frameworks for water quality protection (23)	5.1	4.6	4.1	13.8
2.1.3 Reduce impacts from stormwater runoff (27)	5.5	3.2	4.1	12.9
2.1.4 Water Quality Outreach and Education (16)	4.6	5.0	5.0	14.6
2.2.1 Assess impacts of water circulation impediments in Hood Canal (30)	4.0	3.8	4.2	11.9
2.2.2 Form research agenda to investigate knowledge gaps related to low-dissolved oxygen in Hood Canal (26)	4.5	4.2	4.2	12.9
3.0 Protect and restore Hood Canal forests and freshwater salmonid habitat				
3.1.1 Prioritize forest lands for protection based on ecological value and risk of conversion (18)	4.8	5.1	4.7	14.6
3.1.2 Promote land use policies that support ecological protections (10)	5.3	4.9	4.7	15.0
3.2.1 Adaptively manage salmon recovery plans for Hood Canal watersheds (freshwater habitats) (1)	5.2	5.4	5.2	15.8
3.2.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (freshwater habitats) (11)	4.6	5.2	5.2	14.9
3.2.3 Implement priority salmon recovery projects (freshwater habitats) (7)	5.4	5.0	4.9	15.3
4.0 Hood Canal Shellfish Initiative				
4.1 Develop and implement Hood Canal Shellfish Initiative Action Plan (2)	5.0	5.2	5.4	15.6
4.3 Protect and restore Hood Canal shellfish populations (14)	5.0	4.2	5.5	14.8
4.3.1 Restore native shellfish populations (4)	5.3	4.9	5.3	15.4
4.4.1 Enhance public access to shellfish harvesting areas (25)	3.5	4.1	5.8	13.5

4.4.2 Enhance tribal shellfish subsistence harvest (21)	4.4	5.1	4.5	14.1
5.0 Proactively prepare for climate change Impacts across Hood Canal				
5.1 Develop Hood Canal Climate Adaptation Plan (24)	5.2	4.2	4.3	13.7
5.2 Integrate climate adaptation interventions throughout HCCC and member jurisdiction planning and programs (31)	4.6	3.6	3.7	11.9
5.3 Improve climate resilience of salmon habitat (28)	4.5	3.9	4.4	12.7
6.0 Outreach on IWP implementation effectiveness and ecosystem improvements				
6.1.1 Clarify messaging around HCCC's role in the region and how to engage with partners and the public (3)	4.5	5.1	5.9	15.5
6.1.2 Identify external communications priorities (13)	4.4	5.0	5.4	14.8
6.2.1 Maintain HCCC website as information resource for project partners and local decision makers (8)	4.5	5.1	5.7	15.3
6.2.2 Maintain ecosystem status reports on OurHoodCanal.org website (12)	4.4	4.9	5.6	14.9

The scoring results can also be interpreted in different ways to answer specific questions. For example, which strategies are predicted to deliver the greatest ecosystem impact regardless of political or social readiness or availability of funding?

Next Steps: Utilizing strategic prioritization results

The strategic prioritization results provide the data to inform the HCCC Board of Directors on the selection of both near term and long term strategic priorities. HCCC's capacity and funding limitations require difficult decision-making to put the prioritization results into action. The results will be evaluated to assess how they reflect HCCC's current programs and efforts, suggest shifts in resources to better address highest rated strategies across the three criteria, and inform HCCC's future direction and the enabling conditions required to get us there.

Gaps and Barriers

Table 5 summarizes the barriers, gaps, and resource needs HCCC identified as they relate to ecosystem recovery planning at both the local and regional level.

Table 5: Barriers to accomplishing ecosystem recovery in the LIO area

Barrier	Description	Resources Needed
Data	Ecological assessment data is needed to inform the development and prioritization of strategies. This includes assessments of habitat types quality and assessments of policy effectiveness.	Technical resources are needed to conduct the necessary research and assessments.
Target-Goal setting	Setting goals for board ecosystem components with long lag times for measurable outcomes is extremely difficult and problematic. LIOs rely on our partners to produce this science. Ideally, PSP would facilitate the dissemination of Vital Sign target status information broken out by LIO area to inform how each LIO develops strategies and evaluation the potential contribution to Puget Sound wide goals.	Technical resources are needed.
Partner capacity	HCCC relies on our member jurisdictions for much of our partner participation – this means that a lot is asked of our counties’ staff. With budget constraints, counties are often unable to dedicate their time to participate in LIO processes, either because they are not funded to do so, or they simply have no capacity within their workload. A component of this disinterest is the lack of payoff they have seen from previous efforts, especially in the 2016 NTA round. Local government and NGO staff were not pleased with the amount of work required to submit NTA proposals, and were especially disappointed when most did not receive funding for their projects.	The planning effort to pay-off ratio needs to be balanced for PSP processes in order to keep local stakeholders at the table. Funding for participating in meetings and prolonged planning processes should be provided to participants.
Planning fatigue	Partners and stakeholders are no longer interested in participating in more planning. Especially in HCCC’s case, when our partners expertise and capacity was expended over the course of five years to develop our Integrated Watershed Plan (IWP), which had only been completed for less than two years before the LIO Ecosystem Recovery Plan	Time to implement the plans that are in place, to evaluate effectiveness and adapt as necessary – without a new planning process or product required.

	<p>planning process was initiated. To reduce the amount of work HCCC asked of our partners, HCCC staff did much of the translating from the IWP into the LIO Ecosystem Recovery Plan, and only asked participants to vet completed drafts of plan elements.</p>	
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Adaptive Management

Adaptive management is an iterative process in order to: 1) raise key questions regarding the optimum approach for achieving recovery goals; 2) design ways to answer those questions and address major issues; and 3) incorporate new monitoring data and other relevant information into decision making to improve strategy design and implementation. Adaptive management can help address questions about how to make progress and attain our recovery goals, as well as identify the impact of proposed actions. Adaptive management allows for flexibility to be incorporated into design and implementation due to uncertainty and the need to adjust based on future conditions.

The current state of knowledge regarding the status of ecological and social systems in Hood Canal and valued Hood Canal species is imperfect. This reality, along with an acknowledged level of uncertainty regarding the effectiveness of strategies, requires systematic and continuous evaluation of progress towards achieving desired outcomes.

A comprehensive evaluation of both implementation and change in ecosystem condition (desired impact) will occur at the end of the first five years and will inform the development of the next iteration of the IWP/LIO Ecosystem Recovery Plan. A comprehensive review of strategic effectiveness, and resulting plan updates will occur at five-year intervals. The Theories of Change for each strategy will be updated regularly as projects are implemented, informing annual/biennial solicitations for project proposals according to the Puget Sound Action Agenda update schedule, and annual Salmon Recovery Funding Board processes.

Other elements of the IWP and its supporting framework will continue to be developed as implementation of the five-year strategic priorities occurs. Re-assessment of strategy prioritization for project planning (i.e. for the Near Term Action, and Salmon Recovery Project planning cycles) will occur with each annual cycle. Subsequent versions will reflect an expansion, retraction, or shift in scope as informed by the evaluation process and an assessment of changing circumstances, improved understanding, and/or effectiveness of strategies.

The IWP will continue to evolve to reflect regional priorities and provide a vision for Hood Canal recovery.

Communicating Progress

HCCC has launched OurHoodCanal.org, a web-based ecosystem report card to communicate progress toward desired impacts to Hood Canal communities and regional stakeholders. Indicators associated with each focal component are assessed to produce a state of the Hood Canal report.

References

Biedenweg, Kelly, and Adi Hanein. 2013. *Developing Human Wellbeing Indicators for the Hood Canal Watershed*. U of Washington - Puget Sound Institute. Rep. Tacoma, WA

Scott, Tyler, Ryan Scott, and Kelly Biedenweg. 2014. *Measuring Human Wellbeing Indicators for Hood Canal*. U of Washington - Puget Sound Institute. Rep. Tacoma, WA.

Appendix 1: Glossary of Terms

Actions: Focus on delivery of a specific outcome or output associated with a desired result. Actions include capital projects (e.g., restoration and acquisition), program development or implementation, education and outreach, research, etc. Actions can be completed on a near-term (i.e., 2 years or less) or longer-term time scale.

NTA: Near Term Action, adopted by the LIO for inclusion in the 2016 Acton Agenda. The NTA's identifier is shown as its ID number in the 2016 Action Agenda.

SRP: Salmon Recovery Project, approved via the Hood Canal Lead Entity process in 2016 for recommendation to the Salmon Recovery Funding Board for implementation, or on the Lead Entity workplan to be submitted in subsequent funding rounds. The SRP's unique project ID is included in its description.

Component: Ecosystem or human wellbeing components are the things we care about conserving. They can be individual species, habitat types, ecological processes, or ecosystems chosen to encompass the full breadth of conservation objectives for a specific project. Human wellbeing components are those aspects of human wellbeing related to the natural environment that are the focus of recovery efforts or will benefit from recovery of the ecosystem in the LIO.

Contributing factor: Contributing factors include the indirect threats, root causes, underlying factors, and other factors contributing to the existence or persistence of pressures. Contributing factors can be social, political or ecological and they can also include opportunities or factors outside the scope of the recovery effort, such as regional population growth or global market forces.

Goal: A goal is a desired future condition of a habitat, species, or attribute of human wellbeing.

Effectiveness indicators: Most often developed for critical intermediate results within a results chain, or those that can provide the most information about whether actions are having the desired effects. They can include indicators of implementation, effectiveness, or validation and are used to assess whether progress is being made toward specific objectives and goals. In the Measuring Effectiveness tables in the following section, indicators are rated as follows: 4 = Very High Priority, 3 = High Priority, 2 = Medium Priority, 1 = Low Priority, blank = Priority Not Specified.

Intermediate results: The expected changes following the implementation of a strategy or action that are necessary steps toward achieving a desired future status or goal. Within a results chain, intermediate results may be identified for results boxes (blue) as well as pressure reduction boxes (purple).

Objectives: The desired outcomes for a subset of intermediate results, most often those which are easily monitored or those which provide the most useful information about effectiveness of a specific course of action.

Pressure sources: Human actions that contribute to the creation of stressors that degrade the ecosystem of human wellbeing components. Pressure sources, although often damaging to the environment are often beneficial to humans in other ways.

Strategy: A strategy is a bundle of actions that, when combined, are intended to achieve a common goal. Strategies are intended to mitigate pressures or their underlying conditions and root causes, restore ecosystems or species populations, or provide capacity to achieve goals. Strategies include one or more actions (capital projects, programs, etc.) and are designed to achieve specific outcomes, objectives, and goals.

Stressors: The most proximate causes of ecosystem degradation, such as shoreline hardening, land conversion or altered flows.

Appendix 2: IWP Ecosystem Indicators

Table 6: IWP ecosystem indicators

Focal Component	Indicator	Units	Sample Frequency	Current Status	Desired Future Condition	Responsible to Measure
Shellfish	Shellfish spatial distribution	Acres where shellfish are present	TBD	TBD	TBD	WDFW
Shellfish	Shellfish densities	Number of shellfish per square meter	TBD	TBD	TBD	WDFW
Shellfish	Acres of harvestable shellfish growing areas in Hood Canal	Acres	Ongoing	TBD	TBD	WA Dept. of Health
Shellfish	Emergency closures	Number of acres	Ongoing	TBD	TBD	WA Dept. of Health
Commercial Shellfishing	Value of shellfish	\$	TBD	TBD	TBD	TBD
Commercial Shellfishing	Number of permits pending or issued		TBD	TBD	TBD	WDFW
Forestry	Value of harvested timber	Stumpage value	TBD	TBD	TBD	TBD
Forest	Extent of forest cover by type	Acres of evergreen, deciduous, mixed	TBD	TBD	TBD	TBD
Salmon	Number of spawners by population	Spawning abundance measured by populations of Summer Chum,	TBD	TBD	TBD	TBD

		Steelhead and Chinook. Reported as a number either annually or seasonally Spawning spatial distribution and diversity measured at Hood Canal scale for Summer Chum and Chinook. Reported annually or every 2-5 years as presence/absence				
Cultural Wellbeing	Traditional resource practices	% of population (based on survey response)	Biannual	Good	TBD	TBD
Economic Wellbeing	Natural resources industries	GDP in natural resource industries	Biannual	Good	TBD	TBD
Physical Health	Access to local wild food	% of population (based on survey response)	Biannual	Fair	TBD	TBD
Governance	Communications	% of population (based on survey response)	Biannual	Good	TBD	TBD
Psychological Wellbeing	Positive emotions	% of population (based on survey response)	Biannual	Very good	TBD	TBD
Social Wellbeing	Strong communities	% of population (based on survey response)	Biannual	Good	TBD	TBD

Appendix 3: Pressure Sources and Stressors of Concern in Hood Canal

Table 7: Pressure Sources and Prioritization Ratings in Hood Canal

ID	Pressure Name	Description	Standard Classification	Description	Summary Value
1.1	Residential & Commercial Development	Human settlements or other non-agricultural land uses with a substantial footprint These sources of stress are tied to a defined and relatively compact area.	T10.10: Housing & Urban Areas	Human cities, towns, and settlements including non-housing development typically integrated with housing	Medium
2.3	Livestock Farming & Ranching	Domestic terrestrial animals raised in one location on farmed or non-local resources (farming); also domestic or semi-domesticated animals allowed to roam in the wild and supported by natural habitats (ranching) This class includes small-holder grazing, ranching or farming, and agro-industry grazing, ranching and farming, and nomadic grazing. In farming, animals are kept in captivity; in ranching they are allowed to roam in wild habitats.	T20.40: Livestock Farming & Ranching		Medium
4.3	Transportation & Service Corridors	Long narrow transport corridors and the vehicles that use them This includes transportation and utility corridors outside of human settlements and industrial developments in terrestrial and aquatic environments. These corridors are associated with specific stressors including especially fragmentation of habitats and direct species mortality.	T40.30: Shipping Lanes	Transport on and in freshwater and ocean waterways This class includes vessel traffic as well as dredging and other activities that maintain shipping lanes. It also includes wastewater discharge from tugs and non-military cargo vessel	Very High
7.2.1	Surface Water Withdrawal	Diverting or withdrawing surface water	T70.20: Dams & Water Management/ Use	Changing water flow patterns from their natural range of variation either deliberately or as a result of other activities This class focuses on the human activities that lead to either not enough water or too much water in the ecosystem in question. Note that homogenizing flows to a constant level may be outside the	Medium

