



SECTION 3  
STRATEGIES AND  
ACTIONS

The Action Agenda is made up of strategies, sub-strategies, ongoing programs, and near-term actions, which are organized into five broad categories.

- A. **Freshwater and Terrestrial** includes strategies and actions related to land development and restoration, stewardship of working forest and agriculture lands, floodplains, salmon recovery, and freshwater flows.
- B. **Marine and Nearshore** includes strategies and actions related to shoreline protection, alteration, and restoration; marine area protection and restoration; working waterfronts and public access; and biodiversity and invasive species.
- C. **Pollution** includes strategies and actions related to reducing toxic threats, polluted runoff from urban and rural lands, wastewater management, shellfish bed restoration, and oil spill preparedness and clean up.
- D. **Strategic Leadership and Collaboration** includes much of the core work of the Partnership, as well as some partners, including strategies and actions related to setting priorities, performance management, science and ecosystem monitoring, and promoting stewardship.
- E. **Funding Strategy** describes how increased financial capacity to implement priority ongoing and new actions in the Action Agenda can be achieved through identifying new sources of funding, using existing funding more strategically and efficiently, and developing innovative, market-based programs.

Within each of these broad categories, the strategies and actions are further organized into strategic topics. The following information is presented for each strategic topic.

- **The Challenge** describes the issue.
- **Recovery Targets** presents the relevant vital sign indicators and associated recovery targets.
- **Local Priorities** shows the local integrating organizations (LIOs) with near-term actions (by sub-strategy).
- **Strategies and Actions** presents the strategies and sub-strategies—the overall, long-term directions and approaches—and the ongoing programs and near-term actions that implement them.
  - **Ongoing Programs** describes existing Puget Sound recovery efforts that fit into the Action Agenda framework. Key actions that are expected to be completed within the timeframe for the 2014/2015 Action Agenda are highlighted at the end of the section.
  - **Near-Term Actions** presents Soundwide near-term actions followed by local near-term actions. Local actions are designated by local area abbreviations.
  - **Emerging Issues and Future Opportunities** provides a forward-looking discussion for each strategy, where appropriate.
  - Each **Target View** describes the recovery targets for specific vital signs and identify the strategies and sub-strategies that contribute to achieving the targets.

Additionally, cross-cutting issues—salmon recovery, tribal treaty rights, climate change, and ocean acidification—are highlighted in text boxes throughout Section 3 where they are relevant to the strategies and actions.



STRATEGIES AND ACTIONS

# A: FRESHWATER AND TERRESTRIAL

The protection and restoration of upland and terrestrial systems is fundamental to the health of Puget Sound, yet land development and associated human land use activities have damaged many of the underlying processes that support these systems. The elements of a successful approach to upland and terrestrial systems must ensure that land use and land development practices are carried out in a sustainable fashion; flood hazards do not harm people, residences, and transportation; freshwater quality and quantity supports freshwater and terrestrial food webs and human uses; groundwater levels as well as river and streamflow levels are sufficient to sustain people, fish, and wildlife; salmon are abundant and populations are significantly increasing throughout Puget Sound; species are protected and biodiversity is enhanced; and non-native species do not impair the complex functions of the Puget Sound ecosystem.

The strategies in this section will contribute most significantly to achieving recovery targets for the following vital signs.

- Land development and cover
- Floodplains
- Summer stream flows
- Chinook salmon

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**THIS SECTION DESCRIBES SEVEN STRATEGIES**—and associated sub-strategies, ongoing programs, and actions—that are essential to the protection and restoration of freshwater and terrestrial systems. The strategies and actions are organized under the following headings.

#### Land Development and Cover

- A1.** Focus Land Development Away from Ecologically Important and Sensitive Areas
- A2.** Protect and Restore Upland, Freshwater, and Riparian Ecosystems
- A3.** Protect and Steward Ecologically Sensitive Rural and Resource Lands
- A4.** Encourage Compact Regional Growth Patterns and Create Dense, Attractive, and Mixed-Use and Transit-Oriented Communities

#### Floodplains

- A5.** Protect and Restore Floodplain Function

#### Summer Stream Flows

- A6.** Protect and Recover Salmon

#### Chinook Salmon

- A7.** Protect and Conserve Freshwater Resources to Increase and Sustain Water Availability for Instream Flows
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RECOVERY IN FOCUS



Freshwater and terrestrial strategies and actions contribute to achieving recovery targets for the vital signs shown in color in this *Puget Sound Vital Signs* graphic. The *Puget Sound Vital Signs* is an online tool that tracks and communicates ecosystem conditions and progress toward achieving recovery targets.

# Land Development and Cover

## The Challenge

Land development and cover are essential contributors to the health of both terrestrial and aquatic ecosystem processes and habitats. Due to land conversion from growth and development pressures, many Puget Sound habitats have been reduced in size, diminished in quality, and fragmented, and the ecosystem processes (e.g., water quality, flow, and retention) that form and sustain these habitats have been degraded and disrupted. During the past 50 years, Puget Sound has lost at least 67% of its remaining old growth forest, more than 90% of its native prairies, and 80% of its saltwater and freshwater marshes (Puget Sound Partnership 2008).

Essential to our ability to protect the resources that remain will be encouraging density in urban areas, protecting rural working lands, and avoiding sprawl. Population growth and residential and commercial development are elements of a healthy economy and are not per se what threatens Puget Sound health and recovery; rather, it is *where* and *how* the growth and development occur that can result in adverse pressures on ecosystem functions.

Tools to protect key ecosystem processes include regulatory programs, acquisition programs, partial acquisition of development rights or conservation easements, and conservation leasing. Special designations such as Wilderness, Wild and Scenic Rivers, and Outstanding Water Resources can be used to ensure long-term protection. Acquiring development rights from highly productive working resource lands, such as farms and forests, is an effective way to protect ecosystem processes/structures while ensuring long-term productivity of working landscapes and rural communities.

The National Estuary Program Watershed Grant has identified pilot projects to fund a number of sub-strategies identified in this section. Ecology and Washington State Department of Commerce (Commerce), the lead agencies of the grant, will continue to fund and provide technical support for pilot projects at the local level aimed at implementation of these sub-strategies.

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### CLIMATE CHANGE

Many climate change impacts have links to land cover and land development—particularly with regard to risks to fish, wildlife, and natural systems from habitat degradation and loss, as well as risks to the agriculture and forestry industries. *Preparing for a Changing Climate: Washington State’s Integrated Climate Response Strategy* (Washington State Department of Ecology 2012a) identifies several high-priority, overarching strategies with a connection to reducing pressures from land development, including the following.

- Reducing forest and agricultural vulnerability to climate change impacts. This strategy includes conserving productive and adaptive farmland and forests.
- Safeguarding fish and wildlife and protecting critical ecosystem services that support human and natural systems. This strategy includes protecting and restoring habitat.

The strategies and actions in this section directly implement the state climate response strategy.

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## Recovery Targets

The strategies and actions in this section will contribute more significantly to achieving the recovery targets for land development and cover listed below with their associated indicators.

Vital Sign	Indicator	Recovery Target
Land Development and Cover	Conversion of ecologically important lands, measured by the proportion of vegetated cover converted to developed cover on undeveloped lands identified as ecologically important and that are under high pressure from development for residential, commercial, and industrial uses	Basin-wide loss of vegetation cover on ecologically important lands under high pressure from development does not exceed 0.15% of the total 2011 baseline land area over a 5-year period.
	Growth in urban growth areas, measured by the proportion of population growth occurring in urban growth areas	The proportion of basin-wide growth occurring within urban growth areas is at least 86.5% (equivalent to all counties exceeding their population growth goals by 3%), with all counties showing an increase over their 2000–2010 percentage.
	Forest loss, measured by the number of acres of forest cover converted to development	The average annual loss of forested land cover to developed land cover in non-federal lands does not exceed 1,000 acres per year, as measured with Landsat-based change detection.
	Riparian vegetation restoration, measured by the amount of new vegetated cover delivered by restoration projects along riparian corridors	Restore 268 miles of riparian vegetation or have an equivalent extent of restoration projects under way.

## Local Priorities

LIOs identified near-term actions that address land development and cover. These local actions are presented in the *Strategies and Actions* section along with Soundwide actions under the sub-strategy shaded below. The local action numbering contains the area abbreviation shown in parentheses after each LIO name. See Section 4, *Local Recovery Actions*, for detailed information about local planning.

Local Integrating Organization	Sub-Strategy											
	A1.1	A1.2	A1.3	A1.4	A2.1	A2.2	A2.3	A3.1	A3.2	A4.1	A4.2	A4.3
Hood Canal Coordinating Council (HC)						■						
Island (ISL)												
San Juan (SJI)												
Snohomish-Stillaguamish (SNST)			■			■						
South Central Caucus Group (SC)					■						■	
Alliance for a Healthy South Sound (SS)												
Strait ERN (STRT)		■										
West Central (WC)	■				■	■						
Whatcom (WH)						■						

# Strategies and Actions

## A1. Focus Land Development away from Ecologically Important and Sensitive Areas

Protecting high quality ecological areas is less expensive and more effective than trying to repair or restore damaged areas. In an effort to maintain a balance of development and protection, the sub-strategies recognize that population growth is an integral part of the regional economy, but aim to focus land development away from areas in the Puget Sound that are ecologically vulnerable and important to maintain. In the near term, the sub-strategies focus on identifying what lands are ecologically important and where they are located in Puget Sound, making this information available to local jurisdictions, and equipping them with information they need to make decisions consistent with this strategy.

### A1.1 Identify and prioritize areas for protection, restoration, and best suitable for (low impact) development

#### Ongoing Programs

The Puget Sound Watershed Characterization’s assessment of water flow, water quality and biodiversity importance of Puget Sound basin lands and waters is an important tool used to identify ecologically sensitive areas. This assessment, when used in conjunction with other watershed information and data can help identify which areas should be protected from new development and those areas appropriate for low impact development. Applying the information in the assessment should direct land development away from ecologically important areas. The results are used in several of the sub-strategies in A1, A2, A3, and A4. The assessment incorporates many of the same data sets used in related regional analyses conducted by the Washington State Department of Natural Resources (DNR) (Aquatic Landscape Prioritization), The Nature Conservancy, Washington Department of Fish and Wildlife (WDFW), Washington Biodiversity Council, and Washington Habitat Connectivity Working Group. Therefore, it is an important and appropriate tool for identifying ecologically important lands for the purposes of this effort. In addition to the watershed characterization tool, use of the strategy assessment of the Puget Sound Nearshore Ecosystem Restoration Project, maps produced by the Washington Wildlife Habitat Connectivity Working Group, and the *Puget Sound Salmon Recovery Plan*

(Salmon Recovery Plan), with each of its 14 watershed chapters, should help to tailor information to each watershed and support decisions for what areas to protect.

The watershed characterization's spatially explicit water and habitat assessments provide information for regional, county, and watershed-based planning. It is a coarse-scale decision-support tool that will enable better land use decisions and more effective protection, restoration, and conservation of our region's ecologically sensitive areas. The assessments cover the entire contributing drainage area of Puget Sound and represent the physical, chemical, hydrologic, wildlife, freshwater and nearshore habitat, and human attributes of this landscape that support and interact with the structure and function of ecosystems in Puget Sound. Although based on generalized data, they provide a regional-scale perspective on the spatial distribution of these attributes and impacts that is not generally provided by other available tools. The intended audience is local planners and watershed managers, tribes, the Partnership and other state agencies, city and county governments, and other resource managers including non-governmental organizations.

The Puget Sound Watershed Characterization, which was a high-priority action in the 2008 Action Agenda, is a decision-support tool, not a decision-making tool. It is structured to provide an overview of likely conditions, problems, and opportunities based on geographic information system (GIS) data, organized and analyzed in accord with well-established scientific principles. These analyses can be refined to help support a variety of actions, such as final decisions on priority efforts, designations of changed urban growth areas, or specific on-the-ground actions, typically requiring further levels of local data and information and expertise not provided by the regional-scale maps or tables. The Watershed Characterization Technical Assistance Team is funded to develop solution templates and integrate these templates within a decision support framework for water flow, water quality, and habitat data and assessments (e.g., Watershed Characterization Project and Puget Sound Nearshore Ecosystem Restoration Project). To leverage local expertise, the Watershed Characterization Technical Assistance Team worked with the Partnership's "User Group" consisting of local government planners previously established to review and comment on the effectiveness and usefulness of Puget Sound Watershed Characterization products. The templates and decision support framework is designed to address specific solutions to known environmental

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## SALMON RECOVERY PLAN PRIORITY: HABITAT PROTECTION

Protecting our existing habitat that supports salmon recovery efforts is a key priority for the Recovery Plan. The habitat restoration components of the Plan are based on an assumption that the existing habitat, as of 2005, would be preserved. The Plan also identified more assessment needed to understand how and whether the existing habitat protection infrastructure (regulations, incentives, technical assistance, and education/outreach) is being successful. Two papers released in 2011 illustrated the need to do a better job in protecting and restoring critical salmon habitat in Puget Sound. The first was a report released by NMFS that assessed Puget Sound Chinook Salmon Recovery Plan implementation progress since it was federally approved in 2007. Closely following the NMFS report, the Treaty Tribes of Puget Sound and the Coast released a paper titled "Treaty Rights at Risk – Ongoing habitat loss, the decline of the salmon resource, and recommendations for change."

### How is this priority integrated?

These two papers sparked a new intensive effort to respond to declining salmon runs. The federal agencies that have trust responsibilities to the tribes have been developing a new action plan to address the need to do a better job, and as that plan is developed, the Partnership's strategic priority to protect habitat may be expanded to incorporate the resulting actions.

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problems, using refined knowledge of ecosystem processes, and initial field testing and monitoring to apply and adaptively manage proposed solutions. The goal is to achieve meaningful changes in the local regulations affecting development practices throughout Puget Sound, in concert with local government Growth Management Act review and update processes scheduled for completion in 2015 or 2016.

Stream typing maps, also part of the 2008 Action Agenda, were developed and are maintained by DNR for purposes of implementing the Forest Practices Act and Rules. The maps classify streams and other water bodies in terms of whether or not they are used by fish, and perennial or seasonal flow. They are provided as a starting point to help forest landowners identify and type streams on their property. Forest landowners are required to determine, in the field, the water types within their harvest area and include them on their forest practice application. While some local government entities also use these maps for land use regulation, DNR does not require their use nor do they maintain the maps specifically for local government entities.

The stream typing maps are updated through a concurrence process managed by DNR. Water types can be updated by following a specified protocol and the priority for water type updates is streams and other water bodies on forestland subject to the Forest Practices Act and Rules.

WDFW maintains a number of GIS databases that contain information on the known location of Priority Habitats and Species in Washington State. Priority Habitats and Species is a source of best available science that can inform local planning activities, development projects, conservation strategies, incentive programs, and numerous other land use applications. These data have also been used in several landscape assessments including The Nature Conservancy's eco-regional assessments, the Biodiversity Conservation Opportunity Framework Maps, and the Puget Sound Watershed Characterization. This database is available online in an interactive map and management recommendations to guide how to protect priority habitats and species is also available online.<sup>1</sup>

DNR's Natural Heritage Program collects and manages statewide ecosystem data. The Natural Heritage database has spatial information about important native, intact, and rare ecosystems. The program has published a draft field guide to Washington ecological systems, available through the DNR website, and has key expertise in the state's ecosystems, including Puget Sound.

Many local communities at the watershed, city, or county level have detailed data and maps that help inform local planning. Much of this information is mapped at a finer scale than the Soundwide work.

### ***Key Ongoing Program Activities***

- Ecology and WDFW completed the Puget Sound Watershed Characterization in 2012 (Puget Sound Partnership 2012a). In a collaborative effort, Ecology, the Partnership, and WDFW are developing a regional-scale tool that highlights the most important areas to protect and restore those most suitable for development. The new beta-website and web map application is currently on line.<sup>2</sup>
- DNR, in consultation with Ecology, WDFW, and tribes, will continue to process stream typing updates for streams in the Puget Sound basin.<sup>3</sup>

<sup>1</sup> <http://wdfw.wa.gov/conservation/phs>

<sup>2</sup> <https://fortress.wa.gov/ecy/coastalatlus/wc/landingpage.html>

<sup>3</sup> [www.dnr.wa.gov/businesspermits/topics/forestpracticesapplications/pages/fp\\_watertyping.aspx](http://www.dnr.wa.gov/businesspermits/topics/forestpracticesapplications/pages/fp_watertyping.aspx)

- DNR, working with key partners, will seek to secure adequate and sustainable long-term funding for the Natural Heritage Program.

## Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.1.1 WC1 West Sound inventory of transportation infrastructure projects.** The West Sound Watersheds Council and West Central LIO will develop a process for the review of transportation infrastructure projects that addresses environmental impacts and key fish passage barriers.

### **A1.2 Support local governments to adopt and implement plans, regulations, and policies consistent with protection and recovery targets, and incorporate climate change forecasts**

Land use planning typically occurs on a jurisdiction-by-jurisdiction basis, with some coordination across cities and counties through countywide planning policies and occasionally on a multi-county scale through broader regional initiatives. Typically, a number of jurisdictions are involved in making land use and development decisions that affect a single ecosystem or watershed.

This sub-strategy is aimed at helping local governments act in ways that are consistent with Puget Sound recovery and at identifying and providing incentives to local jurisdictions for implementing, monitoring, and enforcing regulations and permits that are consistent with the broader recovery targets for Puget Sound. Material to be used for identifying and providing these incentives includes, but is not limited to, the San Juan Initiative<sup>4</sup> recommendations, programs being implemented through the Salmon Recovery Plan, and material developed as part of the discussions around habitat protection at the federal, state, tribal, and local levels through the Salmon Recovery Council.

