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The Southeast Alaska Watershed Symposium

FREE!

November 4th-6th, 2013
Centennial Hall, Juneau

- Informed aquatic resource management
- Effective fish habitat conservation activities

Check it out!

Monday
Nov 4th
5:15-7:00

Poster Session and **Evening Social**
Find out what projects are underway in SE

SOUTHEAST ALASKA FISH HABITAT PARTNERSHIP

Symposium Program

SOUTHEAST ALASKA WATERSHED COALITION
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The Southeast Alaska Watershed Symposium

Symposium Goals

This event will provide fisheries and aquatic resource professionals with an opportunity to share information, tools, and methods which promote fish habitat conservation and support aquatic resource management in southeast Alaska.

It is envisioned that the Southeast Alaska Watershed Symposium will be a catalyst for professionals working in southeast Alaska to share relevant work and recent efforts occurring in watersheds across the region as well as provide an opportunity for participants to network and identify strategic partnerships that will advance common fish habitat conservation and aquatic resource management goals.

This symposium is focused on topics of fish distribution, stream/river habitat, watershed assessment and prioritization methods, relevant geospatial tools and information on emerging research in the region. Additionally, the symposium offers an overview of the Clean Water Act Section 404 program and proposed Southeast Alaska Mitigation Fund. It is our hope that this symposium will provide a baseline level of information sharing and become an annual event for future exploration of these and other important thematic topics.

Session Objectives:

1. Provide participants with an overview and demonstration of current fish distribution and fish habitat inventory activities throughout southeast Alaska.

2. Demonstrate watershed scale assessment and prioritization schemas with applications to support fish habitat conservation and aquatic resource management.

3. Showcase geospatial tools and emerging research with applications to support aquatic resource management in southeast Alaska.

4. Provide participants with an overview of the Clean Water Act Section 404 program in Alaska and the role aquatic resource mitigation can play to support mitigation of development impacts to wetlands and fish habitat.

Co-hosted by the Southeast Alaska Watershed Coalition (SAWC) & the Southeast Alaska Fish Habitat Partnership (SEAKFHP)

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November 4th

11:00-12:30 **Poster Session Set-up**
Lead: Nina Horne, Juneau Watershed Partnership

Attendees are encouraged to bring poster presentations to the symposium. Posters will be on display for the duration of the event and highlighted on the evening of November 4th.

12:30-1:15 **Symposium Registration**

1:15 - 1:30 **Welcoming Comments**

1:30 – 2:00 **Table Introductions, Host Partner Overviews, Agenda Overview, Symposium Goals**

Session 1: Fish Distribution and Habitat Inventory Activities in Southeast Alaska
Lead: Jeff Nichols, ADFG - Sport Fish Division, Freshwater Assessment Group

Every year in southeast Alaska, there are numerous efforts undertaken to identify fish distribution patterns, aquatic habitat use and condition, and the natural and anthropogenic factors contributing to changes in any or all of the above. A diversity of approaches have been used to address these information needs, allowing flexibility in methods and data requirements to answer specific questions, adherence to agency protocols, and comparisons across time and space. Inherently, a wide diversity of approaches can contribute to uncertainty in choosing the 'best' approach.

Session Goal: To provide participants with an overview of the most widely used, and emerging, protocols and data holdings related to identifying fish distribution, aquatic habitat use, and condition in Southeast Alaska. Presentations by practitioners will be followed by facilitated panel discussions and open forum, providing further opportunity to explore how differences in spatial and temporal variability and subsequent management or restoration actions drive selection methods.

2:00-3:00 **Presentations – Fish Distribution, Abundance, Mapping**

1. (2:00 – 2:20): Beyond Stream Class (AHMU): Improving Fish Distribution Maps on the Tongass National Forest - **Emil Tucker, USFS**
2. (2:20 – 2:40): Navigating the Anadromous Waters Catalog: What the AWC Can and Can't Tell Us About Fish Distribution – **Matt Kern and Tess Quinn, ADFG-Habitat Division**
3. (2:40 – 3:00): Brief Backgound on ADFG Surveys to Estimate Relative Abundance, Cath, and Harvest Salmonids in Freshwater Habitats (Steelhead snorkel surveys, SWHS, USFS recreational cabin surveys) and Where to Find this Information – **Roger Harding, ADFG-Sport Fish Division**