				"natural range of variation." This includes surface water diversion, channelization, ditching, artificial lakes, groundwater pumping, dam construction, release of too little or cold water from dam operations, sediment control, dikes, levees, floodgates and tidegates, etc.	
7.2.2	Ground Water Withdrawal	Pumping or other extraction of ground water	T70.20: Dams & Water Management/ Use		High
7.3	Freshwater shoreline infrastructure	Armoring of freshwater shorelines and overwater structures that alter, destroy, and disturb habitats and species via a non-consumptive use, including industrial, commercial, and recreational marinas, ports and shipyards.	T70.30: Other Ecosystem Modifications		Medium
7.4	Marine shoreline infrastructure	Armoring of marine shorelines and overwater structures that alter, destroy, and disturb habitats and species via a non-consumptive use, including industrial, commercial, and recreational marinas, ports and shipyards	T70.30: Other Ecosystem Modifications		Medium
9.1.1.2	OSS - Domestic and Commercial Wastewater to Onsite Sewage Systems (OSS)	Discharges from Onsite Sewage Systems (OSS) This class includes sewage and leachates (nutrients, toxic chemicals and/or sediment) from residences and commercial facilities not connected to a municipal system (septic, small private systems, and everything with a drain field).	T91.10: Household Sewage & Urban Waste Water		High
9.1.2	Runoff from residential and commercial lands	Introduction of exotic or excess material into hydrologic system due to surface water loading and runoff from the built environment This class includes runoff from commercial and residential lands, transportation facilities and corridors, as well as hull-cleaning and other pollution from marina infrastructure and land-based boat maintenance practices (i.e. NPDES regulated activities that occur in marinas and shipyards).	T91.10: Household Sewage & Urban Waste Water		Medium

9.5	Climate Change		T91.50: Air-Borne Pollutants	Atmospheric pollutants from stationary and mobile sources This class includes smog and ozone, the specific sources of which can be difficult to determine and difficult to address.	Very High
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Table 8: Stressors of Concern in Hood Canal

ID	Stressor	Details
	Aesthetics	
	Aesthetics are supported	
10.1	Altered hydrologic regime	Shape of the hydrograph
11.3	Altered hydrological regime	Change in the shape of the hydrograph
	Altered low flows	
	Altered peak stream flows	
	Altered sediment dynamics	Supply and movement of sediments and associated habitats
	Areas blocked to migrating species are reconnected	
	Areas of historic floodplain are reconnected to river channel	
24.3	Changes in water temperature from local causes	Changes in water temperature. Changes in temperature of marine water from human-caused climate change (see 26.4) is evaluated separately.
	Changing air temperature	
	Changing freshwater temperature	
	Changing marine water temperatures	
	Changing ocean condition	
	Changing precipitation amounts and patterns	
	Commercially valuable species (plants and animals)	Provisional
1.1	Conversion of land cover for residential, commercial, and industrial use	Conversion of land cover to one dominated by residential, commercial, and/or industrial development. This stressor has to do with the reduction in extent and quality of habitat due to conversion. In the terrestrial and nearshore environments sources include residential and commercial development; in the marine environment consider conversion for marinas and other marine uses. Agriculture and aquaculture (see 01.2) and dredging (see 01.3) are assessed separately. Stress associated with disturbance due to human activities (including in developed areas) is addressed separately (see 07). Terrestrial habitat fragmentation (see 02), shoreline hardening (see 03), and barriers to terrestrial animal

		movement and migration (see 06) are addressed as separate stressors. Pollution impacts are assessed through separate stressors (see 22 through 23). Note that conversion can be step-wise process where, for example, native forest land is converted to managed forests which are then under stress for further conversion to agriculture or residential and commercial development.
	Decrease in frequency of harmful algal blooms	
	Decrease in non-point source toxic chemicals in aquatic systems	
	Decreased artificial shading in marine shallow water habitat	
	Decreased rates of nutrient and pathogen loading into Hood Canal	
	Decreased frequency and magnitude of algal blooms	
12	Disconnection from the floodplain	
	Disturbance of terrestrial and aquatic species is lessened	
	Extent, structure, and function of marine riparian areas is improved	
	Fire risk increase	
	Flood regulation is supported	
	Flood regulation processes are supported	
	Floodplain function is enhanced	
	Food web disruption	
	Fragmentation of terrestrial habitat is reduced	
	Habitat availability shifts	
25	Harmful algal blooms	Presence of biological and chemical agents associated with blooms of algae in marine and freshwater systems.
	Human health and safety is improved and protected	
	Human health and safety is supported	
	Hydrologic cycle altered	
	Impaired shellfish development	
	Impeded marine and freshwater ecological process (sediment and hydrological) are restored	
13.1	In channel structural barriers (including culverts) to water, sediment, debris flows	
	Increase frequency and magnitude of algal blooms	

	Increased beach closures	
	Increased rates of nutrient and pathogen loading into Hood Canal	
	Increased storm severity & frequency	
19.2	Introduction, spread, or amplification of human pathogens	Introduction, spread, or amplification of disease-causing or parasitic organisms to humans. Sources of this stressor include release human and animal waste. This is intended to evaluate effects on humans due to, for example, degradation in water quality and the associated degradation in the quality of aquatic species, such as shellfish, consumed by people.
	Lessened spread of disease and parasites to native species	
	Loss of nearshore function	
	Loss of riparian vegetation	
	Managed forests diminish	
	Marine species biodiversity is improved and protected	
	Native and managed biodiversity is supported	
	Natural hydrological regime is improved	
	Nearshore ecological function is improved	
	Nearshore ecological processes (sediment dynamics and hydrological) are enhanced and protected	
	Nearshore function enhanced	
	Non-point source conventional, persistent/non-persistent water pollution	
21.2	Non-point source, persistent toxic chemicals in aquatic systems	Presence or loading of persistent toxics from non-point sources, such as runoff from developed areas and roads, including from historic (legacy) sources and small (less than 10 gallons) spill events. Sources of this stressor include activities that contribute pollutants to surface water runoff, including that discharged through stormwater conveyance systems. Stress from point sources is evaluated separately, see 21.1.
	Occurrence of low dissolved oxygen levels in Hood Canal reduced	
	Ocean acidification	
	OSS inundated	
	Outdoor recreation and subsistence (hunting, fishing, mushroom picking, clamming, plants, etc.)	

	Outdoor recreation and subsistence shellfish harvest is supported	
	Physical blockage to migrating species	
	Physical blockages to emigrating juvenile salmon are removed	
	Reduced dissolved oxygen levels in Hood Canal	
	Reduced introduction, spread, or amplification of human pathogens	
	Riparian structure and function is improved	
	Riparian vegetation restored	
	Salmon harvest restricted	
	Salmon migration impaired	
	Sea level rise	
	Sediment dynamics are restored	
	Self sustaining populations of native shellfish are reestablished in priorities areas of Hood Canal	
4	Shading of shallow water habitat	Decreased light transmitted into shallow waters. This stressor causes species stresses related to productivity or altered predator-prey relationships. The primary source of this stressor is construction of overwater and on-shore structures.
	Shellfish aquaculture impaired	
	Shoreline erosion	
3	Shoreline hardening and other structural barriers to water and sediment	Change of shoreline habitat or features to conditions that reduce habitat extent and/or disrupt shoreline processes. The primary source of this stressor is the construction of shoreline infrastructure that produces a hard linear surface along the beach or stream bank to reduce erosion (e.g., sea walls, revetments, rip-rap, and rock piles#160;). Habitat conversion for residential, commercial and industrial development and other uses is evaluated separately (see O1).
	Shoreline homes threatened	
	Shoreline hydrologic and sediment dynamics are restored	
	Shoreline infrastructure impaired	
	Shoreline migrates landward	
8	Species disturbance - marine and freshwater	

	Species migration/invasive species outcompete natives	
19.1	Spread of disease and parasites to native species	Introduction, spread, or amplification of disease or parasites from human and animal waste, aquaculture, or non-native species to native species. This is meant to assess the effects of diseases and parasites that affecting species other than humans; diseases affecting humans is evaluated separately (see S2).
	Structure and function of stream and river habitat is improved	
7.1	Terrestrial and aquatic species disturbance	Alteration in the feeding, breeding, or resting behaviors of fish or wildlife due to human presence or activities associated with landscapes dominated by man-made structures, such as light and sound disturbances associated with developed areas. Includes artifacts and debris associated with human activities, except pollution impacts are evaluated through separate stressors (see V through W).
	Terrestrial and aquatic species disturbance in priority shoreline areas is reduced	
2	Terrestrial habitat fragmentation	Division of contiguous habitat into smaller discontinuous patches or different habitat types. Sources of this stressor include development of lands for agriculture, residential, commercial, or industrial uses, or roads and utility corridors. Expressions of this stressor will depend on the endpoint one is assessing. For example, bobcat and certain small passerine birds may have minimum patch size requirements on the order of 25 ha and 3 ha, respectively. Landscapes in which habitat patches are predominantly smaller than these minimums are unlikely to support these species. Disturbance due to human activities (see 07) and habitat conversion (see 01) are evaluated as separate stressors.
	Tourism supported	
	Transportation routes impacted	
	Water quality is improved and protected	
	Water quality is supported	
	Water quantity is improved and protected	
	Water quantity is supported	
	Water temperatures associated with hydrologic regime alteration are improved	
	Wild shellfish harvest restricted	

Appendix 4: Strategy Descriptions and Theories of Change

The strategies listed below are included with descriptions, Theories of Change diagrams, and associated actions or projects.

Theory of Change diagrams were developed for select strategies to illustrate our assumptions about how the strategies and actions included in the results chain are intended to help reduce pressures and achieve our recovery goals. Click on the results chain diagrams below to view enlarged versions.

All implementation projects associated with a strategy are listed in Appendix 5.

1.0 Protect and restore Hood Canal shoreline

Prevent future impacts from shoreline modifications, mitigate unavoidable impacts, restore shoreline habitat in priority areas, and protect intact habitats, especially feeder bluffs and priority shellfish and eelgrass beds. These protections require a suite of approaches, including land use policy and regulatory improvements, public outreach and behavior change strategies, and acquisition and restoration actions.

1.1 Remove/soften/prevent shoreline armoring

Prevent future impacts from shoreline modifications, improve armoring methods and practices, mitigate unavoidable impacts, restore shoreline habitat in priority areas, and protect intact habitats, especially feeder bluffs and priority shellfish and eelgrass beds to maximize potential ecological function of shoreline habitats. These protections require a suite of approaches, including land use policy and regulatory improvements, public outreach and behavior change strategies, and acquisition and restoration actions. Expected near and medium term ecological outcomes include improvements to the extent, structure, and function of marine riparian areas, restoration of nearshore habitat structure and function. The long term desired outcome is an improvement in the status of Beaches and Nearshore and Delta and Estuary habitats and the ecosystem services they provide.

Theory of Change 1.1: Remove/soften/prevent shoreline armoring

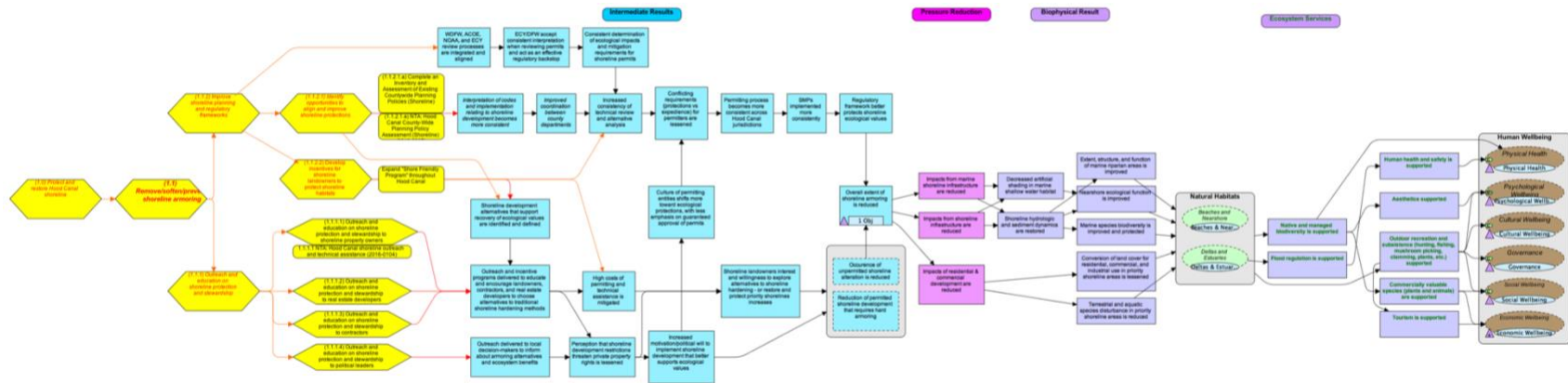


Figure 2: Strategy 1.1 results chain. [Click here](#) to view enlarged results chain diagrams.

The desired outcome of this strategy is a reduction in the extent of shoreline armoring in Hood Canal and a subsequent improvement in the status of Beaches and Nearshore and Delta and Estuary habitats and the ecological and social values they support. To achieve this outcome the strategy focuses on two primary tracks. The first track assesses and improves the current shoreline planning and regulatory frameworks so they more effectively protect the ecological function of shoreline areas. The second track will develop and deliver strategic outreach and education to shoreline property owners, developers, contractors, and political leaders to raise awareness and understanding of the implications of shoreline hardening and strategies to reverse or reduce ecological impacts where developed is appropriate.

Efforts to improve the planning and regulatory frameworks are expected to result in improved integration of state and federal shoreline development permit review processes, more consistent determination of potential impacts and mitigation requirements of shoreline actions, and more consistency across local jurisdictions in the interpretation of planning codes. Incentive programs will also be developed as part of this strategy to select alternatives landowners to select alternatives that better protect shoreline habitats.

Outreach and education actions will seek to improve understanding and awareness of alternatives to traditional shoreline armoring methods (i.e., bulkheads, seawalls, etc.). It is thought that greater awareness of the potential impacts and incentives (including financial and technical support) will motivate landowners and developers to explore and carry out alternative approaches that better protect shoreline habitats. If effective, outreach and education efforts will ultimately lead to a reduction in unpermitted and permitted shoreline armoring.

1.1.1 Outreach and education on shoreline protection and stewardship

Conduct outreach and education to entities/audiences who engage with shoreline property uses, and have a concern for its protection, safety, and access. This sub-strategy focuses on the development of outreach and incentive programs to raise awareness among shoreline landowners, decision makers, and developers, and promote the use of alternatives to traditional shoreline hardening or protection techniques that will better support critical ecological processes and functions. The underlying assumption is that with a more complete awareness and understanding of the impacts of shoreline hardening fewer permitted or unpermitted activities will occur, and where they are determined to be necessary permittees will select alternatives that protect and restore focal components related to shoreline ecological components.

1.1.1.1 Outreach and education on shoreline protection and stewardship to shoreline property owners

Conduct outreach targeting shoreline property owners to improve stewardship practices, and inform residents of available incentives for stewardship actions.

