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Welcome to the Salmon Recovery Funding Board’s fourth biennial conference for recipients of salmon recovery grants. The board extends a special welcome to the Oregon colleagues who are joining us this year. The conference site on the banks of the Columbia River offers us this excellent opportunity to exchange ideas and information across the border.

Many thanks to the speakers, presenters, panel members, and session leads who are sharing their experiences, lessons learned, and expertise about Pacific salmon recovery. Their generous contributions of time and knowledge are what make these conferences such rich learning experiences.

Since 2000, the board has awarded more than $600 million in state and federal funds for more than 2,544 projects statewide. The federal Pacific Coastal Salmon Recovery Fund has provided $337 million. Grant recipients have also contributed more than $211 million in matching funds, bringing the total investment in salmon recovery to $811 million.

Here are just some of the ways you’ve made a difference with that funding:

- You have removed 870 barriers to fish passage, making more than 2,000 miles of stream accessible to salmon.
- You have restored 4,338 acres of estuarine habitat.
- You have protected more than 35,800 acres of crucial salmon habitat.
- You have controlled invasive plants on 17,391 acres of land along rivers, in wetlands, and in estuaries.

Our work over the past decade has accomplished a great deal. This conference allows us to take a couple of days to think about our successes and to focus on building even better salmon recovery projects. Over these two days, we’ll:

- Celebrate what is working in salmon recovery.
- Examine what could work better.
- Share experiences and lessons from the field.
- Assess and reflect on over ten years of salmon recovery work.
- Learn ways to improve the quality and cost-effectiveness of projects.

Enjoy the next two days and—once again—welcome and thank you!
## AT-A-GLANCE-AGENDA: TUESDAY

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<tr>
<td>8-9</td>
<td>Registration &amp; Exhibits (open all day)</td>
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<tr>
<td>9-9:30</td>
<td><strong>Welcome:</strong>&lt;br&gt;Kaleen Cottingham, Recreation and Conservation Office&lt;br&gt;David Troutt, Salmon Recovery Funding Board&lt;br&gt;Bill Iyall, Cowlitz Indian Tribe</td>
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<tr>
<td>9:45 - NOON</td>
<td>Riding the Wave: Large-Scale Marine &amp; Nearshore Projects&lt;br&gt;Build It &amp; They Will Come: Large Projects with Instream Wood&lt;br&gt;Planting Strategies That Work&lt;br&gt;Go Forth &amp; Multiply: Fish Passage Restoration&lt;br&gt;Strategic Connections: Large Scale River Conservation Projects&lt;br&gt;The River is Wide: Floodplain Reconnection Projects&lt;br&gt;Communicating Salmon Recovery: Videos &amp; News Clips&lt;br&gt;Designed to Thrive: Organizational Assessment &amp; Strength Building</td>
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<tr>
<td>12:15 - 1:30</td>
<td>Lunch&lt;br&gt;<strong>Keynote:</strong>&lt;br&gt;The Northwest Power &amp; Conservation Council's Columbia River Basin Fish &amp; Wildlife Plan&lt;br&gt;Phil Rockefeller, Northwest Power and Conservation Council&lt;br&gt;<strong>Keynote:</strong>&lt;br&gt;A Federal Perspective on Salmon Recovery&lt;br&gt;Will Stelle, NOAA Fisheries</td>
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<tr>
<td>1:45 - 4</td>
<td>By the Sea: Smaller Scale Marine &amp; Nearshore Projects&lt;br&gt;Fine Woodworking: Medium &amp; Small-Scale Projects with Instream Wood&lt;br&gt;Buying Plants: You Get What You Inspect, Not What You Expect&lt;br&gt;Clear the Way: Restoring Fish Passage&lt;br&gt;Water Rights Transactions in Washington and Oregon&lt;br&gt;Go Fish: Levee Removal Projects&lt;br&gt;The Salmon Recovery Message</td>
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<td>4</td>
<td>Afternoon Break &amp; Networking</td>
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<td>5:30 - 8</td>
<td>Dinner&lt;br&gt;<strong>Keynote:</strong>&lt;br&gt;Elwha: The Grand Experiment&lt;br&gt;Lynda Mapes, Seattle Times.</td>
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# AT-A-GLANCE-AGENDA: WEDNESDAY

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<tr>
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<td>7:30</td>
<td>Continental Breakfast</td>
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<td>8:00</td>
<td><strong>Welcome to Day 2:</strong></td>
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<td></td>
<td>Kaleen Cottingham, Recreation and Conservation Office</td>
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<td>David Troutt, Salmon Recovery Funding Board</td>
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<tr>
<td>8:15</td>
<td><strong>Keynote:</strong></td>
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<td><strong>Salmon Recovery: Sustaining Momentum in the Face of Change</strong></td>
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<td>Robyn Thorson, U.S. Fish and Wildlife Service</td>
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<td>8:45</td>
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<td>9:00</td>
<td><strong>Ocean, Nearshore &amp; Estuary</strong></td>
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<td>Integrating River Delta Science &amp; Restoration</td>
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<td>9:00</td>
<td><strong>Instream Wood Projects</strong></td>
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<td>Is Wood Really Good?: Wood Placement</td>
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<td>9:00</td>
<td><strong>Riparian Restoration</strong></td>
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<td>Watershed-Scale Riparian Restoration Strategies</td>
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<td>9:00</td>
<td><strong>Fish Passage &amp; Dams</strong></td>
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<td>Rollin’ on the River: Fish Passage Guidelines &amp; Results</td>
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<td>9:00</td>
<td><strong>Acquisition, Protection, Stewardship</strong></td>
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<td>Current Challenges in Stewardship</td>
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<td>9:00</td>
<td><strong>Project Planning</strong></td>
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<td>Developing Alliances: Reconciling Farms &amp; Fish</td>
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<td>9:00</td>
<td><strong>Monitoring</strong></td>
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<td>The Three-Legged Stool of Monitoring: Do we need more legs?</td>
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<td>9:00</td>
<td><strong>Organizational Development</strong></td>
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<td>Sustaining Your Work When the Grants Run Out</td>
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<td>9:15</td>
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<td>10:00</td>
<td>Lunch</td>
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<td><strong>Keynote:</strong></td>
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<td>Phil Anderson, Washington Department of Fish and Wildlife</td>
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<td>10:30</td>
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<tr>
<td>11:30</td>
<td><strong>Ocean, Nearshore &amp; Estuary</strong></td>
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<td>11:30</td>
<td><strong>Lower Columbia Salmon Recovery Issues</strong></td>
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<td><strong>Invasive Species</strong></td>
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<td>Managing for Salmon Recovery in the Lower Columbia River</td>
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<td>11:30</td>
<td><strong>Fish Passage &amp; Dams</strong></td>
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<td>How Do You Solve a Problem Like…Invasive Species?</td>
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<td>11:30</td>
<td><strong>Acquisition &amp; Protection</strong></td>
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<td>Boom or Bust: Big Dam Removal Projects</td>
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<td>11:30</td>
<td><strong>Project Planning</strong></td>
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<td>Distilling Water Rights</td>
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<td>11:30</td>
<td><strong>Monitoring</strong></td>
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<td>Best Practices in Management: Project, Contract, &amp; Risk Management</td>
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<td>11:30</td>
<td><strong>Regional &amp; Statewide Monitoring Efforts</strong></td>
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<td>12:45</td>
<td><strong>What Do We Know Now: Current Research &amp; Planning</strong></td>
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<td>3:30</td>
<td><strong>Conference Wrap Up &amp; Prize Drawing</strong></td>
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How Does the Door Prize Drawing Work?

Here's what you need to do:

- Visit exhibits, chat with exhibitors, and pick up tickets from them.
- Examine door prizes, which are groups of items donated by exhibitors.
- Deposit your tickets by the prizes you would like to win. You may put all your tickets by one prize or distribute them among several prizes.
- Cross your fingers that your ticket is the lucky one drawn!

Drawing will be held at the end of conference, at about 3:30PM on Wednesday, May 15th.

You must be present to win.
RIDING THE WAVE:
LARGE-SCALE MARINE & NEARSHORE PROJECTS

**Tidal Marsh Restoration on Bandon Marsh National Wildlife Refuge**
PRESENTER: Roy Lowe, U.S. Fish and Wildlife Service

For more than a decade the U.S. Fish and Wildlife Service and its many partners pursued the goal of restoring the diked pastures of the Ni-les’tun Unit of Bandon Marsh National Wildlife Refuge to the historic tidal salt marsh habitat that occurred there more than 100 years ago. Following ten years of planning and three years of construction, the 418-acre tidal marsh restoration project was completed in September 2011. Bandon Marsh is located in the Coquille River estuary, which has suffered the greatest percentage loss (95%) of tidal marsh habitat in Oregon. The Ni-les’tun restoration project is the largest tidal marsh restoration constructed in Oregon to date, and upon completion it doubled the amount of tidal salt marsh in the estuary. The project is improving estuarine health and productivity and directly benefits a wide array of fish, wildlife, and invertebrate populations including anadromous fish.

**Grays Harbor Juvenile Fish Use Assessment**
PRESENTER: Todd Sandell, Wild Fish Conservancy

The Grays Harbor Juvenile Fish Use Assessment, now in its third year of sampling, relies primarily on beach seining to determine the species composition, distribution, relative abundance, habitat use, and emigration timing of juvenile salmonids and other fishes in the Grays Harbor estuary of Washington State. The objective is to develop a scientific basis for evaluating potential sites—from riverine tidal waters through marine habitats—for future habitat restoration and protection as well as identifying construction windows. The results from our 2011 and 2012 sampling indicate a wide range of habitat usage by the various species and age classes of salmonids found in Grays Harbor, a large increase in the catch of juvenile salmonids in 2012, and a shift in emigration timing between the years. These results are allowing us to identify which areas should take priority for restoration and conservation, and to model the effects of sea level rise in the estuary to enhance future planning.

**Puget Sound Nearshore Restoration and Shellfish Resources: Conflict or Opportunity?**
PRESENTERS: Doris Small, Washington Department of Fish and Wildlife, and Alex Bradbury, Washington Department of Fish and Wildlife

Recent marine shoreline and estuarine habitat restoration project proposals brought the issue of shellfish resource protection to the forefront, as project managers struggle to find a balance meeting the needs of individual species as well as cultural, recreational, and economic needs, and Tribal treaty rights. This presentation will provide an overview of shellfish management issues and habitat restoration objectives in Puget Sound and then present case studies on potential resource conflicts and issues. We will describe the habitat and shellfish goals, and issues or constraints at recently completed or proposed restoration projects in Hood Canal including Quilcene Bay, Twanoh State Park, Belfair State Park, and Discovery Bay. We will also propose an early consultation process in which common goals and individual constraints can be explored in the design process to avoid conflicts during implementation.

**Fish and Floods — Excavators Hit the Mud at Port Susan Bay**
PRESENTER: Jenny Baker, The Nature Conservancy

The Port Susan Bay Estuary Restoration Project, completed in 2012, was designed to restore natural riverine and tidal processes both within the project site at the mouth of the Stillaguamish River and across the broader Port Susan Bay estuary. In addition, project goals included flood attenuation for neighboring lands, including farms. Restoration activities included setting back a dike, filling borrow ditches, digging “starter” channels, and installing an emergency flood control structure. The dike setback and starter channels reintroduced natural processes and gave juvenile salmon access to 150 acres of diked farmland. The dike setback also restored connections between the Stillaguamish River and northern Port Susan Bay, increasing the health and resilience of the larger estuarine ecosystem. Installing an emergency flood control structure will reduce the duration and intensity of flooding, reduce flood related damages to existing dikes, and return fish entrained in flood waters back to the aquatic system. A diverse group of partners, including the local flood control district, tribes, the conservation district, permitting agencies, and funders planned and implemented the project. Incorporating local knowledge and specific needs strengthened the design and built a broad base of support, resulting in faster permitting and strong relationships. This presentation will focus on the collaborative project development, challenges encountered, and lessons learned.
BUILD IT & THEY WILL COME: LARGE PROJECTS WITH INSTREAM WOOD

Restoration of the Lower Cle Elum River Valley, Washington


The downstream impacts of large dams—altering natural flow regimes and cutting off sediment and wood supply—have severe adverse impacts to in-stream and floodplain habitat. Altered flow regimes can disconnect a river from its floodplain and its secondary channels, both perennial and ephemeral. Reduced flow and sediment can also limit critical habitat-forming processes such as bank erosion and wood recruitment. The habitat consequences of a given flow released from a dam into a simplified channel versus a morphologically complex channel can be dramatically different. Mitigating these impacts is challenging and typically involves naturalizing flow regimes as much as possible, particularly sediment transport and channel-altering flows. In this presentation we will describe a successful example on the Cle Elum River in central Washington State, which used targeted wood placement to restore habitat and mitigate regulated flows and channel incision downstream of dams. The first phase of restoration in 2009 re-connected flow to a floodplain channel; this more than doubled total perennial channel length, enhanced hyporheic exchange, and increased complex cover, pools, and spawning and rearing habitat for salmon. Flow modifications at the dam are not possible, and this project offers an excellent illustration of what can be done with strategic wood placements and minor changes to channel geometry. Phase 2 of the project will restore over 5 miles of perennial side channel. Our approach is broadly applicable to incised alluvial channels with at least some portion of their floodplain intact.

Habitat and Fish Response to the Morse Creek Remeander Project

PRESENTER: Kevin Long, North Olympic Salmon Coalition

The Morse Creek Remeander Project is located on the Olympic Peninsula near Port Angeles. In 2010 the project reconnected 1,900 feet of historic channel that had been diked and abandoned, created 500 feet of side channel and constructed 20 engineered log jams. This presentation will focus on the biological monitoring of the project that has been underway since 2009. Monitoring parameters include: juvenile fish use, stream bed character, channel geometry, large woody debris recruitment, and Benthic Index of Biological Integrity (BIBI). Early monitoring results demonstrate excellent project performance. The restoration project is achieving project goals and providing unexpected habitat benefits.

Utilizing Large Wood to Revitalize Ecosystem Function

PRESENTERS: Kristin Williamson, South Puget Sound Salmon Enhancement Group, and Janet Shonk, Washington State Parks and Recreation Commission

This presentation will compare and contrast two different approaches to project design on the Greenwater and Clearwater Rivers in the Upper Puyallup/White River Watershed in western Washington. The two reach-scale stream restoration efforts took place on two analogous rivers that share a similar history. Phases of the Greenwater River restoration project were completed in 2010 and 2011, with a third phase planned for 2013-2014. Phase 1 of the Clearwater River restoration project will begin in summer 2013. The presentation will detail watershed assessment efforts, structural design approaches, and risk and public safety elements of each project.