Local governments operate in a highly dynamic environment with various levels of laws and regulations governing planning for land development. They must balance economic and ecological pressures along with adherence to local, regional, and state laws and regulations. Further, local conditions, demographics, and preferences factor into local land use decisions. In our resource-constrained environment, the ability of local governments to implement and support the land development and cover strategies is both the single most important success factor and also the most challenging. State funding for Growth Management Act implementation, education, and training has been, as of 2012, nearly eliminated during state budget reductions.

## Ongoing Programs

Three main legislative acts govern planning and land development in the Puget Sound region—the Growth Management Act, the State Environmental Policy Act, and the Shoreline Management Act. This Action Agenda builds off of these programs and identifies actions intended to accelerate, focus, and/or address gaps.

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<sup>4</sup> A public-private partnership to identify new regulatory and voluntary measures that would improve the marine ecosystem of San Juan County.

Currently, Ecology, WDFW, and Commerce provide ongoing technical assistance to local jurisdictions to develop and adopt planning goals and policies that incorporate ecosystem characterization information and protection strategies. Ecology and Commerce are also co-leads on the Watershed Protection and Restoration Grant, providing pass-through money to local jurisdictions to implement the Puget Sound Watershed Characterization. These goals and policies encourage compact urban growth patterns, increased density, strategic redevelopment, and resource and rural lands protection. Ecology and Commerce are also collecting permitting and planning data from local governments to compare planned growth with watershed characterization information. Over time, it may be appropriate for state and federal grant programs to expressly prioritize projects consistent with Puget Sound ecosystem recovery goals, including establishing priorities for projects that encourage compact growth patterns, density and redevelopment, and rural lands protection.

Regional-scale planning and coordination is facilitated by the Puget Sound Regional Council. This council provides the central Puget Sound counties (King, Pierce, Snohomish, and Kitsap), cities, towns, ports, tribes, transit agencies, and the state an opportunity to build a common vision for the region's future—which includes the well-being of people and communities, economic prosperity, and a healthy environment.

### Near-Term Actions

The near-term actions<sup>5</sup> identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

- A.1.2.1 Land use planning barriers, best management practices, and example policies.** Commerce and Ecology, working with local governments, will identify the primary barriers to incorporating policies consistent with implementation of the Action Agenda into local land use planning and decisions and identify best practices and assistance needed to overcome these barriers. This will address implementation of protection strategies, encouraging compact growth patterns, increased density, water quality standards, redevelopment, and rural lands protection. Commerce and Ecology will distribute example growth policies that include best practices that are consistent with protection and recovery targets and the Growth Management Act and Shoreline Management Act.
- A.1.2.3 Fund local Growth Management Act comprehensive plan updates.** Commerce will seek funding to assist local governments in conducting Growth Management Act comprehensive plan updates.
- A.1.2 STRT1 Assess vulnerabilities of local communities, tribes, and natural resources to the effects of climate change and concurrent human population increases.**
- Identify adaptive mechanisms for consideration and possible incorporation into the next updates of Growth Management Act comprehensive plans and other local regulatory and planning processes and documents by the five local jurisdictions and other organizations.

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<sup>5</sup> Gaps in numbering reflect near-term actions that have been completed or otherwise retired.

- Assess the vulnerabilities of the five local jurisdictions and four tribes' usual and accustomed areas to the effects of climate change and concurrent increases in human population on land use, infrastructure, and natural resources. Identify specific adaptive mechanisms (i.e., policies, regulations, programs, and plans) for consideration and possible incorporation into the next updates of Growth Management Act comprehensive plans and other local regulatory and planning processes and documents by five local jurisdictions and other organizations.

### **A1.3 Improve, strengthen, and streamline implementation and enforcement of laws, plans, regulations, and permits consistent with protection and recovery targets**

Local, state, and federal permitting programs all affect the type and kind of impact land development can have on the Puget Sound region. Identifying ways to strengthen and streamline elements of these permitting processes by making permitting decisions more predictable and efficient, and by making sure that information on where ecologically sensitive lands are located is considered, could help direct development to areas that are more ecologically resilient and encourage dense, compact growth patterns. Streamlining, in this case, is not intended to advocate the elimination of regulations, but rather efforts to help regulations be implemented more predictably and efficiently.

#### **Near-Term Actions**

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.1.3.1 The Puget Sound Salmon Recovery Council addresses regulatory exemptions.** The Salmon Recovery Council will address regulatory exemptions to provide effective oversight and mitigation sequencing for activities that impact the ecosystem.

**A.1.3 SNST1 Improve regulatory effectiveness.** Compile and evaluate results from existing studies and those currently being completed on the effectiveness of existing federal, state, and local regulations to protect habitat. Facilitate discussions and building trust among elected officials. Develop strategies to address common issues that are identified.

### **A1.4 Ensure full, effective compensatory mitigation for impacts that cannot be avoided**

When impacts cannot be avoided, it is critical to achieve and maintain full compensatory mitigation. Historically, this has been very difficult to achieve; estimates vary but local, regional, and national studies show that most mitigation projects fail to fully achieve their intended goals and are not effectively replacing lost or damaged resources, habitats, and functions.

#### **Ongoing Programs**

Ecology initiated the Mitigation that Works effort to help ensure that full compensatory mitigation is achieved and maintained when impacts cannot be avoided. The initiative started with a stakeholder process to develop a shared vision for successful mitigation and of a number of short- and long-term recommendations related to improving the mitigation process and mitigation success. It includes efforts to establish and implement a watershed-based approach to mitigation, support development and

piloting of innovative compensatory mitigation tools including market-based techniques and other approaches, and improve effectiveness monitoring programs for mitigation sites.

### Near-Term Actions

None; work will focus on Ecology's Mitigation that Works initiative.

### Emerging Issues and Future Opportunities

- Further incorporation of climate change considerations could include, but would not be limited to addressing habitat connectivity to preserve migration corridors, adding refugia considerations into land development planning, incorporating climate change impacts into long-term stewardship of coastal restoration sites, piloting blue carbon mitigation projects to fund estuary restoration and stewardship, evaluating whether modifications to Growth Management Act, Shoreline Management Act, State Environmental Policy Act, and other state programs are warranted, and integrating adaptation work into local plans.
- Continued improvements in the stream typing maps and uses.
- Evaluating the effectiveness of regulations.
- Identify when and how to provide direction to local governments when local planning is inconsistent with recovery needs.

## A2. Protect and Restore Upland, Freshwater, and Riparian Ecosystems

One of the primary strategies for the Action Agenda is protection of ecologically sensitive or vulnerable lands in the Puget Sound region. This series of sub-strategies is aimed at different facets of ecological protection. Protection in this context means identifying pieces of land that are of high ecological value and protecting them from development or further development. To assist in these protection efforts, the Puget Sound Watershed Characterization and Puget Sound Nearshore Ecosystem Restoration Project, as well as the help of the Puget Sound Watershed Technical Assistance Team, will be enlisted.

### A2.1 Protect and conserve ecologically important lands at risk of conversion

There are a significant number of private and public land protection programs and mechanisms. Local, state, federal, and private acquisition grant programs, land banks, and land conservancies use land protection mechanisms such as fee simple acquisitions, conservation easements, and leases. The preservation of intact, well-functioning land is an important element of these programs. The main challenges of protection through acquisition of property interests are ensuring sufficient land protection resources and implementing funding strategies that prioritize ecologically important lands. Especially as local jurisdictions continue to face revenue losses and local services are reduced, offsetting funding in the future may be required.

## Ongoing Programs

In 2007, the Washington State Legislature (Legislature) created the Habitat and Recreation Lands Coordinating Group (lands group) to improve the visibility and coordination of state habitat and recreation land purchases and disposals. The lands group is comprised of representatives from state natural resource agencies, non-profit organizations, local governments, legislators, private interests, and others. This group uses an established process for making state habitat and recreation land purchases and disposals more visible and coordinated. The process has three components.

- The Annual State Land Acquisition Coordinating Forum brings together state agencies, local governments, non-government organizations, landowners, tribes, and citizens to learn about and share ideas on proposals for state habitat and recreation land purchases and disposals.
- The Biennial State Land Acquisition Forecast Report gives information about the state land purchases and disposals that are being planned around the state.
- The Biennial State Land Acquisition Monitoring Report shows whether state agencies achieved their initial acquisition project objectives.

The Washington State Recreation and Conservation Office (RCO) provides staff support to the lands group and also supports several grant programs that support the protection of habitat and recreation lands. In 2009, using the authority of the Partnership's fiscal accountability legislation (Revised Code of Washington [RCW] 90.71.340), the RCO, Partnership staff, stakeholders, and the two RCO funding boards (Recreation and Conservation Funding Board and Salmon Recovery Funding Board) identified policies to align the grant processes with the 2008 Action Agenda. This work resulted in the following changes to three of the largest RCO grant programs: Aquatic Lands Enhancement Account, Salmon Recovery Funding Board, and Washington Wildlife and Recreation Program Conservation Account.

- Prohibit funding for any project designed to address the restoration of Puget Sound if that project is in conflict with the Action Agenda (effective January 1, 2010).
- Consider whether projects are referenced in the Action Agenda.

The U.S. Fish and Wildlife Service (USFWS) works cooperatively with landowners, communities, and tribes to foster voluntary stewardship efforts on private lands to help conserve species. A variety of tools are available under the Endangered Species Act to help states and landowners plan and implement projects to conserve species. One tool is the Cooperative Endangered Species Conservation Fund (a program to provide financial assistance to states for cooperation under Section 6 of the Endangered Species Act), which provides grants for a wide array of voluntary conservation projects for candidate, proposed, and listed species. The program provides funding to WDFW and the Department of Health (DOH) for species and habitat conservation actions on state and other non-federal lands. USFWS has four grant programs available through the Cooperative Endangered Species Conservation Fund including the "traditional" grants for projects that conserve species via actions that include restoration, monitoring, and captive breeding and the "non-traditional" grants that support local land use planning and land protection actions via Habitat Conservation Planning, Habitat Conservation Plan Land Acquisition Assistance, and Recovery Land Acquisition Grants.

In addition, using special designations to protect high priority lands and waters, especially for the headwaters of rivers, streams, and tributaries that drain into Puget Sound, are an important tool for

Puget Sound recovery. Numerous special designation programs can be used to protect intact priority areas. These include the federal Wilderness Act, Wild and Scenic Rivers Act, Outstanding Water Resources (a federal designation administered by states), and Washington state programs that include the DNR's designation of Natural Area Preserves and Natural Resources Conservation Areas, WDFW's Marine Protected Areas, and local county Shellfish Protection Districts among the many ways to authorize protective measures that ensure the sustainability of high priority lands and waters.

The 2008 Action Agenda included an action to advocate for proposed Wilderness and Wild and Scenic River designations specifically supporting the Alpine Lakes Wilderness addition and the Pratt River Wild and Scenic designation; this is an ongoing effort. In addition, special designations have been suggested for other areas including Wild and Scenic designation of the Middle Fork Snoqualmie River, Wild and Scenic designation of Illabot Creek in the Skagit River watershed, Wilderness and Wild and Scenic designations for rivers and lands on the Olympia Peninsula, the west slopes of the North Cascades, and within the Nooksack River watershed. These ongoing and locally supported protection efforts are critical and need additional and sustained support.

### Near-Term Actions

The near-term actions<sup>6</sup> identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

- A.2.1.2 Updated avoidance and minimization guidance.** Ecology will reinforce the importance of avoiding and minimizing impacts to wetlands, particularly those with high ecological value and that are difficult to replace, by developing and implementing updated avoidance and minimization guidance.
- A.2.1.3 Port Gamble land conservation.** Forterra, working in collaboration with Kitsap County, the Port Gamble S'Klallam Tribe, and the Suquamish Tribe, will coordinate funding and participation to secure the conservation of ~6,700 acres of land near Port Gamble, including 1.5 miles of shoreline.
- A.2.1 SC2 Identify and protect high-value salmon recovery habitat and lands at immediate risk of conversion.** Secure funding to acquire high-priority, high-threat land as identified in salmon recovery plans and seek funding to secure property.
- A.2.1 SC14 Retain forest canopy cover and soils to attenuate stormwater runoff.**
- Promote programs that support retention and increase in forest canopy cover on private and public lands, especially those in priority and sensitive areas.
  - Identify and implement watershed revegetation in the Swan Creek Watershed through the Pierce County Raise the Grade initiative.
- A.2.1 SNST4 Local habitat protection and restoration.** Implement effective habitat protection strategies that have been identified in local plans, recommended by stakeholders, and approved by plan sponsors. Examples include the following.

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<sup>6</sup> Gaps in numbering reflect near-term actions that have been completed or otherwise retired.

- Acquisition by the City of Snohomish of 20 acres at the confluence of the Snohomish and Pilchuck River.
- Protection strategies identified in the Snohomish Basin Protection Plan and the Port Susan Marine Stewardship Area Conservation Action Plan.
- Promote the Conservation Reserve Enhancement Program and the Snohomish Conservation District’s “Free Trees Program”.

**A.2.1 WC14 Kitsap Forest & Bay Divide Property acquisition.** The West Central LIO, along with Great Peninsula Conservancy and other partners, will seek and secure funding to complete acquisition of the Kitsap Forest & Bay Divide Property, part of a larger effort to protect over 7,000 acres of forest and wetland habitat in north Kitsap County.

## **A2.2 Implement and maintain priority freshwater and terrestrial restoration projects**

Numerous upland and riparian restoration efforts are underway in the region. While it is important to focus on those that give the Puget Sound a big lift for recovery, it also is critical to recognize the potential for local stream-based restoration efforts to both make marked improvements to ecosystem health, contribute to salmon recovery, as well as further regional awareness of the benefits a healthy Puget Sound creates for people and improve individual understanding and commitment to actions that will protect and restore Puget Sound. There is nothing like healthy salmon returning to the stream in your neighborhood to bring home the way we all are connected to Puget Sound.

Once installed, restoration projects need to be maintained and monitored over time to ensure that they are functioning as intended, and adapted where needed. Innovative maintenance methods such as partnerships with conservation organizations and citizen volunteers should be considered.

Freshwater restoration projects cover rivers, streams, lakes, and wetlands; within that body of work, a major focus of the Action Agenda is the riparian restoration needed to reach the recovery target. These gains will come from implementation of existing high priority projects in the salmon recovery 3-year work plans that are part of the National Oceanic and Atmospheric Administration (NOAA) approved Chinook Recovery Plan, other adopted multi-species recovery plans, flood hazard management plans, road decommissioning plans, Shoreline Master Programs, GMA programs, and local watershed assessments.

Local implementing organizations looked across these existing local plans to identify high priority projects in their local area. When prioritizing river and stream projects for implementation, local organizations considered the hierarchical restoration strategy of Roni et al. (2002), including (1) habitat reconnection (e.g., culvert improvements, off-channel connections), where prior disconnection is among the problems; (2) road work (e.g., removal, improvement); (3) riparian vegetation restoration; (4) instream habitat restoration (e.g., wood and boulder placement); (5) nutrient enhancement; and (6) habitat creation (e.g., instream with wood and boulders, off-channel).

Private landowners should continue to be encouraged to undertake restoration projects. Existing programs need to continue, expand, and be coordinated to further and effectively encourage private landowners to undertake and maintain restoration projects. Incentives for industrial and commercial landowners may also be needed. There are numerous landowner programs that include incentives and

technical assistance. The Washington State Conservation Commission (WSCC), conservation districts, DNR, Washington State University (WSU) Extension, Washington Sea Grant, local governments, and non-governmental organizations offer programs. Examples include direct financial incentives (e.g., grants, subsidized loans, cost-shares); indirect financial incentives (property tax relief); technical assistance (referrals, trainings, design assistance), recognition/certification for products or operations, and conservation leasing.

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## SALMON RECOVERY PLAN PRIORITY: HABITAT RESTORATION

Habitat restoration is an important part of recovery and needs to be done in a way that targets priority areas for ecosystem functions. Restoration priorities for each watershed are called out in Volume II of the Salmon Recovery Plan and then further developed out in each of the annual 3-year work plans.

**How is this priority integrated into the Action Agenda?** Sub-strategy A2.2 includes restoration of riparian habitat not covered by under floodplain, fish passage, and other upland actions.

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### Ongoing Programs

Ongoing programs related to this strategy include programs that implement species recovery plans including salmon recovery 3-year work plans implemented by the 15 lead entities, flood hazard management plans, road decommissioning plans, fish passage barrier removal via the Forest and Fish Agreement and other requirements, Shoreline Master Programs, GMA programs, DNR Aquatic Landscape Prioritization, and watershed assessments.

An example of work underway at a local level is the Nooksack Tribe's leadership in a wide variety of elk monitoring and habitat enhancement projects that has successfully worked with partners to develop and implement continuing elk habitat enhancement and protection projects. The tribal priority is protection and restoration of terrestrial ecosystems of elk.

Major funding sources for implementation of species recovery plans include Pacific Salmon Recovery Funding through NOAA, which provides funding for elements necessary to achieve overall salmon recovery including habitat projects and other activities that result in sustainable and measurable benefits for salmon and other fish species. Additional resources include NOAA's Community-based Restoration Program and the Puget Sound Acquisition and Restoration, a state capital program coordinated by the Partnership, which implements many of the Action Agenda and Salmon Recovery Plan's habitat restoration priorities. Other significant funding sources include the Estuary and Salmon Restoration Program, and Family Forest Fish Passage Program.