1.1.1.2 Outreach and education on shoreline protection and stewardship to real estate developers

Conduct targeted outreach and education to the real estate development industry to improve understanding of shoreline protection issues and shoreline armoring alternatives

1.1.1.3 Outreach and education on shoreline protection and stewardship to contractors

Conduct targeted outreach and education to landscape/construction contractors to improve understanding of shoreline protection issues and shoreline armoring alternatives

1.1.1.4 Outreach and Education on Shoreline Protection and Stewardship to Political Leaders

Conduct targeted outreach and education to local political to improve understanding of shoreline protection issues and shoreline armoring alternatives

1.1.2 Improve shoreline planning and regulatory frameworks

Identify and create opportunities for improving existing regulatory frameworks operating in Hood Canal so they better protect the natural processes that support ecological components associated with marine shorelines.

1.1.2.1 Identify opportunities to align and improve shoreline protections

Assess regulatory policies and implementation for shoreline armoring and land uses to better understand the regulator context throughout Hood Canal. Identify opportunities to increase consistency across Hood Canal jurisdictions to encourage practices that maximize potential ecological function. This sub-strategy will result in reducing conflicting requirements that permittees face and contribute to a regulatory framework that better supports restoration and protection of Hood Canal's shoreline areas. The implementation of this sub-strategy's actions (1.1.2.1.a) to complete an inventory and assessment of existing countywide planning policies will result in a more comprehensive understanding of the existing policy and regulatory context of Hood Canal across all jurisdictions and identify opportunities for increasing consistency in planning policies and how they are applied with regards to marine shoreline development.

1.1.2.2 Develop Incentives for Shoreline Landowners to Protect Shoreline Habitats

Assess existing best practices for shoreline land use incentive programs and identify opportunities to develop and implement or support appropriate programs for Hood Canal. The implementation of this sub-strategy will identify incentive programs to encourage landowners to engage in regulatory and voluntary programs with stewardship and ecologically sensitive behaviors that protect and preserve the ecological valuable areas along Hood Canal shorelines.

1.2 Protect and restore priority estuarine salmonid habitat

Protect and restore estuarine habitats that are critical for supporting juvenile life history stages of anadromous salmonids native to Hood Canal. Ecological outcomes will include restoration of estuarine habitat structure and function – including sediment and hydrological processes, reconnection of floodplains to river channels, and removal of impediments blocking migration of anadromous salmonids. The long term desired outcome is an improvement in the status of Delta and Estuary habitats and the ecosystem services they provide.

Theory of change 1.2 Protect and restore priority estuarine salmonid habitat

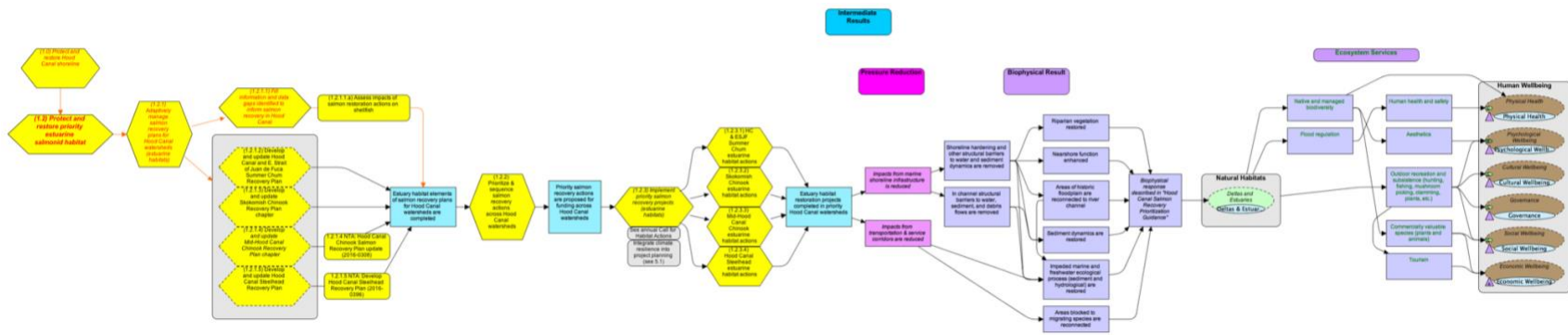


Figure 3: Strategy 1.2 results chain. [Click here](#) to view enlarged results chain diagrams.

This sub-strategy seeks to identify, prioritize, and implement actions that will restore the structure and function of critical salmon habitats across Hood Canal, including Deltas and Estuaries.

The long-term desired outcome is the restoration of habitats in sufficient quantity and in ecologically important locations across Hood Canal to ensure the sustained recovery and persistence of salmon populations. It is expected that projects achieving positive salmon outcomes will also benefit other species native to Hood Canal.

Deltas and estuaries provide critical rearing habitat for juvenile salmon as they prepare to migrate to ocean environments. Restoration and protection actions have been identified through the development of a series of salmon recovery plans and a prioritization framework. Recovery plans will be regularly updated and adapted to integrate evolving and growing scientific knowledge regarding the effectiveness of restoration actions and the linkages between functioning freshwater, estuary, and marine habitats and viable salmon populations.

Updates will be completed for:

- Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan
- Mid-Hood Canal Chinook Recovery Plan chapter
- Skokomish Chinook Recovery Plan chapter
- Hood Canal Steelhead Recovery Plan

Theory of change 1.2 Protect and restore priority estuarine salmonid habitat (cont.)

Key uncertainties have been identified and will be addressed through ongoing scientific investigations including:

- Assess impacts of salmon restoration actions on shellfish
- Nearshore synthesis of past assessments of juvenile salmonid use of estuary and nearshore areas of Hood Canal and eastern Strait of Juan de Fuca
- Nearshore habitat prioritization

Current recovery plans and prioritization frameworks have identified specific projects that will focus on reducing impacts from marine and freshwater shoreline infrastructure, transportation and service corridors, and other pressures identified in recovery planning exercises.

1.2.1 Adaptively manage salmon recovery plans for Hood Canal watersheds (estuarine habitats)

Develop and adaptively manage the estuarine elements of salmon recovery plans for Endangered Species Act (ESA) listed salmonids in Hood Canal and the eastern Strait of Juan de Fuca. Acknowledge the uncertainties associated with recovery strategies and the need to regularly build on current scientific knowledge and understanding. The sub-strategy will focus primarily on pertinent elements of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan related to the restoration and protection of estuarine habitats.

1.2.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal

Focus research and other scientific investigations on reducing key uncertainties regarding salmon and estuary habitat related factors limiting their viability to inform the development of appropriate strategies in the salmon recovery plans. This sub-strategy will focus research and other scientific investigations on reducing key uncertainties regarding salmon and estuary habitat related factors limiting their viability so that appropriate strategies are developed and implemented (1.2.1.2-5, 1.2.2, 1.2.3). This sub-strategy will focus on: 1) Assessment of the interactions of salmon restoration and protection actions and effects on shellfish culture, and 2) assessment and inventory of current nearshore habitats. All of these approaches will assist in the establishment of priorities actions that are needed to pursue affect recovery of listed salmonids.

1.2.1.2 Develop and update Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan

Update the estuarine sections of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery, including development of viable salmon population goals, and population diversity goals.

1.2.1.3 Develop and Update Skokomish Chinook Recovery Plan chapter

Update the existing salmon recovery chapter of the Puget Sound Chinook Recovery Plan for Skokomish Chinook salmon. The Skokomish Tribe has identified a comprehensive ecosystem approach towards the recovery of Puget Sound Chinook salmon in the Skokomish River watershed. Actions planned range in location from the headwaters to the marine nearshore areas.

1.2.1.4 Develop and update Mid-Hood Canal Chinook Recovery Plan chapter

Update the existing salmon recovery chapter of the Puget Sound Chinook Recovery Plan for Mid-Hood Canal Chinook salmon. Mid-Hood Canal Chinook salmon are in need of a better understanding of the issues impeding recovery.

1.2.1.5 Develop and update Hood Canal Steelhead Recovery Plan

Develop the Hood Canal steelhead Recovery Plan. Hood Canal steelhead populations that contribute to overall Puget Sound Steelhead wellbeing are in need of further examination including the issues that impacts steelhead survival and the actions needed to address those issues.

1.2.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (estuarine habitats)

Utilize the prioritization tools for salmon recovery actions across Hood Canal salmonid stocks and watersheds developed by the HCCC Salmon Recovery Program. This guidance adapts with new information, and as projects are completed, informing the annual Hood Canal Lead Entity “Call for Actions.” See [Lead Entity](#) Call for Projects for more detail.

1.2.3 Implement priority salmon recovery projects (estuarine habitats)

Implement the actions that will contribute to the restoration and protection of estuarine habitats that are critical for supporting juvenile and adult life history stages of anadromous salmonids native to Hood Canal. This sub-strategy will focus on strategic implementation of planned salmon recovery projects occurring in estuarine habitats in the Quilcene, Duckabush, Dosewallips, Salmon/Snow, and Skokomish Dewatto and Union river watersheds. Utilize the annual “Call for Actions” facilitated by the Hood Canal Lead Entity to solicit for prioritized salmon recovery projects in focused watersheds areas. The

Hood Canal Lead Entity, with extensive stakeholder engagement through its Technical Advisory Group, Community Advisory Group, and Citizens Committee, will review and recommend projects to the Salmon Recovery Funding Board.

1.2.3.1 Hood Canal and Eastern Strait of Juan de Fuca Summer Chum estuarine habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Hood Canal and Eastern Strait of Juan de Fuca Summer Chum salmon estuary restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.2.3.2 Skokomish Chinook estuarine habitat actions

See annual [Hood Canal Lead Entity](#) projects list for prioritized Skokomish Chinook salmon estuary restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.2.3.3 Mid-Hood Canal Chinook estuarine habitat actions

See annual [Hood Canal Lead Entity](#) projects list for prioritized Mid-Hood Canal Chinook salmon estuary restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.2.3.4 Hood Canal Steelhead estuarine habitat actions

See annual [Hood Canal Lead Entity](#) projects list for prioritized Hood Canal steelhead estuary restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.3 Protect and restore priority nearshore and marine salmonid habitat

Protect and restore nearshore and marine habitats (structure and function) that are critical for supporting juvenile and adult life history stages of anadromous salmonids native to Hood Canal. Ecological outcomes expected to result from this suite of strategies include restoration and protection of nearshore ecological processes that shape and maintain habitat critical to salmonids and remediation of migration corridors blocked by existing transportation infrastructure. The long term desired outcome is an improvement in the status of Beaches and Nearshore habitats and all the ecosystem services they provide.

Theory of change 1.3: Protect and restore priority nearshore and marine salmonid habitat

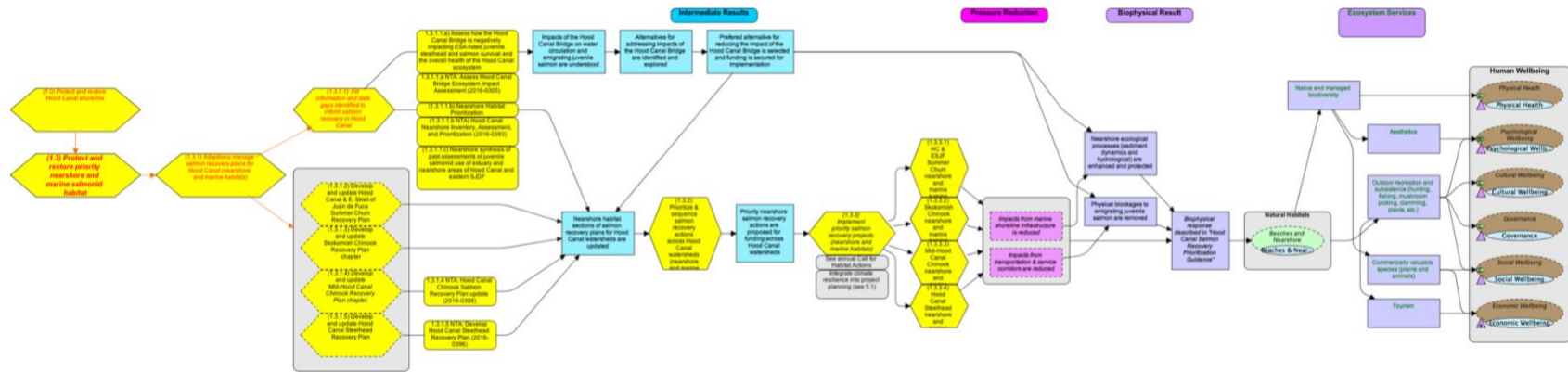


Figure 4: Strategy 1.3 results chain. [Click here](#) to view enlarged results chain diagrams.

This set of sub-strategies seeks to identify, prioritize, and implement actions that will restore the structure and function of critical salmon habitats across Hood Canal Beaches and Nearshore.

The long-term desired outcome is the restoration of habitats in sufficient quantity and in ecologically important locations across Hood Canal to ensure the sustained recovery and persistence of salmon populations. It is expected that projects achieving positive salmon outcomes will also benefit other species native to Hood Canal.

Beaches and nearshore habitats are critical rearing habitats and migratory corridors for juvenile and adult salmon. Restoration and protection actions have been identified through the development of a series of salmon recovery plans and a prioritization framework. Recovery plans will be regularly updated and adapted to integrate evolving and growing scientific knowledge regarding the effectiveness of restoration actions and the linkages between functioning freshwater, estuary, and marine habitats and viable salmon populations.

Updates will be completed for:

- Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan
- Mid-Hood Canal Chinook Recovery Plan chapter
- Skokomish Chinook Recovery Plan chapter
- Hood Canal Steelhead Recovery Plan

Theory of change 1.3: Protect and restore priority nearshore and marine salmonid habitat (cont.)

Key uncertainties have been identified and will be addressed through ongoing scientific investigations including:

- Assess how the Hood Canal Bridge is negatively impacting ESA-listed juvenile steelhead and salmon survival and the overall health of the Hood Canal ecosystem
- Nearshore synthesis of past assessments of juvenile salmonid use of estuary and nearshore areas of Hood Canal and eastern Strait of Juan de Fuca
- Nearshore habitat prioritization

Current recovery plans and prioritization frameworks have identified specific projects that will focus on reducing impacts from marine and freshwater shoreline infrastructure, transportation and service corridors, and other pressures identified in recovery planning exercises.

1.3.1 Adaptively manage salmon recovery plans for Hood Canal (nearshore and marine)

Develop and adaptively manage the nearshore elements of salmon recovery plans for Endangered Species Act (ESA) listed salmonids in Hood Canal and the eastern Strait of Juan de Fuca. Acknowledge the uncertainties associated with recovery strategies and the need to regularly build on current scientific knowledge and understanding. The sub-strategy will focus primarily on pertinent elements of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan related to the restoration and protection of nearshore and marine habitats.