Upper North Fork Toutle River

PRESENTERS: Pad Smith, Washington Department of Fish and Wildlife, and Tim Kuhn, U.S. Army Corps of Engineers

The North Fork Toutle River was heavily impacted by the eruption of Mt. St. Helens in 1980. This presentation will cover recent efforts which utilized wood in the Upper North Fork of the Toutle River. Several projects involving the placement of wood have been completed by various entities and funding sources. These projects were constructed in multiple phases with the first project breaking ground in 2007. We will discuss various approaches ranging from sediment management, protection of elk grazing and overwintering grounds, riparian revegetation, and avulsion protection of tributaries. These tributaries contain some of the only viable fish habitat in the Upper North Fork Toutle River system. Although none of these efforts were specifically intended to provide immediate and direct benefits to fish habitat, all of the approaches have a valuable indirect benefit that was realized immediately. It is anticipated that there will be long-term benefits that will directly improve fish habitat. Discussions will include a brief description of the techniques utilized along with observations and lessons learned.
PLANTING STRATEGIES THAT WORK

Riparian Plant Restoration along an Incised Stream to Improve Habitat and Provide Food for Beaver
PRESENTER: Jason Hall, NOAA Fisheries

Channel incision is a widespread problem within the dry interior Columbia River basin and other semiarid regions throughout the world. Lowered water tables along incised streams make traditional pole and bare root planting strategies ineffective without irrigation and create significant challenges to re-establishing riparian trees and shrubs. We conducted four years of experimental plantings on disconnected floodplains along an incised tributary to the John Day River, Oregon, with the goal of developing a tree planting strategy that would 1) maximize survival without requiring irrigation and 2) reduce browse impacts from deer and elk. We evaluated deep-planting as an alternative approach to irrigation by using motorized augers to penetrate lowered water tables in disconnected floodplains up to two meters above the incised streambed. We also tested the efficacy of different tree shelter designs that incorporated combinations of vented plastic tree shelters, mesh tree shelters, and circular fence cages. Our results suggest that survival of dormant pole cuttings of black cottonwood (Populus trichocarpa) and willow (Salix spp.) along incised streams can be maximized and ungulate browse impacts minimized if plants are: 1) planted in auger holes that penetrate the water table via deep-planting, and 2) protected with 6-foot plastic tree shelters.

Strategies for Planting: Successful Riparian Restoration in the Walla Walla River Basin
PRESENTER: Mike Denny, Walla Walla County Conservation District

This presentation will focus on a planting strategy we have developed in the Walla Walla River Basin for successful riparian restoration. This restoration work takes place in a broad range of precipitation zones (10 to 25 inches annually) and elevations (we have successful projects from 485 foot elevation to over 1,300 foot elevation). We use only native species adapted for the Blue Mountain region. I will show how and what we plant in the different zones and their rates of survival, including native tree and woody shrub species. We also face invasive plant issues in these greatly varied zones. We have just finished planting our 201st mile of riparian restoration in the Walla Walla River drainage.

Rapid Riparian Revegetation in the Willamette Basin Model Watersheds
PRESENTERS: Peter Guillotzet, Guillotzet Consulting LLC, and Sarah Dyrdahl, South Santiam, North Santiam, and Calapooia Watershed Councils

Successful riparian revegetation is an integral component of contemporary ecosystem management, enhancement, and restoration. It underpins emerging “restoration economies” in Oregon and the Pacific Northwest, but the lack of a coherent methodology has hampered the continued development and widespread adoption of successful techniques. With major funding from the Meyer Memorial Trust and the Oregon Watershed Enhancement Board, the Willamette Model Watershed Councils are engaged in a 10-year effort to implement a broad range of in-stream and riparian restoration projects. To gain efficiencies in riparian revegetation, all of the Councils are participating in cooperative native plant procurement and several have adopted an approach that reduces the risk of failure and promotes the rapid establishment of free-to-grow riparian forest buffers. Key elements, including adequate site preparation, use of bare root nursery stock, reference-site-based planting, efficient site layout and effective maintenance practices, have evolved into a coherent approach termed Rapid Riparian Revegetation (R3) (Guillotzet et al. in preparation). Since adopting the R3 approach in 2010, the Willamette Model Watershed Councils have led a rapid increase in the number and size of riparian revegetation projects in the Willamette Valley. We provide data from the program and projects to highlight practices, timelines, costs, and outcomes, and to advance the broader discussion concerning riparian revegetation in the Pacific Northwest.
Results of Controlled Experiments on the Effects of Watering, Mulch, and Fabric on Tree Survival

PRESENTER: Josh Latterell, King County

Virtually every stream restoration project includes plantings. Plants provide essential functions and significant resources are invested in plant maintenance to meet permit conditions and to reach performance targets. But another reason is that plantings are visible to the public, and excessive plant mortality attracts embarrassing scrutiny. This sets up a “ratchet effect” that favors ever-higher levels of maintenance over time. A “ratchet” can form when the risks posed by failure are high, but risks from spending money on unnecessary maintenance are low—or when there is no way to know what might have happened without maintenance. One antidote to the ratchet effect is a controlled experiment. Accordingly, King County is using experimental controls at restoration sites to develop evidence-based guidelines for restoring native forests. Initial studies indicate that, when springs were wet and summers were dry, watering was not necessary to ensure >80% survival of planted trees. Experiments with mulch indicated that although mulch delayed increases in herb cover, it did not affect tree survival, but rather reduced natural tree recruitment, and may have increased vole damage. Similarly, plastic fabric squares did not increase tree survival in the absence of strong invaders. More sites, years, and species are needed for to broaden our scope of inference. However, a few simple experiments have challenged long-held assumptions about the cost-effectiveness of irrigation, mulch, and weed fabric. Using experimental controls allows us to adaptively manage planting projects and has already led to significant cost-savings.

Fish Passage Barrier Prioritization Based on Multiple Parameters: Methodology and Results

PRESENTER: Ken Loffink, Oregon Department of Fish and Wildlife

Fish passage is a key component to many facets of fisheries resource management. Connectivity between aquatic habitats is an important part of garnering successful and healthy fish populations. Without habitat connectivity, resident or fluvial fish species such as native trout and suckers become isolated, leading to reduced levels of genetic diversity and fitness. For anadromous populations, fish passage can allow access to important rearing habitats or fertile spawning grounds that are pivotal for success of the species. Population isolation due to fish passage barriers also heightens migratory fish exposure to disturbances, thus increasing the potential magnitude of the disturbance at a population of individual level. Fish passage barriers are prevalent throughout the Oregon landscape. Over time, despite fish passage rules and regulations, access to native fish habitats has been blocked or impaired by the construction of impassable culverts, dams, tide gates, dikes, bridges, and other anthropogenic infrastructure. The Oregon Department of Fish and Wildlife’s latest inventory shows over 27,800 artificial obstructions to fish passage in the state. Of those, only 17% are documented as providing adequate fish passage for native migratory fish. With so many barriers spread across the landscape, and funding becoming scarce, it is paramount that we thoroughly prioritize fish passage, with inclusion of multiple parameters. This will allow for a focused effort to improving passage conditions and meeting a critical need of Oregon’s native migratory fish. This presentation explains the methodology used to create the Oregon Department of Fish and Wildlife’s new 2013 statewide fish passage priority list.

Allison Springs Estuary Restoration

PRESENTERS: Laurence Reeves, Capitol Land Trust, and Brian Combs, South Puget Sound Salmon Enhancement Group

This presentation will provide an in-depth look into a recent estuary restoration project on Eld Inlet in Olympia, Washington. Working with federal, state, local, and non-profit partners, this team effort removed multiple dams, berms, tide gates and culverts that impounded naturally formed springs for more than 50 years. The project is restoring chum spawning habitat and improving nearshore function. And if that isn’t enough, there are burning buildings, gushing wells, and a great short video of the project.
The Family Forest Fish Passage Program

PRESENTERS: Rick Kuykendall and Michelle Peterschick, Washington Department of Natural Resources, Laura Till, Washington Department of Fish and Wildlife, and Dave Caudill, Recreation and Conservation Office

The Family Forest Fish Passage Program (FFFPP) assists Washington’s private non-industrial forestland owners in replacing culverts and other stream crossing structures that keep trout, salmon, and other fish from reaching upstream habitat. During our session we will show a video about the program and give a presentation explaining how you can get involved and sponsor a project. Come and find out how FFFPP can fit into a restoration strategy.

STRATEGIC CONNECTIONS:
LARGE-SCALE RIVER CONSERVATION STRATEGIES

A Watershed-Scale Approach to Protection and Restoration of the Cedar River

PRESENTERS: Tom Beavers, King County, and Cyndy Holtz, Seattle Public Utilities

This presentation discusses the tools, strategies and partnerships used to protect and restore the Cedar River, King County, Washington, via a large-scale acquisition approach. We discuss planning for conservation acquisitions, linking protected areas, developing interagency partnerships, leveraging funding, and the importance of public outreach. Our goal is to highlight what great conservation work can occur when partners assemble, develop a clear focus, and set an acquisition strategy into action. The Cedar River Watershed contains much of the best remaining aquatic habitat in the Lake Washington ecosystem and significant efforts have been undertaken to protect and restore it. Salmonid populations (Chinook, coho) show encouraging signs of resiliency, but long-term viability is at risk partly from widespread habitat degradation. The Cedar River supplies drinking water to 1.5 million people in and around Seattle. The upper two-thirds of the watershed (92,000 acres) is protected for source water supply. The lower one-third of the river has experienced significant habitat loss as a result of suburban development and a system of levees. Through an ambitious partnership, local agencies, governments, and organizations are protecting and restoring the lower river and taking advantage of the unique opportunity that the protected headwaters provide.

Coordinating Restoration and Acquisition in a Salmon Stronghold: From Dam Removal to a Conservation Corridor on Oregon’s Sandy River

PRESENTERS: Steve Wise, Sandy River Basin Watershed Council, and Josh Kling, Western Rivers Conservancy

Removal of Marmot Dam on the Sandy River in Oregon not only restored free-flowing conditions to an iconic wild salmon stronghold in Portland’s back yard, but also opened the doors to an extensive collaborative effort to restore habitat for threatened Lower Columbia River wild salmon and steelhead. The 15-member Sandy Basin Partners developed science-based assessment and restoration priorities for anchor habitat, while public and private partners are implementing land acquisition in key reaches. This presentation will review milestones and strategies that created and maintain coordinated, multi-agency acquisition and restoration efforts in the Sandy, as well as public-private efforts to establish a conservation corridor that protects habitat, water quality, and exceptional year-round recreation and that lays a foundation for wild fish recovery in the Sandy and Lower Columbia.
The Lewis River watershed in Washington State has been severely impacted by past clearing and snagging, past gravel mining, residential development, dams that blocked large woody debris transport, and flow regulation. Due to these impacts, the North Fork Lewis River consists of a single-thread channel composed of a long glide with very little cover, complexity, or pools for creating early rearing habitat for juvenile Chinook, steelhead, and coho that originate in the upstream reaches. The Lewis River Side Channel Enhancement Project at river mile 13.5 removed an estimated 23,000 cubic yards of material, placed over 400 pieces of large woody debris, enhanced the connection of a spring creek tributary, and constructed a new 2,800-foot long side-channel. The upstream half of the side-channel contains a low gradient pool-riffle habitat reach with gravel substrate suitable for salmonid spawning. The downstream half of the channel contains abundant alcove slack water habitat, perfect for rearing juveniles seeking velocity refuge. After project completion, we have observed a dramatic increase of margin rearing habitat that is critical to juvenile fall Chinook, one of the highest priority species for recovery in the Lower Columbia region. Due to the support provided by the Salmon Recovery Funding Board and cooperation from the landowner Samuel Kysar, this project has successfully enhanced spawning, rearing, and adult holding habitat for all salmonid species on the North Fork Lewis River.

Abernathy Creek: A Tale of Two Bridges

PRESENTER: Eli Asher, Cowlitz Indian Tribe

Smooth projects yield few lessons. This presentation focuses on challenges faced and lessons learned while implementing a highly engineered channel re-meandering project on a flashy coastal stream under the scrutiny of a risk-averse landowner, suspicious neighbors, and interested research scientists. Major lessons learned range from how to confirm prevailing wage rates to knowing when to involve police to avoid an armed confrontation during construction. Abernathy Creek is a modestly sized tributary to the Lower Columbia River west of Longview, Washington. The project reach is home to winter steelhead and coho, flows through Washington Department of Natural Resources trust lands, and is immediately upstream of a tight-knit community of rural residential landowners. The creek’s role in the Lower Columbia Intensively Monitored Watershed complex further raises its profile in the salmon recovery world. Like many of its cohorts, Abernathy Creek has endured a litany of human insults. This project capitalized on an opportunity to reverse the effects of a hundred years of intense management in a high priority stream reach, immediately creating high quality habitat and setting the stage for the next century of habitat-forming processes.

Reecer Creek Floodplain Restoration: Nature is the Teacher

PRESENTERS: Rebecca Wassell, Mid-Columbia River Fisheries Enhancement Group, and Carol Ready, Yakima Tributary Access and Habitat Program

How ten years of planning, ten funding sources, and four flood events moved a mile of creek and 180,000 cubic yards of soil. First envisioned around 2001, the construction of the Reecer Creek Floodplain Restoration project was completed in 2011. The project improved ecosystem function on 58 acres near the confluence of Ellensburg’s Reecer Creek and the Upper Yakima River with a mile-long setback levee and relocated the creek onto its re-contoured floodplain. The project placed wood structures in the new stream channel, and installed more than 10,000 native rooted plants and live stakes along the banks, while dramatically increasing the floodplain’s capacity. Site maintenance is ongoing. This presentation will focus on lessons learned in coordinating 30 project partners, two engineering firms, and hundreds of volunteers.
Innovative Approaches to Restoring Complex Stream Ecosystems: Is it Time for a New Regulatory Framework?

PRESENTER: Michael Pollock, NOAA Fisheries

Our understanding of how streams historically functioned is rapidly evolving. Accumulating evidence suggests that many streams and rivers had complex flow patterns with multiple, anastomosing channels that were formed in part by numerous obstructions such as beaver dams, large wood, and living vegetation, and that these obstructions elevated water tables such that floodplains were regularly inundated. In this understanding, stream channels, adjacent wetlands, and riparian vegetation are viewed together as inseparable components of complex stream ecosystems. Recognizing these components as an integrated ecosystem better reflects both the influence of biota on physical fluvial processes, as well as the dynamic and transitory nature of particular habitat elements within these systems. Current paradigms in stream restoration are shifting towards recognition of this stochastic and dynamic complexity. Embedded in this shift is the recognition that much of the complexity in stream ecosystems derives from obstructions to flow that slow and redirect the movement of sediment and water. We also observe that there are spatial patterns to the numerous types of instream obstructions that historically existed in watersheds and that the ecological functions provided by a particular type of obstruction depend on watershed position. Current regulations governing stream restoration emphasize channel form rather than processes and focus on keeping channels free of obstructions so that sediment and water can move efficiently downstream. These regulations would benefit from revisions to reflect the importance of instream obstructions in restoring the complexities of stream function.

COMMUNICATING SALMON RECOVERY: VIDEOS & NEWS CLIPS

This session is an opportunity to view a number of short videos and news clips portraying different aspects of salmon recovery.