A number of past commenters noted that more work is needed to strengthen stewardship incentive programs to increase the ability of private landowners to undertake and maintain restoration projects. This is an issue for discussion in future Action Agenda updates.

### Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

- A.2.2.1** **Prairie and oak woodland restoration.** WDFW in consultation with DNR, USFWS, and Joint Base Lewis McCord, will implement priority prairie and oak woodlands restoration projects.
- A.2.2 HC2** **HCCC in lieu fee mitigation.** The HCCC established an In Lieu Fee Mitigation Program and will continue to manage it to provide mitigation for unavoidable adverse impacts from development projects within the program’s service area. Specific mitigation projects and progress of the program will be reported as part of the 2016 Action Agenda.
- A.2.2 WC12** **West Sound Priority Watersheds for Protection.** The Suquamish Tribe will develop a detailed protection and restoration plan for the upper Chico Creek watershed. The Tribe will seek funding to undertake similar work for the high priority refugia, Curley and Blackjack Creek watersheds.
- A.2.2 WC15** **Springbrook Creek fish passage enhancement and water quality retrofit.** The City of Bainbridge Island will seek funding to complete study and design for a watershed scale project that would ultimately replace two stream crossing culverts to improve fish passage; eliminate stream bank erosion through habitat enhancement; and reduce pollutants from road runoff by adding water quality retrofits, including addressing fecal coliform sources upstream of an important shellfish growing area and eliminating impound ponds.
- A.2.2 WC16** **Duwe’iq stormwater treatment wetland and stream restoration.** Kitsap County Surface and Stormwater Management will complete construction of the Duwe’iq Stormwater Treatment Wetland and Stream Restoration project, which will reduce fecal coliform and other stormwater pollutants from 30 acres of commercial runoff into Clear Creek, improve stream habitat, advance public education about stormwater via Clear Creek Trail access, and increase green space in the urban Silverdale corridor.
- A.2.2 WC17** **Clear Creek floodplain restoration.** With an ultimate goal of freshwater habitat restoration and enhancement, Kitsap County Surface and Stormwater Management will complete a project to construct floodplain, restore stream habitat, remove road, enhance trails, reduce downstream flooding, and advance public education about floodplains/wetlands/stormwater in Clear Creek. This includes:
- Completion of restoration design.
  - Completion of project permitting.
  - Completion of project construction.
- A.2.2 WH4** **Padden Creek enhancements—24th to 30th Streets.** This freshwater project greatly improves existing habitat conditions for the section of Padden Creek that is immediately upstream of the newly daylighted tunnel. This site is now accessible to salmonid species. The project will increase the diversity and amount of fish habitat available by reconnecting Padden Creek to its floodplain, adding log jams, boulders and pools in an

urban environment. Steps include completing design, obtaining permits, constructing, planting the site, maintaining plantings, and monitoring site evolution.

**A.2.2 WH5 WRIA 1 culvert inventory maintenance.** Whatcom County completed an inventory of culverts in WRIA 1 in 2005. The document may need to be updated to reflect culverts replaced or repaired and inventories recently completed by WDFW. Completing designs for priority fish passage barriers would enable those barriers to be “shovel-ready” when funding becomes available to implement projects.

### **A2.3 Implement restoration projects in urban and developed areas while accommodating growth, density, and infill development**

Restoration in urban areas also is needed. Examples of work include removing non-native invasive species, replanting, maintaining and stewarding native trees and vegetation, removing non-native invasive species, removal of shoreline bulkheads and bank regrading, setting aside portions of private lots for open space, day-lighting of creeks, and other stream restoration efforts. Many of these activities are supported by local conservation organizations, volunteer groups, and neighborhood associations. Actions that contribute to freshwater restoration and to improvement and maintenance of water quality include retrofitting stormwater infrastructure, incorporating bio-swales and rain gardens in urban environments. Restoration actions in urban areas need to be achieved in concert with the needs of these areas to accommodate anticipated growth.

#### **Ongoing Programs**

Many cities, counties, and organizations in urban and suburban areas have programs and ordinances to encourage maintaining and increasing urban tree canopies, removal of invasive species, planting native vegetation, and restoring creeks and streams. Protection of ecologically sensitive and important areas is also designated in critical area ordinances and shoreline management programs.

#### **Near-Term Actions**

None; work in the near-term will focus on implementation of ongoing programs.

#### **Emerging Issues and Future Opportunities**

- Further incorporation of climate change considerations could include, but would not be limited to, planning restoration projects in freshwater and terrestrial ecosystems. For example, projected changes to hydrological regimes from climate change.

## **A3. Protect and Steward Ecologically Sensitive Rural and Resource Lands**

Private forest and agricultural lands provide critical fish and wildlife habitat and other ecosystem functions, especially in highly productive lower elevation riparian areas. These lands, however, are at significant risk of conversion to non-farm and non-forest uses, particularly residential and commercial development.

Maintaining the vibrancy of agriculture is crucial to recovering Puget Sound and instrumental in providing a high quality of life in the region. However, farming in the Puget Sound basin faces an uncertain future. Global competition for agricultural commodities has reduced prices for Puget Sound farm products while costs of land and raw materials continue to rise. Low profit margins have forced many farmers out of business and farmland is being converted to other uses at an alarming rate. Rural areas have a low density of impervious surfaces and farmland provides greater flood plain function than developed areas. The continued loss of farms in the region and conversion to non-farm uses is not only detrimental to individual farmers and to the regional farm economy; but is detrimental to the recovery of Puget Sound.

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## CLIMATE CHANGE

As identified in *Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy* (Washington State Department of Ecology 2012a), climate change impacts on forest lands include larger and more frequent fires, mountain pine beetle outbreaks, and changes in geographic range, growth, and productivity. Key impacts on agriculture include changes in crop productivity, decreases in water availability, increased stress from extreme events, reduced livestock productivity, increased stress from invasive weeds, diseases, and pests, and global economic impacts related to food production, processing, and transportation.

The state strategy identifies the following high-priority, overarching strategy.

- Conserving productive and adaptive farmland and forests.

Forest-related adaptation strategies include the following.

- Conservation and restoration of healthy, resilient forests across ownership boundaries and large geographic ranges.
- Maintaining and protecting forest species and genetic diversity.
- Protecting, expanding, and managing urban forests.
- Building capacity and support for maintaining, enhancing, and restoring resilient and healthy forests.

Agriculture-related adaptation strategies include the following.

- Protection of productive agricultural land.
  - Reduction of impacts of severe droughts and floods.
  - Prevention and control of invasive species.
  - Engagement of agricultural communities in adaptation efforts.
  - The Action Agenda strategies for forest and agricultural land conversation and multi-benefit approaches to restore floodplains help to implement the state strategy.
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### **Forest Lands**

According to the Washington State Forestland Database, developed by the University of Washington Rural Technology Initiative, about 972,000 acres of private forestland in western Washington are threatened with conversion. Population pressures, changing forest ownership patterns, and the desire for rural housing sites are fragmenting once continuous forests into smaller tracts that are economically and environmentally unsustainable. The potential risk of private forestland conversion is highest in the Puget Sound region. Forest conversion also eliminates major opportunities to leverage forest carbon sequestration to address climate change and also negatively affect biodiversity, fisheries resources, and open space (University of Washington College of Forest Resources 2009).

## Agricultural Lands

In 1950, there were about 1.4 million acres of farmland in the region. Today, less than 600,000 acres remain—a 58% loss. If this rate of loss continues, we will lose the last acre of farmland in seven of the Puget Sound counties by 2050 and the last acre in 2065. In the 15-year period from 1982 to 1997, the Puget Sound region lost nearly 20% of its farmland and 50% of its dairy farms.

Analyses indicate that 1 acre converted from agricultural to urban development produces 10 to 15 times the runoff and runoff-borne pollutants, including far higher concentrations of heavy metals, petroleum and other key pollutants. Farmland also provides habitat and food resources for migratory bird species, promotes aquifer recharge, and uses far less water than an equivalent area of urban development. At the same time, many salmon-bearing rivers and streams traverse farmland, which often results in degraded or removed habitat or alterations to habitat conditions. This creates a challenging dynamic for protecting farmland from urban development while also recognizing that some farmland is located in prime salmon habitat (Canty pers. comm.).

Development in rural areas presents a particularly concerning pressure on the ecosystem because it is in those rural areas (including both forested and agricultural lands) where high-quality habitat and significant ecological processes remain partially or largely intact. Rural area forest cover and agricultural land is being converted to housing and other uses in 5-acre and smaller patchwork patterns. The network of infrastructure (primarily roads, but also other utilities) constructed to serve such development further fragments the landscape, and interrupts or modifies the delivery, movement, and storage of water, sediment, woody debris, and nutrients, and impairs functions of fish and wildlife habitats for feeding, breeding, rearing, and migrating for numerous species. In addition, sea level rise projections pose a threat to potential future loss of

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## OCEAN ACIDIFICATION

As identified in *Ocean Acidification: From Knowledge to Action, Washington State's Strategic Response* (Washington State Blue Ribbon Panel on Ocean Acidification 2012), delivery of nutrients and organic carbon from land into marine waters contributes to Ocean Acidification. Agriculture, businesses, and coastal communities play an important role in helping to maintain shellfish production by reducing nutrient pollution to the marine system.

One of the Blue Ribbon Panel's recommendations includes providing a forum for agricultural, business, and other stakeholders to engage with coastal resource users and managers in developing and implementing solutions. The Action Agenda strategies for protecting and providing stewardship of ecologically sensitive rural and resource lands will help to implement the Blue Ribbon Panel's recommendations by helping to maintain the economic viability of working forests and farms.

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## SALMON RECOVERY PLAN PRIORITY: PROTECTION OF WORKING LANDS

The Salmon Recovery Plan calls for the protection of working lands within the context of how these working lands contribute to salmon recovery. Many of the watershed plans in Volume II specifically call out this need and also speak to the fact that some working lands are located in areas critical to salmon—for example, some estuarine habitat is currently being farmed—and that it is important to find solutions to both sustain working lands and recover salmon. Watershed chapters such as the Whatcom, Skagit, Stillaguamish and Snohomish are areas where this is called out.

**How is this priority integrated in the Action Agenda?** Strategy A3 and its associated sub-strategies and actions address the protection of working lands in the context of habitat protection and restoration. However, more discussion and agreement about these slightly different areas of focus is needed. Where working lands are the same as the lands needed for habitat restoration, more flexibility and creativity in conservation tools may be needed to achieve both restoration and farmland protection.

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agricultural lands and saltwater intrusion, particularly in the Skagit, Snohomish, Stillaguamish, and Nooksack deltas.

### **A3.1 Use integrated market-based programs, incentives, and ecosystem markets to steward and conserve private forest and agricultural lands**

Numerous incentive programs are available for landowners to encourage stewardship and conservation. However, they are not well coordinated, lack adequate funding, tend to be opportunistic rather than strategic, and are not being fully utilized or targeted at the most important lands. In addition, the eligibility requirements may not address the resource impacts. The strategies contained in this Action Agenda support the prioritization of incentive programs toward the highest-priority ecologically sensitive and important lands.

#### **Ongoing Programs**

Programs include the Designated Forest Land and Open Space Tax Program as well as the Forest Riparian Easement Program, Riparian Open Space Program, the Family Forest Fish Passage Program and the newly established voluntary stewardship program established by House Bill 1886 in the 2011 legislative session, among others. There are also numerous federal incentive programs offered through the Natural Resources Conservation Service (NRCS) and other federal programs.

DNR offers and administers a variety of landowner assistance programs targeted primarily at private forest landowners. The Forest Stewardship Program is a nationwide program which provides advice and assistance to help family forest owners manage their lands. The program is cooperatively funded by the U.S. Department of Agriculture (USDA) USFS and state forestry agencies and offers stewardship assistance, technical assistance, educational materials, and financial/cost-share assistance. At DNR, the Forest Stewardship Program is administered by the Small Forest Landowner Office.

The Voluntary Stewardship Program at the WSCC, created in 2011, requires counties across the state to either opt into the program or resume the process of updating their critical areas on agricultural lands under existing Growth Management Act processes. Counties who opt in must designate their priority watershed, then designate a lead agency to coordinate other local entities toward developing a work plan, which identifies critical areas on agricultural lands as well as an outreach plan to offer landowners incentives to protect critical areas. These coordinated efforts will enable resources to be targeted toward the most ecologically important areas, improving the efficient application of these incentives.

The NRCS offers programs to support the conservation of private forest and agricultural lands through economic incentives and market-based programs. — The Conservation Reserve Enhancement Program, administered by the Farm Services Agency and the WSCC, is a voluntary land retirement program that helps agricultural producers protect environmentally sensitive land, decrease erosion, restore wildlife habitat, and safeguard ground and surface water. The Environmental Quality Incentives Program (EQUIP) is a voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years. EQUIP provides financial assistance to help plan and implement conservation practices that address natural resource concerns and for improvements to soil, water, plant, animal, air, and related resources on agricultural land and non-industrial private forestland.

There are also a wide variety of financial incentive-based programs for private forest and agricultural landowners in Washington administered through other state agencies. For example, the Conservation Reserve Enhancement Program offered by the Farm Service Agency focuses on improving the water quality of streams that provide habitat for endangered salmon by planting trees along riparian buffers. Natural Resources Conservation Service's EQUIP provides technical assistance and funding for conservation practices on private, non-industrial forests or agricultural land anywhere in the state. The WDFW also administers a financial incentive program for private landowners called the Landowner Incentive Program (LIP). LIP is a competitive grant program to provide financial assistance to private landowners for the protection and restoration of habitat to benefit species-at-risk on privately owned lands. Funds are a direct appropriation from Congress passed through the USFWS to state fish and wildlife agencies in a nationally competitive process. Currently, there are no funds for LIP.

Market-based approaches will help achieve this sub-strategy. A common theme among five reports addressing the preservation, conservation, and stewardship of important resource and habitat lands is consideration of ecosystem markets for farm and forest land services; keeping these lands economically viable is a mechanism for protecting them from conversion (Washington State Conservation Commission 2009; Washington Biodiversity Council 2007; University of Washington College of Forest Resources 2009; The Cascade Land Conservancy 2005; Forterra 2011). The *Washington Conservation Markets Study*, issued by the WSCC (2009) in response to Substitute House Bill 6805, specifically evaluated the feasibility of conservation markets in Washington to pay farmers and foresters for environmental benefits from conservation projects on their land and concluded, "Private farms and forests could supply substantial conservation gains in Washington," and that, "conservation actions on private farms and forests can be a viable, sustainable, and cost-effective way to achieve a wide variety of environmental goals."

Various ecosystem markets or "conservation banking" services, that are either topical or geographically limiting, are beginning to emerge in Washington, including markets for wetlands, carbon credits, biodiversity conservation, and development rights. Currently, however, these markets are uncoordinated and operate with different procedures and by various organizations—at least eight state agencies have conservation markets within their purview—and some centralized organization and management of these markets may be beneficial.

### ***Key Ongoing Program Activities***

- DNR and the WSCC will continue to direct stewardship funding, consistent with current statutory and regulatory requirements, to ecologically important areas as defined by the Puget Sound Watershed Characterization and other assessment and characterization information.
- The WSCC will continue assessing existing stewardship incentive programs to identify changes to better include underserved landowners, including small farmers and owners of non-working rural lands.
- The WSCC will continue working with other entities including WSU Extension, conservation districts, and counties to improve and expand public recognition for voluntary private sector stewardship of lands.

## Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.3.1.1 Use of Agriculture Conservation Program funds.** WSCC will enhance use of conservation and habitat restoration program funding from a variety of sources, (i.e., Conservation Reserve Enhancement Program and Environmental Quality Incentives Program) that are currently underused by and not tailored for western Washington growers.

**A.3.1.2 Landowner incentives for transfer of development rights and ecosystem markets.** Commerce and Ecology, in coordination with DNR and WSCC, will provide technical support and fund local projects to identify and implement landowner incentives, including transfer of development rights and ecosystem services markets.

## A3.2 Retain economically viable working forests and farms

**Forest lands.** The key recommendation from the 2008 Northwest Environmental Forum on protecting Washington forests, led by the University of Washington College of Forestry, is the establishment of a legislatively appointed Task Force to direct and produce an overall plan for integrating Washington's complex and various regulatory, tax, and forest land protection initiatives.

**Agricultural lands.** As described earlier, since 1950 we have lost more than half of the farmland in the Puget Sound region. Effectively preserving agricultural land will involve tackling a complex set of interrelated issues including real work to ensure that agriculture continues to be a viable, and vibrant, industry in Puget Sound.

## Ongoing Programs

### Key Ongoing Program Activities

- All sales from forested state trust lands currently are certified under the Sustainable Forestry Initiative® Standard. The sustainable harvest on state trust lands is being recalculated in 2014.

## Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.3.2.1 Protect working forests.** DNR will work with other interested parties to develop a comprehensive strategy for retaining economically viable, long-term working forestlands.

**A.3.2.2 Agriculture strategy.** The Partnership, in collaboration with WSDA, Ecology, WSCC, and agricultural partners has convened an advisory committee to consider development of a Puget Sound agricultural strategy. The strategy will identify a) needs for maintaining the health of the industry b) key areas where the agricultural industry can contribute to the protection and restoration of Puget Sound and c) challenges to be addressed for achieving these goals and implementing a successful strategy. This near term action

could be further amended or integrated into the regional funding strategy as appropriate.