1.3.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal

Focus research and other scientific investigations on reducing key uncertainties regarding salmon and nearshore habitat related factors limiting their viability so that appropriate strategies are developed and implemented. A key approach will be to complete an assessment and synthesis that improves understanding of juvenile use of estuary and nearshore habitats (1.3.1.1.b) and potential impacts of the Hood Canal Bridge on movement of juvenile salmon and water circulation patterns (1.3.1.1.a). The information will inform the adaptive management of salmonid recovery plans, and guide prioritization of recovery actions (1.3.2) needed to address identified issues (1.3.3).

1.3.1.2 Develop and update Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan

Update the nearshore sections of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery, including development of viable salmon population goals, and population diversity goals.

1.3.1.3 Develop and update Skokomish Chinook Recovery Plan chapter

Update the existing salmon recovery chapter of the Puget Sound Chinook Recovery Plan for Skokomish Chinook salmon. The Skokomish Tribe has identified a comprehensive ecosystem approach towards the recovery of Puget Sound Chinook salmon in the Skokomish River watershed. Actions planned range in location from the headwaters to the marine nearshore areas.

1.3.1.4 Develop and update Mid-Hood Canal Chinook Recovery Plan chapter

Update the existing salmon recovery chapter of the Puget Sound Chinook Recovery Plan for Mid-Hood Canal Chinook salmon. Mid-Hood Canal Chinook salmon are in need of a better understanding of the issues impeding recovery.

1.3.1.5 Develop and update Hood Canal Steelhead Recovery Plan

Develop the Hood Canal steelhead Recovery Plan. Hood Canal steelhead populations that contribute to overall Puget Sound Steelhead wellbeing are in need of further examination including the issues that impacts steelhead survival and the actions needed to address those issues.

1.3.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (nearshore and marine habitats)

Utilize the prioritization tools for salmon recovery actions across Hood Canal salmonid stocks and watersheds developed by the HCCC Salmon Recovery Program. This guidance adapts with new information, and as projects are completed, informing the annual Hood Canal Lead Entity “Call for Actions”.

1.3.3 Implement priority salmon recovery projects (nearshore and marine habitats)

Implement the actions that will contribute to the restoration and protection of nearshore and marine habitats that are critical for supporting juvenile and adult life history stages of anadromous salmonids native to Hood Canal. This sub-strategy will result in the strategic implementation of planned salmon recovery projects occurring in priority marine nearshore areas. The Hood Canal Lead Entity will distribute an annual “Call for Actions” to solicit for the highest priority actions using updated guidance and research related to recovery needs and prioritization across Hood Canal. The Hood Canal Lead Entity, with

extensive stakeholder engagement through its Technical Advisory Group, Community Advisory Group, and Citizens Committee, will review and recommend projects to the Salmon Recovery Funding Board.

1.3.3.1 Hood Canal and ESJF Summer Chum nearshore and marine habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Hood Canal and Eastern Strait of Juan de Fuca Summer Chum salmon nearshore restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.3.3.2 Skokomish Chinook nearshore and marine habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Skokomish Chinook salmon nearshore restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.3.3.3 Hood Canal Chinook nearshore and marine habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Mid-Hood Canal Chinook salmon nearshore restoration projects recommended for funding to the Salmon Recovery Funding Board.

1.3.3.4 Hood Canal Steelhead nearshore and marine habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Hood Canal steelhead nearshore restoration projects recommended for funding to the Salmon Recovery Funding Board.

2.0 Improve and protect Hood Canal water quality

Ensure that Hood Canal water quality supports the species and our activities that rely on it. Pollution sources are often from on-site septic systems (OSS) but can also be related to wildlife activity. Continue to advance the state of knowledge around best practices for water quality monitoring and conduct outreach to ensure homeowners are properly maintaining their OSS.

2.1 Prevent pollution sources from entering Hood Canal marine and fresh waters

Limit pollution entering Hood Canal aquatic systems by improving the level of knowledge of the sources and fates of water pollution in Hood Canal and the effectiveness of policies and regulatory structures that are designed to protect water quality. This knowledge will result in improvements to policies and regulatory frameworks and the implementation of programs and actions aimed at reducing or eliminating the threats from pollution sources that bring harmful contaminants, nutrients and toxins into Hood Canal waters, resulting in swimming beach closures, prohibited shellfish growing areas, and contributing to algal blooms and fish kills.

Intermediate ecological outcomes from the reduction of point and non-point pollution discharge into fresh and marine aquatic ecosystems include a decrease in frequency and magnitude of algal blooms, improvement of the resulting dissolved oxygen depletion, reduced occurrence of introduction or spread of human pathogens, restoration of natural hydrological regimes. Long-term ecological outcomes will be an improvement in the status and condition in the habitats of Forests, Beaches and Nearshore, Deltas and Estuaries, Rivers and Floodplains, and Marine Deepwater – and the species and ecological services they support.

Theory of change 2.1: Prevent pollution sources from entering Hood Canal marine and fresh waters

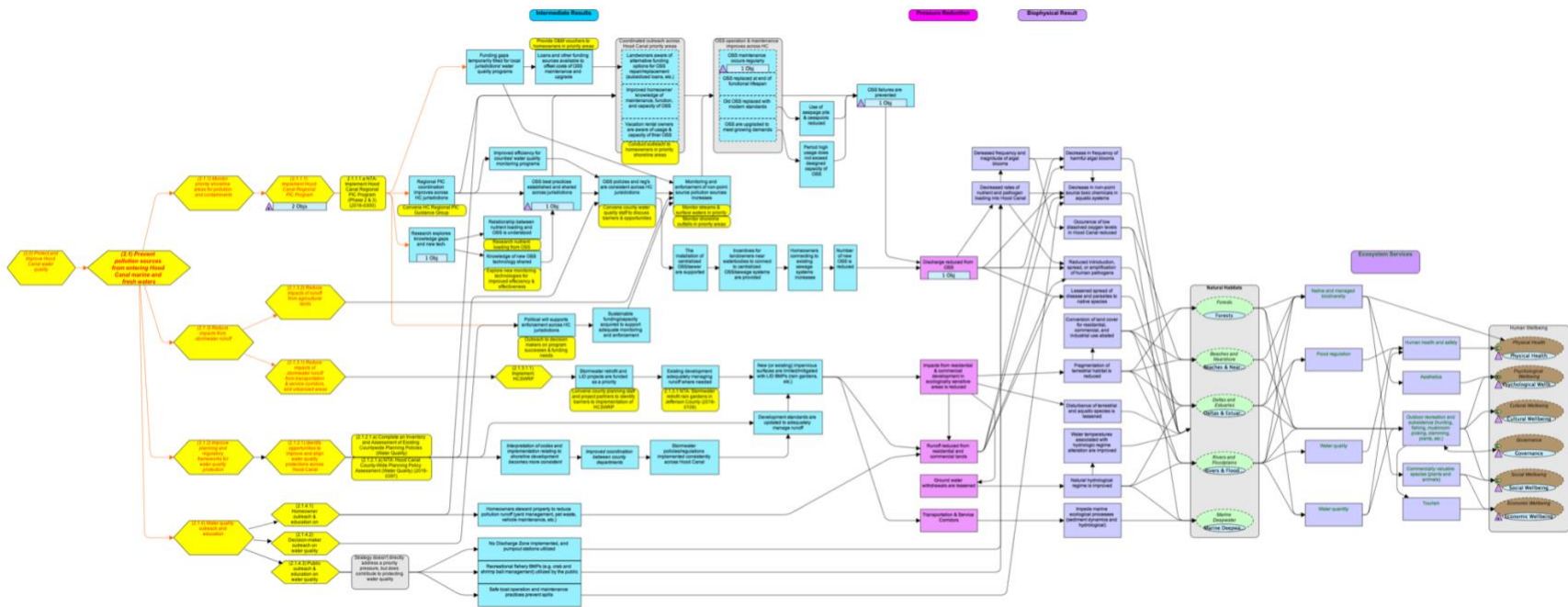


Figure 5: Strategy 2.1 results chain. [Click here](#) to view enlarged results chain diagrams.

The desired outcomes of this sub-strategy include the prevention of onsite septic systems (OSS) failures, a reduction in the number of new OSS, and a reduction in the volume of polluted runoff originating from residential and commercial areas and

Theory of change 2.1: Prevent pollution sources from entering Hood Canal marine and fresh waters (cont.)

transportation infrastructure (roads, bridges, etc.). Achieving these outcomes will decrease ecological impacts of pollution inputs in Hood Canal including low dissolved oxygen in deep water habitats, harmful algal blooms, and introduction of toxic chemicals and pathogens into ecological food webs.

Long-term ecological outcomes will be an improvement in the status and condition in the habitats of Forests, Beaches and Nearshore, Deltas and Estuaries, Rivers and Floodplains, and Marine Deepwater – and the species and ecological services they provide Hood Canal and regional communities.

This sub-strategy will focus on monitoring priority shoreline through implementation of the Hood Canal Regional Pollution Identification and Correction (PIC) Program, reducing impacts from stormwater runoff, assessing and improving planning and regulatory frameworks for water quality protection, and conducting water quality related outreach and education.

The PIC Program will take a coordinated approach across all Hood Canal jurisdictions to improve knowledge related to new technologies that improve function of OSS, delivery of information and technical support to homeowners to help them improve maintenance practices of OSS and understand the capacity and operation of their OSS.

Efforts to reduce runoff from agricultural lands, transportation corridors, and urbanized areas will include implementation of the Hood Canal Stormwater Retrofit Plan (including promotion of low impact development approaches, installation of rain gardens, etc.) and improved monitoring and enforcement of non-point source pollution sources.

Improvements to planning and regulatory frameworks will update development standards to ensure runoff management sufficiently protects water quality.

Outreach and education will target homeowners to provide knowledge and tools to improve the stewardship of their property in ways that reduce polluted runoff, decision-makers to promote the political will necessary to support water quality enforcement, and the general public that engage in recreational water-based activities.

2.1.1 Monitor priority shorelines areas and waterways for pollution and contaminants

Monitor outfalls for fecal contamination from on-site septic failures and other pollution sources in priority shoreline areas and streams in order to trace pollution hotspots up the drainage, identify the source, and work to implement repairs.

Monitoring approaches include pollution identification and correction and 303(d) listed stream protocols. This sub-strategy will result in the identification and subsequent remediation of pollution originating from OSS in Hood Canal. Successful implementation of this and associated sub-strategies will reduce the overall rate of nutrient and pathogen loading into Hood Canal thereby diminishing the occurrence and magnitude of dissolved oxygen depletion events.

2.1.1.1 Implement Hood Canal Regional PIC Program

Implement the Hood Canal Regional Pollution Identification and Correction (HCRPIC) Program with the engagement of all three county health jurisdictions and member tribal governments. Engage regional partners who contribute to water quality protection, such as outreach to landowners and the agricultural community, including conservation districts and WSU Extension offices. The HCRPIC Program seeks to align and expedite PIC work across the Hood Canal region, share information to solve complex problems, and advance the field of science to improve methodologies going forward. The HCRPIC Program will result in prioritize monitoring and enforcement of pollution discharges on Hood Canal shorelines, and the application of support programs to assist landowners in repairing or upgrading OSS so they operate up to current standards. The HCRPIC Program will also result in the accumulation and sharing of existing and emerging knowledge regarding pollution correction technologies across Hood Canal and the larger region. Successful application of the PIC program will reduce the overall volume of discharge originating from OSS, decreasing the rate of nutrient and pathogen loading into Hood Canal and reducing the frequency and magnitude of dissolved oxygen depletion events as well as the spread of human pathogens.

2.1.2 Improve planning and regulatory frameworks for water quality

Enhance the effectiveness of the regulatory framework for water quality protections across Hood Canal jurisdictions, including efficient monitoring and enforcement of pollution discharges, permit program implementation that incentivizes ecologically protective actions, support for centralized OSS, and implementation of the Hood Canal Regional Stormwater Retrofit Plan. These actions will result in more centralized OSS, reduction of harmful runoff from residential areas, and reduction of runoff from developed lands. Resulting near-term ecological outcomes include improved water quality and reduced fragmentation of terrestrial habitats and the species they support.

2.1.2.1 Identify opportunities to improve and align water quality protections across Hood Canal

Assess water quality protection policies and program implementation to better understand the regulatory context and identify opportunities to improve protections and efficiencies.

2.1.3 Reduce impacts from stormwater runoff

Reduce stormwater runoff from developed areas and associated infrastructure (2.1.3.1) and agricultural lands (2.1.3.2) – Reduce the input of associated pollutants into freshwater and marine aquatic ecosystems by supporting projects that prevent runoff from directly discharging into the marine and freshwater environments.

2.1.3.1 Reduce impacts of stormwater runoff from transportation and service corridors, and urbanized areas

Reduce the impacts of stormwater runoff from residential and commercial areas, and transportation and service corridors by supporting smart development that incorporates low-impact development (LID) technologies, and other protective stormwater retrofit applications. This sub-strategy will result in actions (include those identified in the [Hood Canal Regional Stormwater Retrofit Plan](#)) that reduce the volume of stormwater runoff from developed areas and associated contaminants from entering aquatic ecosystems of Hood Canal.

2.1.3.2 Reduce impacts of runoff from agricultural lands

Support Hood Canal working farms to incorporate water quality protective actions by balancing regulatory and incentive-based strategies. This sub-strategy will result in actions and practices that reduce the volume of stormwater runoff originating from agricultural areas from entering and impacting Hood Canal's aquatic ecosystems.

2.1.4 Water quality outreach and education

Outreach to the public and decision-makers to support and encourage water quality protective actions, from private property applications, to policy arenas.

2.1.4.1 Homeowner outreach and education on private property water quality protections

Conduct outreach to property owners in priority shoreline areas and watersheds to educate homeowners on the stewardship activities, support, and incentives available for water quality protection.

2.1.4.2 Decision-maker outreach on water quality protections in policy

Conduct outreach to local decision-makers to support HCCC's water quality protection efforts.

2.1.4.3 Public outreach and education on water quality protections for water-based activities

Conduct outreach and education to the public to encourage behaviors that support Hood Canal water quality while participating in water-based activities, or to sustain Hood Canal’s water recreation opportunities (i.e., use of boat pump-outs to support compliance with the Puget Sound No Discharge Zone, proper bait management for fishing/crabbing/shrimping, boat maintenance, beach cleanups, etc.)

2.2 Investigate low dissolved oxygen content in Hood Canal marine waters.

Investigate Hood Canal’s unique hydrological and bathymetric characteristics and human influences that exacerbate hypoxic conditions in the marine environment. Build off of the research conducted by the Hood Canal Dissolved Oxygen Project.

2.2.1 Assess impacts of water circulation impediments in Hood Canal

Identify and assess water circulation impediments created from both natural and artificial structures in the Hood Canal marine environment to build understanding around the factors leading to low dissolved oxygen in the canal and how it influences other strategic actions for salmon recovery and habitat restoration.