WORKSHOP:
DESIGNED TO THRIVE: ORGANIZATIONAL ASSESSMENT AND STRENGTH BUILDING

PRESENTER: Carri Munn, Solid Ground Consulting

Come learn a distinct framework for organizational success that moves beyond check lists of policies and procedures. This session will introduce you to a holistic model that integrates the core capacities that underlie organizational health: Being, Doing, and Balancing. Find out about the fundamentals of an organizational health check, understand how to evaluate challenges from the perspective of life cycle analysis, and receive guidance on how to support effective planning, branding, communications, and decision-making with both staff and board. Audience participation ensures relevant case studies and offers a forum for your questions. If you are interested in conscious leadership, committed teams, and enduring impact, this session will prepare you to start making a positive difference in your organization.

Carri Munn provides consulting, coaching and training to enhance the outcomes of organizations, leaders, and collaborations in the Pacific Northwest. She is committed to people who love what they do, work well together, and make a meaningful difference in the world. Carri brings over 20 years’ of experience including 10 years in management and 12 years of consulting. She has played lead roles in strategic planning, community engagement, and collaboration development in a wide variety of projects for nonprofits, public agencies, and business.
**BY THE SEA:**
**SMALLER-SCALE MARINE & NEARSHORE PROJECTS**

**Klingel Estuary Restoration: Returning Tides to the Klingel Wetlands**

**PRESENTER:** Kate Kuhlman, Great Peninsula Conservancy

The 66-acre Klingel Wildlife Refuge on the Union River estuary of Hood Canal sits at the heart of 90 acres of conserved land owned by Great Peninsula Conservancy. The refuge is part of a larger matrix of over 900 acres of conserved wetlands and tidelands. In the early 1950s, a previous owner diked the Klingel property to exclude saltwater and create pasture and hayfields. After farming ceased 45 years ago, much of the pasture reverted to freshwater wetland. This project removed the levee and opened 13 acres to tidal inundation to restore shoreline habitat diversity and function and to allow natural revegetation of a high salt marsh community. From design to construction, this project has taken many years and many partners to complete. The presentation will focus on the challenges presented and overcome along the way from a landowner’s perspective.

**Stavis Natural Resource Conservation Area Nearshore Restoration**

**PRESENTER:** Tom Smayda, Smayda Environmental Associates, Inc.

The Washington Department of Natural Resources acquired a 120-acre property on the banks of Hood Canal in 2006 as part of the Stavis Natural Resource Conservation Area. The property had been settled in 1850 as a homestead and was maintained for self-sufficiency. It included a lawn on 2 acres of filled salt marsh, a 765-foot long bulkhead in the intertidal zone, a ditched stream, agricultural lands, dug ponds, miles of fencing and pipes, 1.5 miles of road, several buildings, and even a small hydroelectric plant. The restoration project, constructed summer 2009, removed these manmade features following the “reference reach approach.” The sole intent of the project was to restore ecosystem functioning. We created a naturally-shaped landscape of native soils, sands, and gravels by removing fill material to expose original contours. Using T-sheets (1850s survey maps) and nearby reference areas as models, we created a meandering stream, an estuarine pocket estuary, a sand spit with abundant driftwood, and upland woods. We excavated about 11,000 cubic yards of soil to uncover the salt marsh. On the site, we planted over 4,000 locally-obtained beach, wetland, and upland plants. Following construction, the estuarine plant community has flourished, including an assemblage of pickleweed (Salicornia), grasses (Elymus, Deschampsia), and gumweed (Grindelia). Coho salmon have returned to the stream for the first time this century.

**Nearshore Restoration at Comet Bay, Deception Pass State Park**

**PRESENTER:** Joan Drinkwin, Northwest Straits Marine Conservation Foundation

Comet Bay, Deception Pass State Park, is one of the most used day-use areas and boat launches in the Washington State Parks system. This project resulted in the restoration of approximately 1.25 acres of nearshore habitat, removing a creosoted bulkhead and associated contaminated fill. The project installed native vegetation and appropriately-sized beach gravel and included regular monitoring of fish use, forage fish spawning, and eelgrass extent. The project was a close partnership between the Northwest Straits Marine Conservation Foundation, the Island Marine Resources Committee, the Whidbey Island Conservation District, and State Parks. The project is part of a larger vision of nearshore restoration at the site and next steps are planned.

**Penrose Point Bulkhead Removal Project**

**PRESENTER:** Kristin Williamson, South Puget Sound Salmon Enhancement Group

Penrose Point State Park is on the shore of Puget Sound on the Key Peninsula. This project spanned a four-year planning process and three salmon recovery grants that covered watershed project development, project design, and implementation. The project, completed in March 2013, removed a 700-foot long creosote bulkhead consisting of creosote piles and timbers, cable tiebacks, rip-rap armor, and fill along a bluff-backed beach. The bulkhead was positioned at the head of a long, natural low tide spit, at the divergent end of two drift cells. Project actions restored sediment delivery and riparian processes to the nearshore ecosystem, improved the beach profile for rearing and foraging salmonids, and improved local water quality and public safety. Project presenters will share their experiences managing the multi-faceted design, permitting, and construction process.
FINE WOODWORKING:
MEDIUM- & SMALL-SCALE PROJECTS WITH
INSTREAM WOOD

Cost-Effective, Low-Impact Large Wood Replenishment: Can It Work for You?
PRESENTER: Jill Cobb, U.S. Forest Service

The Granite Creek Large Wood Replenishment project in northeast Washington State used unique, cost-effective, and low impact methods to reintroduce large woody structure into seven miles of stream federally-designated as critical habitat for threatened bull trout. An interagency team of fish biologist, hydrologist, environmental engineer, and forester identified structure locations, designs, and trees to be used in the field. Goals included maximizing stream hydraulics to create scour, pools, gravel retention, and cover. A two-person team, including a highly skilled sawyer and rigger, using a combination of hand tools and directional felling techniques, installed 380 logs and log complexes in seven weeks along the North and South Forks of Granite Creek, a tributary to Priest Lake, Idaho in the summer of 2012. Construction cost was $200/log—about a quarter of the cost of log placement using heavy equipment. No heavy equipment entered the stream or riparian zone. The team felled all trees from the adjacent riparian zone and used a grip hoist to move logs into position. For a few structures, large equipment assisted by winching from nearby roads. Environmental impact was minimal. The team passively anchored the structures, using ballast trees and bracing against existing trees or boulders. They installed smaller diameter or shorter length woody material upstream of wood complexes to initiate future natural “racking” of additional debris.

Middle McKenzie Side Channel Enhancement Project
PRESENTER: Jared Weybright, McKenzie Watershed Council

The Middle McKenzie Side Channel Enhancement Project added large wood to multiple side channels and floodplain ponds on U.S. Forest Service lands in the McKenzie River watershed in Lane County, Oregon, to enhance aquatic habitat for upper Willamette River spring Chinook salmon, bull trout, and other native aquatic species. The project relied on a combination of live tree pulling and helicopter placement, with the pulled trees serving as anchor pieces for the wood that was helicoptered in. Project personnel used large, mature conifers ranging in size from 30” to 64” diameter at breast height for the pulled trees. In total the projects added over 200 pieces of large wood to six side channels and three ponds, creating approximately 40 log structures over 1.5 miles of river channel and 6 acres of pond habitat. The project included a robust education component, with approximately 50 students participating in various aspects of project monitoring. Project partners have included the Willamette National Forest—McKenzie Ranger District, the McKenzie Watershed Council, McKenzie High School, Thurston High School, Cottage Grove High School, and the University of Oregon Environmental Leadership Program.

Lower Tahuya River Large Woody Debris Restoration Project
PRESENTER: Mendy Harlow, Hood Canal Salmon Enhancement Group

This presentation describes two strategies used to add large woody material to the lower Tahuya River in Mason County, Washington. The river supports a substantial supplemental population of endangered Hood Canal summer chum salmon. The added wood is to increase pools and tailouts so that the extent and quality of spawning habitat is improved. Phase 1 included placing 71 whole trees plus 40 smaller pieces onto the project site by helicopter to create 12 log jams. These trees, from a 1-acre site, were toppled whole, including roots, stems and branches, and included primarily cedar, Douglas-fir and big leaf maple. These were placed without anchors using various strategies. During the past two years most of the jams have accumulated substantial additional wood, resulting in large brushy jams with excellent pools and gravel deposits. The Phase 2 project, constructed further downstream in the intertidal portion of the river, included placing a variety of wood pieces, mostly boom sticks plus small structurally-complex pieces, with an excavator. Nine log jams of wood were anchored by partial burial, pressing into the soft peat river bank without excavation, and excavation where soils were too stiff for direct insertion. One winter has passed since this installation. Pool formation is occurring to some extent, and adult fish congregate at the installation sites. This wood has been stable but has not recruited additional wood to the extent that the whole trees have done. We will share details of the project to describe the unique anchoring techniques, differences between helicopter and excavator work, and lessons we learned from our experiences on the Lower Tahuya River.
Wood Replenishment: A Superhero in the Battle against Climate Change

PRESENTER: Scott R. Nicolai, Yakama Nation

Streams in Washington have been wood-deficient and degraded for generations. In many locations wood removal and channel straightening have disconnected streams from their floodplains. In eastern Washington, upland forests are typically overstocked due to the legacy of forest fire suppression. By using excess coniferous trees as a stream restoration material, projects can occur at low cost using simple techniques. We took this approach in Taneum Creek, a high priority tributary to the Yakima River in Kittitas County, Washington. The project began in 2008, and we have placed 1,250 trees at 50 locations. Phase 1 involved thinning adjacent uplands and moving full-length trees to the stream with manual tools and Washington Conservation Corps labor. Phase 2, with partners Washington Department of Fish and Wildlife and U.S. Fish and Wildlife Service, involved heavy equipment. Forest thinning of a four-acre stand provided 400 full-length trees at extremely low cost. Off site, we obtained trees with rootwads and transported them to the project area. We placed loose logs without anchorage. Tribal habitat biologists designed the project with pencil and paper. We completed project work in fall 2010. Six months later, a 100-year flood occurred, activating floodplains, creating over two miles of side channels (subsequently colonized by beavers), and allowing countless native riparian plants to germinate and grow. These outcomes buffer against the adversity that climate change poses to cold-water fishes and other wildlife in the Taneum watershed. It also demonstrates that low-cost methods and designs can restore upland forests and a watershed simultaneously.

WORKSHOP:
BUYING PLANTS FOR RIPARIAN PROJECTS

Buying Plants — You Get What You Inspect, Not What You Expect

PRESENTER: Susan Buis, Washington State Department of Transportation

And before you can inspect them, you have to specify them. In this session, you will learn how to write plant specifications and inspect plants. Writing clear plant specifications is essential when you don’t have time to cut each live stake or choose each plant from the nursery yourself. Traditional plant specifications that focus on size and appearance don’t guarantee vigorous plants. In restoration, plant health is paramount, as the site conditions are difficult, maintenance is often spotty, and only the healthiest plants survive. You must determine what specs will define a plant that is “fit for purpose.” I will share language describing healthy plants, from leaves to roots, that is not available from sources like the American Standard for Nursery Stock (ASNS ANSI Z60.1 Standard) because if you don’t ask for it in the contract, you can’t insist on it at delivery. Then we will have a plant inspection “lab.” Plant inspection helps ensure that you receive healthy plant material of the size and quantity you asked for. We will go through a five step sampling process that you can use to efficiently and effectively check that your plant specifications were followed. During the lab we will physically examine live stakes, bare root, and container plants to see if they meet our specifications. Bring a hand lens if you have one and come prepared to get your hands dirty.

CLEAR THE WAY:
RESTORING FISH PASSAGE

Contributing Factors in Decisions to Remove Dams

PRESENTER: Denise Hoffert-Hay, American Rivers

Dam removals are becoming increasingly common throughout the Pacific Northwest. Grant funding for removals focuses on restoring fish passage and stream processes. However, the factors that lead to decisions for privately and publicly owned dams to be removed typically also include one or more of the following categories. Safety factors: failing or unsafe structures with potential to cause loss of life or significant property damage. Economic factors: owners can no longer afford the necessary repairs or maintenance of the structure. Relevance: The structure is outdated or no longer serves a useful purpose. Utilizing grant funding to meet the dam owner’s needs and desires for the functions the river can provide after dam removal is often the most complex part of a project’s development. Providing dam owners with options and funding to maintain existing functions is often necessary to gain permission for dam removal projects to move forward. Examples from recently implemented Oregon projects will be used to illustrate how projects have reconciled dam owner needs with available funding resources.
Improving Fish Passage and Habitat Complexity in Pataha Creek, Washington

PRESENTER: Eric Hoverson, Confederated Tribes of the Umatilla Indian Reservation

Degraded and disconnected habitat conditions in the Tucannon River Basin in southeast Washington have contributed to a decline in salmonid abundance, particularly in Pataha Creek. A variety of habitat assessments determined key factors limiting salmonid abundance, which included: fish passage, habitat complexity, water quantity, and water quality. Channel straightening had reduced channel migration and floodplain connectivity, resulting in simplified aquatic habitat, passage issues, entrenchment, bank erosion, and degraded water quality. In 2011, the Confederated Tribes of the Umatilla Indian Reservation Fisheries Habitat Program implemented two projects at Pataha Creek to improve fish habitat conditions. A roughened channel strategy was used to eliminate 1- and 2-foot step-heights at road crossings located at river mile 1 and 10. The project strategically placed 32 whole trees and hundreds of large boulders within the roughened channel to add complexity. Plantings of thousands of trees in adjacent riparian areas helped to stabilize bank conditions and provide stream shade. Landowner input was included as part of the design process. The site-specific applicability of the restoration technique, along with proper implementation and effective maintenance and monitoring, ultimately translated into project success at both project locations. The total cost of the two projects was approximately $400,000. The majority of funding was provided by the Snake River Salmon Recovery Board. Bonneville Power Administration also contributed.

Hemlock Dam Removal — Clearing a Path for Steelhead Recovery in Trout Creek

PRESENTER: Bengt Coffin, U.S. Forest Service

Hemlock Dam was a 26-foot high, 180-foot long concrete structure on Trout Creek on the Gifford Pinchot National Forest in southwest Washington. The creek is a tributary and important steelhead producer in the Wind River watershed. The original purpose of the dam, built by the Civilian Conservation Corps in 1935, was to supply hydropower. The dam obstructed migration of Lower Columbia River steelhead and affected water quality and instream habitats throughout lower Trout Creek. In 2009, the Gifford Pinchot National Forest removed the dam, exhuming and reconstructing the historic channel upstream of the dam that had been buried in silt for nearly 100 years. The project resulted in unobstructed passage for steelhead and other aquatic organisms to upper Trout Creek. It also restored normal sediment routing processes, improved substrates, and changed water temperature dynamics in lower Trout Creek. In 2010, the number of adult steelhead returning to the Wind River watershed, including Trout Creek, nearly doubled, suggesting the system is now densely-seeded. Dam removal was accomplished by a local contractor with heavy equipment who excavated over 50,000 cubic yards of sand and silt from behind the dam to expose the historic channel and to permit reconstruction of a channel through reservoir deposits. The project built stream banks using over 1,000 logs and whole trees. The entire site was then planted and seeded heavily to protect against invasive weed colonization. No hardware or other non-native materials were used in the constructed channel.