3:00-3:20 **Break/Poster Session Set-up**

3:20 – 4:20 **Presentations – Habitat Inventory / Assessment and Application**

1. (3:20 – 3:40): Instream Flow Protection Through Reservations of Water – **Jarrod Sowa, ADFG-Sport Fish Division**
2. (3:40 – 4:00): Reach Based Stream Assessment – Tools and Strategies Used by the Tongass National Forest – **Katherine (K.K.) Prussian, USFS**
3. (4:00 – 4:20): Making Sense of Restoration Activities, Effectiveness Monitoring, and the Response of Fish – **Hal Geiger, St. Hubert Research Group and Jeff Nichols, ADFG-Sport Fish Division**

November 4th

4:20-5:00	**Facilitated Panel Discussion/Open Forum**
5:00-5:15	**Final Points and Wrap-up**
5:15-7:00	**Poster Session and Evening Social**

November 5th

8-8:30 Welcome

8:30-8:45 Table Introductions, Brief Re-Cap of Day 1 and Day 2 Agenda Overview

Session 2: Habitat Inventory and Assessment (Continued) and Watershed Scale Prioritization

Lead: Neil Stichert, USFWS Southeast Alaska Habitat Restoration Program

This session will continue inventory and assessment themes from Day 1 and close the morning with regionally relevant watershed prioritization schemas and decision support tools for fish habitat restoration and preservation needs.

Session Goal: In Southeast Alaska, various regional and watershed-scale prioritization efforts and decision support tools have been developed and used to support management decisions and restoration project site selection. These schemas and tools are used to inform conservation or restoration plans, prioritize funding allocations, and optimize benefits to the resource. This session will provide an overview of existing and emerging activities in the region.

8:45-11:40 Habitat Inventory & Assessment/Watershed Scale Prioritization Presentations

1. (8:45 – 9:05): Forest Service Watershed Condition Framework (big picture assessment of watershed condition); Priority Setting – **Julianne Thompson, USFS**
2. (9:05 – 9:25): Using Aquatic Habitat Survey Information to Guide Restoration Efforts: A Case Study Twelvemile Creek – **Sarah Brandy, USFS**
3. (9:25 – 9:45): Design and Implementation of Large Wood Structures to Restore Hydrological Functions to Twelvemile Creek: A Case Study – **Sean Claffey, USFS**
4. (9:45 – 10:05): Tongass National Forest Watershed Restoration Effectiveness Monitoring Program (WREM) Overview – **Sheila Jacobson, Forest Fish Biologist, Tongass National Forest, USFS**

10:05-10:20 Break

5. (10:20 – 10:40): Fish Passage Assessment in Southeast Alaska – **Gillian O'Doherty, ADFG-Sport Fish Division**
6. (10:40 – 11:00): Fish Passage Inventory and Prioritization in the Haines Borough - **Brad Ryan, Takshanuk Watershed Council, Haines**
7. (11:00 – 11:20):Identifying Restoration Opportunities in the MatSu Valley Through Inventory, Assessment and Prioritization - **Bill Rice, USFWS, Anchorage**
8. (11:20 – 11:40): Using a Community Survey to Integrate Social Priorities with Ecological Needs for Restoring Watersheds - **Scott Harris, Sitka Conservation Society**
9. (11:40-12:00): How do we use collaboration and coordination to increase the collective impact of watershed restoration activities? – **Bob Christensen, SEAWEAD**

12:00-1:00 Lunch & Overview Presentation Spnsored by the Southeast Alaska Fish Habitat Partnership (SEAKFHP) - Debbie Hart, SEAKFHP Coordinator

November 5th

Session 3: Showcase Geospatial Tools and Emerging Research and Monitoring in Southeast Alaska

Lead: Cindy Hartmann Moore, NOAA, NMFS, Alaska Region – Habitat Conservation Division

Session Goal: Progressive geospatial applications, tools, and data repositories are being developed to support fish conservation and aquatic resource management decisions in Southeast Alaska. In addition, new research is emerging from agencies, NGO's, and University partners across the region that provides insights on potential changes in aquatic habitat in the future, describes fish/habitat associations, outlines monitoring schemas, and other contributed topics. This session will provide an overview of these applications and tools as well as includes some of the relevant emerging research taking place in southeast Alaska.