2.2.2 Form research agenda to investigate knowledge gaps related to low-DO in Hood Canal

Build off of the research conducted by the Hood Canal Dissolved Oxygen Project. Convene stakeholders to identify an updated research agenda to continue to explore these issues.

3.0 Protect and restore Hood Canal forests and freshwater habitats

Apply a variety of tools to identify, restore, and protect ecologically important forested areas and their associated freshwater systems (rivers, streams, and wetlands). Aim to reduce the impacts of historic land management activities, climate, and ongoing permanent conversion of forestlands to other uses.

Outline interventions to gather and process information that informs and adaptively manages river and stream habitat restoration actions designed to contribute to the recovery of viable self-sustaining populations of native salmonids.

3.1 Hood Canal forests and Open Space Strategy

Identify priority forestlands that are at risk of being permanently converted by development or other uses that are incompatible with supporting forest related ecological values. Implement Strategies to preclude conversion and retain forests in sufficient scale to

support their ecological integrity and ensure to continued delivery of ecosystem goods and services that support ecological and human wellbeing components. Protection tools could include enhanced land use policies, community forests programs, conservation easements, conservation futures programs, and conservation acquisitions. Ecological outcomes that would result from this suite of sub-strategies include improvement of stream channel, riparian, and associated floodplain structure and function. Enhancement of these ecological functions will improve the status of habitats associated with Forests and Rivers and Floodplains.

Theory of change 3.1: Hood Canal forests and Open Space Strategy

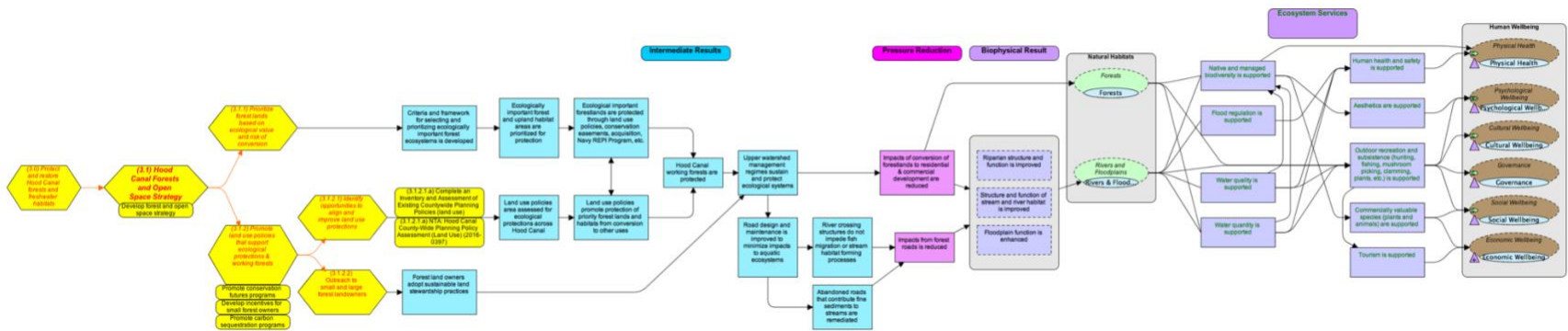


Figure 6: Strategy 3.1 results chain. [Click here](#) to view enlarged results chain diagrams.

The protection of Hood Canal forestlands and open spaces will begin with the collaborative development of a forestland and open space strategy. This strategy will define goals that reflect the full range of ecological and economic values these areas provide local and regional communities. It will also involve the development of actions to reduce ongoing pressures (e.g. forestland conversion, forest road management, etc.) thereby improving the status of habitats associated with Forests and Rivers and Floodplains as well as the full range of social ecosystem components. For example, the strategy could promote conservation futures programs, develop incentives and tools for small forestland owners, promote carbon sequestration programs, etc.

3.1.1 Prioritize forest lands based on ecological value and risk of conversion

Develop a science-based framework and criteria to identify and prioritize forestlands that provide a high level of ecological and social values and that are at risk of being permanently converted to other land uses. The framework will inform a process to implement protection actions that may include augmented land use policies, conservation easements, or acquisitions.

3.1.2 Promote land use policies that support ecological protections

Improve consistency of regulatory policies and their implementation for forests and open space land uses across Hood Canal jurisdictions. This sub-strategy will result in improvements to existing land use policies to ensure they adequately protect forestland ecosystems, associated rivers, riparian areas, and floodplains. Resulting actions could include promotion of conservation futures programs, incentive programs for small forest landowners, or carbon sequestration programs.

3.1.2.1 Identify opportunities to align and improve land use protections

Implement a process to comprehensively inventory and assess current planning policies across all Hood Canal jurisdictions to determine the level to which they protect ecological components, and identify and advance opportunities to improve land use policies to ensure the protection of forestland ecosystems and associated freshwater systems. Resulting protection measures include the protection from conversion and implementation of road management practices that eliminate fish passage barriers and reduced elevated sediment inputs.

3.1.2.2 Outreach to small and large forest landowners

Conduct outreach to both small and large forest landowners of natural and working forests to broaden understanding and adoption of land stewardship and protection opportunities, leverage land use protections, and encourage restoration actions across Hood Canal forests. This outreach aims to support upper watershed management regimes that sustain and protect forest and freshwater ecological systems.

3.2 Protect and restore priority freshwater and salmonid habitat

Identify, prioritize, and implement freshwater habitat restoration and protection actions in salmon bearing watersheds of Hood Canal. The cumulative impact of these projects will be the reduction of factors and pressures impacting the status and condition of Deltas and Estuaries and Rivers and Floodplains – ecological components that support critical life history stages of native salmonids.

Theory of change 3.2: Protect and restore priority freshwater and salmonid habitat



Figure 7: Strategy 3.2 results chain. [Click here](#) to view enlarged results chain diagrams.

This sub-strategy seeks to identify, prioritize, and implement actions that will restore the structure and function of critical salmon habitats across Hood Canal Rivers and Floodplains.

The long-term desired outcome is the restoration of habitats in sufficient quantity and in ecologically important locations across Hood Canal to ensure the sustained recovery and persistence of salmon populations. It is expected that projects achieving positive salmon outcomes will also benefit other species native to Hood Canal.

Freshwater habitat supports vital spawning and rearing habitat as well and migratory corridors so salmon can access these areas. Restoration and protection actions have been identified through the development of a series of salmon recovery plans and a prioritization framework. Recovery plans will be regularly updated and adapted to integrate evolving and growing scientific knowledge regarding the effectiveness of restoration actions and the linkages between functioning freshwater, estuary, and marine habitats and viable salmon populations.

Updates will be completed for:

- Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan
- Mid-Hood Canal Chinook Recovery Plan chapter
- Skokomish Chinook Recovery Plan chapter
- Hood Canal Steelhead Recovery Plan

Theory of change 3.2: Protect and restore priority freshwater and salmonid habitat (cont.)

Key uncertainties have been identified and will be addressed through ongoing scientific investigations including:

- Assess how the Hood Canal Bridge is negatively impacting ESA-listed juvenile steelhead and salmon survival and the overall health of the Hood Canal ecosystem

Current recovery plans and prioritization frameworks have identified specific projects that will focus on reducing impacts from marine and freshwater shoreline infrastructure, transportation and service corridors, and other pressures identified in recovery planning exercises.

3.2.1 Adaptively manage salmon recovery plans for Hood Canal (freshwater habitats)

Develop and adaptively manage the freshwater elements of salmon recovery plans for Endangered Species Act (ESA) listed salmonids in Hood Canal and the Eastern Strait of Juan de Fuca. Acknowledge the uncertainties associated with recovery strategies and the need to regularly build on current scientific knowledge and understanding. The sub-strategy will focus primarily on pertinent elements of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan related to the restoration and protection of freshwater habitats.

3.2.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal

Focus research and other scientific investigations on reducing key uncertainties regarding salmon and freshwater habitat related factors limiting their viability so that appropriate strategies are developed to fully implement the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan (3.2.1.2), and other salmon recovery plans for Hood Canal.

3.2.1.2 Develop and update Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Recovery Plan

Update the freshwater sections of the Hood Canal and Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery, including development of viable salmon population goals, and population diversity goals.

3.2.1.3 Develop and update Skokomish Chinook Recovery Plan chapter

Update the existing salmon recovery chapter of the Puget Sound Chinook Recovery Plan for Skokomish Chinook salmon. The Skokomish Tribe has identified a comprehensive ecosystem approach towards the recovery of Puget Sound Chinook salmon in the Skokomish River watershed. Actions planned range in location from the headwaters to the marine nearshore areas.

3.2.1.4 Develop and update Mid-Hood Canal Chinook Recovery Plan chapter

Update the existing salmon recovery chapter of the Puget Sound Chinook Recovery Plan for Mid-Hood Canal Chinook salmon. Mid-Hood Canal Chinook salmon are in need of a better understanding of the issues impeding recovery.

3.2.1.5 Develop and update Hood Canal Steelhead Recovery Plan

Develop the Hood Canal steelhead Recovery Plan. Hood Canal steelhead populations that contribute to overall Puget Sound Steelhead wellbeing are in need of further examination including the issues that impacts steelhead survival and the actions needed to address those issues.

3.2.2 Prioritize and sequence salmon recovery actions across Hood Canal watersheds (freshwater habitats)

Utilize the prioritization tools for salmon recovery actions across Hood Canal salmonid stocks and watersheds developed by the HCCC Salmon Recovery Program. This guidance adapts with new information, and as projects are completed, informing the annual Hood Canal Lead Entity “Call for Actions”.

3.2.3 Implement priority salmon recovery projects (freshwater habitats)

Implement the actions that will contribute to the restoration and protection of freshwater habitats that are critical for supporting juvenile and adult life history stages of anadromous salmonids native to Hood Canal and Eastern Strait of Juan de Fuca, including the Skokomish River, Duckabush River, Dosewallips River, Quilcene River, Snow Creek, Vance Creek, and the Chimacum, Big Beef, Tahuya, and Dewatto Rivers. The Hood Canal Lead Entity will distribute an annual “Call for Actions” to solicit for the highest priority actions using updated guidance and research related to recovery needs and prioritization across Hood Canal. The Hood Canal Lead Entity, with extensive stakeholder engagement through its Technical Advisory Group, Community Advisory Group, and Citizens Committee, will review and recommend projects to the Salmon Recovery Funding Board.

3.2.3.1 Hood Canal and ESJF Summer Chum freshwater habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Hood Canal and Eastern Strait of Juan de Fuca Summer Chum salmon freshwater restoration projects recommended for funding to the Salmon Recovery Funding Board.

3.2.3.2 Skokomish Chinook freshwater habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Skokomish Chinook salmon nearshore restoration projects recommended for funding to the Salmon Recovery Funding Board.

3.2.3.3 Mid-Hood Canal Chinook freshwater habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Mid-Hood Canal Chinook salmon freshwater restoration projects recommended for funding to the Salmon Recovery Funding Board.

3.2.3.4 Hood Canal Steelhead freshwater habitat actions

See annual Hood Canal Lead Entity projects list for prioritized Hood Canal steelhead freshwater restoration projects recommended for funding to the Salmon Recovery Funding Board.

4.0 Hood Canal Shellfish Initiative

Develop the Hood Canal Shellfish Initiative. The initiative will seek innovative solutions to address the barriers to achieving balance between recreational, subsistence, and commercial shellfish harvest, native species restoration, water quality protection, and relative land use issues. This will result in an action plan that outlines the necessary steps that HCCC and its partners can take to collaboratively achieve desired outcomes, to enhance Hood Canal shellfish resources and the industry and cultural values it supports.

Theory of Change 4.0: Hood Canal Shellfish Initiative

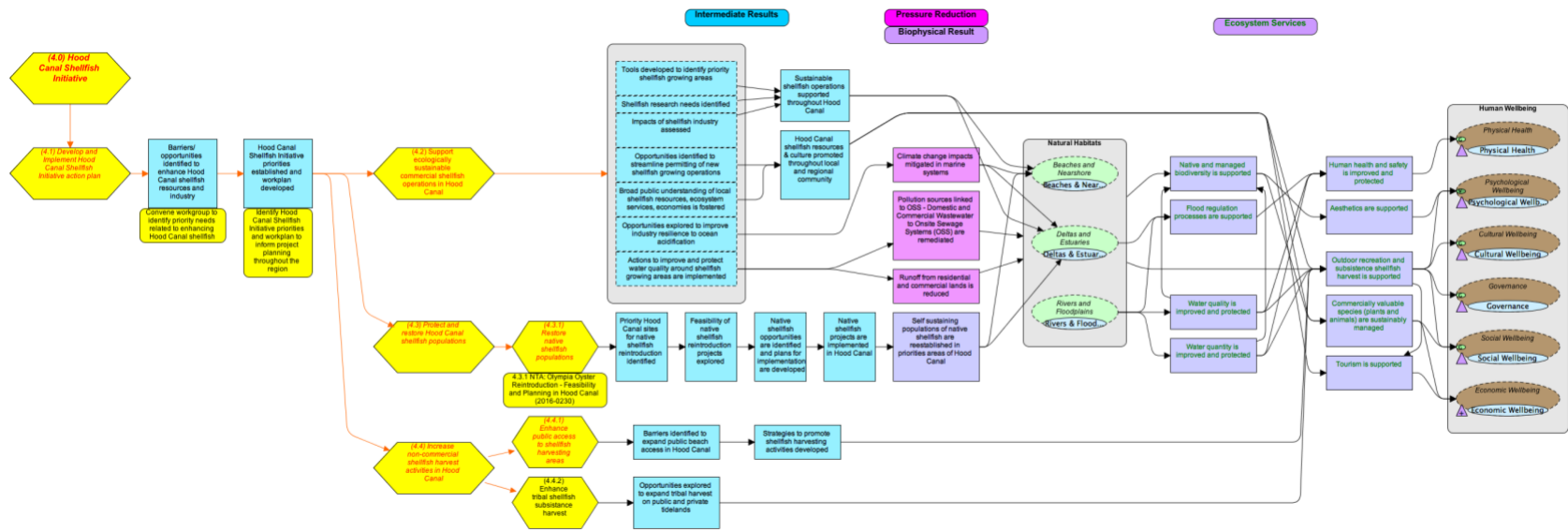


Figure 8: Strategy 4.0 results chain. [Click here](#) to view enlarged results chain diagrams.

This sub-strategy will result in the collaborative development of a shellfish initiative for Hood Canal – modeled after the Washington State shellfish initiative. The Hood Canal shellfish initiative will focus on understanding and supporting shellfish from ecological, economic, and cultural perspectives and will result in a common understanding of the barriers to enhancing Hood Canal shellfish resources and opportunities for overcoming them. It will include the development of strategies for supporting ecologically sustainable commercial shellfish operations, restoring and protecting native and wild shellfish populations, and increasing non-commercial tribal subsistence and public recreational shellfish harvest.