### Emerging Issues and Future Opportunities

- Assessing the ecological functions and values that can be achieved on working farms in the Puget Sound region, and the risks to these functions and values associated with conversion of farmland to non-farm uses.
- Continued development of incentive based approaches and conservation markets to conserve land and ecosystem functions while promoting the long-term sustainability of farming in the region.
- Identify and map all land within the Puget Sound basin that is currently in agricultural use to create a baseline.
- Work directly with farmers to better understand ecological and economic issues and viable solutions.

## A4. Encourage Compact Regional Growth Patterns and Create Dense, Attractive and Mixed-Use and Transit-Oriented Communities

Encouraging compact urban patterns would direct development away from working farms and forestlands and protect food and fiber production, wildlife habitat, ecosystem functions and water quality. Compact development patterns reduce impervious cover that leads to run-off pollution, and decrease shoreline development that leads to erosion and habitat destruction. Finally, compact development is more energy efficient, reducing energy-related pollution including greenhouse gas emissions.

### A4.1 Integrate growth, infrastructure, transportation, and conservation planning at sub-regional levels and across jurisdictions

Regional planning alliances similar to the Puget Sound Regional Council, Thurston Regional Planning Council, South Sound Military and Communities Partnership, or Skagit Alternative Futures could plan for compatible land uses, growth, and corresponding infrastructure needs and concurrent ecosystem protection and recovery strategies at scales that are more efficient and provide more opportunity for examining and optimizing future planning scenarios and alternatives that reduce sprawl, increase density in urban areas, and promote and plan for regional transit solutions. For example, they could tackle issues related to which jurisdictions or portions of jurisdictions are best suited to accommodate projected growth, develop regional economic development strategies, which could allow for revenue sharing and minimization of competition among local governments, address inequities of tax structure that occurs with new development (e.g., fiscal zoning) and annexation issues.

## Near-Term Actions

The near-term actions<sup>7</sup> identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.4.1.2 Regional sustainable communities program.** Commerce will work with local communities to implement Soundwide integrated regional planning that will integrate ecosystem protection, land use, transportation and housing, similar to the federal sustainable communities program.

## A4.2 Provide infrastructure and incentives to accommodate new and re-development within urban growth areas

Barriers to achieving dense and vital urban centers can include restrictive development regulations, environmental constraints, legacy pollution, land ownership patterns, inadequate infrastructure, lack of coordination between cities and special purpose governments, lack of urban amenities, lack of grocery stores, lack of schools, public perceptions, and fear of political risks. If we are to achieve compact urban patterns that direct development away from working farms and forestlands and protect wildlife habitat, ecosystem functions and water quality overall in the Puget Sound, we must work to encourage new and redevelopment in urban growth areas while at the same time recognizing the potential for protection and restoration of critical habitats within urban growth areas.

Infrastructure gaps also can present a hurdle to re-development in urban growth areas, whether it is water supply, sewer treatment capacity, or transportation improvements. Beyond such functional infrastructure, investments in urban amenities and recreational facilities also can make a large difference in how cities attract additional population and private investment. Infrastructure is expensive and is a growing concern as cities address both existing and planned future development (Peters pers. comm.).

## Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.4.2 SC13 Complete Regional Alliances Project and share results to increase infill development in urban centers while meeting stormwater requirements and Growth Management Act mandates.** Through the Regional Alliance Project,

- Develop recommendations for incentives and cost-effective tools to meet stormwater management and Growth Management Act requirements for development in urban areas in order to encourage infill development in urban centers instead of greenfield locations and to improve water quality.
- Develop recommendations related to comprehensive plan policy and development regulations to inform 2015 updates.
- Other actions may be identified.

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<sup>7</sup> Gaps in numbering reflect near-term actions that have been completed or otherwise retired.

Key partner in these efforts: Commerce

#### **A4.3 Enhance and expand the benefits of living in compact communities**

Accommodating growth inside urban growth areas likely will require increasing density in some places. To ensure this space is actually used, we must determine how to achieve truly livable density that is attractive to families. While there are currently no near-term actions identified for this sub-strategy, it will be a critical effort to begin to better understand this issue and to work with local governments to achieve and support density in the right places.

##### **Near-Term Actions**

No near-term actions identified.

# Target View: Land Development and Cover

## Land Development

The land surrounding Puget Sound is home to several million people who live, work, and play in our region. The needs for homes, office buildings, stores, and agricultural lands to support our lives must be taken into consideration as we strive to preserve working forests and habitats, and reduce polluted runoff into streams and the Sound.

In 1990, Washington State passed the Growth Management Act, which requires local governments to comprehensively plan for the location and manner of land development. Although this act has been successful in addressing our growth needs, there still are many pressures to develop in our rural areas which would further affect some of our high quality remaining habitat. Watershed-based approaches to locating where development occurs within urban growth areas and how it occurs within these areas are essential to minimizing pressures to ecological processes, habitat structures, and ecosystem functions.

A functioning, resilient Puget Sound ecosystem includes landscapes that provide important habitat and hydrology functions and a land base to support the built environment for a growing human population.

### *Recovery Target*

- Basin-wide loss of vegetation cover on ecologically important lands under high pressure from development does not exceed 0.15% of the total 2011 baseline land area over a 5-year period.
- The proportion of basin-wide growth occurring within urban growth areas is at least 86.5% (equivalent to all counties exceeding their population growth goals by 3%) with all counties showing an increase over their 2000–2010 percentage.

### *Relevant Strategies (and Sub-Strategies)*

- A1. Focus land development away from ecologically important and sensitive areas (A1.1, A1.2, A1.3, A1.4)
- A2. Protect and restore upland, freshwater, and riparian ecosystems (A2.1, A2.3)
- A3. Protect and steward ecologically sensitive rural and resource lands (A3.1, A3.2)
- A4. Encourage compact regional growth patterns and create dense attractive mixed-use and transit-oriented communities (A4.1, A4.2, and A4.3)
- A5. Protect and restore floodplain function (A5.2, A5.3, A5.4)
- A6. Maintain and enhance the community infrastructure that supports salmon recovery (A6.5)
- B1. Focus development away from ecologically important and sensitive nearshore areas and estuaries (B1.1, B1.2, B1.3)
- B2. Protect and restore nearshore and marine ecosystems (B2.1, B2.2, B2.4)
- B3. Protect and restore marine ecosystems (B3.1, B3.2)
- B4. Use, coordinate, expand, and promote financial incentives and programs for best practices at ports and in the marine industry that are protective of ecosystem health (B4.1)
- B5. Protect and restore native diversity and abundance of species (B5.1, B5.2)

Figure C-1 (Appendix C, *Results Chains*) depicts how the strategies (and related sub-strategies) contribute to reducing pressures related to land development and achieving the land development recovery target. Appendix C also contains a results chain for each individual strategy in the Action Agenda, showing how that strategy (and its related sub-strategies) reduces pressures and contributes to achieving numerous recovery targets.

## Land Cover

Land cover is an essential indicator of ecosystem health because of its importance for both terrestrial and aquatic ecosystem processes and habitats. During the past 50 years, Puget Sound lost at least two-thirds of its remaining old growth forest, more than 90% of its native prairies, and 80% of its saltwater and freshwater marshes. From 1992–2006, approximately 60,000 acres of forest-covered lands were converted to developed land.

A functioning, resilient ecosystem includes a mosaic of forestlands, agricultural lands, open space, natural lands (i.e., forest, prairie), and developed lands and related infrastructure to support habitat needs, support natural processes, and generate ecosystem services.

### **Recovery Target**

- The average annual loss of forested land cover to developed land cover in non-federal lands does not exceed 1,000 acres per year, as measured with Landsat-based change detection.
- Restore 268 miles of riparian vegetation or have an equivalent extent of restoration projects under way.

### **Relevant Strategies (and Sub-Strategies)**

- A1. Focus land development away from ecologically important and sensitive areas (A1.2, A1.3)
- A2. Protect and restore upland, freshwater, and riparian ecosystems (A2.1, A2.2)
- A3. Protect and steward ecologically sensitive rural and resource lands (A3.1, A3.2)
- A4. Encourage compact regional growth patterns and create dense attractive mixed-use and transit-oriented communities (A4.1, A4.2, A4.3)
- B1. Focus land development away from ecologically important and sensitive nearshore areas and estuaries (B1.2)
- C4. Manage surface runoff from forest lands (C4.1, C4.2)

Figure C-2 (Appendix C, *Results Chains*) depicts how the strategies (and related sub-strategies) contribute to reducing pressures related to land cover and achieving the land cover recovery target. Appendix C also contains a results chain for each individual strategy in the Action Agenda, showing how that strategy (and its related sub-strategies) reduces pressures and contributes to achieving numerous recovery targets.

# Floodplains

## The Challenge

Floodplains play a vital, often unrecognized role in the health of the Puget Sound ecosystems and watersheds. Floodplains support a variety of key ecological functions: They slow and store flood waters, filter our water, generate economically and culturally valuable fisheries, produce fertile soils for farming, recharge our aquifers, create a variety of recreational opportunities, and provide critical habitat and sustenance for a diverse array of terrestrial and aquatic life. Floodplains are one of the most productive ecosystems in Puget Sound, yet they are also one of the most degraded portions of the Puget Sound ecosystem, and these impacts have significant consequences for people and nature. Several factors have impeded floodplain recovery (and related salmon recovery and water quality goals) to date. These factors include a lack of public support, high costs associated with restoration, and the existence of divergent and uncoordinated agency goals. Despite the tens of millions of dollars spent on ecosystem recovery and flood risk reduction, habitat remains in decline and flood risks continue to mount.

Local, state, and federal agencies employ a variety of programs to address floodplain management issues—sometimes in contradictory ways. Flood risk reduction projects developed in ways that don't take fish and wildlife needs into account get caught up in Endangered Species Act conflicts that prevent or delay construction and add mitigation costs. Habitat restoration projects developed as single-purpose projects are opposed by communities concerned with maintaining farmland or water management infrastructure. Progress on both sides has been too slow and arguably outweighed by the increased costs associated with continued development. The net result has been a continued decline of ecosystem functions and increase in human flood risks. Yet divergent floodplain management goals—flood hazard mitigation, clean water, salmon—are not inherently at odds with one another. Those portions of the river corridor that present the greatest risks to people (i.e., incur the most flooding and erosion) are often the same areas where salmon habitat, water filtering wetlands, groundwater recharge and flood storage are most likely to occur.

## CLIMATE CHANGE

As identified in *Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy* (Washington State Department of Ecology 2012a), flood frequency is projected to increase progressively from the 2020s through the 2080s, with the largest increases predicted for mixed rain-snow runoff basins located in Puget Sound. Flooding can cause widespread damage to communities and property.

The state strategy identified several high-priority, overarching strategies related to floodplain protection and restoration, including the following.

- Protecting people and communities from climate change impacts.
- Reducing the risk of damage to buildings, transportation systems, and other infrastructure. This strategy specifically calls for reducing flood damage by restoring floodplains and capturing more water.
- Safeguarding fish and wildlife and protecting critical ecosystem services that support human and natural systems.
- Reducing the vulnerability of coastal communities, habitat, and species.
- Supporting the efforts of local communities and strengthening capacity to respond and engage the public.

## Recovery Targets

The strategies and actions in this section will contribute to achieving the recovery targets for floodplains.

Vital Sign	Indicator	Recovery Target
Floodplains	Under development	Restore, or have projects underway to restore, 15% of degraded Puget Sound floodplain area.
	Under development	Have no net loss of floodplain function in any watershed.

## Local Priorities

LIOs identified near-term actions that address floodplains. These local actions are presented in the *Strategies and Actions* section along with Soundwide actions under the sub-strategy shaded below. The local action numbering contains the area abbreviation shown in parentheses after each LIO name. See Section 4, *Local Recovery Actions*, for detailed information about local planning.

Local Integrating Organization	Sub-Strategy			
	A5.1	A5.2	A5.3	A5.4
Hood Canal Coordinating Council (HC)				
Island (ISL)				
San Juan (SJI)				
Snohomish-Stillaguamish (SNST)				
South Central Caucus Group (SC)				
Alliance for a Healthy South Sound (SS)				
Strait ERN (STRT)				
West Central (WC)				
Whatcom (WH)				

# Strategies and Actions

## A5. Protect and Restore Floodplain Function

### A5.1 Improve data and information to accelerate floodplain protection, restoration, and flood hazard management

Complete and up-to-date information is fundamental to achieving floodplain recovery. All strategies and actions associated with floodplain protection and recovery assume that decision makers have access to reliable data on floodplain locations, conditions, and recovery priorities.

#### Near-Term Actions

The near-term actions<sup>8</sup> identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.5.1.2 Regional floodplain vision and program.** Identify the goals, capital project plans and funding needs associated with achieving the floodplain recovery goal.

**A.5.1 WH3 Lower Nooksack floodplain management.** Complete habitat assessments and restoration plans for Reaches 1-4 of the mainstem Nooksack. The restoration plans will advance the Flood/Fish Integration action in the WRIA 1 Salmonid Recovery Plan (through incorporation into Systemwide Improvement Framework Plan and/or Comprehensive Flood Hazard Management Plan), and will provide technical information to support the Whatcom Conservation District’s restoration and riparian efforts in agricultural areas. This action is critical to ultimately restoring Nooksack River floodplain.

<sup>8</sup> Gaps in numbering reflect near-term actions that have been completed or otherwise retired.

## **A5.2 Align policies, regulations, planning, and agency coordination to support multi-benefit floodplain management, incorporating climate change forecasts**

Floodplain management policies have been developed over many decades. Some of these policies conflict with Puget Sound recovery goals and present obstacles to achieving the floodplain restoration target. Flood risk management and ecosystem recovery are not mutually exclusive goals yet have been historically pursued independent of one another.

One of the principal challenges to achieving the recovery target is the sheer cost involved in floodplain restoration projects, most of which will involve expensive infrastructure work. Asking agencies to coordinate their programs to pool funding and achieve greater efficiencies is easy in theory; however, agencies are required to use cost-benefit analyses focused specifically on their programmatic mandate when making decisions about which projects or activities to fund. Developing a more holistic approach to cost-benefit analysis that speaks to multiple agency goals will be critical to enabling a coordinated, multi-agency approach to funding floodplain projects that will make people safer and our ecosystem healthier. Creating a decision making framework that enables agencies to identify projects that meet multiple program goals is a critical step toward being able to coordinate floodplain investments and finance floodplain recovery projects.

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### **CLIMATE CHANGE**

Projected changes in weather patterns are expected to cause an increase in the frequency and magnitude of flooding, increased sediment delivery to our rivers, and a rise in the Puget Sound sea level. These changes have significant implications for infrastructure and other land uses in floodplains and near-shore environments. Restoring floodplain functions can help mitigate this impact while creating more resilient communities. At the same time, our floodplain ecosystems will need to adapt to these changing conditions. Incorporating climate change forecasts into floodplain management strategies implies having a deeper understanding of what the potential is for localized impact to climate change, identifying how these impacts can be accounted for in existing planning processes, and most importantly appropriately reflecting the value of floodplain protection and restoration into decision making. The strategies delineated in this section represent the long-term solution and the near-term actions represent only the beginning of a much longer conversation needed to identify the full set of needed actions.

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### **SALMON RECOVERY PLAN PRIORITY: PROTECTING AND RESTORING FLOODPLAINS**

Functioning floodplains are critically important for salmon across the Puget Sound and need to be protected and restored. Specific floodplain protection and restoration areas are identified for all the mainstem, natal, watersheds in Volume II. Two key issues that have come out of salmon recovery but are relevant to the greater recovery effort are the biological opinion issued by NOAA/National Marine Fisheries Service (NMFS) on the Federal Emergency Management Agency (FEMA) National Floodplain Insurance Program and the U.S. Army Corps of Engineers (Corps) Levee Vegetation Management Standards.

- **NMFS Biological Opinion on FEMA National Floodplain Insurance Program:** The biological opinion indicated that the development that has been allowed in the floodplains across the Puget Sound has acted as a ‘take’ of salmon and orcas. This biological opinion is an important document in the information related to the need to protect and restore floodplain habitat.
- **Levee Vegetation:** the allowable amount and size of vegetation along Corps certified levees impacts the riparian habitat for many critical salmon-bearing streams and rivers. Opportunities may exist to increase riparian vegetation, consistent with Corps levee maintenance standards (or variances to these standards with the approval of levee owners). Work has been done to reinforce the Seattle variance but more work is needed to ensure this can be used.

**How is this priority integrated in the Action Agenda?** The strategies and actions in the Action Agenda generally reflect the themes and actions identified in the Salmon Recovery Plan through the need to protect and restore floodplains into functioning ecosystems. As all Chinook salmon populations need to get to a low risk status, prioritization of floodplain areas for protection, restoration, and farmland protection should be considered a sequencing question. In addition, identification of these areas should consider those already important for salmon in the Salmon Recovery Plan. Finally, prioritization efforts should not slow down the existing work to protect and restore floodplain areas known as important per the Salmon Recovery Plan.

As with the integration of working lands priorities, consideration about the flexibility of conservation tools may need to be more clearly articulated. The watershed chapters have specific information about where floodplain restoration gains could be made.

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## Ongoing Programs

### *Key Ongoing Program Activities*

- In coordination with the Corps, and local levee owners, the Partnership is currently leading the development of new regional levee-based vegetation standards. Seattle District of the Corps is serving as the local federal lead for interagency coordination efforts on variances from mandatory Corps vegetation-management standards.

## Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.5.2.1 Improved permit process.** Support WDFW, Ecology, Corps, USFWS, and NOAA in making changes to improve the current permit process.