Aquatic Habitat Restoration on Washington Department of Natural Resources Managed State Lands

PRESENTER: Allen Lebovitz, Washington Department of Natural Resources

This presentation will explain how State-Owned Aquatic Lands are defined; discuss the process for authorizing projects proposed to occur on Washington Department of Natural Resources-managed state lands; and describe the habitat restoration program of the department’s Aquatic Resources Division.
PANEL:
WATER RIGHTS TRANSACTIONS IN OREGON & WASHINGTON

Integrating Flow Restoration into Salmon Recovery

PANEL MODERATOR: Lisa Pelly, Trout Unlimited Washington Water Project
PANELISTS: Kacy Markowitz, National Fish and Wildlife Foundation
Scott McCaulou, Deschutes River Conservancy
Jeri Timm, Trout Unlimited

This panel will share information on the significant role of flow efforts to salmon recovery and how coordination of land, habitat, and water projects can enhance those efforts. As water supply decreases and demand increases, balancing water needs in- and-out-of-stream has become increasingly important to meet salmon recovery and community requirements. The panel will explain the multiple tools used for managing water for the mutual benefit of irrigators and fish. Options range from simply leasing or buying water rights from individuals, to coordinating full-scale irrigation efficiency upgrades for canal companies to permanently protect the saved water instream and on farm lands. Ensuring adequate aquatic habitat for fish is a fundamental component of salmonid recovery that addresses the priority recommendations in salmon recovery plans across Washington State. The panel will share case studies of successful instream flow projects that have been implemented across the Pacific Northwest and discuss when and how these conservation tools are best used.

FLOODPLAIN RECONNECTION II

GO FISH:
LEVEE REMOVAL PROJECTS

Otter Point: A Case Study in Estuary Restoration in the Columbia River Estuary

PRESENTER: Matt Van Ess, Columbia River Estuary Study Taskforce

Estuarine habitat restoration projects are particularly complex. Project development and design often require in-depth habitat analysis, rigorous engineering, modeling, and community outreach to reach successful implementation. The Otter Point Estuarine Habitat Restoration project near Astoria, Oregon, implemented by Columbia River Estuary Study Taskforce in 2012, included each of these factors. The project was designed specifically to benefit juvenile salmon rearing in the Columbia River Estuary through restoring fish access and realized function for juvenile salmon, and to improve habitat quality to historic wetlands identified and mapped by Lewis and Clark. We designed the restoration to allow full tidal inundation from the Lewis and Clark River to 33.5 acres of wetland habitat that had been cut off by a levee for a century. The project constructed 1,400 feet of new cross levee, excavated historic and new intertidal channels to the interior of the wetland, and breached the old outer levee in several locations. Cross levee construction is subject to the U.S. Army Corps Section 408 process for a major modification to a federal levee system. Implementation at Otter Point sets the stage for increased meaningful large-scale restoration in the Columbia River estuary.
Effects of Levee Removal on Channel Dynamics and Fish Habitat in the Lower Tolt River

PRESENTER: Josh Latterell, King County

In the lowlands of the Puget Sound basin in Washington State, large rivers near cities are being restored in an effort to recover Chinook salmon. Process-based restoration projects in rivers aim to re-establish channel migration, wood recruitment, and flooding to produce a dynamic habitat mosaic. In 2009, King County removed a levee from the mouth of the Tolt River to improve salmon habitat through natural processes. After levee removal, the channel began to migrate, to form bars, backwaters, and side channels, to scour pools, and to capture wood. Over two years, the channel migrated 14 meters, gravel bar area increased by a factor of five, and a 180-meter side channel complex formed. The bankfull channel grew wider and shallower, with a more uneven thalweg. Instream wood storage declined by 34%—against expectations—as pre-existing piles disintegrated, but logs over 16 meters long became twice as abundant. These changes increased the amount of slow-water edge habitat for salmonids by a factor of 2.5. Preliminary findings suggest levee removal has been effective at restoring key habitat-forming processes in the lower Tolt River. These processes, in aggregate, appear to have increased habitat capacity for sub-yearling Chinook salmon. Further work is needed to determine whether these early responses accurately represent future conditions.

The Long Haul: Removing a Haul Road from the Floodplain of the Klickitat River

PRESENTER: Lindsay Cornelius, Columbia Land Trust

Perched on fill and flanked by riprap in the active floodplain of the Klickitat River in Washington State, a two-lane, paved haul road stretches for 15 miles through the heart of a wildlife area otherwise undisturbed by human infrastructure. Constructed in the 1920s as a railroad and later converted to a paved road, the corridor functioned as a through-way for railcars and trucks hauling timber from the upper watershed to the mill at Klickitat. After a major washout during the 1996 flooding events, the privately-owned road ceased to be used commercially but continued its tenure as a recreation spot for locals. Columbia Land Trust purchased the right-of-way in 2007 and began planning for the road’s removal with partner Yakama Nation to restore geomorphic processes and reconnect the river to its historic floodplain. The project area comprises an important reach of a culturally, economically, and ecologically significant river that provides critical spawning, rearing, and migratory habitat for winter and summer steelhead, spring and fall Chinook, and coho salmon. In a decades-long restoration process, we’ve learned many lessons, solved perplexing problems, heard countless opinions, and seen exciting results. Results include: 15 acres of asphalt removed from the floodplain; 1.7 miles of hill-slope re-contoured; 1.8 miles of fill removed; 27 acres of riparian vegetation enhanced; 1 railroad bridge removed; quarter-mile of floodplain channel constructed; and more than 12 large woody debris jams installed. This presentation will outline the planning and implementation process and address the complexities of a project of this scope in a beloved landscape.

Levee Removal and Reconfiguration: Lessons Learned in Yakima County

PRESENTER: Joel Freudenthal, Yakima County

Focusing on reaches of the Yakima River in Washington State, this presentation will discuss the changes that levee construction brings to riverine hydraulic and geomorphic processes and why those changes generally lead to further expansion of levees and levee systems. I will also consider the general effects of levees on current and future conditions in terms of planning for the habitat and flood hazard reduction benefits of levee removal or reconfiguration, and the different means to implement those projects. The presentation will discuss the costs, complexity, and timeline for projects that included levee and levee system removal, breaching, and setback, and the projects’ relationship with reconfiguration of other infrastructure (bridges, wastewater treatment plant) and land use (floodplain wrecking yards, recreation, residential and agriculture) on the Wapato and Gap to Gap reaches of the Yakima River.
THE SALMON RECOVERY MESSAGE

Innovation and Marketing for Salmon Recovery

PRESENTER: Joe Starinchak, U.S. Fish and Wildlife Service
Washington State is very far down the road in implementing a comprehensive approach to salmon restoration, with impressive accomplishments through different legislative initiatives and a statewide infrastructure to support salmon recovery and restoration. Additionally, the existence of the Governor’s Salmon Recovery Office makes it clear that salmon are a very important issue for the state. Given this longstanding, comprehensive, bottom-up approach that gives citizens and communities ownership of salmon recovery process, where would marketing and innovation fit?

Where I believe Washington State can enhance its efforts is through marketing and innovation that specifically targets and engages the private sector. Creating voluntary opportunities for all businesses to join in and participate in salmon recovery efforts could truly elevate salmon recovery. An example would be to encourage state government to define the unique value proposition of salmon recovery, brand this proposition (e.g., “Salmon State of Mind”), and translate this into a variety of different private sector engagement opportunities for corporations and small businesses.

This presentation will focus on a number of ideas for engaging private enterprises in salmon recovery. Examples of voluntary opportunities could include:
• changing business practices, such as energy use and water use, that create impacts and make them salmon friendly
• using applications such as CarrotMob (https://carrotmob.org/) to harness the power of money to drive change, raise awareness, and provide complementary funding
• providing opportunities for corporate or small business employee engagement in salmon recovery efforts through the different regional organizations and lead entities.

Panel: Coordinating the Salmon Recovery Message: Now and in the Future

PANEL MODERATOR: Steve Martin, Snake River Salmon Recovery Board
PANELISTS: Darcy Batura, Lead Entity Advisory Group
Bruce Botka, Washington Department of Fish and Wildlife
Katherine Cheney, NOAA Fisheries
Jennifer Johnson, Governor’s Salmon Recovery Office
Sara Thompson, Columbia River Inter-Tribal Fisheries Commission
Pat Zimmer, Bonneville Power Administration

Members of this panel will share their respective organization’s salmon recovery communications strategies. They will discuss their target audiences and lessons learned in engaging those audiences and the general public. The panel will also give examples of how coordinated messaging has worked in the past and explore future opportunities for collaboration.
INTEGRATING RIVER DELTA SCIENCE & RESTORATION

Introduction

Good restoration is both a science and an art, and good science includes more than a little art. Funding decisions mix the art and science of restoration with politics. The fate of approximately 20 Puget Sound river delta ecosystems depends on this mixture of science, art, and politics. We are at a critical moment. An initial wave of work has initiated restoration of the Nisqually, Skokomish, and Quilcene delta ecosystems, but the restoration of the northern Puget Sound deltas has just begun. Will our methods be sufficient to realize this generational effort? All delta ecosystems are similar in that they are composed of distributaries and tidal channels that dissect a delta floodplain where river discharge interacts with tides creating marsh and swamp. But each delta has unique gradients in sediment delivery, tidal inundation, vertical land motions, vegetation succession, and land-use that influence habitat change and restoration outcomes. Every juvenile salmon in Puget Sound rears and smolts in these ecosystems. Current deltas are a fraction of their historical size and complexity, and restoration actions manipulate these fragments. Each new project modifies how freshwater, tides, sediments and fish move through these systems, and affects their future evolution. Changes in sea level and river discharge are anticipated to further modify delta ecosystems. These four presentations explore our current knowledge of physical and ecological processes in deltas, and propose an approach for working as a community to learn from delta restoration to improve restoration practice.

Using River Delta Science to Improve Restoration Practice

PRESENTER: Paul Cereghino, NOAA Restoration Center

Capital projects in delta ecosystems are largely based on conceptual models. Quantitatively estimating the effects of restoration is challenging ecological research. Even if new knowledge is generated, how do we use that knowledge to improve restoration practices? Restoration monitoring frequently suffers from lack of pre-project monitoring, statistically weak study design, and haphazard funding. These three weaknesses can feed off each other, to the point where restoration science is not useful because it is poorly funded, and restoration science is not funded because it is not seen as useful. Can we work together to design an approach to the use of science in restoration that actively improves practice?

Sediment Budgets, Routing, and Marsh Accretion to Achieve Puget Sound Estuary Restoration


Wild salmon recovery in Puget Sound is considered a national priority that is expected to require landscape-scale restoration of estuarine and associated wetland habitats, the latter of which have sustained 80-90% loss of their historical area. Over the last hundred years, wide-spread hydrological alterations (levees, dams, channelization) and watershed deforestation have significantly modified hydrological and sediment transport processes essential for estuary function. These processes are projected to be further modified by climate change and sea level rise, yielding complex cumulative effects on recovery outcomes in the coming decades. Our field and modeling efforts in large river deltas around Puget Sound demonstrate that high between-site variability in processes like sediment delivery, marsh accretion, channel development, and vegetation succession drive restoration outcomes, necessitating restoration strategies formulated for local conditions. For example, despite the highest sediment load of all Puget Sound Rivers, the potential for marsh accretion in Skagit Delta is diminished by extensive levees that redirect most sediment offshore. In contrast, marsh accretion in Nisqually Delta is limited by sediment trapping in Alder Lake and delivery dependent almost entirely on tidal connectivity. Although sediment input to Skokomish Delta is high, it may still be subsiding rapidly. Modeling the transport of sediment helps to inform actions needed to restore and maintain estuary wetland and channel habitats and functions that are uniquely shaped across the dynamic environmental gradients affecting Puget Sound estuaries.

CONTINUED
Puget Sound Tidal Channel Geometry: Developing a Design and Planning Tool for Tidal Marsh Restoration and Monitoring

PRESENTER: W. Gregory Hood, Skagit River System Cooperative

Engineers, planners, and restoration ecologists require the ability to predict the outcomes of proposed restoration activities in tidal marshes—the more quantitative the prediction, the better. I am developing an empirical model of tidal channel geometry that can ultimately be linked to predictions of juvenile salmon production. Preliminary results of analyzing aerial photos with GIS indicate similar scaling with marsh island area of tidal channel count, total channel surface area, total channel length, and various other geometric parameters for tidal channel networks in over 20 locations in Puget Sound. However, there is variation in scaling relationship elevations (regression intercepts) that is associated with tide range and exposure to wind fetch. Large tide ranges are associated with greater tidal channel development. Additionally, areas with similar tide ranges, but contrasting exposure to storm waves, suggest protected sites have larger tidal channel networks than exposed sites. Other factors likely also contribute to variation in tidal channel geometry, such as marsh elevation. The results provide guidance and standards for tidal marsh restoration design, planning, and monitoring throughout Puget Sound and this is illustrated by comparing a typical conceptual restoration design with model predictions. Model results also demonstrate non-linear cumulative effects on tidal channel network surface area and length, which has significant implications for restoration planning, e.g., restoring one 100-hectare marsh produces more tidal channel area or length than does restoring ten 10-hectare marshes, and “splitting-the-baby” compromises in contested restorations can produce greater than 50% concessions of tidal channel habitat quantity.

Connectivity and Estuary Habitat Use in Juvenile Fish: An Analysis of Tide Gates in the Pacific Northwest

PRESENTER: Correigh Greene, NOAA Fisheries

In this presentation, we focus on the effects installing “fish-friendly” or self-regulating tide gates (SRTs), and examine their effectiveness in two different ways. 1) We used a spatially extensive design to compare three site types: SRTs, flap gates, and unimpeded reference sites. 2) We used a temporally extensive design at three SRT sites to examine seasonal changes in upstream habitat areas and cumulative densities of Chinook salmon relative to downstream values, before and after SRTs installation. In 1) site type appeared to affect a number of physical metrics including connectedness, water elevation, and temperature, but the degree varied. Densities of Chinook salmon and estuary-rearing fish species were much greater at reference sites. For other species, densities did not differ between sites. In 2), the upstream/downstream ratio of Chinook salmon cumulative density at SRTs was higher than at traditional flap gates. The cumulative density ratio at one site increased 6-fold after a passive flap gate was replaced with an SRT. However, cumulative density ratios decreased 7-fold when a passive and manually manipulated side-hinged gate was replaced with a SRT, and this measure at all three SRT sites was an eighth to a tenth that of reference channels. Together, these findings indicate that SRTs vary substantially in performance. For juvenile Chinook, habitat use above SRTs is much less than in natural channels and a little more than above traditional flap gates. For other salmon, SRTs do not appear to strongly inhibit passage or juvenile rearing density.
IS WOOD REALLY GOOD? WOOD PLACEMENT

Facts and Fiction about Wood Placement in Streams

PRESENTER: Phil Roni, NOAA Fisheries

Despite decades of research on the ecology and importance of wood in rivers, the addition of wood still remains controversial. Four major arguments about the appropriateness of wood as a restoration tool continue to be debated: 1) whether wood is a natural part of some river systems, 2) failure and success rates, 3) physical effectiveness, and 4) biological effectiveness. We synthesize existing information to shed light on the facts supporting or refuting these arguments. First, decades of research on river ecology have demonstrated that large woody debris was a part of most major rivers systems. Second, studies have demonstrated that historically, “failure rates” of instream structures exceed 50%, but more recent studies have shown much lower failure rates (<10%). The vast majority of studies on wood placement have reported improvements in physical habitat (e.g., pools, habitat complexity). Those that have not reported such improvements were often because sediment or other processes had not been addressed prior to wood placement. Finally, despite being the most evaluated restoration technique, there is still debate about the biological effectiveness (e.g., fish, macroinvertebrates). Most published evaluations of fish response to wood placement have shown positive responses, and recent meta-analyses have concluded that wood placement leads to increased abundance of many salmonids. However, wood placement may not increase salmonid abundance if watershed-scale issues that have not been addressed.