The initiative will create the opportunity for stakeholders to collectively reduce pressures to shellfish and their habitats by addressing climate change impacts, eliminating sources of pollution associated with OSS, and stormwater runoff from residential and commercial areas. Desired ecological outcomes include improvement to habitat and water quality and establishment of self-sustaining populations of native shellfish. These outcomes would improve the condition of habitats associated with Beaches and Nearshore, Deltas and Estuaries, and Rivers and Floodplains.

4.1 Develop and Implement Hood Canal Shellfish Initiative Action plan

Convene stakeholders representing all aspects related to Hood Canal shellfish in a collaborative and inclusive process to develop an integrated action plan with strategic approaches that are multi-beneficial to support Hood Canal's shellfish culture. The plan will provide a comprehensive review of the persistent barriers (and opportunities) to sustaining robust shellfish resources that support a range of social and ecological values. The plan will identify priority shellfish areas, outline information gaps and research needs, examine relevant land use policies, expand public awareness of the value and importance of shellfish resources to the region, identify adaptations to climate change impacts, and identify actions necessary to protect water quality. The plan will result in an actionable workplan to achieve desired ecological and social outcomes.

4.2 Support ecologically sustainable commercial shellfish operations in Hood Canal

Identify actionable steps to enhance the Hood Canal commercial shellfish industry, supporting the cultural, and economic wellbeing of the Hood Canal community. The implementation of this strategy will initially require extensive information gathering from Hood Canal community members, to assess the ecological impacts of the current scope of commercial shellfish operators in Hood Canal, identify research needs to advance the industry's science, identify opportunities to streamline permitting processes for new or expanding shellfish growers, protect water quality around active shellfish beds, and explore opportunities to mitigate climate change impacts on shellfish.

4.3 Protect and restore Hood Canal shellfish populations

Restore shellfish populations to levels that support existing demand for recreational and commercial harvest activities as well as contribute to the function and health of tidal, intertidal, and nearshore ecological systems. Restoring Hood Canal shellfish populations requires both native species reintroduction and shellfish habitat restoration. Successful shellfish populations require clean, oxygenated water.

4.3.1 Restore native shellfish populations

Explore the feasibility of re-establishing viable and resilient native shellfish populations in Hood Canal areas prioritized for re-introduction according to the WDFW's Plan for Rebuilding Olympia Oyster Populations. Longer-term results will contribute to continued learning and evaluation of the effectiveness of reintroduction approaches and techniques and an expansion to additional areas in order to establish a resilient self-sustaining Hood Canal population.

4.4 Increase non-commercial shellfish harvest activities in Hood Canal

Support the promotion of shellfish harvest activities throughout Hood Canal; ensure that shellfish resources and access to them supports outdoor recreation and subsistence shellfish harvest.

4.4.1 Enhance public access to shellfish harvesting areas

Work to increase and enhance public access to shellfish harvest areas, by keeping public beaches open to harvest and increasing access opportunities for recreational and subsistence shellfish harvest. This will promote continued public involvement in shellfish resources management, actions that protect shellfish and the ecological functions needed to support them.

4.4.2 Enhance tribal shellfish subsistence harvest

Assess opportunities to enhance tribal subsistence shellfish harvest opportunities, by prioritizing water quality improvements/protections in tribal harvest areas in order to prevent or lift shellfish bed closures, utilizing policy tools for access to traditional tidelands, or supporting tribal tideland acquisitions. Shellfish harvest is an extremely important cultural tradition of Hood Canal tribes. Increasing these opportunities will enhance the psychological, cultural, and physical wellbeing of tribal members, continuing a traditional resource practice that dates back to time immemorial.

5.0 Proactively prepare for climate change impacts across Hood Canal

Improve understanding of biophysical (or ecological) impacts resulting from a changing climate. Hood Canal is already seeing the impacts of a changing climate. As air and water temperatures rise, species migrate, seasonal patterns and sea chemistry changes, and sea levels rise, HCCC must be proactive, anticipating potential impacts and developing interventions to meet these changes with smart adaptive measures. This more complete knowledgebase will result in the identification and implementation of adaptation strategies designed to mitigate or reduce the impacts influencing the status and condition of all ecological components (Forests, Beaches and Nearshore, Deltas and Estuaries, Rivers and Floodplains, and Marine Deepwater), associated ecosystem services, and all human wellbeing components.

Theory of Change 5.0: Proactively prepare for climate change Impacts across Hood Canal

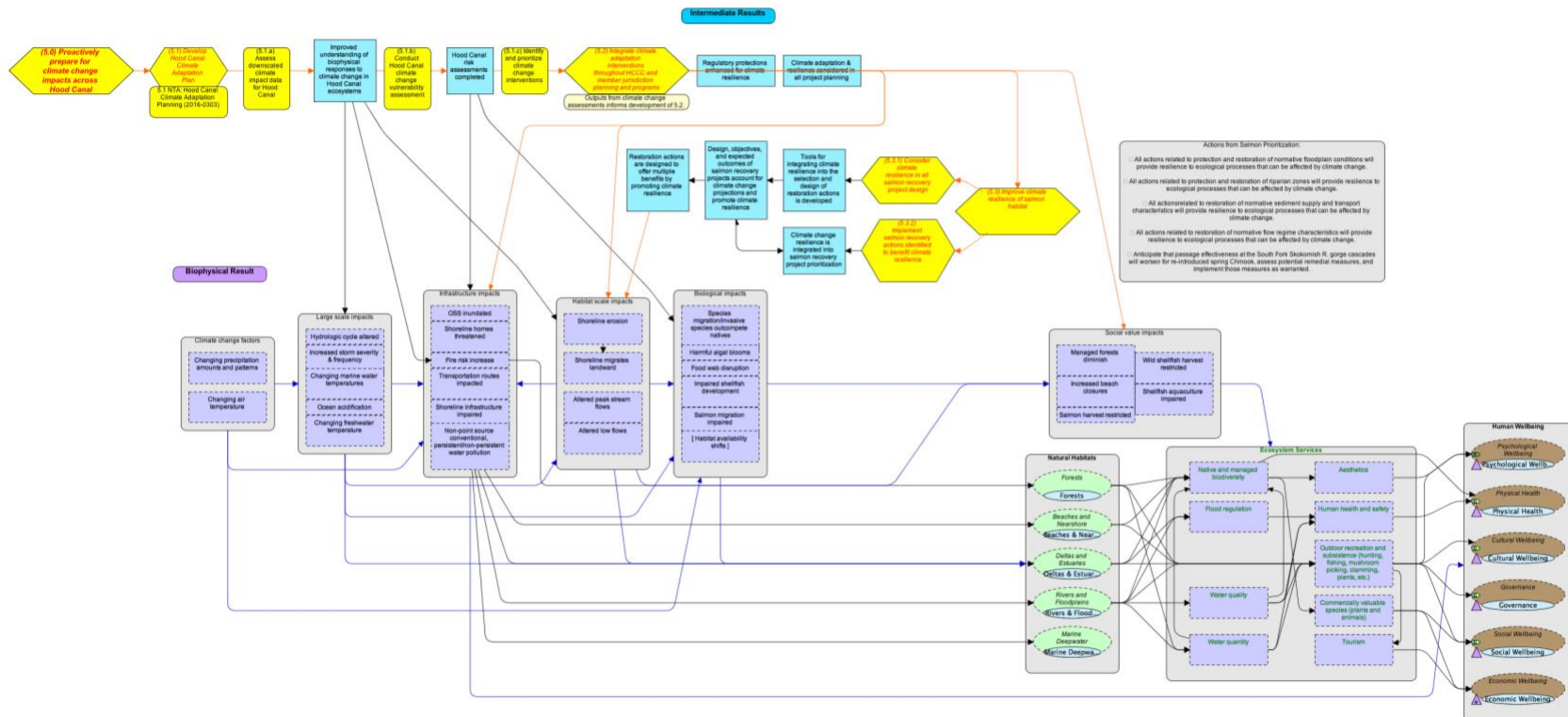


Figure 9: Strategy 5.0 results chain. [Click here](#) to view enlarged results chain diagrams.

This sub-strategy will result in a current and more comprehensive understanding of potential climate change impacts to Hood Canal’s ecosystems and built environments. This more complete knowledge will result in the development of a Hood Canal Climate Adaptation Plan containing strategies designed to mitigate or reduce the impacts influencing the status and condition of all ecological components (Forests, Beaches and Nearshore, Deltas and Estuaries, Rivers and Floodplains, and Marine Deepwater), associated ecosystem services, and all human wellbeing focal components.

Once completed the Climate Change Adaptation Plan will be used to guide the planning processes of regional jurisdictions, inform prioritization of actions promoting the resilience of freshwater salmon habitats, and ensure that planned salmon recovery projects will be assessed for objectives that contribute to climate change resilience of salmon habitats.

5.1 Develop Hood Canal Climate Adaptation Plan

Engage Hood Canal Coordinating Council partners in a comprehensive regional climate adaptation planning process to incorporate recommendations into the Hood Canal Integrated Watershed Plan, and provide actionable guidance to integrate climate interventions into existing regional planning processes. The climate adaption process will include compiling downscaled climate impact data, conducting a vulnerability assessment across all ecosystem components and risks to ecological systems, associated social values, as well as to the built environment and associated infrastructure, and identifying strategic climate adaptation interventions that mitigate or avoid climate change impacts.

5.2 Integrate climate adaptation interventions throughout HCCC and member jurisdiction planning and programs

Coordinate integration of climate adaption interventions into the Hood Canal Integrated Watershed Plan, across Hood Canal jurisdictions, and HCCC project planning.

5.3 Improve resilience of freshwater salmon habitats

Prepare for climate impacts to salmon habitat by identifying opportunities to enhance habitat resiliency to sustain ecosystem services and function in spite of future changes. Climate change assessments conducted as part of Sub-Strategy 5.1 will inform the prioritization of actions promoting the resilience of freshwater salmon habitats to the impacts of climate change. This prioritization will contribute to future project funding decision processes.

5.3.1 Consider climate resilience in all salmon recovery action design

Integrate climate adaptation interventions and consideration of climate resiliency in salmon recovery project planning. Future salmon recovery projects will be assessed for objectives that contribute to climate change resilience of freshwater salmon habitats.

5.3.2 Implement salmon recovery actions identified to benefit climate resilience (see actions listed from Salmon Prioritization Guidance)

Update existing salmon recovery plans for Hood Canal and the eastern Strait of Juan de Fuca to reflect adaptations necessary to address impacts to salmon recovery, restoration, and protection from climate impacts. The integration of climate resilience strategies will inform the selection of salmon recovery actions that demonstrate a potential to more broadly (beyond salmon a salmon focus) lead to resilience of aquatic habitats to the impacts of climate change.

6.0 Outreach to HCCC partners, decision makers, and community on Hood Canal ecosystem improvements and IWP implementation effectiveness

Develop and deliver communications to organizational partners, decision makers, and community members to inform them of the circumstances and context of ecosystem recovery efforts, actions that are being taken to achieve recovery objectives and goals, and progress toward implementing actions and reaching long term desired outcomes.

6.1 Develop and implement HCCC Strategic Communications plan

Finalize ongoing communications planning efforts with an actionable communications plan for HCCC. Communications strategies will strive to improve the effectiveness of existing programs (HCCC Salmon Recovery Program, Hood Canal Regional Pollution Identification and Correction Program, In-lieu Fee Mitigation Program, etc.) that are contributing to ecosystem recovery goals.

6.1.1 Clarify messaging around HCCC's role in the region and how it engages with partners and the public

Clarify HCCC's role in the effort to recover Hood Canal ecosystems and how it partners and collaborates with local government jurisdictions, tribes, non-governmental organizations, state and federal agencies, private foundations, academia, and the public to define and achieve long term desired outcomes.

6.1.2 Identify external communications priorities

Define external communications priorities for HCCC as well as for each of its primary program areas.

6.2 Maintain role as central information source on Hood Canal ecosystem recovery

Define and reinforce HCCC's role as a central information source for a broad array of stakeholders including project partners, local decision makers, regional interests, and the general public. Provide current and accurate information to ensure consistent understanding of the ecological and social circumstances of natural resource stewardship in Hood Canal and support informed decision-making and recovery actions.

Theory of Change 6.2: Maintain role as central information source on Hood Canal ecosystem recovery

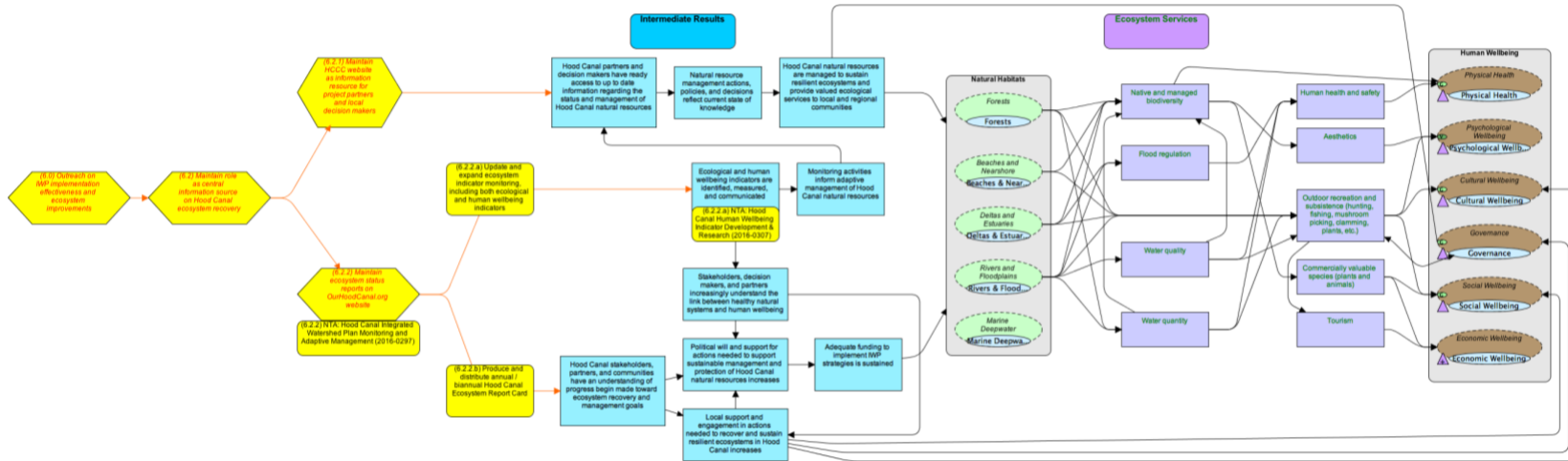


Figure 10: Strategy 6.2 results chain. [Click here](#) to view enlarged results chain diagrams.