**A.5.2 SC5 Improve floodplains management by creating partnerships of interested parties (especially local governments and business community).**

- Work with federal and state agencies to address and resolve conflicts between regulations that are a barrier to completing multi-benefit projects.
- Over the next 2 years, support King County's effort to lead the advisory committees of the Green River System-Wide Improvement Framework (SWIF) in developing integrated priorities for levee improvements that meet flood protection, safety, economic development, and, habitat, vegetation management, agriculture, and recreation objectives and that bridge conflicts in federal regulations.
- Over the next 2 years, support the Russell Foundation's work with WRIA 10 to complete a Watershed Open Space Strategy (WOSS). The process will focus on development of a regional strategy by aligning with current ecological management efforts in the watershed to promote inter-organizational collaboration and action.
- Share information among local governments on successful approaches to meeting requirements of the FEMA Biological Opinion.
- Participate in forums to address conflicts between agriculture, flood hazard reduction projects, and habitat restoration projects in the floodplain.

- Advocate for state to improve alignment and coordination between minimum requirements for local Flood Hazard Reduction Plans, Comprehensive Plans under the Growth Management Act (GMA), and minimum requirements for regulation of Frequently Flooded Areas.
- Implement major floodplain protection and restoration projects in King and Pierce Counties funded under state 2013 Capital Improvement Plan appropriation for Coordinated Investment Strategy, including Carlin Project and Lower Cedar River Integrated Floodplain Restoration Project in King County and the Green and White rivers in Pierce County.
- Continue to identify, implement, and publicize floodplain restoration projects, including the Needham Road Setback Levee Project and Calistoga Reach Setback Levee and Side Channel Construction Project that provide multiple benefits, including public safety, salmon habitat enhancement, open space, and recreation.
- Demonstrate quantifiable benefits of major floodplain restoration projects to salmon recovery, flood resilience, water quality, and agriculture and help make the case for ongoing investments of state funding in multi-objective flood hazard reduction projects. Work with King County, Corps, and other partners to identify alternatives to the existing policies on levee vegetation.

**A.5.2 SNST7 Floodplain management for farm-fish-flood.** Snohomish County, together with project partners, will complete the development of reach-scale plans for the Sustainable Lands Strategy project and begin the implementation of those plans.

- Continue development of Farm-Fish-Flood Coordination efforts led by King County.
- Utilize synergies between local and state agencies to coordinate and leverage efforts that deal with farm-fish-flood issues, such as Floodplains by Design.

### **A5.3 Protect and maintain intact and functional floodplains**

In Puget Sound, protection of the remaining intact habitat functions of floodplains and restoration of lost functions is noted as a high priority in many listed species recovery plans, and the Action Agenda includes several near-term actions supporting these outcomes. Most of the intact and functional floodplains are in undeveloped areas. The focus of this sub-strategy is on ecosystem-level programmatic actions that contribute to maintaining and protecting floodplains. It is also important to note that in parallel to the protection and restoration of floodplains, there needs to be an effort to change the demand for development in dense/urban growth areas.

FEMA implements the National Flood Insurance Program, which issues flood insurance to homeowners and greatly influences the type and extent of development in floodplains. In late 2008, NMFS issued a biological opinion finding that the National Flood Insurance Program jeopardizes the existence of several Puget Sound species listed under the Endangered Species Act. NMFS has identified seven actions for FEMA that would bring the program into compliance with the act, the third of which calls for FEMA to modify its implementation of the program minimum criteria to prevent and/or minimize the degradation of channel and floodplain habitat. NMFS set a deadline of September 22, 2011, for work by FEMA and 122 communities in Puget Sound to implement this action (Puget Sound Partnership 2010b).

FEMA, with concurrence from NMFS, has prepared additional guidance that is intended to clarify certain aspects of the biological opinion and that should be considered with the biological opinion when compliance actions are undertaken. FEMA and local jurisdictions are working to ensure their policies and procedures prevent and/or minimize degradation of existing channel and floodplain habitat functions.

## Ongoing Programs

FEMA and NOAA technical assistance teams are continuing to work with other local, state and federal governments to implement the BiOp and provide tools and mechanisms to promote consistency with other regulations. A performance metric is the number of National Flood Insurance Program communities with biological opinion compliance packages approved by FEMA.

### Key Ongoing Program Activities

- DNR, WDFW, and other state agencies, tribes, local governments, and non-governmental entities use applicable federal and state grants, local government funds, and private funds to purchase development rights from working forest and farm landowners for lands at risk of conversion in key Puget Sound watersheds.

## Near-Term Actions

The near-term actions<sup>9</sup> identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

- A.5.3.2 Critical areas ordinance updates on frequently flooded areas.** Ecology, Commerce, and other interested state agencies will develop a strategy for and lead effective state engagement with local governments in the next round of critical areas ordinance updates on frequently flooded areas.
- A.5.3.3 Biological opinion compliance and floodplain target.** The Partnership will evaluate how biological opinion compliance contributes to achieving the floodplains target. This includes policy analysis of jurisdictional compliance, development that has occurred since the biological opinion, and recommendations for next steps.
- A.5.3.4 Levee vegetation.** The Partnership will continue to support King County and Whatcom County, in coordination with the Corps and regional partners, to craft a prioritized list of floodplain capital projects addressing flood risk and habitat issues and, as needed, variances for specified segments of levees through the system-wide improvement framework (SWIF) pilot projects being led by each county. Upon completion of the SWIF pilot projects and working with the pilot leads and the Corps, the Partnership will develop lessons learned and technical and process best practices for conducting integrated flood risk and habitat capital planning, and share this information through all appropriate means. The Partnership will work with pilot leads, the Corps, and additional regional entities to identify policy issues emerging from the work as related to Puget Sound recovery and consider appropriate actions to address them.

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<sup>9</sup> Gaps in numbering reflect near-term actions that have been completed or otherwise retired.

**A.5.3.5 Floodplain permitting assistance.** Ecology and Commerce will develop policy and technical assistance programs that integrate the recommendations and requirements listed within a) NMFS' National Flood Insurance Program Biological Opinion, and b) FEMA's National Flood Risk Information Project policy and program recommendations for implementation.

#### **A5.4 Implement and maintain priority floodplain restoration projects**

The target identified for Puget Sound recovery calls for a 15% restoration of floodplains. This is an ambitious goal, but, because of the importance of floodplains to overall Puget Sound recovery, an absolutely critical one. Achieving it will require overcoming key barriers in order to deliver the necessary public support, funding, and interagency coordination. It will take significant commitment and collaboration from agencies and a new approach that aligns flood risk management efforts and programs so that the necessary support and funding is garnered to accelerate recovery actions.

Floodplain forested lands are critically important habitat and provide several indispensable ecosystem services. The ecosystem services include rainfall diversion and storage to stem the flow of water to reduce downstream flood damage; surface water quality protection; groundwater recharge; and mitigation of erosion and sedimentation deposit.

The production of arable soils is one of the most valuable ecosystem services society gets from floodplains. The result is that the majority of farmland in Puget Sound is located in floodplains because of the rich, fertile soil. However, agricultural land use can significantly alter the functionality of floodplains. In their rating of existing floodplain function in Puget Sound, the NMFS found that agriculture-dominated Water Resource Inventory Areas (WRIAs) (25% or greater agricultural use) had "poor" or "poor-fair" conditions (Smith 2005 in Puget Sound Partnership 2010c) Farmers also experience the direct social and economic costs of floods when they occur. As we look to the future there is an opportunity to change agricultural management practices to make it more compatible with recovering floodplain functions. Coordinating with these floodplain agricultural interests can enhance stewardship of critical floodplain habitat while maintaining viability for critical resource lands.

It is important to locate new and replacement public infrastructure (e.g., bridges, roads, rails, treatment plants) outside of floodplains and ensure that the design of new or replacement infrastructure optimizes and enhances floodplain function. Repairs to infrastructure that cannot be relocated should be the least disruptive of floodplain function as possible.

#### **Ongoing Programs**

There are several grant programs and other finance mechanisms that create incentives for protection, enhancement, or restoration of floodplain function on forest and agricultural lands, some of which are listed below.

The **Family Forest Fish Passage Program** is a cost-share program that helps small forest landowners renovate barriers on their land to allow fish passage in small waterways. Artificial barriers in streams can prevent many fish from reaching miles of upstream habitat, and can be devastating to species such as salmon. As a public resource, fish are protected by state Forest Practice Rules which require landowners to restructure fish barriers by 2016 in a way that allows unobstructed fish passage. The program

provides 75 to 100% of the cost of removing the barrier, with the funding provided varying based on the quality of the habitat, number of salmon and trout species benefiting from the correction, and project cost. This program allows working forest lands to remain viable while supporting ecosystem function.

The **Forestry Riparian Easement Program** compensates eligible owners of small forest lands in exchange for a 50-year conservation easement on qualifying timber. Landowners agree to leave timber unharvested during the easement period, while still maintaining property rights and full access. The riparian benefits of the forested lands are maintained by the state. This program allows landowners to benefit from helping to preserve local waterways, thereby improving rural communities while helping to restore flood protection in these areas.

The **Aquatic Lands Enhancement Account** program is targeted at re-establishing the natural, self-sustaining ecological functions of the waterfront, providing or restoring public access to the water, and increasing public awareness of aquatic lands as a finite natural resource and irreplaceable public heritage. Typical projects include removing bulkheads to restore natural beach function, restoring estuaries, and restoring shoreline for salmon habitat. Funded by revenue generated from DNR's management of state-owned aquatic lands, these grants are available to local agencies, state agencies, and Native American tribes.

The **Land and Water Conservation Fund** provides funding to preserve and develop outdoor recreation resources, including parks, trails, and wildlife lands. Project goals typically involve protecting wildlife habitat or renovating parks. Funded by revenue from federal sales and leasing of off-shore oil and gas resources, these funds are available to local agencies, park and recreation districts, school districts, special-purpose districts, state agencies, and Native American tribes.

The **Salmon Recovery Funding Board** funds riparian, freshwater, estuarine, near-shore, saltwater, and upland projects that protect existing, high quality habitats for salmon. It also funds projects to restore degraded habitat to increase overall habitat health and biological productivity of the fish. Funds come from the sale of state general obligation bonds and federal Pacific Coastal Salmon Recovery Funds. These funds are available to state and local agencies, conservation districts, Native American tribes, non-profit organizations, private landowners, regional fisheries enhancement groups, and special purpose districts.

The **Estuary and Salmon Restoration Program** provides grants to protect and restore the Puget Sound near-shore. The program was created by WDFW to support the emerging priorities of the Puget Sound Nearshore Ecosystem Restoration Program. Typical projects include protection of nearshore and wetland habitat, restoration of salmon habitat and estuaries, and removal of bulkheads. Funding comes from the State Building Construction Fund. Federal funding also has been received from the NOAA's Community Based Restoration Program and USFWS. Federal funding for projects in Puget Sound is expected from the EPA. Funds are available to local, state and federal agencies, Native American tribes, academic institutions, private institutions and non-profit organizations.

The **Wetlands Reserve Program** provides grants to assist eligible applicants in the restoration, creation, protection and enhancement of wetlands on their property through a voluntary, environmentally safe and cost effective manner. This program is administered by NRCS through consultation with the State Technical Committee. In addition to the Wetlands Reserve Program, the NRCS has several other

conservation programs that help reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters.<sup>10</sup>

**Puget Sound Acquisition and Restoration** funds were requested by Governor Gregoire as part of her initiative to protect and restore Puget Sound by 2020 to accelerate implementation of the Salmon Recovery Plan. Funding has been provided by the Legislature through the capital budget to protect and restore habitat in Puget Sound with a focus on acquiring and protecting critical habitat and restoring habitat function. These funds are available to state and local agencies, conservation districts, Native American tribes, non-profit organizations, private landowners, regional fisheries enhancement groups, and special purpose districts. In 2011, the program was revised to prohibit state agencies from using Puget Sound Acquisition and Restoration funds to acquire land.

### **Key Ongoing Program Activities**

- RCO, the Partnership, and Puget Sound lead entities with local and regional partners implement relevant habitat restoration projects identified in salmon recovery 3-year work plans (see Strategy A6).
- Snohomish Sustainable Lands Strategy and Skagit Tidegate Initiative are multi-benefit approaches that enable agricultural infrastructure improvements and/or provide regulatory certainty in exchange for restoration actions.

### **Near-Term Actions**

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

- A.5.4.1**      **Prioritization of state highways with floodplain impacts.** WSDOT will identify and prioritize the state highway bridges (approximately 550 structures) that have the biggest impacts on floodplain function and connectivity, including consideration of WSDOT's 2011 Climate Impacts Vulnerability Assessment Report.
- A.5.4.2**      **Agricultural land ecosystem services markets.** WSCC, working with conservation districts, watershed groups, and counties will identify three pilot project opportunities that demonstrate ecosystem services markets associated with flood hazard prevention and agricultural lands in floodplains.
- A.5.4.3**      **Candidate areas for land swaps.** WSCC will work with conservation districts, agricultural community, watershed planning groups, and local jurisdictions to use the outputs from the characterization work (A5.1.1) to identify potential land swaps (i.e., county land use and conservation districts) and identify candidate areas available to expand for agriculture outside of priority floodplain areas.
- A.5.4.4**      **Implement priority multiple-benefit floodplain restoration projects.** Secure funding for high-priority projects listed.

<sup>10</sup> [www.wa.nrcs.usda.gov/programs/index.html](http://www.wa.nrcs.usda.gov/programs/index.html)

- A.5.4.5**      **Implement priority multiple-benefit floodplain restoration projects.** Develop and initiate a regional technical team to support the development of integrated reach-scale plans and projects.
- A.5.4 WH8**      **Marietta Acquisition.** Acquire properties in repetitive flood loss area to prevent future loss and to enhance upstream habitat restoration opportunities. Clean up three former gas stations sites as dictated by site conditions.

### Emerging Issues and Future Opportunities

- The Floodplain Protection and Policy Team could tackle additional key items such as the following.
    - Develop a decision making framework that enables agencies to identify cross-agency floodplain project priorities based on their ability to meet multiple goals and delineates a coordinated funding approach, including cost-share mechanisms, for floodplain-friendly modifications to flood protection infrastructure in a cost-effective manner.
    - Identify federal, state, local, and private funding to develop case studies that are illustrative of the benefits of a multi-objective approach to floodplain restoration and implement a pilot program to fund projects that leverage the work of the case studies.
    - Assess the disincentives for reestablishing habitat land on agricultural lands.
  - Support changes to state comprehensive flood management planning and project funding policies to ensure that plans and projects supported with state funding fully incorporate projected changes to sea level rise, flood frequency and volumes, sediment regimes and other issues that could be a major threat to human safety and floodplain ecosystem health.
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## Target View: Floodplains

A functioning, resilient ecosystem requires freshwater floodplains that support natural processes and deliver ecological services to keep people and property safe during flood flows, support fisheries production, and provide water filtration and groundwater recharge. Floodplains are lush regions that provide food and fresh water, as well as good agricultural land through soil and habitat formation. We also know that improving riverside and floodplain habitat is a key part of virtually all recovery plans for salmon.

Unfortunately, many floodplains in Puget Sound have been lost through a combination of shoreline armoring and levees, as well as residential, commercial, industrial and agricultural development. Better management of floodplains is essential for recovering salmon and Puget Sound.

### *Recovery Target*

- Restore, or have projects underway to restore, 15% of Puget Sound floodplain area.
- Have no net loss of floodplain function, in any watershed.

### *Relevant Strategies (and Sub-Strategies)*

- A1. Focus land development away from ecologically important and sensitive areas (A1.2, A1.4)
- A4.2. Provide infrastructure and incentives to accommodate new and re-development within urban growth areas
- A5. Protect and restore floodplain function (A5.1, A5.2, A5.3, A5.4)
- A6.1. Implement high priority projects identified in each salmon recovery watershed's 3-year work plan
- B1.2. Focus land development away from ecologically important and sensitive nearshore areas and estuaries

Figure C-3 (Appendix C, *Results Chains*) depicts how the strategies (and related sub-strategies) contribute to reducing pressures on floodplains and achieving the floodplain recovery target. Appendix C also contains a results chain for each individual strategy in the Action Agenda, showing how that strategy (and its related sub-strategies) reduces pressures and contributes to achieving numerous recovery targets.

# Chinook Salmon

## The Challenge

Salmon are a symbol of the Pacific Northwest and Puget Sound. The tribal cultures of the Pacific Northwest developed around the salmon as an abundant and critical resource. In addition, salmon have been an integral part of the Puget Sound ecosystem for thousands of years—a critical food source for local wildlife and a source of nutrients for the streamside forests.

When early settlers arrived the salmon were initially viewed as an inexhaustible resource. However we know now that was not true. A history of habitat destruction, overharvesting, and poor hatchery practices have led to a significant decline of the salmon. Puget Sound Chinook, Hood Canal summer chum, Puget Sound steelhead, and Puget Sound bull trout are all now listed under the Endangered Species Act.

There are currently 22 Chinook populations remaining, with estimated abundance at 10% or less than historic levels. In 2005, recovery plans were completed for Puget Sound Chinook salmon and Hood Canal and Eastern Strait of Juan de Fuca summer chum. These NOAA-approved plans, along with the 2006 NOAA supplement and the watershed 3-year work plans, guide implementation of the Salmon Recovery Plan. In addition, there is a draft bull trout recovery plan that is being updated and finalized by USFWS.