Effectiveness Monitoring of Nooksack Watershed Instream Habitat Projects

PRESENTERS: Mike Maudlin and Treva Coe, Nooksack Tribe

We shall present the results of structure-scale and project-scale effectiveness monitoring efforts for instream habitat restoration projects implemented in the North and South forks of the Nooksack River in Washington from 2001 through 2010. These projects were developed by a variety of agencies, designed by a variety of consulting firms, and constructed by a variety of contractors over the course of ten years. Project objectives varied somewhat, but all of the South Fork projects included pool formation and increase in woody cover as objectives, while both of the North Fork projects included side-channel creation. The structure-scale effectiveness monitoring in the South Fork focused on quantification of pool formation and woody cover associated with each logjam structure, the two functions considered to be the most limiting to Chinook salmon in the South Fork Nooksack. Where other project objectives, such as thermal refuge creation or sediment reduction, were identified for South Fork projects, these were evaluated on a site-by-site basis. For North Fork projects, monitoring focused on the availability and connectivity of side channels, which provide stable spawning habitats relative to the North Fork mainstem. Channel instability is considered to be the primary factor limiting North Fork Chinook.

Evaluating the Performance of the Edgewater Slough Habitat Restoration Project

PRESENTER: Sue Madsen, Skagit Fisheries Enhancement Group

The Edgewater Park site in the City of Mount Vernon, Washington, is located on the west side of the Skagit River in the floodplain. A Salmon Recovery Funding Board-funded project completed in 2005 constructed a quarter-mile-long side channel slough that was open to the river at both ends, as well as a “blind” backwater channel that was open to the river only at the downstream end. The project planted native trees and shrubs along the slough, backwater, and mainstem Skagit River. In 2012 the Skagit Watershed Council requested that the Skagit Fisheries Enhancement Group and Skagit River System Cooperative evaluate the current performance of the Edgewater off-channel restoration project. Monitoring work involved comparing existing habitat to as-built conditions, evaluating connectivity and hydraulic data (depth and velocity) relative to juvenile salmonid outmigration timing and habitat preferences, and sampling fish use.
Small is Beautiful: Experiences with Flood Fencing and Other Ways to Play with Large Wood

PRESENTERS: Paul DeVries, R2 Resource Consultants, and Bob Aldrich, Snohomish County

We describe the motivation and context for our projects, involving cost-effective bioengineering applications in large dynamic rivers using large wood. The intent of these projects is 1) conserving materials and reducing design and construction costs, 2) reducing risks to humans, property, and infrastructure and lowering the potential for expensive losses by incorporating failure into the design process, and 3) letting the river do the work. We provide examples from Salmon Recovery Funding Board-funded projects in the Skykomish and Stillaguamish River basins in Washington State.

WATERSHED-SCALE RIPARIAN RESTORATION STRATEGIES

Conserving Riparian Habitat AND State Dollars with the Conservation Reserve Enhancement Program (CREP)

PRESENTER: Carol Smith, Washington Conservation Commission

The Conservation Reserve Enhancement Program (CREP) is specifically tailored to address riparian restoration and wetland enhancement along and near salmon streams in Washington State. It's good for the state because state dollars pay for only about 20% of the costs. The bulk of the program is paid by the federal Farm Service Agency. It's good for landowners because they do not have to supply any match and they receive a federal financial bonus for signing up. They also receive rent from the federal government annually for the life of their contract. It's good for the salmon because it has a proven record of success. One of the primary reasons for its success is that the riparian buffers are actively maintained for about five years after planting. This is the only program that supplies longer-term maintenance dollars for this purpose. By controlling weeds and supplying water during drought in the critical establishment phase of the buffer, the plants have high growth and survival rates. This results in a 72% canopy cover in projects that are only 5-10 years old. In the Tucannon River valley, CREP has been one of their tools for restoring two major limiting factors, riparian condition and water temperature. In the last 14 years, about 79% of the riparian area has been restored, summer water temperatures have dropped about 10°F, and juvenile spring Chinook salmon have been documented in a 20 mile reach of the river that was previously too warm for them.

Watershed Scale Riparian Restoration in Mason County, Washington

PRESENTER: Evan Bauder, Mason Conservation District

This presentation will describe two ways the Mason Conservation District in Washington State has been managing watershed-scale riparian restoration programs. One program is within a large river system and includes intensive invasive species treatment. The other program targets many small systems within an entire Water Resource Inventory Area (WRIA), and focuses on the highest value projects based on prioritized list generated by a riparian assessment.

A Watershed Approach to Riparian Restoration in the Willamette River Watershed

PRESENTER: Sarah Dyrdahl, Calapooia, South Santiam, and North Santiam Watershed Councils

Riparian revegetation at the reach scale is an integral component of a whole basin restoration strategy. Restoring ecosystem processes and functions not only addresses recovery of threatened and endangered species, but also aims to instill resiliency in ecosystems so they can adapt to broader landscape and climate changes. Through participation in Oregon’s Willamette Model Watershed Program (Bonneville Environmental Foundation, Meyer Memorial Trust, and Oregon Watershed Enhancement Board), the Calapooia, South Santiam, and North Santiam Watershed Councils have built a riparian revegetation program that aims to restore processes and function in high priority 7th field hydrological units. We began this ten-year program in 2009, and we have partnered to share resources, staff, and funding across a large geographic landscape to perform strategic, prioritized restoration. Yearly monitoring informs our progress in meeting our objectives. In its third year, our riparian revegetation program has grown to cover over 250 acres of riparian restoration at 55 sites. This presentation will discuss our strategy from project prioritization to effectiveness monitoring.
Increasing Stream Complexity and Storing Water — One Beaver at a Time

PRESENTERS: Kent Woodruff, U.S. Forest Service, and William Meyer, Washington Department of Fish and Wildlife

Many rivers and streams are significantly less complex now when compared to historic conditions. As we seek to recover salmon and steelhead, re-introduction of beaver, a keystone species, helps restore stream complexity. Beavers were historically numerous in the watersheds of the Northwest. Fur trapping by the Hudson’s Bay Company and other commercial trappers essentially eliminated beavers from these watersheds. The removal of beavers, coupled with other anthropogenic changes has dramatically altered our watersheds. Our watersheds still bear the signature of this loss. In addition, climate change predictions show that our winter snowpack-dominated river systems will transition to rain-snow, or rain-dominated systems. This trend will result in early spring runoff and lower summer flows. Restoring beavers in the upper reaches of our watersheds is a strategy that will help counter this trend.

Beaver activities store water, which improves flow for fish and water users, increase stream complexity, and create and maintain habitat for salmonids. We have initiated sister projects in the Yakima and Methow Basins in eastern Washington to relocate nuisance beavers to areas within their historic range. It’s not as easy as dropping beavers out of the back of the pickup. Watershed-sized problems require watershed-scale solutions. An important project goal is to work cooperatively with other restoration efforts. In the last five years we have learned much. We will share some of our techniques, our challenges, and our successes.

ROLLIN’ ON THE RIVER: FISH PASSAGE GUIDELINES & RESULTS

Freeing the Rogue River: Four Dams Down

PRESENTER: Scott Wright, River Design Group, Inc.

In a span of just three years, three mainstem dams were removed from the Rogue River, and one tributary dam was partially removed. This historical achievement in southern Oregon opened up over 157 miles of mainstem river habitat to unhindered fish passage and freed the way to hundreds of more miles of tributary habitat. This effort was undertaken in response to the Endangered Species Act to help recover coho salmon and their critical habitat. This presentation will touch on the four dams. 1) Savage Rapids Dam catalyzed these dam removals. Evaluations of fish passage in the 1980s determined that the dam was obstructing fish passage and killing salmon and steelhead. These evaluations started a series of lawsuits that supported dam removal. It was ultimately removed in 2009, with a portion of the structure retained to stabilize river banks. 2) Gold Hill Dam was the first removal, in 2008. This full-spanning dam was no longer used to generate power and served no purpose. 3) The Army Corps’ Elk Creek Dam was partly removed at the same time. This dam spanned more than 300 feet across the valley and had completely blocked fish passage in this important tributary for more than 20 years. 4) Finally, Gold Ray Dam was removed in 2010. It was a defunct hydro-power facility that had not generated power since 1970. It had hindered fish passage due to an inadequate fish ladder.

Reproductive Success of Chinook and Coho Salmon Colonizing Newly Accessible Habitat

PRESENTER: Joe Anderson, Washington Department of Fish and Wildlife

Although dam removal and fish passage projects offer extraordinary potential to conserve threatened Pacific salmon and other migratory fishes, the biological response to these restoration activities is seldom quantitatively evaluated. Following construction of a fish ladder at Landsburg Diversion Dam on the Cedar River, Washington, in fall 2003, we sampled virtually all Chinook and coho salmon bypassing the dam and used DNA-based parentage analysis to measure their reproductive success. For both species, salmon originating from below the dam or elsewhere ("strays") immediately colonized the newly accessible habitat and were present in all years 2003–2009, including a large proportion of hatchery-origin Chinook salmon. Abundance of adult salmon increased at a more rapid rate for coho salmon compared to Chinook salmon, due in part to the higher productivity of this species. For Chinook salmon, hatchery males were consistently but not significantly less productive than naturally spawned males, but the pattern for females varied between years. We also found evidence that dispersal of juvenile coho salmon, especially immigration into a tributary where few adults had spawned, contributed to spatial expansion during colonization. Overall, these results demonstrated that Pacific salmon are capable of rapidly exploiting re-colonization opportunities, particularly at sites containing high quality habitat adjacent to a potential source population.

CONTINUED
**FISH PASSAGE & DAMS III**

**CONTINUED**

**SESSION LEAD:**
Sarah Thirtyacre
Recreation and Conservation Office

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**ACQUISITION, PROTECTION, & STEWARDSHIP III**

**ROOM HOST:**
Kim Sellers
Recreation and Conservation Office

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**PROJECT PLANNING I**

**SESSION LEAD:**
Kelley Jorgensen
Kelley Jorgensen Consulting

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**DEVELOPING ALLIANCES: RECONCILING FARMS & FISH**

**Beyond Restoration: Support for a Sustainable Land Ethic While Ensuring a Viable Local Economy**

**PRESENTER:** Deborah Oaks, Stewardship Partners

Stewardship Partners will highlight a few of their successes and lessons learned in working with private landowners to improve the ecological health of the watershed while supporting small-scale farm and forest production that is both economically viable and environmentally sustainable in the Snoqualmie Valley in Washington State. Several organizations, community groups, agencies, and businesses have teamed up through the years to overcome antagonism between different stakeholders. Through these efforts, a shared desire is emerging to create a unified vision for a sustainable future for the watershed. This year Stewardship Partners is teaming up with Mountains to Sound Greenway Trust to engage the broader public in creating a framework for this vision. Through what is dubbed the “Snoqualmie Strategy,” we hope to further determine what communities in the watershed need to support a healthy land ethic that considers both the local ecology and the local economy. One particular project exemplifies the process that was necessary to get where we are today: The Snoqualmie Restoration Initiative. The Initiative involved

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**Introduction to Water Crossing Design Guidelines 2013**

**PRESENTER:** Donald C. Ponder, Washington Department of Fish and Wildlife

Washington Department of Fish and Wildlife has completed a new document, Water Crossing Design Guidelines 2013, to replace the Design of Road Culverts for Fish Passage, 2003. The 2013 guidelines feature new and expanded chapters on Geomorphic Design, Bridge Design, Tide Gates, Culvert Abandonment, Channel Profile Adjustment, Alternative Analysis, and Tidally Influenced Culverts. In 2009, an evaluation of 77 culverts permitted by WDFW found that a surprising number failed to provide the most basic fish passage, and an even greater number did not comply with simple design criteria that have been widely available since 1994 (Price, Quinn et al. 2010). We hope that the guidance contained in Water Crossing Design Guidelines 2013 relays practical, real-world knowledge and techniques to improve the overall success of water crossing structures.

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**PANEL:**

**CURRENT CHALLENGES IN STEWARDSHIP**

**Current Challenges in Stewardship**

**PANEL MODERATOR:** Laurence Reeves, Capitol Land Trust

**PANELISTS:**
- Heide Anderson, Methow Conservancy
- Erik Kingfisher, Jefferson Land Trust
- Brad Nye, Deschutes Land Trust
- Laurence Reeves, Capitol Land Trust
- Ian Sinks, Columbia Land Trust

This session will be a panel discussion, with audience participation, on the challenges to stewarding conserved properties in perpetuity. Specific emphasis will be on:
- Reviewing Land Trust Alliance and Salmon Recovery Funding Board requirements for land acquisition and stewardship.
- Funding a stewardship program: stewardship endowments and grants for stewardship work.
- Ensuring permanence of conserved properties: managing second and third generation owners, back-up holders, community “ownership” of conserved properties.
- Reporting to funders: demonstrating your stewardship to project partners.
- Putting stewardship systems in place for efficiency and effectiveness: new ideas and approaches.
- Managing public access, public perception, and neighbors.
eight landowners, seven partners, and will involve volunteers from several local organizations and businesses to complete. We believe that the collective experience in the Snoqualmie Watershed can aid other watersheds in reconciling the differences that may be present so they too can find innovative ways to support their land base while also supporting a local economy.

**The Common Ground of Fisher Slough: Long-term Socioeconomic Benefits from a Freshwater Marsh Restoration**

**PRESENTERS:** Polly Hicks, NOAA Restoration Center, and Mark Buckley, ECONorthwest

The Fisher Slough Freshwater Tidal Marsh Restoration project, located in the Skagit River Valley in Washington State, was designed to improve habitat for juvenile Chinook salmon and provide benefits to the Skagit agricultural community by improving drainage, irrigation, and flood protection infrastructure. This was the first estuary restoration project completed on private lands in the Skagit Valley. The Nature Conservancy collaborated with local diking and drainage partners to establish and ensure that the project met its common and equal goals of 1) creating tidal rearing habitat for juvenile Chinook salmon, 2) improving passage for coho and chum spawning access, 3) increasing flood storage to protect agriculture, and 4) creating a diversity of native habitats. At the end of the project, The Nature Conservancy and NOAA worked with ECONorthwest to conduct a socioeconomic study of the project to estimate the non-fish benefits that would be derived from the project. In addition to providing improved passage to 15 miles of stream and restoring 60 acres of freshwater marsh habitat, the $7.7 million project is estimated to provide $9 to $21 million in benefits to the community over the next several decades. The project was also found to have helped create trust between sectors of the agricultural and restoration communities. This presentation will provide an overview of the project, a summary of the socioeconomic study and its results, and a discussion of how these results and the trust generated between parties is being leveraged to create future multiple-benefit projects in the Skagit.