This sub-strategy supports all other strategies - and all ecological and social focal components of the IWP. The eventual desired outcome of this sub-strategy is that all natural resources of Hood Canal are managed in ways that sustain resilient ecosystems and support human wellbeing.

Managing, processing, and disseminating information will increase awareness and lead to a more complete understanding among a broad audience of Hood Canal stakeholders regarding the ecological and social circumstances of natural resource stewardship in Hood Canal. Increased understanding is expected to enhance interest and engagement, improve political will and support for strategy implementation, increase success in accessing funding programs, and build overall capacity to carryout IWP strategies. A more informed, interested, and engaged population of stakeholders will increase the likelihood that Hood Canal resources are managed and stewarded in ways that achieve ecological and human wellbeing component goals.

Specific actions to accomplish this include the consistent maintenance of the main HCCC website, continued ecosystem status reporting on the “Our Hood Canal” website, the production and distribution of an annual or biannual Hood Canal Ecosystem report card, and update and expansion of ecosystem indicator monitoring.

6.2.1 Maintain HCCC website as information resources for project partners and local decision makers

Provide easy access to current and relevant information for project or strategy implementation for HCCC partners and local, state, regional, and federal decision makers and managers, and the Hood Canal community. Ready access to current information will increase overall understanding and awareness and improve the efficiency of carrying out management actions.

6.2.2 Maintain ecosystem status reports on OurHoodCanal.org website

Provide a more accurate and current accounting of progress toward ecological and social ecosystem recovery goals by developing and implementing an ecosystem and human wellbeing monitoring framework. This sub-strategy will result in better-informed adaptive management as well as a more accurate accounting of progress toward ecosystem recovery goals. An accurate accounting of ecosystem indicators (including both ecological and social wellbeing indicators) will give decision-makers more confidence to represent and discuss recovery efforts with their constituents and support continued implementation. This strategy will also result in the continued exploration and research of ecosystem indicator monitoring efforts, to improve methodologies and analysis, and the application of informational tools in decision-making.

Produce a compelling periodic (annual/biannual) ecosystem report card to provide Hood Canal stakeholders, partners, and communities of strategy implementation progress and resulting outcomes. This tool will promote and facilitate communications between decision-makers and their constituents and increase political will to support and seek funding to continue implementation of IWP strategies.

Appendix 5: IWP Implementation Projects

IWP Projects are listed below, organized by strategy and sub-strategy. Projects can include capital projects (e.g., restoration and acquisition), program development or implementation, education and outreach, research, or other types of activities. Actions can be completed on a near-term (i.e. two years or less) or longer-term time scale. More information about each project can be found online. For Near Term Actions (NTA), search for the project on Puget Sound Info’s [Action Agenda Tracker](#). For salmon recovery projects (SRP), search for projects on the Washington State Recreation and Conservation Office’s [PRISM database](#).

Table 9: IWP implementation projects

1.0 Protect and restore Hood Canal shoreline					
1.1 Remove/Soften/Prevent shoreline armoring					
1.1.1 Outreach and education on shoreline protection and stewardship					
1.1.1.1 Outreach and education on shoreline protection and stewardship to shoreline property owners					
Strategy	Project Name	Type	Year	ID	Status
1.1.1.1	Hood Canal Shoreline Outreach and Technical Assistance	NTA	2016	2016-0104	Proposed
1.1.1.2 Outreach and education on shoreline protection and stewardship to real estate developers					
1.1.1.3 Outreach and education on shoreline protection and stewardship to contractors					
1.1.1.4 Outreach and education on shoreline protection and stewardship to political leaders					

1.1.2	Improve shoreline planning and regulatory frameworks				
1.1.2.1	Identify opportunities to improve and align shoreline protections across Hood Canal				
Strategy	Project Name	Type	Year	ID	Status
1.1.2.1.a	Complete an Inventory and Assessment of Existing Countywide Planning Policies (for Shoreline)	NTA	2016	2016-0397	In progress
1.1.2.2	Develop incentives for landowners to protect shoreline habitats				
1.2	Protect and restore priority estuarine salmonid habitat				
1.2.1	Adaptively manage salmon recovery plans for Hood Canal watersheds (estuarine habitat)				
1.2.1.1	Fill information and data gaps identified to inform salmon recovery in Hood Canal				
1.2.1.2	Develop and update Hood Canal and Eastern Juan de Fuca Summer Chum Recovery Plan				
1.2.1.3	Develop and update Skokomish Chinook Recovery Plan chapter				
1.2.1.4	Develop and update Mid-Hood Canal Chinook Recovery Plan chapter				
Strategy	Project Name	Type	Year	ID	Status
1.2.1.4	Hood Canal Chinook Salmon Recovery Plan Update (estuarine habitats)	NTA	2016	2016-0308	Proposed
1.2.1.5	Develop and update Hood Canal Steelhead Recovery Plan				

Strategy	Project Name	Type	ID	Status	
1.2.1.5	Develop Hood Canal Steelhead Recovery Plan (estuarine habitats)	NTA	2016	2016-0396	Proposed
1.2.2	Prioritize and sequence salmon recovery actions across Hood Canal watersheds (estuarine habitats)				
1.2.3	Implement priority salmon recovery projects (estuarine habitats)				
1.2.3.1	Hood Canal and Eastern Strait of Juan de Fuca Summer Chum estuarine habitat actions				
Strategy	Project Name	Type	Year	ID	Status
1.2.3.1	Duckabush River Robinson Road Levee Removal	SRP	2007	07-1636 R	Completed
1.2.3.1	Dosewallips River & Duckabush River Engineered Log Jam Design	SRP	2007	07-1915 P	Completed
1.2.3.1	Mid Hood Canal Dosewallips River & Duckabush River Acquisition	SRP	2009	09-1630 A	Completed
1.2.3.1	Dosewallips River and Duckabush River Acquisitions 2012	SRP	2012	12-1385 AR	In Progress
1.2.3.1	Duckabush River Floodplain Acquisition 2013	SRP	2013	13-1221 AR	In Progress
1.2.3.1	Duckabush River Riparian Habitat Acquisition	SRP	2014	14-1322 A	In Progress
1.2.3.1	Duckabush Estuary Restoration Planning	SRP	2015	15-1190 P	In Progress
1.2.3.1	Duckabush Estuary Restoration Support Acquisition	SRP	2016	16-1492	Proposed
1.2.3.1	Duckabush River Oxbow Side Channel Restoration Support Design	SRP	2016	16-1472	Proposed
1.2.3.1	Duckabush Estuary Restoration Support and Preliminary Design	SRP		Planned	Planned
1.2.3.1	Duckabush Estuary Restoration Final Design	SRP		Planned	Planned
1.2.3.1	Duckabush Estuary Restoration Construction	SRP		Planned	Planned

1.2.3.1	Duckabush River Oxbow Side Channel Restoration Construction	SRP		Planned	Planned
1.2.3.1	Duckabush River Acquisition and Restoration	SRP		Planned	Planned
1.2.3.1	Dosewallips Estuary Restoration Phase 1	SRP	2002	02-1482 AR	Completed
1.2.3.1	Dosewallips River Floodplain Acquisition	SRP	2004	04-1639 A	Completed
1.2.3.1	Dosewallips Estuary Restoration Phase 2	SRP	2005	05-1606 R	Completed
1.2.3.1	Dosewallips River Floodplain Acquisition II	SRP	2006	06-2288 A	Completed
1.2.3.1	Lower Dosewallips River Floodplain & Estuary Restoration	SRP	2007	07-1916 R	Completed
1.2.3.1	Dosewallips River & Duckabush River Engineered Log Jam Design	SRP	2007	07-1915 P	Completed
1.2.3.1	Mid Hood Canal Dosewallips River & Duckabush River Acquisition	SRP	2009	09-1630 A	Completed
1.2.3.1	Dosewallips River Engineered Log Jams SRFB	SRP	2010	10-1606 R	Completed
1.2.3.1	Dosewallips River Riparian Corridor Acquisition	SRP	2010	10-1545 A	Completed
1.2.3.1	Dosewallips River Floodplain & Estuary Restoration 2011	SRP	2011	11-1354 R	In Progress
1.2.3.1	Dosewallips River and Duckabush River Acquisitions 2012	SRP	2012	12-1385 AR	In Progress
1.2.3.1	Dosewallips River Riparian Corridor Acquisition Phase II	SRP	2013	13-1211 A	In Progress
1.2.3.1	Dosewallips River Floodplain & Estuary Restoration 2016	SRP	2016	16-1482	Proposed
1.2.3.1	Hood Canal Summer Chum Riparian Enhancement	SRP	2016	16-1476	Proposed
1.2.3.1	Dosewallips River Acquisition and Restoration	SRP		Planned	Planned
1.2.3.1	Lower Dosewallips River Channel Analysis and Preliminary Design	SRP		Planned	Planned
1.2.3.1	Lower Dosewallips River Channel Restoration	SRP		Planned	Planned

1.2.3.2 Skokomish Chinook estuarine habitat actions

1.2.3.3 Mid-Hood Canal Chinook estuarine habitat actions

1.2.3.3 Hood Canal Steelhead estuarine habitat actions

1.3 Protect and restore priority nearshore and marine salmonid habitat

1.3.1 Adaptively manage salmon recovery plans for Hood Canal (nearshore and marine habitats)

1.3.1.1 Fill information and data gaps identified to inform salmon recovery in Hood Canal

Strategy	Project Name	Type	Year	ID	Status
1.3.1.1.a	Assess Hood Canal Bridge Impacts	NTA	2014	A6.4.HC9	Replaced
1.3.1.1.a	Hood Canal Bridge Assessment	NTA	2016	2016-0393	Proposed
1.3.1.1.a	Hood Canal Bridge Impact Assessment	SRP	2015	15-1191 P	In Progress
1.3.1.1.b	West Kitsap Hood Canal Nearshore Assessment	SRP	2008	08-1909 P	Completed
1.3.1.1.b	Hood Canal Nearshore Fish Use Assessment	SRP	2011	11-1355 P	Completed
1.3.1.1.b	Hood Canal Summer Chum Nearshore Habitat Use Assessment	SRP	2015	15-1202 P	In Progress
1.3.1.1.b	Hood Canal Nearshore Inventory, Assessment, and Prioritization	NTA	2016	2016-0393	Proposed

1.3.1.2 Develop and update Hood Canal and Eastern Juan de Fuca Summer Chum Recovery Plan

1.3.1.3	Develop and update Skokomish Chinook Recovery Plan chapter				
1.3.1.4	Develop and update Mid-Hood Canal Chinook Recovery Plan chapter				
Strategy	Project Name	Type	ID	Status	
1.3.1.4	Hood Canal Chinook Salmon Recovery Plan Update (nearshore and marine habitats)	NTA	2016	2016-0308	Proposed
1.3.1.5	Develop and update Hood Canal Steelhead Recovery Plan				
Strategy	Project Name	Type	ID	Status	
1.3.1.5	Develop Hood Canal Steelhead Recovery Plan (nearshore and marine habitats)	NTA	2016	2016-0396	Proposed
1.3.2	Prioritize and sequence salmon recovery actions across Hood Canal watersheds (nearshore and marine habitats)				
1.3.3	Implement priority salmon recovery projects (nearshore and marine habitats)				
1.2.3.1	Hood Canal and Eastern Strait of Juan de Fuca Summer Chum nearshore and marine habitat actions				
1.2.3.2	Skokomish Chinook nearshore and marine habitat actions				
1.2.3.3	Mid-Hood Canal Chinook nearshore and marine habitat actions				
1.2.3.3	Hood Canal Steelhead nearshore and marine habitat actions				

2.0 Protect and improve Hood Canal water quality

2.1 Prevent pollution sources from entering Hood Canal marine and fresh waters

Strategy	Project Name	Type	Year	ID	Status
2.1	Reduce the Use of Seepage Pits and Eliminate Cesspools throughout Hood Canal	NTA	2014	C9.4.HC8	Completed

2.1.1 Monitor priority shoreline areas and streams for pollution and contaminants

2.1.1.1 Implement Hood Canal Regional Pollution Identification and Correction Program

Strategy	Project Name	Type	Year	ID	Status
2.1.1.a	Implement Hood Canal Regional PIC Program (Phase 2)	NTA	2014	C9.4.HC3	In progress
2.1.1.a	Implement Hood Canal Regional PIC Program (Phase 2 & 3)	NTA	2016	2016-0300	In progress

2.1.2 Improve planning and regulatory frameworks for water quality protection

2.1.2.1 Identify opportunities to align and improve water quality protections

Strategy	Project Name	Type	Year	ID	Status
2.1.2.1.a	Complete an Inventory and Assessment of Existing Countywide Planning Policies (for Water Quality)	NTA	2016	2016-0397	In progress

2.1.3 Reduce impacts from stormwater runoff

2.1.3.1 Reduce impacts of stormwater runoff from transportation and service corridors, and urbanized areas

2.1.3.1.1 Implement Hood Canal Stormwater Retrofit Plan (HCSWRP)					
Strategy	Project Name	Type	Year	ID	Status
2.1.3.1	Hood Canal Regional Stormwater Retrofit Plan	NTA	2014	C2.3.HC4	Completed
2.1.3.1	Stormwater Retrofit Rain Gardens in Jefferson County	NTA	2016	2016-0109	Proposed
2.1.3.2 Reduce impacts of stormwater runoff from agricultural lands					
2.1.4 Water Quality Outreach and Education					
2.1.4.1 Homeowner outreach and education on private property water quality protections					
2.1.4.2 Decision-maker outreach on water quality protections in policy					
2.1.4.3 Public Outreach and education on water-based activities					
2.2 Investigate low dissolved oxygen content in Hood Canal marine waters					
2.2.1 Assess impacts of water circulation impediments in Hood Canal					
Strategy	Project Name	Type	Year	ID	Status
2.2.1	Hood Canal Bridge Assessment	NTA	2014	A6.4.HC9	Replaced
2.2.1	Hood Canal Bridge Assessment	NTA	2016	2016-0305	In progress

2.2.2 Form research agenda to investigate knowledge gaps related to low-Dissolved Oxygen in Hood Canal

3.0 Protect and restore Hood Canal forests and freshwater salmonid habitat

Strategy	Project Name	Type	Year	ID	Status
3.0	HCCC In-Lieu Fee Mitigation Program	NTA	2014	A2.2.HC2	Completed

3.1 Hood Canal forests and open space strategy

3.1.1 Prioritize forest lands for protection based on ecological value and risk of conversion

3.1.2 Promote land use policies that support ecological protections

3.1.2.1 Identify opportunities to align and improve land use protections

Strategy	Project Name	Type	Year	ID	Status
3.1.2.1.a	Complete an Inventory and Assessment of Existing Countywide Planning Policies (for Land Use)	NTA	2016	2016-0397	In progress