The two recovery plans articulate a long-term (50-year) approach with consistent funding, an integration of the different management decisions across harvest, hatchery, habitat protection, and habitat restoration, and a flexible adaptation approach that incorporates new information. The salmon recovery plans call for protection and restoration of habitats (specifically estuaries, floodplains, riparian areas, and the nearshore), improved access to habitat, sufficient water flows, improved water quality, harvest management, hatchery management, as well as integration of habitat, harvest and hatchery actions.

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## TRIBAL TREATY RIGHTS

A treaty is a legally binding contract between sovereign nations. Treaties are recognized under the U.S. Constitution as the “supreme law of the land.” In 1854–55, tribes in western Washington signed treaties with the U.S. government, ceding most of the land that is now western Washington which allowed the peaceful settlement of the territory. In the treaties the tribes reserved the right to fish, hunt, and gather shellfish and other natural resources in all of their traditional places to preserve the tribal way of life. The courts have found that the treaty rights to hunt and fish in usual and accustomed areas is a property right. Those rights pre-date the property rights of all other citizens of the State of Washington. The unique legal status of tribes and presence of tribally reserved rights and cultural interests throughout the state creates a co-management relationship between tribes and the state agencies responsible for managing and protecting fish and shellfish of the state. The tribes’ treaty rights are guaranteed under the treaties and by federal law.

The tribes’ treaty rights have been affirmed by the federal courts including the U.S. Supreme Court in numerous rulings including the 1974 U.S. v. Washington case known as the Boldt decision. The ruling upheld tribal treaty-reserved rights, established the tribes as co-managers of the salmon resource with the state of Washington, and re-affirmed the tribal right to half of the harvestable number of salmon returning to Washington waters every year.

The tribes note for those rights to have meaning, however, there must be salmon for treaty tribes to harvest. Salmon populations continue to decline at an alarming rate despite massive harvest reductions, hatchery mitigation and a huge financial investment in habitat restoration during the past four decades. A primary cause of the decline is that salmon habitat is being damaged and destroyed faster than it can be restored. This trend shows no sign of improvement and has led to the loss by some tribes of basic ceremonial and subsistence fisheries, a cornerstone of tribal culture.

In the summer of 2011, the treaty Indian tribes in western Washington launched the Treaty Rights at Risk initiative that calls on the federal government to take charge of salmon recovery. The federal government has both the obligation and authority to recover salmon and protect tribal treaty rights. Tribes want the federal government to align its agencies, programs and authorities to lead a more coordinated and effective salmon recovery effort. A white paper developed for the effort cites numerous examples from across western Washington of continued loss of habitat due to shoreline armoring, timber harvesting, an increase in paved lands, and filling and diking of estuarine wetlands. The Treaty Rights at Risk initiative is a call to action, intended to galvanize and energize response by federal, state, local and tribal governments and policy makers to reverse the decline of our salmon and their habitat.

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Chinook and summer chum recovery work is an ongoing, long-term effort by tribes, state, federal and local government, non-governmental organizations, businesses and private landowners. Much of the work to implement the recovery plans is already underway and needs continued or more support. Implementation of the approved salmon recovery plans faces the following challenges.

- Regional concerns about the lack of habitat protection: In the spring and summer of 2011, NOAA/NMFS and the Northwest Indian Fisheries Commission each published documents that present strong critiques of the existing habitat protection system. These documents highlight the need to improve regional habitat protection efforts so that ecological functions for salmon are sustained.
- Under-investment in capital projects: When the Chinook Plan was completed in 2005 the estimated annual investment for the first 10 years was \$120 million for Chinook and bull trout for capital and some non-capital actions. The investment rate has consistently been less than half of this estimated need. The summer chum plan also estimated a need of \$136 million for the first 10 years for capital and non-capital actions.

- Addressing other barriers to habitat restoration: Potentially conflicting values for how best to manage the lands including resolving agricultural land needs with salmon habitat needs, addressing the impacts of transportation infrastructure such as highways and railroads, and permitting challenges for restoration projects.
- Under-investment in human infrastructure: Implementation of salmon recovery programs requires a robust human infrastructure within watersheds and regional entities. For local communities to agree on technically and community-supported salmon recovery strategies and actions, it is necessary to have people on the ground who can facilitate those conversations with all the relevant jurisdictions, tribes, and other stakeholders and also push for implementation of the high priority actions. Current staffing reductions are reducing the ability to implement harvest, hatchery, habitat restoration, and habitat protection actions.
- Lack of investment in several specific priorities identified in the Recovery Plans: Resolving technical and policy uncertainties about water availability and implementation of protective water quantity measures, resolving uncertainty about whether the regional water quality actions address the needs of salmon, furthering our understanding of watershed habitat status and trends, as well as project effectiveness to improve adaptive management, and a coordinated approach for making decisions associated with harvest, hatchery, habitat restoration, and habitat protection management.

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## CLIMATE CHANGE

While Pacific salmon have persisted in the face of exceptional climate variability for thousands of years—involving such large-scale factors as the advance and retreat of glaciers covering huge swaths of western North America—future climate change projections are troubling when considered in combination with the impacts that human development has had, and continues to have, on the landscapes of Puget Sound and elsewhere (Francis and Mantua 2003).

Pacific salmon have complex life cycles and highly diverse survival strategies, but all species rely to some degree on functional freshwater, estuarine, and marine habitat for successful reproduction, growth, and development. Impacts of climate change are likely to affect Pacific salmon across all of these habitats, but recent studies (e.g., Beechie et al. 1997; Mantua et al. 2009) have identified summertime stream temperatures, seasonal low flows, and changes in the frequency and magnitude of peak flow events as key pressures limiting the productivity of salmon populations in freshwater environments. By the latter half of this century, most watersheds in Puget Sound are likely to experience higher summertime water temperatures, lower summertime flows over longer periods of time, and higher peak flows occurring earlier in the winter/spring transitional period (Mantua et al. 2009). Particularly for species such as steelhead, coho, sockeye, and stream-type Chinook that rely heavily on freshwater for rearing over the first 1 to 2 years of life, these changes have the potential to significantly impact productivity. For others—such as pink, chum, and ocean-type Chinook—changes in freshwater environments will likely have relatively less impact.

Climate change is also expected to have a range of complex impacts on the marine environment. Projected warmer ocean temperatures are likely to increase stratification, yet potential increases in winds may counteract this impact and actually improve upwelling of the nutrients that drive oceanic food webs. In sum, though, the result of multiple stresses including altered thermal structure and increasingly acidic waters is likely to be negative for the marine environment in general (Miles 2009), and by extension, for Pacific salmon specifically.

Francis and Mantua (2009) find that in general, salmon populations in regions with healthy habitat are likely to persist in the face of climate change as long as the time scale of environmental change does not exceed the rate at which they are able to adapt. Salmon recovery actions that focus on habitat restoration and protection—particularly in lower elevation watersheds (Battin et al. 2007)—with the intent of maintaining and increasing

functional habitat are thus an important component of a larger suite of strategies to improve the capacity of salmon populations to withstand climate change impacts expected over the next half century, and beyond.

*Preparing for a Changing Climate: Washington State’s Integrated Climate Response Strategy* (Washington State Department of Ecology 2012a) identifies high priority response strategies related to salmon recovery.

- **Improving water management to address climate-related water supply reduction.** This includes ensuring sufficient cold water in salmon bearing streams during critical seasons.
- **Safeguarding fish and wildlife and protecting critical ecosystem services** that support human and natural systems.
- **Reducing the vulnerability of coastal communities, habitat, and species.**
- **Supporting the efforts of local communities and strengthening capacity to respond and engage the public.**

The state strategy calls for reducing non-climate stressors to help fish, wildlife, plants and ecosystem be more resilient to the effects of climate change. The strategies and actions in the Action Agenda are designed to achieve this need. It also calls for managing species and habitats to protect ecosystem functions and provide sustainable cultural, recreational, and commercial use in a changing climate. This means incorporating climate change information into existing and new management plans, refining vulnerability assessments, conserving genetic diversity.

## Recovery Targets

The strategies and actions in this section will contribute to achieving the Chinook salmon recovery target.

Vital Sign	Indicator	Recovery Target
<b>Chinook Salmon</b>	Chinook salmon population abundance as measured by the number of natural origin adult fish returning to spawn.	Stop the overall decline and start seeing improvements in wild Chinook abundance in two to four populations in each biogeographic region (Figure 2 In latest data and maps section).

## Local Priorities

LIOs identified near-term actions that address Chinook salmon. These local actions are presented in the *Strategies and Actions* section along with Soundwide actions under the sub-strategy shaded below. The local action numbering contains the area abbreviation shown in parentheses after each LIO name. See Section 4, *Local Recovery Actions*, for detailed information about local planning.

Local Integrating Organization	Sub-Strategy				
	A6.1	A6.2	A6.3	A6.4	A6.5
Hood Canal Coordinating Council (HC)	■				
Island (ISL)	■				
San Juan (SJI)	■				
Snohomish-Stillaguamish (SNST)	■				
South Central Caucus Group (SC)	■				
Alliance for a Healthy South Sound (SS)	■				
Strait ERN (STRT)	■		■		
West Central (WC)	■			■	
Whatcom (WH)	■				

# Strategies and Actions

## A6. Protect and Recover Salmon

### A6.1 Implement high priority projects identified in each salmon recovery watershed’s 3-year work plan

In addition to the strategies and actions identified in the watershed chapters of the original Puget Sound Chinook Recovery Plan, each of the watersheds associated with a chapter in the Recovery Plan annually updates their proposed salmon recovery project list. This list always looks 3 years out and is referred to as the 3-year work plan. The watershed community prioritizes these projects based on the strategies outlined in their chapter.

The pace of implementation of these projects has been much slower than originally envisioned in the plan due to both financial and other barriers to implementation.

#### Ongoing Programs

##### Key Ongoing Program Activities

- Updating and implementing the 3-year work plans is a key ongoing program. All LIOs include salmon recovery 3-year work plan projects in their local priority actions; these projects represent 25 local near-term actions in the Action Agenda.

#### Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.6.1.1 Secure annual chinook investment.** The Partnership, in collaboration with the Salmon Recovery Council, the Governor’s Salmon Recovery Office in the Recreation and Conservation Office, WDFW, and the Northwest Indian Fisheries Commission will develop and implement a strategy to secure from a combination of sources, the annual investment of \$120 million to fully implement the approved Puget Sound Chinook

Salmon Recovery Plan. The Partnership will work with its salmon recovery partners to align that funding in support of the highest priority protection and restoration projects as identified by salmon recovery lead entities.

- A.6.1.2 Restoration permit barriers.** Develop a strategy for a new interagency permitting team that would assist in faster permitting of habitat recovery projects, including multiple objective restoration projects.
- A.6.1 HC6 Hood Canal salmon recovery funding.** HCCC is both the Lead Entity for Chinook salmon and the regional recovery organization for Hood Canal and eastern Strait of Juan de Fuca summer chum. HCCC will develop a process for prioritizing acquisition, protection, and restoration actions and continue to target funding to the highest priority salmon recovery actions.
- A.6.1 HC7 Hood Canal salmon recovery monitoring and adaptive management.** HCCC working with many partners, state and federal agencies, and the tribes will complete a Monitoring and Adaptive Management Framework for both Skokomish Chinook and Mid Hood Canal Chinook. Monitoring protocols and plans for both Chinook salmon recovery chapters will be completed.
- A.6.1 ISL6 Restore tidal inundation.** Island County will restore tidal inundation to one or more isolated pocket estuaries or tidal wetlands. The project selected will address either poor design or malfunctioning tidegates to improve habitat for juvenile salmon.
- A.6.1 SC3 Implement high-priority projects listed in local salmon recovery plans.** Secure funding for high-priority projects listed in the salmon recovery 3-year work plans for WRIAs 8, 9, and 10.
- A.6.1 SJI10 Salmon recovery, habitat protection and restoration (Near Term Shoreline Action II).**
- A.6.1 SNST13 Salmon/multi-species recovery plans.** Support priority projects as specified in the salmon recovery plan, salmon recovery 3-year work plans, and basin's 10- and 50-year salmon recovery goals.
- Identify and implement one to three top priority habitat restoration projects in each basin.
  - Establish the baseline condition of key habitats such as forest cover, wetlands, riparian areas, floodplains, nearshore, and assess trends and rate of change. Use analysis to predict future anticipated gains/losses based on population and build out trajectories as well as evaluating current restoration and protection benchmarks.
- A.6.1 SS12 Salmon recovery 3-year work plan implementation—WRIA 10/12.** Each lead entity will implement at least one top tier project each year from their South Sound Salmon Recovery 3-Year Work Plan. They will determine year one project and set up performance measures at the start of each fiscal year.
- A.6.1 SS13 Salmon recovery 3-year work plan implementation—WRIA 13.** Each lead entity will implement at least one top tier project each year from their South Sound Salmon

Recovery 3-Year Work Plan. They will determine year one project and set up **performance measures at the start of each fiscal year.**

- A.6.1 SS14** **Salmon recovery 3-year work plan implementation—WRIA 14.** Each lead entity will implement at least one top tier project each year from their South Sound Salmon Recovery 3-Year Work Plan. They will determine year one project and set up performance measures at the start of each fiscal year.
- A.6.1 SS15** **Salmon recovery 3-year work plan implementation—WRIA 11.** Each lead entity will implement at least one top tier project each year from their South Sound Salmon Recovery 3-Year Work Plan. They will determine year one project and set up performance measures at the start of each fiscal year.
- A.6.1 SS16** **Salmon recovery 3-year work plan implementation—WRIA 15.** Each lead entity will implement at least one high priority project each year from their South Sound Salmon Recovery 3-Year Work Plan. They will determine year one project and set up performance measures at the start of each fiscal year.
- A.6.1 STRT4** **Implement the highest priority habitat restoration and protection projects in the Elwha River ecosystem as informed by adaptive management.** Refer to the monitoring and adaptive management plans for the Elwha and the North Olympic Lead Entity for Salmon’s 3-year work plan, in part, for guidance. Adaptive management over the coming years may show that habitat restoration and protection projects become a higher priority. The 3-year work plan currently includes the following high priority restoration projects: Little River Large Woody Debris, Elwha Dike Removals, Elwha River Estuary Restoration Engineering Feasibility, and Elwha Conservation Planning. Elwha Revegetation and Elwha Engineered Log Jams projects are also a part of the 3-year work plan but are specifically cited as separate Strait Action Area local near-term actions. See the 3-year work plan for descriptions and costs for each project.
- A.6.1 STRT5** **Implement the high priority actions listed within the most current North Olympic Lead Entity for Salmon’s 3-year work plan.** This effort includes working with the HCCC-Lead Entity on summer chum recovery. Eventually, steelhead actions will also be incorporated into the 3-year work plan. Note: Number of projects funded each year is dependent on funding available and cost of each project.
- A.6.1 STRT6** **Implement the restoration and revegetation plan for Lake Mills and Lake Aldwell on the Elwha River.**
- A.6.1 STRT7** **Implement Dungeness river floodplain restoration projects.**
- A.6.1 STRT8** **Monitor interaction of existing engineered log jams with sediment load from removed Elwha River dams and consider additional engineered log jams, when and where necessary.**
- A.6.1 STRT9** **Implement the Pysht River salt marsh estuary restoration project.** Project includes removal of suction and clamshell dredge deposits placed on a 21.5 acre area of historic

salt marsh within the Pysht River estuary. Also, construct a series of tidal channels (2 miles) to allow for natural recolonization of salt tolerant native plants.

- A.6.1 STRT10 Implement the high priority actions for the Strait Action Area listed within the most current HCCC-Lead Entity salmon recovery 3-year work plan.** This effort includes working with the North Olympic Lead Entity for Salmon on summer chum recovery. Eventually, steelhead actions will also be incorporated into the 3-year work plan. Note: Number of projects funded each year is dependent on the funding available, cost of each project, and the current reevaluation of priorities.
- A.6.1 STRT11 Implement the Snow Creek Estuary and Maynard Beach nearshore restoration project.** Project includes railroad grade fill removal, bulkhead removal, estuary restoration, and beach restoration. (Note: Effort will also address the Olympic Discovery Trail)
- A.6.1 STRT37 Implement stream flow improvement projects within the Dungeness portion of the Elwha-Dungeness Water Resources Area (WRIA 18).** Stream flow improvement projects include Water Acquisitions, Irrigation Efficiency, Water Storage & Aquifer Recharge, and Source Substitution; Also, work to update Ecology's 2003 Final Environmental Impact Statement on water conservation needs.
- A.6.1 WC9 West Sound SR3 Chico Creek culvert replacement.** The WSDOT will develop a funding strategy and schedule for replacing the SR3 culvert with a bridge on Chico Creek. Chico is the most productive salmon stream in West Sound and a high priority watershed for protection and restoration, and replacing the culvert with a bridge will improve fish passage and restore estuarine functions.
- A.6.1 WC18 Chico/Keta Park culvert replacement and floodplain restoration.** Kitsap County Roads and the Suquamish Tribe will replace a triple box culvert and reconnect/restore upstream floodplain habitat at Keta Park, on the mainstem of Chico Creek. This includes completion of project design, for which funding has already been secured.
- A.6.1 WH1 Implement Chinook restoration projects in the WRIA 1 Salmon Recovery 3-Year Work Plan.** The preparation and updating of the 3-year work plan is an element of salmon recovery and is a regional requirement for lead entities, occurring annually. The local recovery plan and restoration strategies are the foundation for the updates, and reflect local restoration strategies and priorities.