**Manastash Creek Restoration: Working with Farmers to Restore Fish Habitat**

**PRESENTER:** Anna Lael, Kittitas County Conservation District

The Manastash Creek Restoration Project started as a threatened lawsuit pitting environmental interests against the agricultural community over the impacts of irrigation diversions on Mid-Columbia summer steelhead in the lower six miles of Manastash Creek in Washington State. Over the last decade, the project has developed into an example of cooperation, coordination, and partnerships between farmers, environmental interests, and local, state, and federal agencies. Funding from a variety of sources has helped to complete fish screen installations and fish passage and screening facilities at three major points of diversion, sprinkler conversions on 580 acres, and water rights acquisition all in an effort to improve instream flow and achieve safe passage into more than 20 miles of quality habitat in the upper watershed. A new and related effort has blossomed in the past year to plan for improvements to instream habitat conditions—the next logical step after passage is achieved.

**Sustainable Lands Strategy: Fish, Farms, and Floodplains**

**PRESENTER:** Bob Aldrich, Snohomish County

For the Snohomish and Stillaguamish watersheds in Washington State, most of the highest priority areas for salmon recovery projects are located within the river floodplains—in the same geography as most of the Growth Management Act-designated agricultural resource lands. This creates a unique problem for counties, which are tasked with both restoring critical habitat for listed species, while protecting and enhancing Growth Management Act-protected resource lands. This presentation covers the work of the Sustainable Lands Strategy—a cooperative effort between Tribes, restoration interests, and the agricultural community—to develop strategies which result in net gain for both fish and farms.
THE THREE-LEGGED STOOL OF MONITORING: DO WE NEED MORE LEGS?

Salmon Recovery Funding Board-Funded Intensively Monitored Watersheds

PRESENTER: Bill Ehinger, Washington Department of Ecology

Since 2005 Washington’s Salmon Recovery Funding Board has funded three Intensively Monitored Watershed complexes that focus on coho salmon and steelhead: Strait of Juan de Fuca, Hood Canal, and Lower Columbia. The primary purpose of the Intensively Monitored Watershed complexes is to evaluate whether salmon habitat restoration actually produces more fish. However, implementing a sufficient number of restoration projects to produce a basin-wide response in out-migrant production has been challenging due to constraints on funding and timing. Little Anderson Creek in the Hood Canal complex is an exception, where coho smolt production increased five-fold after a partial barrier to fish passage was removed. We’ll also present recent data from the Strait of Juan de Fuca complex suggesting that restoration actions directed toward specific coho life histories could increase their effectiveness.

Project-Scale Effectiveness Monitoring in Washington: Where We Have Been, Where We Are Going

PRESENTER: Jennifer O’Neal, TetraTech

Since its inception, the Washington Salmon Recovery Funding Board has distributed more than $500 million in project funding for restoration efforts. Programmatic evaluation of a subsample of these projects has been on-going since 2004. Results of monitoring are summarized by project category, and sub-sampled projects were randomly selected from each of the following categories: fish passage, instream habitat, riparian planting, livestock exclusion, floodplain enhancement, spawning gravel placement, diversion screening, and habitat protection. Results from the first eight years of monitoring show significant improvements in pool area and depth for instream habitat and floodplain enhancement projects, and reduction in bank erosion for livestock exclusion projects. Juvenile fish densities have shown an increase in fish passage projects and floodplain enhancement projects for some species. Results to date for the program and each project sampled in the program are available through the Habitat Work Schedule. Project scale data have also been used to report on project-specific goals and objectives for regional recovery organizations. Future work in project monitoring will include integration of monitoring data with the project design process so that the data can serve multiple purposes.

Hood Canal Summer Chum Salmon Adaptive Management: Taking a Fresh Look at Progress towards Recovery with Implementation, Escapement, and Harvest Monitoring Data

PRESENTER: Richard Brocksmith, Hood Canal Coordinating Council

The Hood Canal/Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan was written nearly 10 years ago and included interim fish targets and a federal viability analysis, but it did not include locally-adopted fish and habitat goals. This presentation will overview population status and our progress in addressing factors for decline as measured by our regional implementation monitoring program, while estimating negative future impacts of residential and commercial build-out at the reach and watershed scales. These measures will tell us our progress to date, but adaptive management also requires us to establish measurable goals for how much more habitat recovery is enough. We will present an updated population-level viability analysis informed by harvest and escapement monitoring data that evaluates the effects of decadal-scale ocean production regimes and projected variability expected from future climate change. Both should be considered in updating fish and habitat goals. The viability analyses have also been downscaled to subpopulation levels to estimate the remaining gap between current and recovered states for subpopulation performance. Priority projects and programs are being conceptualized to address remaining habitat gaps and will form the basis for establishing watershed specific habitat goals.
Pacific Northwest Aquatic Monitoring Partnership’s Integrated Status and Trends Monitoring Demonstration Project: Fish Monitoring

PRESENTERS: Dan Rawding, Washington Department of Fish and Wildlife, and Jen Bayer, U.S. Geological Survey

Many salmonid populations in the Pacific Northwest are listed under the Endangered Species Act (ESA). Federal, state, and tribal organizations spend millions of dollars annually to assess the status and trends of these fish populations and to evaluate the effectiveness of recovery efforts. Pacific Northwest Aquatic Monitoring Partnership’s Integrated Status and Trends Monitoring Demonstration Project is intended to demonstrate approaches and the utility of integrating the collection of information to address multi-scale fish and habitat status and trends questions. The fish monitoring component of this project has developed a step-wise approach to align and integrate monitoring efforts and data needed to address high priority salmon recovery and management questions. This approach facilitates effective and cost-efficient viable salmon population monitoring through collaborative partnerships and innovative tools to prioritize, assess, manage monitoring efforts, and inform alignment of monitoring efforts across jurisdictions. Local and regional salmon recovery programs, such as the Lower Columbia Salmon Recovery and Fish and Wildlife Plan and Draft Anadromous Salmonid Monitoring Strategy for the Columbia River Basin, can directly benefit from this approach. This presentation will demonstrate value of this integrated viable salmon population fish monitoring approach for ESA-listed salmonid populations in the lower Columbia River developed cooperatively with the Oregon Department of Fish and Wildlife, Washington Department of Fish and Wildlife, and the Lower Columbia Fish Recovery Board. Pacific Northwest Aquatic Monitoring Partnership is currently exploring using this approach to enhance monitoring efforts in other locations in the Pacific Northwest.

Lower Columbia Intensively Monitored Watersheds

PRESENTER: Mara Zimmerman, Washington Department of Fish and Wildlife

The Lower Columbia Intensively Monitored Watersheds study evaluates the response of coho and Chinook salmon and steelhead to habitat restoration actions. The study focuses on three adjacent watersheds (Mill, Abernathy, and Germany creeks) that flow into the Lower Columbia River. The abundance, survival, and distribution of all three species are assessed annually at three life stages; spawner, summer parr (coho and steelhead only), and out-migrant. Habitat characteristics, such as large woody debris counts and pool frequency, are quantified on an annual basis. Water quality characteristics, such as flow and temperature, are measured on a daily basis at stations in each watershed. The study is designed as a before-after control-impact study with Mill Creek as the control watershed and Abernathy and Germany creeks as the treatment watersheds. In Germany Creek, completed restoration projects include a culvert replacement and bank stabilization as well as three years of watershed-scale carcass analog treatments. In Abernathy Creek, completed or in-progress restoration projects include road abandonment and removals, channel restructuring, and large woody debris placements. Additional projects, identified in the Abernathy and Germany Creeks Intensively Monitored Watershed Treatment Plan, are yet to be implemented. Pre-project monitoring began in 2005 with an additional four years of out-migrant data prior to this time. Currently, post-project monitoring includes two years of data from Germany Creek. Restoration in Abernathy Creek has not yet been substantive enough for “post-treatment” monitoring.

WORKSHOP: FUNDRAISING

Sustaining Your Work When the Grants Run Out

PRESENTER: Susan Howlett, Fundraising Consultant

If you’re unsure how you’ll fund your work in years to come, this encouraging session has the answers. Find out who your best prospective supporters are, how to connect with them, and get optimal value from them in this interactive breakout, filled with stories, examples, laughter, and chocolate. You’ll leave with simple tools for engaging your board in fundraising too, in ways that suit their skill set, their comfort zone, their interests, and their schedules.

Presenter Susan Howlett, author of Getting Funded and Boards on Fire, is known for offering practical solutions that work in any community, in any economy, with any size organization—without spending more money or making more work. And you’ll learn how fundraising is like romance.
WHAT DO WE KNOW NOW:
CURRENT RESEARCH & PLANNING & PUGET SOUND STEELHEAD RECOVERY

Ocean Survival of Salmon Project
PRESENTER: Kurt Fresh, NOAA Fisheries

Since the late 1990s, the Northwest Fisheries Science Center has been studying the physical, biological, and ecological mechanisms that control the early marine survival of juvenile salmonids originating from the Columbia River Basin. The overall purpose of this study is to define the importance of the Columbia River plume and near coastal ocean environments on overall salmonid survival and adult returns and then use this information to help manage salmonids in the Columbia River Basin. We have found that early ocean growth and survival of Columbia River Basin juvenile salmonids are determined by physical processes operating at multiple scales that affect both bottom-up (food web) and top-down processes (predation and competition). Many aspects of the early marine ecology of juvenile salmon, such as ocean distribution, diet, time and size of ocean entry, vary between species, population groups, and life history types. Although we have not fully analyzed all species and population groups within the Basin, results of our work suggest that much of the variability in overall survival from the smolt-to-adult life stage of Columbia River Basin salmonids is a function of ocean conditions. In particular, for a number of species and population groups, the first several months of ocean life is a critical period. Conditions the fish experience during this period can be strongly related to adult returns and overall smolt-to-adult rates, although no single ocean factor or factors accounts for variability in ocean survival for all species and population groups we are studying.

Life-Cycle Modeling of Columbia River Basin Salmonid Populations: Translating Mitigation Actions into Population Viability Metrics
PRESENTER: Rich Zabel, NOAA Fisheries

Salmon populations suffer from anthropogenic impacts throughout their life history. Accordingly, recovery plans for threatened and endangered populations typically involve mitigation actions in several life stages. This presents the challenge of assessing how multiple mitigation actions will integrate into cumulative benefits for a population. Incorporating a suite of predicted survival improvements into life-cycle models is a useful approach for translating these improvements into changes in population viability metrics, such as probability of extinction or long-term abundance. We developed stage-based life-cycle models of salmon and steelhead populations throughout the interior Columbia River basin. We included climate effects in freshwater rearing and in early ocean survival, and density dependent recruitment of juveniles. We used the models to predict how mitigation actions in freshwater rearing habitats and in the estuary, and improvements in the hydropower system, will enhance population viability. A great challenge in this type of modeling is the need to translate results from field experiments into parameters in life-cycle models, and we discuss our experiences with this issue. We also address the question of how future climate change scenarios will influence the efficacy of mitigation actions and how populations will respond differentially to climate change. Finally, because life-cycle models are only as strong as the data that support them, we discuss the need to link modeling and monitoring efforts.

The Salish Sea Marine Survival Project
PRESENTER: Michael Schmidt, Long Live the Kings

Working with a multi-disciplinary group of scientists from over 20 federal and state agencies, tribes, and academia, with managers, and with funders from the public and private sectors, Long Live the Kings and the Pacific Salmon Foundation are facilitating the development of a joint United States and Canada research program, utilizing intellectual and capital resources from both countries to evaluate the causes of weak juvenile salmon survival in the Salish Sea marine environment. Through the development of a comprehensive, ecosystem-based research framework; coordinated, standardized data collection; and improved information sharing, the Salish Sea Marine Survival Project will help managers better understand the relationship between juvenile salmon and the marine environment. In November 2012, we held a workshop with 90 participants to receive feedback from the broader scientific community regarding the critical elements of a U.S.-Canada Salish Sea marine survival research program. A second workshop to identify potential ecosystem indicators for adult return forecasting followed, focusing on one management implication. The results and are available at: http://www.ltk.org/SSMSWorkshop. Scientists are using the workshop results to build upon the Pacific Salmon Foundation’s proposal to restore Strait of Georgia Chinook and coho production (2009) and the Puget Sound marine survival hypotheses and preliminary research recommendations report of the US Salish Sea Marine Survival Technical Team (2012). The near-term result will be a suite of research proposals for the Salish Sea, including a research plan specifically tailored for Puget Sound steelhead.
Steelhead Trout Abundance and Survival Trends in Puget Sound, the Washington Coast, and the Lower Columbia River

PRESENTER: Neala Kendall, Washington Department of Fish and Wildlife

Steelhead trout numbers are falling dramatically in Puget Sound. Returns of adult steelhead to the Sound are now less than 10 percent of historic averages, and most Puget Sound steelhead stocks had fewer spawning fish in 2010 than a decade earlier. To better understand the patterns and put them into context, we seek to confirm the declining steelhead abundance and survival trends (both hatchery and wild fish) in Puget Sound and compare these trends with other neighboring regions, including the Washington coast and lower Columbia River. Here we will present trends on abundance and productivity (including smolt-to-adult returns) for hatchery and wild steelhead populations from all years with available data. Overall, steelhead data are more difficult to collect than for other salmonids and are available over shorter time periods, but the trends we document from a number of populations and hatcheries reveal interesting patterns.

Early Marine Survival of Steelhead Smolts in Puget Sound

PRESENTER: Megan Moore, NOAA Fisheries

Smolt-to-adult survival rates for steelhead populations in Washington State have declined substantially over the last 25 years and remain at or near historic lows. From 2006–2009, we tracked nearly 1,400 steelhead smolts from 9 watersheds within Puget Sound from river mouth to the Pacific Ocean using acoustic telemetry to: 1) estimate early marine survival through Puget Sound, 2) identify common areas of abnormally high mortality along the migration route, and 3) identify factors that may influence survival. Cormack-Jolly-Seber mark-recapture models were used to jointly estimate survival and detection rate at telemetry arrays. Estimated survival rates from river mouths to near the Pacific Ocean ranged from 2.7% (White River hatchery smolts in 2009) to 44.8% (Skokomish River wild smolts in 2006), and averaged 16.8% for all populations. Factors influencing survival included population, migration year, and rearing type (i.e., hatchery or wild), while geographic region, body length, and tag type showed lesser effects. Comparison of survival rates between migration segments implicated central Puget Sound and Admiralty Inlet as potential areas of heightened mortality. Early marine survival rates estimated here are very low considering that steelhead smolts spend only two to three weeks in Puget Sound before entering the Pacific Ocean. Mortality in Puget Sound may be a major driver behind low observed smolt-to-adult survival rates. This study addresses a major gap in steelhead marine life history knowledge and can help inform future Puget Sound steelhead recovery planning efforts.