3.1.2.2 Outreach to small and large forest landowners

3.2 Protect and restore priority freshwater salmonid habitat

Strategy	Project Name	Type	Year	ID	Status
3.2	Hood Canal Salmon Recovery Monitoring & Adaptive Management	NTA	2014	A6.1.HC7	Replaced

3.2	Hood Canal Salmon Recovery Funding (Lead Entity)	NTA	2014	A6.1.HC6	Completed
3.2.1	Adaptively manage salmon recovery plans for Hood Canal watersheds (freshwater habitat)				
3.2.1.1	Fill information and data gaps identified to inform salmon recovery in Hood Canal				
3.2.1.2	Develop and update Hood Canal and Eastern Juan de Fuca Summer Chum Recovery Plan				
3.2.1.3	Develop and update Skokomish Chinook Recovery Plan chapter				
3.2.1.4	Develop and update Mid-Hood Canal Chinook Recovery Plan chapter				
Strategy	Project Name	Type		ID	Status
3.2.1.4	Hood Canal Chinook Salmon Recovery Plan Update (freshwater habitats)	NTA	2016	2016-0308	Proposed
3.2.1.5	Develop and update Hood Canal Steelhead Recovery Plan				
Strategy	Project Name	Type		ID	Status
3.2.1.5	Develop Hood Canal Steelhead Recovery Plan (freshwater habitats)	NTA	2016	2016-0396	Proposed
3.2.2	Prioritize and sequence salmon recovery actions across Hood Canal watersheds (freshwater habitats)				
3.2.3	Implement priority salmon recovery projects (freshwater habitats)				
3.2.3.1	Hood Canal and Eastern Strait of Juan de Fuca Summer Chum freshwater habitat actions				

Strategy	Project Name	Type	Year	ID	Status
3.2.3.1	Duckabush River Robinson Road Levee Removal	SRP	2007	07-1636 R	Completed
3.2.3.1	Dosewallips River & Duckabush River Engineered Log Jam Design	SRP	2007	07-1915 P	Completed
3.2.3.1	Mid Hood Canal Dosewallips River & Duckabush River Acquisition	SRP	2009	09-1630 A	Completed
3.2.3.1	Dosewallips River and Duckabush River Acquisitions 2012	SRP	2012	12-1385 AR	In Progress
3.2.3.1	Duckabush River Floodplain Acquisition 2013	SRP	2013	13-1221 AR	In Progress
3.2.3.1	Duckabush River Riparian Habitat Acquisition	SRP	2014	14-1322 A	In Progress
3.2.3.1	Duckabush Estuary Restoration Planning	SRP	2015	15-1190 P	In Progress
3.2.3.1	Duckabush Estuary Restoration Support Acquisition	SRP	2016	16-1492	Proposed
3.2.3.1	Duckabush River Oxbow Side Channel Restoration Support Design	SRP	2016	16-1472	Proposed
3.2.3.1	Duckabush Estuary Restoration Support and Preliminary Design	SRP		Planned	Planned
3.2.3.1	Duckabush Estuary Restoration Final Design	SRP		Planned	Planned
3.2.3.1	Duckabush Estuary Restoration Construction	SRP		Planned	Planned
3.2.3.1	Duckabush River Oxbow Side Channel Restoration Construction	SRP		Planned	Planned
3.2.3.1	Duckabush River Acquisition and Restoration	SRP		Planned	Planned
3.2.3.1	Dosewallips Estuary Restoration Phase 1	SRP	2002	02-1482 AR	Completed
3.2.3.1	Dosewallips River Floodplain Acquisition	SRP	2004	04-1639 A	Completed
3.2.3.1	Dosewallips Estuary Restoration Phase 2	SRP	2005	05-1606 R	Completed
3.2.3.1	Dosewallips River Floodplain Acquisition II	SRP	2006	06-2288 A	Completed

3.2.3.1	Lower Dosewallips River Floodplain & Estuary Restoration	SRP	2007	07-1916 R	Completed
3.2.3.1	Dosewallips River & Duckabush River Engineered Log Jam Design	SRP	2007	07-1915 P	Completed
3.2.3.1	Mid Hood Canal Dosewallips River & Duckabush River Acquisition	SRP	2009	09-1630 A	Completed
3.2.3.1	Dosewallips River Engineered Log Jams SRFB	SRP	2010	10-1606 R	Completed
3.2.3.1	Dosewallips River Riparian Corridor Acquisition	SRP	2010	10-1545 A	Completed
3.2.3.1	Dosewallips River Floodplain & Estuary Restoration 2011	SRP	2011	11-1354 R	In Progress
3.2.3.1	Dosewallips River and Duckabush River Acquisitions 2012	SRP	2012	12-1385 AR	In Progress
3.2.3.1	Dosewallips River Riparian Corridor Acquisition Phase II	SRP	2013	13-1211 A	In Progress
3.2.3.1	Dosewallips River Floodplain & Estuary Restoration 2016	SRP	2016	16-1482	Proposed
3.2.3.1	Hood Canal Summer Chum Riparian Enhancement	SRP	2016	16-1476	Proposed
3.2.3.1	Dosewallips River Acquisition and Restoration	SRP		Planned	Planned
3.2.3.1	Lower Dosewallips River Channel Analysis and Preliminary Design	SRP		Planned	Planned
3.2.3.1	Lower Dosewallips River Channel Restoration	SRP		Planned	Planned
3.2.3.1	Big Quilcene River Habitat Acquisition	SRP	1999	99-1666 A	Completed
3.2.3.1	Lower Big Quilcene N. Bank Acquisition	SRP	2001	01-1394 A	Completed
3.2.3.1	Quilcene Floodplain Acquisition	SRP	2006	06-2301 A	Completed
3.2.3.1	Quilcene Estuarine Wetlands Rest-Schinke	SRP	2006	06-2225 R	Completed
3.2.3.1	WDFW Big Quilcene Estuarine Dike Removal	SRP	2007	07-1635 R	Completed
3.2.3.1	Big Quilcene Estuary Acquisition Planning	SRP	2010	10-1525 P	Completed

3.2.3.1	Big Quilcene Delta Acquisition	SRP	2011	11-1349 AR	Completed
3.2.3.1	Quilcene River Acquisitions 2012	SRP	2012	12-1384 AR	In Progress
3.2.3.1	Lower Big Quilcene River Master Plan Design	SRP	2013	13-1209 P	In Progress
3.2.3.1	Lower Big Quilcene River Riparian Protection	SRP	2014	14-1321 AR	In Progress
3.2.3.1	Big Quilcene Floodplain Key Pieces	SRP	2015	15-1189 AR	In Progress
3.2.3.1	Lower Big Quilcene Restoration Final Design	SRP	2016	16-1481	Proposed
3.2.3.1	Lower Big Quilcene Floodplain Acquisitions	SRP	2016	16-1480	Proposed
3.2.3.1	Lower Big Quilcene Floodplain Acquisitions	SRP		Planned	Planned
3.2.3.1	Lower Big Quilcene Floodplain Construction	SRP		Planned	Planned
3.2.3.1	Lower Big Quilcene River Acquisition and Restoration	SRP		Planned	Planned
3.2.3.1	Big Quilcene Moon Valley Acquisition and Planning	SRP		16-1494	Proposed
3.2.3.1	Big Quilcene Moon Valley Construction	SRP		Planned	Planned
3.2.3.1	Salmon and Snow Creek Estuary 99	SRP	1999	99-1721 A	Completed
3.2.3.1	Salmon and Snow Creek Estuary 01	SRP	2001	01-1346 A	Completed
3.2.3.1	Salmon/Snow Creek Lower Watershed Restoration	SRP	2004	04-1649 R	Completed
3.2.3.1	Salmon & Snow Creek Riparian Project 2007	SRP	2007	07-1638 R	Completed
3.2.3.1	East Jefferson Summer Chum Riparian Project	SRP	2009	09-1657 R	Completed
3.2.3.1	Snow Creek Delta Cone & Estuary Design	SRP	2010	10-1611 P	Completed
3.2.3.1	Salmon & Snow Creek Riparian Project	SRP	2010	10-1574 R	Completed

3.2.3.1	L. Brown Snow Creek Acquisition	SRP	2012	12-1310 AR	In Progress
3.2.3.1	Snow Creek Watershed Acquisition and Restoration	SRP	2013	13-1198 AR	In Progress
3.2.3.1	East Jefferson Summer Chum Riparian Phase 2	SRP	2013	13-1199 R	In Progress
3.2.3.1	Snow Creek Uncas Preserve Phase 2	SRP	2015	15-1200 AR	In Progress
3.2.3.1	East Jefferson Summer Chum Riparian Phase 3	SRP	2016	16-1473	Proposed
3.2.3.1	East Jefferson Summer Chum Riparian Phase 4	SRP		Proposed	Proposed
3.2.3.1	Snow Creek Acquisition and Restoration	SRP		Planned	Planned
3.2.3.1	Lower Tahuya River Reach Assessment and Large Woody Debris Design	SRP	2008	08-1995 P	Completed
3.2.3.1	Tahuya River Watershed Assessment	SRP	2016	16-1490	Proposed
3.2.3.2 Skokomish Chinook freshwater habitat actions					
Strategy	Project Name	Type	Year	ID	Status
3.2.3.2	LeBar Creek Road Decommissioning/Stabilization	SRP	2001	01-1426 R	Completed
3.2.3.2	South Fork Skokomish River Large Woody Debris Enhancement	SRP	2006	06-2302 R	Completed
3.2.3.2	South Fork Skokomish River Large Woody Debris Enhancement Phase 2	SRP	2007	07-1657 R	Completed
3.2.3.2	South Fork Skokomish River Large Woody Debris Enhancement Phase 3A	SRP	2014	14-1332 R	In Progress
3.2.3.2	South Fork Skokomish River Large Woody Debris Enhancement Phase 3B	SRP	2015	15-1206 R	In Progress
3.2.3.2	Upper South Fork Skokomish River Channel - Floodplain Assessment	SRP	2015	15-1196 P	In Progress
3.2.3.2	South Fork Skokomish River Large Woody Debris Enhancement Phase 5	SRP	2016	16-1488	Proposed
3.2.3.2	South Fork Skokomish River Large Woody Debris Enhancement Phase 6	SRP		Planned	Planned

3.2.3.2	Vance River Reach Assessment	SRP	2007	07-1659 P	Completed
3.2.3.2	Vance Creek Watershed Restoration Assessment	SRP	2016	16-1491	Proposed
3.2.3.2	Skokomish Valley Rd Realignment Conceptual Design	SRP	2015	15-1195 P	In Progress
3.2.3.2	Skokomish Valley Road Relocation Final Design	SRP	2016	16-1487 P	Proposed
3.2.3.2	Skokomish Valley Rd Realignment Construction	SRP		Planned	Planned
3.2.3.2	Skokomish River, N. Channel Oxbow	SRP	1999	99-1679 R	Completed
3.2.3.2	Skokomish River Confluence Reach	SRP	2006	06-2343 A	Completed
3.2.3.2	Skokomish River Confluence Reach Restoration Design	SRP	2007	07-1925 P	Completed
3.2.3.2	Skokomish River General Investigation, Phase 2 & 3	SRP	2007	07-1644	Completed
3.2.3.2	Skokomish River General Investigation, Phase 2 & 3	SRP	2008	08-1996 P	Completed
3.2.3.2	USACE General Investigation of Skokomish River Support	SRP	2009	09-1668 P	Completed
3.2.3.2	USACE General Investigation of Skokomish River	SRP	2010	10-1567 P	Completed
3.2.3.2	Skokomish River Floodplain Acquisition & Restoration	SRP	2011	11-1358 AR	In Progress
3.2.3.2	Skokomish River Confluence Levee Design and Acquisition	SRP	2013	13-1220 PA	In Progress
3.2.3.2	Skokomish River General Investigation, 2014	SRP	2014	14-1328 P	In Progress
3.2.3.2	USACE Skokomish River Ecosystem Restoration Support 1	SRP	2016	16-1496	Proposed
3.2.3.2	Skokomish River Confluence Reach Acquisition Phase 2	SRP	2016	16-1485	Proposed
3.2.3.2	USACE Skokomish River Ecosystem Restoration Support 2	SRP	2016	16-1497	Proposed
3.2.3.2	USACE Skokomish River Ecosystem Restoration Support 3	SRP	2016	16-1497	Planned

3.2.3.2	Skokomish River Floodplain Restoration	NTA	2016	2016-0265	Proposed
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3.2.3.3	Mid-Hood Canal Chinook freshwater habitat actions
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3.2.3.3	Hood Canal Steelhead freshwater habitat actions
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4.0 Hood Canal Shellfish Initiative

4.1	Develop and implement Hood Canal Shellfish Initiative Action Plan
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4.2	Support ecological sustainable commercial shellfish operations in Hood Canal
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4.3	Protect and restore Hood Canal shellfish populations
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4.3.1	Restore native shellfish populations
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Strategy	Project Name	Type	Year	ID	Status
4.3.1	Olympia Oyster Reintroduction-Feasibility and Planning in Hood Canal	NTA	2016	2016-0230	Proposed

4.3	Increase non-commercial shellfish harvest activities in Hood Canal
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4.4.1	Enhance public access to shellfish harvesting areas
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4.4.2	Enhance tribal shellfish subsistence harvest
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5.0 Proactively prepare for climate change impacts across Hood Canal

5.1 Develop Hood Canal Climate Adaptation Plan

Strategy	Project Name	Type	Year	ID	Status
5.1	HCCC Climate Change Adaptation	NTA	2014	D2.1.HC5	Replaced
5.1	Hood Canal Climate Adaptation Planning	NTA	2016	2016-0303	Proposed

5.2 Integrate climate adaptation interventions throughout HCCC and member jurisdiction planning and programs

5.3 Improve climate resilience of freshwater salmon habitat

5.3.1 Consider climate resilience in all salmon recovery project design

5.3.2 Implement salmon recovery actions identified to benefit climate resilience

6.0 Outreach on IWP implementation effectiveness and ecosystem improvements

6.1 Develop and implement HCCC Strategic Communications Plan

6.1.1 Clarify messaging around HCCC's role in the region and how to engage with partners and the public

6.1.2 Identify external communications priorities

6.2 Maintain role as central information source on Hood Canal ecosystem recovery

6.2.1 Maintain HCCC website as information resource for project partners and local decision makers

6.2.2 Maintain ecosystem status reports on OurHoodCanal.org website

Strategy	Project Name	Type	Year	ID	Status
6.2.2	HCCC Integrated Watershed Plan	NTA	2014	D2.1.HC1	Completed
6.2.2	Hood Canal Integrated Watershed Plan Monitoring and Adaptive Management	NTA	2016	2016-0297	Proposed
6.2.2.a	Hood Canal Human Wellbeing Indicator Development and Research	NTA	2016	2016-0307	Proposed