## **A6.2 Implement the high priority salmon recovery actions identified in other parts of the Action Agenda and the Biennial Science Work Plan**

The vast majority of strategies and actions in the Action Agenda will support salmon recovery by improving ecosystem function. Full implementation of the Action Agenda will support salmon recovery.

### **Near-Term Actions**

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.6.2.1 Implement the Puget Sound federal agency action plan.** Work with the Puget Sound Federal Caucus to advance Puget Sound recovery. Federal agencies with authorities in Puget Sound will work in coordination to address key barriers to recovery. For example, federal agencies will work together to address fish passage barriers, shoreline armoring regulation, and floodplain and riparian habitat restoration. These actions will contribute to advancement of the Action Agenda and respond to the concerns raised by treaty tribes in western Washington.

### **A6.3 Implement harvest, hatchery, and adaptive management elements of salmon recovery**

The Chinook recovery plans have unique actions related to harvest management, hatchery management and adaptation.

#### **Ongoing Programs**

- **Harvest management.** Harvest of salmon in Puget Sound is co-managed by the Treaty Tribes and the State of Washington. Fisheries are focused on healthy wild runs and hatchery salmon but there is some incidental take of listed stocks as well. NMFS reviews the plan that guides fisheries management decisions made by the co-managers to evaluate its potential impact on recovery. The Comprehensive Management Plan for Puget Sound Chinook: Harvest Management component submitted by the Puget Sound tribes and the state of Washington was approved by NMFS in 2011 and will be in effect through 2014.
- **Hatchery management.** To evaluate the impact of hatcheries and hatchery actions on recovery of listed species, NMFS requires each hatchery to submit a Hatchery Genetic Management Plan. This plan describes the operation of the hatchery and evaluates the potential impact of those operations on recovery of listed species. Draft plans have been submitted to NMFS for review by the tribal and state hatcheries in Puget Sound. In addition, the tribes and the State of Washington are working together to write Hatchery Action Implementation Plans that consolidate descriptions of hatchery programs from each watershed into a single document that addresses co-manager priorities, legal requirements of the Puget Sound Salmon Management Plan and the Endangered Species Act, and recommendations of the Hatchery Scientific Review Group. These plans also will describe how the hatchery actions will integrate with harvest management and habitat actions to work towards achieving salmon population goals.
- **Monitoring and adaptive management.** Monitoring of salmon populations and habitat is ongoing work that needs to continue. Ongoing work also includes development of the adaptive management plans that document the changes in the limiting factors and salmon populations, as well as incorporates this information into implementation. This work is being conducted by both by the Recovery Implementation Technical Team (RITT) and watershed groups, but needs funding to advance. There is also a significant gap in our understanding of how landscape changes impact our ability to recover salmon. Continued and increased investment in watershed based habitat status and trends monitoring, as well as project effectiveness monitoring is key to improving our adaption efforts. Work has begun to integrate these and other salmon recovery monitoring needs into the broader Puget Sound Monitoring Program.

### Key Ongoing Program Activities

- **Harvest:** Implementation of the Comprehensive Management Plan for Puget Sound Chinook: Harvest Management component.
- **Hatcheries:** Completion and implementation of Hatchery Genetic Management Plans.
- **Adaptive management and monitoring:** The coordinated adaptation work of the watersheds, RITT and NOAA.

### Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.6.3.1 Implementation of hatchery actions.** WDFW and the tribes, in coordination with NMFS, will advance implementation of hatchery actions by completing and approving hatchery genetic management plans.

**A.6.3.2 Salmon recovery monitoring and adaptive management plans.** The Partnership, in coordination with the Puget Sound Recovery Council and the Puget Sound Regional Implementation Technical Team, will facilitate and support salmon recovery watershed groups to complete monitoring and adaptive management plans for each Puget Sound Salmon Recovery watershed chapters. This is a condition of the approved Chinook Recovery Plan to improve the quality and success of plan implementation.

**A.6.3 STRT3 Implement the Elwha River restoration project monitoring and management plans.** Plans include two hatchery genetic management plans, one for each hatchery facility, and the Elwha Project's Chinook and Steelhead Monitoring Plan. Implementation of these plans will also be informed by a comprehensive Elwha monitoring and adaptive management plan to be published by the USFWS (currently in peer review).

### A6.4 Protect and recover steelhead and other imperiled salmonid species

Puget Sound steelhead were recently listed as threatened under the Endangered Species Act and planning for the recovery of Puget Sound steelhead is now underway. The ongoing coordination with NMFS, the Governor's Salmon Recovery Office, the Partnership, and the Puget Sound watersheds to develop a Puget Sound Steelhead Recovery Plan needs to continue.

### Near-Term Actions

The near-term actions<sup>11</sup> identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.6.4.2 Steelhead recovery plan.** In collaboration with NMFS' Steelhead Recovery Team, the Partnership and the Puget Sound Salmon Recovery Council will support the development of a Puget Sound steelhead recovery plan. This will include creating a framework for use by all watersheds in developing local chapters of the recovery plan,

<sup>11</sup> Gaps in numbering reflect near-term actions that have been completed or otherwise retired.

and securing sufficient funding to support watersheds in populating these local chapters. The overall planning process will be inclusive and integrated with regional work by NMFS and the co-managers, and will look at various actions to achieve recovery, including full funding and implementation of a 5-year, joint U.S.-Canada marine survival research program developed by the Salish Sea Marine Survival Project Technical Team. It will also include actions like the designation of Wild Steelhead Management Zones where consistent with the objectives identified in watershed recovery chapters. WDFW and the tribes, by agreement of the co-managers, will work to establish three streams (one in each Technical Recovery Team identified Major Population Group) where no juvenile hatchery steelhead would be released, no recreational fisheries for steelhead would occur, and habitat protection and restoration actions would be accelerated. This early steelhead recovery action would consider information already compiled for the steelhead recovery plan that is under development.

**A.6.4 WC11 West Sound Steelhead Recovery Chapter.** The West Sound Watersheds Council will develop a local chapter of a Steelhead Recovery Plan. The Council will propose a budget and implementation strategy for its local chapter of the recovery plan.

## **A6.5 Maintain and enhance the community infrastructure that supports salmon recovery**

Implementation of the salmon recovery plans requires a robust infrastructure within local watersheds and at the Soundwide, federal, tribal, and state level to implement the habitat, harvest and hatchery actions. Both the capacity and the implementing structures to do the work in the best way possible are needed. The following is a list of entities to be kept strong and integrated for salmon recovery.

### **Ongoing Programs**

- **Lead entities.** Lead entities are responsible for local coordination related to managing and advancing watershed-level strategic restoration protection and restoration activities. Their work includes managing the 3-year work plans that articulate near-term recovery actions and adapting local strategies (RCO, local match).
- **Local jurisdictions.** Cities and counties are responsible for many of the decisions about habitat protection and land use management as well as key participants in habitat restoration actions. Local jurisdictions include counties, cities, and special districts such as drainage and public utility districts.
- **Co-managers.** The tribes and WDFW are responsible for determining appropriate harvest rates and implementing the recommendations of the Hatchery Science Review Group.
- **Other state agencies.** Other state agencies include the Governor’s Salmon Recovery Office (state-level direction and coordination) and the Recreation and Conservation Office (grant management for protection and restoration projects).
- **Tribes.** Tribes are strongly connected to salmon recovery through tribal treaty rights, technical expertise, cultural values, and political work.
- **NOAA.** This federal agency is responsible for the Chinook, summer chum, and steelhead plans.

- **Other federal agencies.** Notable agencies include USFWS (responsible for Bull Trout), the Corps (water resources), FEMA (floodplain management), and EPA (water pollution and other water resources).
- **Project sponsors.** A broad array of sponsors implement habitat restoration projects including but not limited to local governments, regional fisheries enhancement groups, land trusts, tribal governments, and conservation districts.
- **Puget Sound Partnership.** This state agency, by statute, administers the regional salmon recovery program. This includes coordination of the annual updates to the Salmon Recovery Plan and related 3-year work plan from each Puget Sound salmon recovery watershed, facilitating regional agreement across Puget Sound on the distribution of available salmon recovery funds, assisting the watersheds in developing and submitting to the state Salmon Recovery Funding Board an annual prioritized list of salmon recovery projects for funding, staffing and facilitating the work of the Puget Sound Salmon Recovery Council and the Watershed Leads to support regional collaboration and decision making on salmon recovery plan implementation, facilitating the RITT to provide scientific guidance on salmon recovery implementation, as well as facilitating regional discussions and strategy development for implementation of priority actions in and funding for the Salmon Recovery Plan.

Current budget constraints have resulted in loss of staffing at all levels mentioned above, impacting our collective ability to implement salmon recovery. Funding for this capacity, including for keeping the entities engaged, is increasingly difficult.

### Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

- A.6.5.1 Lead entity and partner funding strategy.** The Partnership, in collaboration with the Salmon Recovery Council, the Governor’s Salmon Recovery Office in the Recreation and Conservation Office and WDFW, will identify a funding strategy and approach to support salmon recovery lead entities and the associated partner programs essential to implementing the salmon and steelhead recovery.

### Emerging Issues and Future Opportunities

- Integrate climate change scenario information, including water availability and sea level rise, in 3-year work plans and funding programs. This could include adjusting prioritization criteria for project sponsors and funders.
- Addressing liability issues for private landowners with restoration projects on their land.

## Target View: Chinook Salmon

Salmon remain an important part of the economic and cultural identity of Puget Sound. The goal of the region's recovery plan is that there is a 95 to 99% probability that Puget Sound Chinook salmon can persist on their own for 100 years. This equates to an abundance of 60,580 to 271,640 wild Puget Sound Chinook salmon, depending on the productivity of the Chinook populations.

Puget Sound Chinook have an approved plan developed by local watershed communities, and are one of the few species in Puget Sound that have numerical targets and benchmarks for recovery. Chinook salmon are generally at less than 10% of their historic levels in Puget Sound river systems, with some below 1%. An estimated eight to 15 populations of Chinook salmon have been lost entirely.

### **Recovery Target**

- Stop the overall decline and start seeing improvements in wild Chinook abundance in two to four populations in each biogeographic region (Figure 2 In latest data and maps section).

### **Relevant Strategies (and Sub-Strategies)**

- A4.2. Provide infrastructure and incentives to accommodate new and re-development within urban growth areas
- A5.4. Implement and maintain priority floodplain restoration projects
- A6. Protect and recover salmon (A6.1, A6.2, A6.5, A6.3, A6.4)
- B2.1. Permanently protect priority nearshore physical and ecological processes and habitat
- B3. Protect and restore marine ecosystems (B3.2, B3.1)
- B5.1. Implement species recovery plans in a coordinated way
- C1. Prevent, reduce, and control the sources of contaminants entering Puget Sound (C1.3, C1.1, C1.4, C1.6)
- C2. Use a comprehensive approach to manage urban stormwater runoff at the site and landscape scales (C2.2, C2.4)
- C6.1. Reduce the concentrations of contaminant sources of pollution conveyed to wastewater treatment plants
- C8. Effectively prevent, plan for and respond to oil spills (C8.1, C8.2, C8.3)
- C9. Address and clean up cumulative water pollution impacts in Puget Sound (C9.1, C9.2)

Figure C-4 (Appendix C, *Results Chains*) depicts how the strategies (and related sub-strategies) contribute to reducing pressures on Chinook salmon and achieving the Chinook salmon recovery target. Appendix C also contains a results chain for each individual strategy in the Action Agenda, showing how that strategy (and its related sub-strategies) reduces pressures and contributes to achieving numerous recovery targets.

# Summer Stream Flows

## The Challenge

Surface-water flows and groundwater levels in most watersheds of Puget Sound have been altered as a result of dams and other hydrological modifications, loss and change of vegetative cover, water withdrawals for municipal, domestic, commercial, industrial, and agricultural water supplies, and in some cases, over-allocation of water rights. Climate change will compound these problems by reducing snowpack and groundwater infiltration, increasing stormwater runoff, raising stream temperatures, and concentrating pollutants in water bodies. As a result, Puget Sound aquatic habitats are degraded, native species have declined, and there is an uncertain future water supply for human consumption, especially in rural areas. Low water flows are identified as priority issues for salmon in 14 of the 19 Puget Sound WRIs.

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### CLIMATE CHANGE

Increasing temperatures will significantly reduce snowpack in Cascade and Olympic Mountains. This will lead to reduced summer stream flows, reduced soil moisture, higher summer stream temperatures, and an increased risk of drought for water users, including agriculture, municipalities, and fish and wildlife. Increased water demand could increase the potential for conflict among users. Coldwater fish species including salmon, steelhead, and bull trout are especially at risk.

One of the high-priority, overarching strategies in *Preparing for a Changing Climate: Washington State's Integrated Climate Response Strategy* (Washington State Department of Ecology 2012a) is to improve water management to address climate-related supply reductions. This strategy includes promoting integrated water management in vulnerable basins, implementing enhanced water conservation and efficiency programs, ensuring sufficient cold water in salmon-bearing streams during critical seasons, and adapting water management and planning practices to reflect changing water availability and flow timing.

Recommended actions include, but are not limited to, developing guidance on whether and how to incorporate projected climate information and adaptation actions into planning, policy and investment decisions related to approval of new or changing existing water rights, adoption of instream flow rules, implementing well-coordinated land and water policies, fostering climate-ready utility initiatives, improving existing water infrastructure, and adopting up-to-date water conservation technologies.

The sub-strategies in this section help to implement the state strategy, as do Strategies A1 through A5 and C2. Additional adaptation work will be needed for this strategy in the future.

Puget Sound watersheds require a comprehensive approach to protecting year-round, instream flows for people and instream uses. This is particularly important with increasing human population in the region and concomitant projected increases in water demand. Current approaches to managing stream flows, groundwater, water use, land use, and stormwater management are fragmented and the many programs that address water quantity are not coordinated. Many of the programs for managing water are funded from the state's General Fund, and have seen disproportionate cuts in recent years. A fundamental realignment in policy, regulation, and funding structure is needed at the state level to repair the system, one that ensures the protection of natural hydrologic processes and associated habitats within Puget Sound watersheds. Some of these actions will also help improve water quality.

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## SALMON RECOVERY PLAN PRIORITY: FRESHWATER

Adequate water availability is critical for salmon. Water availability for salmon recovery also includes the timing and the type of flow (e.g., peak flows, rain-on-snow events, water levels during summer versus levels during spring). The Recovery Plan calls for resolving technical and policy uncertainties around water availability and flow, and the implementation of protective water quantity measures.

**How is this priority integrated in the Action Agenda?** While the Action Agenda strategies and actions have some actions around instream flows and water availability, the Salmon Recovery Plan places a higher emphasis on resolving the water availability issues than is highlighted in the Action Agenda. The flow work has not advanced in the region as articulated in 2005. More work is needed to address the concerns around instream flows for salmon recovery.

## Recovery Targets

The strategies and actions in this section will contribute to achieving the recovery targets for summer stream flows.

Protecting and improving stream flows also will help support recovery targets related to insects in small streams, wild Chinook salmon abundance (which in turn supports recovery targets for Puget Sound resident killer whales), and freshwater quality.

Vital Sign	Indicator	Recovery Target
Summer Stream Flows	Summer low flows	<ul style="list-style-type: none"> <li>• Maintain stable or increasing flows in highly regulated rivers: Nisqually, Cedar, Skokomish, Skagit, Green.</li> <li>• Monitor low flow in the Elwha River after dam removal.</li> <li>• Maintain stable flows in unregulated rivers that currently are stable: Puyallup, Dungeness, Nooksack.</li> <li>• Restore low flows to bring the Snohomish River from a weakly decreasing trend to no trend.</li> <li>• Restore low flows to bring the Deschutes River, North Fork Stillaguamish River, and Issaquah Creek from a strongly decreasing trend to a weakly decreasing trend.</li> </ul>

## Local Priorities

LIOs identified near-term actions that address summer stream flows. These local actions are presented in the *Strategies and Actions* section along with Soundwide actions under the sub-strategy shaded below. The local action numbering contains the area abbreviation shown in parentheses after each LIO name. See Section 4, *Local Recovery Actions*, for detailed information about local planning.

Local Integrating Organization	Sub-Strategy		
	A7.1	A7.2	A7.3
Hood Canal Coordinating Council (HC)			
Island (ISL)			
San Juan (SJI)			
Snohomish-Stillaguamish (SNST)			
South Central Caucus Group (SC)			
Alliance for a Healthy South Sound (SS)			
Strait ERN (STRT)			
West Central (WC)			
Whatcom (WH)			

## Strategies and Actions

### A7. Protect and Conserve Freshwater Resources to Increase and Sustain Water Availability for Instream Flows

This strategy is intended to develop coordinated, watershed-based water management approaches, accounting for existing ecosystem goals, water management agreements, projected future climate conditions and water availability, projections of future instream flow demands, and maintaining low flows in tributaries. This strategy approaches freshwater protection and conservation from three perspectives.

- Regulation, monitoring, and enforcement.
- Water demand and conservation.
- Groundwater supplies and recharge.

#### A7.1 Update Puget Sound instream flow rules to encourage conservation

A critical tool for protecting and conserving freshwater resources is rulemaking for instream flows. Ecology has authority to set instream flows under several statutes—Chapters 90.22, 90.54, and 90.82, of the RCW. The term “instream flow” is used to identify a specific stream flow (typically measured in cubic feet per second, or cfs) at a specific location for a defined time, and typically following seasonal variations. Instream flows are usually defined as the stream flows needed to protect and preserve instream resources and values, such as fish, wildlife, water quality, aesthetics, and recreation.