Aquatic Habitat Restoration on Washington Department of Natural Resources Managed State Lands

PRESENTER: Allen Lebovitz, Washington Department of Natural Resources

This presentation will explain how State-Owned Aquatic Lands are defined; discuss the process for authorizing projects proposed to occur on Washington Department of Natural Resources-managed State Lands; and describe the habitat restoration program of the department’s Aquatic Resources Division.
PANEL PRESENTATION:
MANAGING FOR SALMON RECOVERY IN THE LOWER COLUMBIA RIVER: FISHERIES TO PREDATION

PANELISTS: Sandra Jonker, Washington Department of Fish and Wildlife
Eric Kinne, Washington Department of Fish and Wildlife
Guy Norman, Washington Department of Fish and Wildlife
John North, Oregon Department of Fish and Wildlife
Steve Williams, Oregon Department of Fish and Wildlife

Current conditions for managing for salmon recovery in the lower Columbia River could not be more complex. Endangered Species Act-guided recovery plans have been developed throughout the Columbia River basin to restore important habitat, improve dam passage survival, re-tool hatchery programs to assist wild populations, reduce predation, and close or reshape fisheries to focus on selectively harvesting healthy hatchery fish. These are comprehensive recovery plans that identify and provide an implementation strategy to reduce all sources of mortality throughout the salmon’s life cycle. The recovery efforts are tied directly to a coordinated and collaborative effort involving federal, state, tribal, local government and public interests, and require significant investment by the region. Some of the key recovery actions are driven by federal court orders and federal Biological Opinions regarding hydropower operations, mitigation requirements, and treaty Indian and non-Indian harvest. Columbia River salmon and steelhead harvest is conducted within a co-management structure driven by state, federal, and tribal management agreements and individual state policies that focus on providing commercial and recreation fishing opportunities consistent with conservation responsibilities.

This panel will provide an update on Columbia River fishery management policies recently put in place by the Oregon and Washington Fish and Wildlife Commissions, efforts by both states to test alternative fishing gear aimed to harvest more hatchery fish with reduced mortality of wild salmon, and the status and challenges that come with managing predation from Caspian terns, double-crested cormorants, and sea lions.

HOW DO YOU SOLVE A PROBLEM LIKE...INVASIVE SPECIES?

Invasive Species Prevention Measures

PRESENTER: Wendy Brown, Washington Invasive Species Council

This presentation will discuss the wide range of invasive species present in Washington, as well as threats outside our state, that pose the biggest risk to salmon recovery. I will speak about invasive species pathway management and the work of the Washington Invasive Species Council in this regard. In particular, I will highlight field protocols developed by the council to reduce the introduction and spread of invasive species during construction and restoration work.

Non-Native Species of the Pacific Northwest: An Overlooked Risk to Salmon?

PRESENTER: Beth Sanderson, NOAA Fisheries

Non-native species are recognized as one of the major threats to global diversity and have been cited as a cause in the decline of 42% of the species listed under the ESA. We identify and categorize all documented introduced species in the Pacific Northwest, including fish, invertebrates, birds, plants, amphibians and others. The Pacific Northwest is home to more than a thousand aquatic and terrestrial non-native species. During their life cycle, salmonids traverse large geographic areas spanning freshwater, estuary, and ocean habitats where they encounter numerous invasive species. We examine the extent to which introduced species are a potentially important risk to threatened and endangered salmon, ultimately by contributing to higher levels of life-cycle mortality. Non-native recreational game fishes such as smallmouth bass and walleye prey extensively on juvenile salmonids throughout the Columbia River Basin. Moreover, several native taxa such as northern pikeminnow and Caspian terns are also significant predators on salmon, and it is largely because of their negative impacts on ESA-listed salmonids that these species have achieved ‘invader’ status. Strategies used to manage native and non-native invaders are highly inconsistent among species.
Whereas some species are lethally controlled and harassed, other invaders continue to be promoted. We examine the diverse strategies used to deal with invaders in the Pacific Northwest, highlight the challenges of managing their impacts on threatened and endangered salmon, and provide examples of research that can inform management.

DON'T Walk On By! Invasive Plants and Salmon Recovery in Washington's Coastal Rivers

PRESENTER: Jill Silver, 10,000 Years Institute

In 1999, when knotweed suddenly appeared along a pristine reach of the upper Hoh River in Washington State, we began a journey of discovery about the importance of addressing invasive species in watershed-level restoration of the native riparian forests and ecosystem processes critical to maintaining healthy salmon habitat. These introduced plants evolved over thousands of years on the Eurasian continent with livestock, insects, and diseases to keep them in balance. After 100 years without natural controls, they're spreading rapidly in Washington's coastal rivers and wetlands where they establish as monocultures, displacing native plant communities and the ecological services they provide, just as restoration projects are working to restore salmon and their habitats. The most impactful species are now being introduced via restoration project materials and equipment, road construction, resource extraction, recreation, and development activities. Projects on the Hoh, Queets, Clearwater, and Quinault Rivers have grown into a programmatic approach to prevent new invasions and effectively address established populations of plants that fundamentally impair ecosystem processes. This presentation covers lessons learned and provides strategies for success—including prioritizing which invasive species to tackle, obtaining short-term funding for very long-term projects, addressing cross-project contamination issues, building productive partnerships, gaining landowner support, and training and retaining skilled crew.

Panel: Strategies for Developing Successful Long-Term Invasive Species Control Programs

PANEL MODERATOR: Luke Cherney, Hood Canal Coordinating Council
PANELISTS: Steve Burke, King County
Kelley Jorgensen, Salmon Recovery Funding Board Review Panel
Chad Phillips, Washington State Department of Agriculture
Jill Silver, 10,000 Years Institute
Angelica Velasquez, Cowlitz County.

BOOM OR BUST: BIG DAM REMOVAL PROJECTS

Restoration of the Elwha River: Project Update and Some Early Monitoring Results

PRESENTER: Mike McHenry, Lower Elwha Klallam Tribe

Removal of two dams on the Elwha River began during the fall of 2011 and is the largest intentional dam removal attempted to date. The removal of the two Elwha River dams presents a compelling opportunity to restore anadromous fisheries with a watershed that is 85% within the boundaries of Olympic National Park. The project is unprecedented in terms of the amount of sediment that must be managed to achieve positive project outcomes. An estimated 34,000,000 cubic yards of sediment has accumulated behind the dams since their construction in the early twentieth century. Dam removal activities have progressed rapidly and as of this date Elwha Dam has been completely removed and Glines Canyon Dam is projected to be removed by the fall of 2013. An estimated 6,000,000 cubic yards of sediment has evacuated to former dam sites. In this presentation we will provide an overview of the project history, updates on dam removal activities, and efforts to manage sediments. We will discuss the fate of sediment as it is routed through different habitats and sediment impacts on freshwater and marine biota. The presentation will also provide updates on salmon re-colonization efforts, both natural and human-assisted, and discuss long-term monitoring of those populations. Finally we will provide an update on revegetation activities in the newly de-watered reservoirs.

This project includes multiple complex elements with many unknowns and we will attempt to provide an overview of what has been learned to date. There will no doubt be many more surprises and lessons learned in the next few years.
Condit Hydroelectric Project Decommissioning

PRESENTERS: Todd Olson, PacifiCorp Energy, and Larry Moran, JR Merit

The Condit Dam and other components of the Condit Hydroelectric Project were built during 1912-1913 on the White Salmon River in south central Washington State. The project was built to supply electricity to the Crown Willamette Paper Company in Camas, Washington, and to meet the growing need for electricity from Washougal, Washington to Portland, Oregon. Following a lengthy process to seek a new federal operating license that ultimately resulted in a determination that decommissioning the project was in the best interest of its customers, PacifiCorp joined with 22 other parties in 1999 on an agreement to shut down generation at a future date and remove the dam. In reaching a cost-effective plan for PacifiCorp’s customers, parties weighed the short-term environmental impacts of dam removal against the long-term benefit provided by restoration of a natural river environment. On April 21, 2011, following more than 12 years of studies, permit filings, and stakeholder engagement, PacifiCorp received the final approval for dam decommissioning. On October 26, 2011, a detonation of 700 pounds of explosives caused the breach of Condit Dam. This presentation will provide a brief overview of the Condit Decommissioning Project, summarize the issues leading up to the settlement agreement, and identify permitting challenges once the settlement agreement was reached. The presentation will describe the methods used in Project facility removal. The presentation will finish with a look at the ongoing process of ecological restoration and future management.

Fall Chinook Salmon and Removal of Condit Dam: Mitigation Efforts during the Year of Removal and Update One Year Post-Removal

PRESENTER: Rod Engle, U.S. Fish and Wildlife Service

The breaching of Condit Dam in 2011 and draining of Northwestern Reservoir was expected to temporarily eliminate anadromous spawning in the lower White Salmon River, Washington, by inundating the spawning area with reservoir sediments. The White Salmon Working Group, consisting of the U.S. Fish and Wildlife Service, Yakama Nation, Washington Department of Fish and Wildlife, NOAA-Fisheries, U.S. Forest Service, PacifiCorp, and U.S. Geological Survey-Biological Resources Division, decided in 2008 to translocate returning adult lower Columbia River fall Chinook salmon into upstream areas not impacted by the dam’s deconstruction. Before the dam breaching, we translocated 679 salmon upstream. We observed a total of 191 redds from the 310 female fall Chinook salmon translocated, but 24% occurred where streambed downcutting in the former reservoir likely affected their survival. Overall, the 2011 translocation effort was a success based on pre-removal planning and criteria outlined by the White Salmon Working Group. In 2012, one year post-breaching, we recorded high redd counts: 194 lower Columbia River fall Chinook salmon redds and 257 bright fall Chinook salmon redds. We documented redds of both stocks upstream and downstream of the former dam site. Observed carcasses of natural origin (based on presence of an adipose fin) were 118 (93%) of total lower Columbia River fall Chinook salmon and 97 (71%) for bright fall Chinook salmon. Total escapement of LCR fall Chinook salmon in 2012 was 755 adults and 1,061 for bright fall Chinook salmon.

WORKSHOP: WATER RIGHTS

Distilling Water Rights

PRESENTERS: Lisa Pelly, Trout Unlimited Washington Water Project, and Peter Dykstra, The Wilderness Society

The ability to protect water instream is one of the single most important restoration actions to improve stream health and advance salmon recovery. This workshop will explore the fundamentals of Washington water law, the basics of water rights transactions, transactions tools (including: leases, purchases, donations, change in points of diversion, do not divert agreements) and discuss the applications for using a water right as part of a restoration project. We will review administrative and legal documents for working with, changing, and transferring water rights and discuss the process and schedules to ensure successful water right transactions and applications.
Designing Effective Stream and Watershed Restoration: Guidance Based on Three Decades of Restoration Science

PRESENTER: Phil Roni, NOAA Fisheries

Hundreds of millions of dollars are spent annually to restore salmon habitat. Unfortunately, many of these well-intentioned efforts fail to meet their objectives because they ignore watershed processes or do not follow key steps needed to adequately plan, implement, and evaluate restoration. Here we provide an overview of the key factors needed to plan restoration, assess watershed conditions, identify restoration actions, select and prioritize restoration techniques, and evaluate restoration projects. We provide examples of successful methods used to address each of these key steps. Before assessing conditions or identifying restoration opportunities, it is important to have a clearly defined restoration or recovery goal. Assessment of watershed processes and habitat conditions should include assessment of potential and current rates or conditions, and identify the causes of habitat degradation and loss. In selecting appropriate restoration actions, it is important to be aware of whether the actions restore underlying processes or simply improve habitat as well as the longevity and likelihood of success. Several approaches exist for prioritizing restoration actions and these largely depend on goals of restoration. Monitoring of restoration projects needs to be designed well before the projects are implemented and have clear testable hypotheses and rigorous study design. Unfortunately, many monitoring programs fail not because of inadequate design, but because of poor implementation, quality control, and management—all factors that can usually be overcome by diligent project management. The steps and considerations outlined above, if followed, will help assure that restoration actions are effective at restoring watershed processes and habitat.

Project Management for Restoration Projects

PRESENTER: Scott Wright, River Design Group, Inc.

Most successful river restoration projects involve significant integration of science, engineering, and construction that require comprehensive application of project management expertise throughout all stages of the project. This presentation provides an overview of key project management areas to serve as a context for detailed discussions on practical application of procuring (contracting) services for planning, design, and implementation of restoration projects. Specifically, I will discuss project management principles, the importance of contract development and application regardless of the project stage, and provide an explanation of the main types of contracts and the contracting process through project implementation and construction. Restoration projects that have already been implemented will serve as case studies for the discussion. This presentation focuses on practical application of project management techniques and is intended for people who want to learn more about project management and how to successfully manage projects from start to finish.

This presentation will:

- Provide an overview of project management
- Discuss practical application of project procurement concepts (contracts)
- Review the types of contracting to reduce uncertainties (risks) in the planning stages (cost, schedule, performance)
- Discuss contractual relations
- Present the types of contracts and application of contract types
- Provide an overview of bid processes and contractor selection.
Risk Management Considerations for Habitat Restoration Projects

PRESENTER: David Cline, Shannon Wilson

Habitat restoration projects can be complex and subject to a variety of risks. Project owners, sponsors, professional scientists and engineers, and funders are responsible for managing project risks, and they ultimately assume the liabilities of the project. With increasing habitat project size, complexity, and costs, there are corresponding increases in risk, potential liabilities, and financial responsibilities. Habitat restoration projects should seek to characterize, assess, document and manage these escalating project risks.

This presentation will:
• Address questions of what is risk, liability, and negligence? What are some typical types of risk encountered on habitat restoration projects? What are common risk management tools for these situations?
• Review a recent Washington legal case study showing allocation of risk and liability for an engineering negligence case.
• Present a risk management “gaming” scenario showing how different risk management strategies can affect a project bottom line.

This presentation will give a broad brush overview of common project risks encountered in habitat restoration projects and present a few tools and techniques used in managing these risks. The objective of the presentation is to engage the salmon recovery community in a conversation on an important aspect of managing habitat restoration projects.

REGIONAL & STATEWIDE MONITORING EFFORTS

Adaptively Managing Watershed-Scale Stream Habitat Restoration Experiments

PRESENTER: Chris Jordan, NOAA Fisheries

Substantial efforts have been undertaken to benefit ESA-listed salmon and steelhead populations in the Pacific Northwest, but successful demonstrations of population-scale benefits of these actions are rare. While research has shown some improvements in specific phases of salmonid life history due to management actions, much stronger cause-effect relationships must be established to assess the effectiveness of regulatory and restoration actions.

For most populations of ESA-listed salmonids in the Pacific Northwest, current recovery strategies rely heavily on restoring freshwater habitat for spawning and rearing because of the relative ease with which these actions can be conceptualized and implemented, and the intuitive assessment that anthropogenic disturbance must be a primary limiting factor. Recently, the concept of Intensively Monitored Watersheds has arisen, with the basic premise being to concentrate actions such that populations can be treated and assessed, thereby generating sufficiently large effect sizes to be detected and attributed. To generate sufficient effect sizes requires a concentrated effort of habitat restoration projects since individual actions generally do not directly impact population processes. To generate the direct cause-and-effect relationships between habitat actions and fish population response requires a rigorous experimental design that incorporates the space and time scales of the predictor and response variables. An adaptive management framework is necessary for the successful implementation and design of these projects; the framework forces the development of predictive process models, affords the application of interim performance metrics for program modification, and is the basis for application of learning within and between project watersheds.

Digital Elevation and Hydrodynamics Models for Estuary Restoration Performance Monitoring


Evaluation of ecosystem response and restoration performance relies on fundamental baseline data sets and strategic research and monitoring. Capacity to predict restoration outcomes, particularly adaptive management measures that will increase desired benefits, is significantly increased if monitoring metrics are linked to processes (drivers) that affect change (responses). Metrics of estuary restoration and recovery considered critical for salmon recovery in Puget Sound are conceptually formulated but restricted in their utility due to significant information gaps. Across Puget Sound’s complex intertidal ecosystems, basic data for elevations and hydrodynamics that shape wetland and channel habitat do not exist or are often of insufficient quality to confidently predict restoration outcomes. Employing a suite of interdisciplinary tools and approaches, the U.S. Geological Survey with many partners is generating high-resolution digital elevation and habitat cover models using high-resolution light detection and ranging (LiDAR) and bathymetry as...
in the Skokomish Delta. These are linked to new measurements of tidal and storm inundation and the hydrodynamic forces that redistribute sediment and water to shape estuaries. This information will enable restoration managers to quantitatively track ecosystem response to large-scale estuary restoration and to evaluate vulnerabilities associated with climate change, which may be important to factor in to restoration prioritization.

**Relative Land Conversion Rates in Eight Representative Water Resource Inventory Areas (WRIAs) across Washington’s Eight Salmon Recovery Regions**

**PRESENTER:** Ken Pierce, Washington Department of Fish and Wildlife

As part of the 2012 State of the Salmon report we looked at land-use change in one Water Resource Inventory Area in each of the eight salmon recovery regions in Washington. We applied high resolution change detection for the 2009 to 2011 time period to four west side and four east side watersheds. By applying a consistent land-cover change analysis over different parts of the state we were able to compare current land conversion rates. We compared overall rates of development with those inside and outside of urban growth areas and within different perimeters around designated fish-bearing streams. Since this method principally focuses on land conversion due to development, Puget Sound and other areas with expanding population bases will find the most benefit from this information. The key information derived from high resolution change detection is the location of change events that can be compared with other spatial data such as stream locations, critical areas, planning districts, and other areas of concern or planned densification. Over time, these data will provide both a monitoring tool for understanding landscape changes on fish and wildlife populations and as an effectiveness monitoring tool for land-use planning and growth management.

**Pacific Northwest Aquatic Monitoring Partnership’s Monitoring Resources: Overview of Online Tools to Support Design and Documentation**

**PRESENTER:** Jacque Schei, U.S. Geological Survey

Federal, state, tribal, local, and private aquatic monitoring programs in the Pacific Northwest evolved independently in response to different organizational and jurisdictional mandates and needs. To enhance efficiency and effectiveness of their monitoring efforts, the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) provides a forum that supports collaboration and coordination among organizations and across jurisdictions. PNAMP consists of federal, tribal, and state partners, other interested participants, and a coordinating staff. Our work largely focuses on best practices for data management and exchange. Currently, one focus is development of online tools to promote better documentation and support more efficient collaboration and data sharing between monitoring programs. This suite of complementary tools, located at MonitoringResources.org, is designed to assist practitioners with documenting their programs (e.g., protocols, sample designs, metadata records, etc.) from the early design stage through implementation, and help with generating descriptive statistics. Our goal is to provide a place where practitioners can easily document information once and share many times, and where funders and managers can review existing and proposed work and better understand gaps and overlaps in a given spatial extent. These important collaboration and coordination tools are being developed so they are integrated and have plans for future support. We are seeking feedback as we continue into our next phase of development. In addition, these tools are intended to support information sharing across other online systems, so we are also seeking input about what systems and organizations to try to connect with.
Habitat Work Schedule by the Numbers

PRESENTER: Tim Smith, Paladin

In 1998, five species of Pacific salmon were listed under the Endangered Species Act. Headlines warned of the impending collapse of the regional economy. And because of the complex life-history of the species and the magnitude of the problems, many doubted the ability of local, state, tribal, and federal governments to craft a solution. In Washington State, key decision-makers understood that success would be determined by our ability to collaborate and communicate from the watersheds up and across all levels of government. The Washington Department of Fish and Wildlife proposed a new approach to salmon recovery. Instead of reviewing and commenting on plans, scientists would be responsible for communicating their knowledge about salmon life history and limiting factors to the public. Watershed groups would be responsible for identifying and prioritizing local projects consistent with that science and would have community support. A funding board, made up of citizens and agency representatives, would assure that only projects based on sound science and supported by local citizens would be funded. Project sponsors would be required to identify project goals, and performance would be tracked. Finally, projects would be monitored and results reported. Scientists would review the results and issue updates to support a new round of proposed projects. And this new approach would be supported by a data system designed to optimize transparency and accountability. That system, Habitat Work Schedule, has now been in place for five years. A recent case study reveals some surprising statistics about what worked, and what didn't, and what we can learn going forward.

Monitoring Sockeye Salmon Using Imaging Sonar by the Makah Tribe

PRESENTER: Stephanie Martin, Makah Tribe

This presentation will highlight the efforts thus far that the Makah Tribe and NOAA have made utilizing an Adaptive Resolution Imaging Sonar (ARIS-DIDSON) to monitor ESA-listed Lake Ozette sockeye on the Olympic Peninsula, Washington. This project is investigating the transition from traditional monitoring methods, such as a weir and visual beach surveys, to the technological methods of sonar imagery. This transition is expected to produce more efficient and higher quality data, address concerns of weir-related mortality and weir rejection, as well as factors that limit traditional methods, such as high flow and visibility. The investigation will allow the weir and ARIS-DIDSON to operate simultaneously for at least two years to allow correlation between weir counts and imaging sonar. Utilizing imaging sonar for beach spawning surveys is expected to provide more methodical replication to surveys and provide additional information on spawning locations not detectable using current methods.

Panel Discussion with Salmon Recovery Regions

PANEL MODERATOR: Keith Dublanica

PANELISTS:
Miles Batchelder, Coast
Jeff Breckel, Lower Columbia
Alex Conley, Mid-Columbia
Steve Martin, Snake River
James White, Upper Columbia
To Be Determined, Puget Sound
**Phil Anderson, Washington Department of Fish and Wildlife**

Phil Anderson began his employment with the Washington Department of Fish and Wildlife (WDFW) in 1994, serving as a Special Assistant to the Director overseeing intergovernmental issues associated with both fish and wildlife. As part of his responsibilities in this role, he led the Department’s team in implementing Judge Rafeedie’s decision that affirmed the treaty Indian tribes’ right to harvest up to 50% of shellfish and marine fish. In 1999, Phil created and led a policy group that was responsible for representing the Director’s office in intergovernmental forums related to fish, wildlife, and environmental issues. In 2007, Phil was appointed as one of two Deputy Directors. In this capacity, he supervised the Assistant Directors for the Fish, Wildlife, Habitat, and Enforcement Programs and continued his lead role relative to resource policy issues and intergovernmental policy. In December 2008, Phil was named as Interim Director of the Department. He was selected as the permanent Director by the Fish and Wildlife Commission in September 2009. Prior to coming to WDFW Phil owned and operated a charter fishing boat out of Westport and Neah Bay. He was heavily involved in a variety of fishery management entities including the Pacific States Marine Fisheries Commission, co-management activities including the North of Falcon process, the negotiations leading up to the U.S.-Canada Salmon Interception Treaty, and was appointed and served as a council member of the Pacific Fishery Management Council from 1987-1994.

**Kaleen Cottingham, Recreation and Conservation Office**

Governor Chris Gregoire appointed Kaleen Cottingham director of the Washington Recreation and Conservation Office in 2007, building on Kaleen’s distinguished career that has blended law and environmental policy. Kaleen has worked for three governors, serving as natural resources policy advisor, legal counsel, and a member the Pollution Control and Shorelines Hearing Board. She also served the elected Commissioner of Public Lands as both deputy commissioner and supervisor, leading the Washington Department of Natural Resource’s strategic direction and policy initiatives on a wide variety of natural resources issues and managing the daily operations of the department. She has a Bachelor of Science degree in forest resources from the University of Washington and a law degree from the University of Puget Sound law school.

**Bill Iyall, Cowlitz Indian Tribe**

First elected to the Cowlitz Tribal Council in 1993, Bill became Vice Chairman in 2006, and has served as Chairman since 2008. He was appointed by Governor Gary Locke to the Lewis and Clark 200 Year Commemoration Commission, representing Western Washington Tribes at the White House Celebration, July 4, 2002. Bill helped achieve federal recognition of the Cowlitz Tribe and served as the Economic Development Committee Chair, providing leadership in the Tribe’s economic development project on its Initial Reservation. Among his many duties, he is responsible to the General Council for the tribal operations in Natural Resources. Bill has worked at the national and local level on many Cowlitz Tribal issues. He has a Bachelor of Science degree in Civil Engineering from Saint Martin’s University, and has worked as a professional engineer on structural design, project management, personnel management and operations management of public utilities and public works facilities such as roads, bridges, sewers, buildings, parks, and other municipal facilities, also specializing in environmental regulations.

**Lynda Mapes, Seattle Times**

Lynda Mapes is a reporter at the Seattle Times, specializing in covering nature, natural history, and Indian tribes. She is also the author of the book Elwha: A River Reborn, just published by The Mountaineers Books and the Seattle Times. In 1997, while working at the Spokesman Review in Spokane, Washington, she was awarded the Gerald Loeb award for a series on salmon recovery efforts in the Columbia Basin. Lynda has also written two other books, Washington: The Spirit of the Land and Breaking Ground: The Lower Elwha Klallam Tribe and the Unearthing of Tse-whit-zen Village.

**Phil Rockefeller, Northwest Power and Conservation Council**

At the conclusion of the 2011 Legislative Session, Governor Chris Gregoire appointed Phil Rockefeller to the Northwest Power and Conservation Council. Prior to his appointment to the Council Phil served 13 years in the Washington State Legislature where he chaired the Senate Environment, Water & Energy Committee. His previous work includes service in the U.S. Air Force, federal employment with the U.S. House of Representatives, and various federal agencies in the Pacific Northwest, as well as four years as assistant to former Governor John Spellman. Among Phil’s legislative accomplishments are the 2007 bill creating the Puget Sound Partnership legislation enacted in 2011 which transitions Washington State from coal-based power production at the TransAlta facility in Centralia. He is a strong advocate of renewable energy investment, fish and wildlife protection, and development of state and local adaptation strategies to address impacts of climate change. Phil received his undergraduate degree from Yale University and his law degree from Harvard.
William W. Stelle, Jr., NOAA Fisheries

Will Stelle was appointed as the Regional Administrator for the Northwest Region of the National Oceanic and Atmospheric Administration’s National Marine Fisheries Service in 2010. The Northwest Region administers fisheries, endangered species, and marine mammal programs off the coasts of Oregon and Washington, and in the vast inland watershed habitats of Pacific salmon and steelhead in Washington, Oregon and Idaho. Will is also the West Coast Salmon Coordinator. Before joining the Obama Administration, Will was a partner at the law firm of K&L Gates. His practice concentrated on projects involving complex federal and state environmental regulatory challenges, specializing in freshwater and marine issues habitats and endangered species. He served as NOAA Fisheries’ Northwest Regional Administrator from 1994 until 2000, where he managed the listings of salmon and steelhead populations under the Endangered Species Act in Washington, Oregon, Idaho, and California. Before settling in the Northwest, Will held a variety of policy positions dealing with a range of environmental and natural resource programs in Washington, D.C. He served as the Associate Director for Natural Resources with the White House Office on Environmental Policy overseeing federal forestry and natural resource policies. Before that he was Special Assistant to the Secretary of the Interior where he helped develop and implement major changes to western federal land management under the Northwest Forest Plan. Will has a Bachelor of Arts degree from Boston University and law degrees from the University of Washington School of Law and the University of Maine Law School.

Robyn Thorson, U.S. Fish and Wildlife Service

Robyn Thorson is the U.S. Fish and Wildlife Service Regional Director. The region she directs includes the states of Washington, Oregon, and Idaho, plus Hawaii and Pacific Islands (all the way to Guam). This is the largest region in the Fish and Wildlife Service, spanning 5 time zones, the International Date Line, and the Equator. Its issues are as varied as the diverse ecosystems and cultures that make up this huge expanse. The Fish and Wildlife Service addresses wildlife and habitat conservation through several programs, including Migratory Bird Management, National Wildlife Refuges, Endangered Species, Fisheries, and conservation grants, among other programs. Robyn oversees the activities on 64 national wildlife refuges, two dozen hatcheries and more than 400 listed species in the Endangered Species Program. Robyn has been in the Fish and Wildlife Service 28 years. She spent ten years working in Alaska; two in the Southwest; over five years in the Midwest, and two tours of duty at headquarters in Washington DC. She started her Service career in the Pacific Northwest in 1985 in the Portland Regional Office, and four years ago was assigned to come back to what she considers “home.” She earned her law degree at the University of Oregon School of Law.

David Troutt, Salmon Recovery Funding Board

Governor Jay Inslee appointed David to be the new chair of the Salmon Recovery Funding Board in April, 2013. David is one of the citizen members of the Board and its longest serving member. David has served as Natural Resources Director for the Nisqually Indian Tribe since 1987. He heads a diverse department comprised of salmon harvest management, two large salmon hatcheries, shellfish management, data operations, environmental management, wildlife management, legal, administration, and budget development and monitoring. He also serves as chair of the Nisqually River Council and president of the Nisqually River Foundation. David has also served on the Washington Biodiversity Council, the Executive Committee of the Tri-County Response to ESA, the Development Committee of the Shared Strategy for Puget Sound, the Steering Committee for the Hatchery Reform Project, and as a voting member of the Resource Advisory Committee for the Mount Baker-Snoqualmie National Forest. David received his Bachelor of Science from the University of Washington School of Fisheries.
Many thanks to these organizations for making the 2013 Salmon Recovery Conference possible:

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Primary Sponsor: NOAA Fisheries PCSRF

Partnering Sponsor: Northwest Power & Conservation Council

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• Washington Department of Fish and Wildlife
• Oregon Department of Fish and Wildlife
• Oregon Watershed Enhancement Board
• Governor's Salmon Recovery Office
• Lead Entity Advisory Group