It is important to note that instream flows are intended to set limits on the use of other, less senior water users. Often instream flows, once established, will not be met for much of the time. Instream flows can help to stop the decline of stream flows. However, other programs are needed to restore flow levels so that instream flows can be met more often.

Instream flows are most often described and established in a formal legal document, typically an adopted state rule. Ecology establishes in stream flow rules through the Administrative Procedures Act (RCW 34.05). In areas of the state where watershed planning has occurred, local planning units can

make recommendations to Ecology for instream flow rules to be established or, for existing rules, amended. WDFW provides technical assistance in the form of instream flow studies, flow study interpretation and analysis in light of hydrology and species-specific ecology, developing instream flow recommendations based on interpretation of instream flow study results, and explaining instream flow ecology and methods to stakeholders.

Most of the watersheds in WRIAs 1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 17 are currently covered by instream flow rules. Only four of these rules, however, address permit-exempt groundwater withdrawals that can have a cumulative effect on stream flows, especially in late summer. For example, the instream flow rule for Kennedy—Goldsborough WRIA 14 was codified in 1988 and has not been updated. In general in the Puget Sound region, there is limited data on actual water use and the effects of groundwater withdrawal on stream flows. This lack of data can make it hard to understand and communicate how additional water withdrawals might impact senior water right users, and listed species.

An additional challenge to updating instream flow rules is the degree of local support and/or opposition to the rule-making process within any given basin. The degree of support or opposition can greatly influence both the cost and time required to adopt or update a rule, as evidenced by recent rule-making activity in WRIA 17 and WRIA 18. New instream flow rules often limit access to groundwater supplies, raising concerns among home builders, realtors, and property owners. To address this challenge, it will be important to work with local officials, legislators, tribes, and stakeholders to reach agreement on regulatory approaches and solutions to water supply problems. Finding solutions to the growing demand for water can take longer than developing the rule language itself. Education and outreach efforts are also critical for building public understanding and support. Outreach strategies would be tailored for specific basins. Ecology's staffing for instream flow rules has been reduced in recent years due to budget cuts—there are currently only two instream flow rule writers for this work statewide.

### Ongoing Programs

Ecology's Watershed Plan Implementation and Flow Achievement Capital Grant Program and Watershed Planning Operating Budget Grant include specific technical approval criteria such as amount of water added to instream flows and improvements to fish habitat.

Performance measures from Ecology's Water Resources Division include two instream flow rules adopted (Q6, 2009–2011 biennium), number of instream flow rules adopted, 0% of monitored stream flows below critical flow levels, and 1,250 acre-feet of water saved for instream flow (for each period, 2009–2011 biennium). Additional measures include percentage of Hood Canal summer chum and Puget Sound Chinook stocks with spawner escapement (number of fish returning to a stream or river to spawn) exceeding 1993–1997 levels (base period prior to Endangered Species Act listing). An increasing number of populations with spawner escapement exceeding the population's 1993–1997 levels would indicate progress toward a healthier Puget Sound ecosystem.

Ongoing programs also establish minimum flow regimens on rivers where flows are controlled by dams. In general, these rivers have stable or positive trends relative to minimum flows. Note that implementation of minimum flow requirements for dam releases is just one mitigation measure for a variety of negative environmental impacts that dams can cause. There are six Puget Sound rivers where

flows are highly controlled by dams: the Cedar River, the Elwha River (although this will change in the future as the dams are removed), the Green River, the Nisqually River, the Skagit River, and the Skokomish River. Two additional Puget Sound rivers, the Deschutes River and the Snohomish River, are slightly regulated by dams.

### **Key Ongoing Program Activities**

- Ecology will continue to support implementation of the recommendations from approved watershed plans prepared under the Watershed Planning Act (RCW 90.82), to the extent possible within legislatively approved funding levels, consistent with the Action Agenda and coordinated with other local restoration and protection efforts. Approved watershed plans in Puget Sound include Nooksack, San Juan, Island, Nisqually, Skokomish-Dosewallips, and Quilcene. Other areas stopped the RCW 90.82 planning process (Kitsap, Kennedy-Goldsborough, Chambers-Clover, Deschutes, Lower Skagit-Samish, Upper Skagit), and still other areas are not expected to participate in RCW 90.82 planning (Stillaguamish, Snohomish, Cedar-Sammamish, Duwamish-Green, Puyallup-White). Work is needed to provide support and funding for flow-protection and enhancement actions in approved watershed plans.
- Ecology will renew efforts to require metering in all new and existing diversions in the Puget Sound region and use metering data in making water availability decisions, modeling groundwater, and updating instream flow rules.

### **Near-Term Actions**

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.7.1.1 Set instream flows in priority watersheds.** Ecology, with support from WDFW, will by 2020 set flow rules in the remaining priority Puget Sound watersheds that currently do not have instream flow rules:

- 1) WRIA 16.
- 2) The western portion of WRIA 17 (Sequim Bay watershed).
- 3) The western portion of WRIA 18 (Elwha-Morse watershed planning area).

Priority will be given to critical basins or those with known significant problems meeting instream or out-of-stream demands. Note that including the Elwha River in an instream flow rule may be delayed because of the need to develop a method to determine and set instream flows in the Elwha after dam removal and river stabilization.

**A.7.1.2 PEP development and implementation.** Ecology will develop and implement the comprehensive basin flow protection and enhancement programs called for in the recovery plans for Puget Sound Chinook and Hood Canal/Strait of Juan de Fuca Summer Chum.

**A.7.1.3 Water code compliance and enforcement.** Ecology will establish a strong program for Puget Sound watersheds to increase water code compliance and enforcement. This program will include the creation of Ecology “compliance officer” staff positions. These

positions would be similar to “water masters” used in other parts of the state, but also different because of the absence of adjudication and increased focus on mitigation strategies.

**A.7.1 STRT36 Develop, adopt, and implement the water resources management program rules for Elwha-Dungeness WRIA 18.** This action includes implementing the adopted rule that applies to eastern WRIA 18, the Dungeness watershed, from Bell Creek on Sequim Bay to the Bagley Creek sub-basin (WAC 173-518). Development of the Water Resources Program Rule for the Elwha portion of WRIA 18, that would involve the Elwha-Morse Management Team, is delayed awaiting completion of removal of the Elwha dams and river restoration.

**A.7.1 STRT38 Develop, adopt, and implement a water resources management program rule for eastern Clallam County’s portion of WRIA 17.** Eastern Clallam County’s Sequim Bay–Miller Peninsula portion of the Quilcene-Snow WRIA 17 is within the Dungeness River Management Team’s purview.

**A.7.1 STRT39 Develop, adopt, and implement a water resources management program rule for WRIA 19 the Lyre Hoko watershed.**

## **A7.2 Decrease the amount of water withdrawn or diverted and per capita water use**

While the previous sub-strategy (A7.1) focuses on regulation and monitoring of freshwater resources through implementation of instream flow protection programs, this sub-strategy considers freshwater resource protection through demand and conservation strategies. Managing demand and promoting conservation will be critical as the human population increases in the Puget Sound region. Population stress on water supply will be further exacerbated by predicted decrease in snow-pack and increased frequency of droughts brought about by climate change. The near-term objectives for water demand and water conservation address four key sectors: municipalities, agriculture, industry, and rural domestic water users. Demand and conservation goals will be met through a combination of implementation/enforcement of rules, voluntary participation in conservation programs, market-based approaches to adjust water usage, and deployment of current and emerging water conservation technologies.

### **Ongoing Programs**

#### **Key Ongoing Program Activities**

- The Partnership will support municipal water systems’ implementation of the DOH’s Water Use Efficiency Rule, including establishing water conservation goals, metering, and reporting from all municipal suppliers.
- Ecology will support an increase in periodic audits of industrial water users.

### **Near-Term Actions**

No near-term actions; work in the near-term is focused on implementation of ongoing programs.

### A7.3 Implement effective management programs for groundwater

A critical approach to protection and restoration of freshwater resources includes management of groundwater in conjunction with surface water to better account for the interaction between the two.

Work on groundwater should emphasize monitoring of groundwater resources (including exempt wells) and use projections, and completion and implementation of groundwater management plans throughout Puget Sound. It will require an emphasis on work in areas without current groundwater management plans that are at high risk of groundwater pollution and/or current or future demand. The Critical Aquifer Recharge Area program (under the Growth Management Act) is one potential vehicle for coordinating protection of groundwater resources across Puget Sound counties to support instream flows.

#### Near-Term Actions

The near-term actions identified for this sub-strategy are described below. Appendix D, *Near-Term Actions*, provides a consolidated table of all near-term actions, performance measures, and owners.

**A.7.3.1 Exempt wells.** Ecology will work with Tribal Nations, local governments, and other partners to develop and support a consistent approach to making decisions about exempt wells, and to ensure that both the physical and legal availability of water is considered in decisions. This will include workshops on exempt well issues to be completed by 2015.

**A.7.3 SNST16 Groundwater study.** Identify the costs and potential funding sources for conducting an impairment analysis for groundwater resources in the Stillaguamish and/or Snohomish River basins.

#### Emerging Issues and Future Opportunities

A number of ideas for future work could be undertaken to address protection of freshwater flows in Puget Sound. These ideas, listed below, should be an ongoing part of the regional discussion about freshwater flows, and may inform future funding decisions, programmatic priorities and guidance, and/or may become near-term actions in future Action Agenda cycles.

- Establishment of a stable dedicated funding source for water resource management. The dependence on General Funds for these initiatives must be reduced for progress to be made. A funding program should address funding both for state agencies and for local governments to help build partnerships that can make progress in implementing water resource elements of the Action Agenda.
- The proper balance between establishing new instream flow rules and updating existing rules. Ecology currently has no resources to update existing rules. Diverting resources to update existing rules would slow establishment of new instream flows. In general, this is a very resource challenged area of the Action Agenda.
- Development of additional information on the effects of groundwater withdrawals on stream flows and completion of groundwater resource assessments/water mapping.

- Application of more holistic, watershed and integrated water budget and planning based approaches that would examine all the water needs in a watershed (e.g., growth, industry/agriculture, stream flows) and all the potential water resources (e.g., reclaimed water, stormwater, and rainwater harvesting) and work to best match needs and resources.
  - Consideration of a comprehensive “Puget Sound Water Plan”, which would integrate all of the water issues in the basin, including water rights, water quality, land use permitting, habitat protection, and watershed management, and provide a mechanism to deploy relevant programs to increase the likelihood that instream flow targets will be met. Some commenters on the draft Action Agenda suggested that additional enforcement authorities are needed to ensure instream flows are met.
  - Use of water acquisition through, for example, water right leases and purchases, to restore/protect flows.
  - Consideration of new implementation mechanisms for planning, these might include consideration of watershed districts, which would have independent revenue (e.g., taxation authority) and the ability to review all permits for conformity with the plan and to step in where a proposal has a watershed-wide impact and take the lead for planning, for example for flood hazard mitigation or water supply planning.
  - Work with stakeholders and partners to build on existing public-private models, to support utilities adoption of demand management strategies (such as tiered pricing structures) to discourage inefficient and unnecessary use of municipal water, particularly in flow-limited areas or low flow periods.
  - More specific incorporation of climate change projections throughout Puget Sound.
  - The potential for work with Canadian partners in the development of groundwater management programs for transboundary aquifers such as the Abbotsford-Sumas Aquifer.
  - The need to ensure adequate flow in both mainstem rivers and tributaries.
-

## Target View: Summer Stream Flows

Summer stream flows support salmon habitat needs, other ecosystem needs, and water for people. The summer (June through October) lowest 30-day average flow is a statistical measure of flow that has been linked to salmon habitat needs.

Summers in the Puget Sound region are often glorious, with comfortable temperatures and little rain. One result of this great weather is that the flow of water from rivers and streams around the Sound also declines, affecting salmon runs, wildlife, and our water supply. There are other man-made reasons for lower summer stream flows, such as new wells that tap ground water and new buildings and development that cover up the ground and decrease seepage—reducing the amount of water that would reach the stream in summer.

Of course, stream flows vary from year to year. But there are good measurements available for most of the rivers in the Puget Sound basin.

The river-specific targets for stream flow are displayed in the following graph. All flows are from U.S. Geological Service gages. Most gages are near the mouth of the river, except the Deschutes River and Dungeness River gages are higher in the watershed.

### **Recovery Targets**

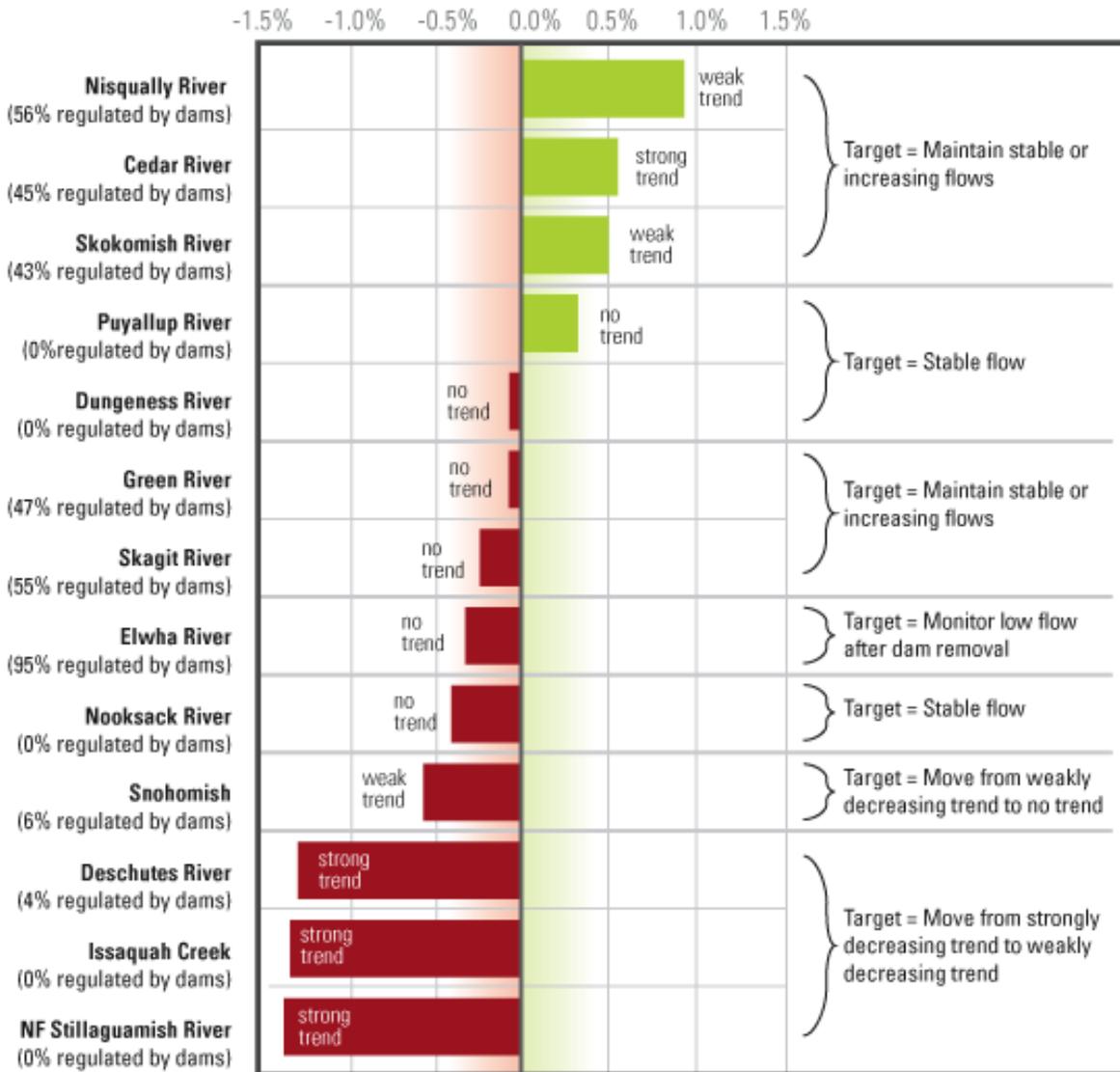
- Maintain stable or increasing flows in highly regulated rivers: Nisqually, Cedar, Skokomish, Skagit, and Green.
- Monitor low flow in the Elwha River after dam removal.
- Maintain stable flows in unregulated rivers that currently are stable: Puyallup, Dungeness, and Nooksack.
- Restore low flows to bring the Snohomish River from a weakly decreasing trend to no trend.
- Restore low flows to bring the Deschutes River, North Fork Stillaguamish River, and Issaquah Creek from a strongly decreasing trend to a weakly decreasing trend.

### **Relevant Strategies (and Sub-Strategies)**

- A1. Focus land development away from ecologically important and sensitive areas (A1.1, A1.2)
- A7. Protect and conserve freshwater resources to increase and sustain water availability for instream flows (A7.1, A7.2, A7.3)
- C2. Use a comprehensive approach to manage urban stormwater runoff at the site and landscape scales (C2.3, C2.5)
- C6.5. Promote appropriate reclaimed water projects

Figure C-5 (Appendix C, *Results Chains*) depicts how the strategies (and related sub-strategies) contribute to reducing pressures related to summer stream flows and achieving the summer stream flow recovery target. Appendix C also contains a results chain for each individual strategy in the Action Agenda, showing how that strategy (and its related sub-strategies) reduces pressures and contributes to achieving numerous recovery targets.

### Average Change in Low Water Flows in 13 Puget Sound Rivers Percent per year, 30-day average summer low flow, 1975-2010



Source: Washington State Department of Ecology