1:00-2:40 Information Tools and Approaches - Presentations

1. (1:00 – 1:20): Southeast Alaska GIS Library: Services, Applications and Geospatial Partnerships for Southeast Alaska – **Kim Homan, University of Alaska Southeast**
2. (1:20 – 1:40): SEAKHYDRO—Unified Representation of Hydrography and Fish Distribution - How it's Been Developed and Applications for Users – **Becci Anderson, USGS Geospatial Liaison and Kim Homan, University of Alaska Southeast**
3. (1:40 – 2:00): NetMap in Southeast Alaska- Tongass: A Community Based Environment Analysis System – **Lee Benda, Earth Systems Institute**
4. (2:00 – 2:20): Salmon and People in Alaska: Toward an Integrated Approach to Salmon Habitat Assessment and Resource Planning– **David Albert, The Nature Conservancy**
5. (2:20 – 2:40): Alaska ShoreZone Data – **Steve Lewis, NMFS, Analytical Team**

2:40-3:00 Break

3:00 – 4:30 Emerging Research - Presentations

1. (3:00 – 3:20): Food Webs and Fish Habitat Quality in Glacially-Influenced Estuaries of Southeast Alaska – **Anne Beaudreau, University of Alaska Fairbanks, Juneau Center**
2. (3:20 – 3:40): Predicting Distributions of Estuarine-Associated Fish and Invertebrates in Southeast Alaska – **Katharine Miller, NOAA NMFS Alaska Fisheries Science Center, Auke Bay Laboratories**
3. (3:40 – 4:00): Climate Change Implications in the Northern Coastal Temperate Rainforest of North America - **Mike Goldstein, USFS**
4. (4:00 – 4:20): Hydroclimatic Vulnerability Index for Pacific Salmon Research and Conservation in Southeast Alaska – **Colin Shanley, The Nature Conservancy**
5. (4:20 – 4:40): Spatiotemporal Analysis of Regional Climate Effects on Stream Temperatures in Southeast Alaska- **Sanjay Pyare, University of Alaska Southeast**
6. (4:40-5:00): Assessing Ecologic Metrics in Second-Growth Riparian Forests of Southeast Alaska – **Adelaide Johnson, USFS-PNW Research Station**

5:00-5:15 Wrap-up

November 6th

8:00-8:30 **Coffee**

8:30-9:00 **Table Introductions, Brief Re-Cap of Day 2 and Day 3 Agenda Overview**

Session 4: Building an Effective Clean Water Act Section 404 Program for Southeast Alaska

Leads: Jessica Kayser, SAWC- In Lieu Fee Program Development and Karen Johnson, The Nature Conservancy, Virginia Aquatic Resources Trust Fund, Mitigation Program Manager

In 1972, Section 404 of the Clean Water Act established a program to regulate the impacts to the waters of the United States. The program works to ensure that unavoidable impacts to aquatic resources are mitigated. In 2008 the United States Army Corps of Engineers and the Environmental Protection Agency issued revised regulations to the Section 404 program. The improved federal regulation seeks to address the significant losses to aquatic resources over the past several decades- nation wide- and improve compensatory mitigation for authorized impacts to wetlands, streams and other waters of the U.S.

In order to ensure the Alaska Section 404 regulatory program is able to effectively mitigate losses to important aquatic resources and fish habitat in Southeast Alaska there is a critical need for aquatic resource scientists, managers, practitioners, policy and decision makers, and developers to come together and support the development of regionally relevant compensatory mitigation policies, tools, guidance and science.

9:00-10:30 **Overview of Section 404 Regulatory Program in Alaska**

9:00-9:30 An overview of the Section 404 program in Alaska and a discussion regarding tools and resources that could be developed and/or are being developed to ensure valuable aquatic resources are being mitigated under the regulatory program in Southeast Alaska. **Randy Vigil and Matthew Brody, US Army Corps of Engineers, Juneau Field Office**

9:30- 10:00 An overview of the State-wide Inter Agency Review Team being developed for Alaska. Including goals, objectives and plans to develop and/or provide guidance on state and regional guidance that work to ensure valuable aquatic resources are mitigated. **Matthew LaCroix, Environmental Protection Agency, Region 10, Anchorage**

10:00-10:30 An update of Alaska Senate Bill 27 "404 Primacy" and the actions being carried out by ADEC and ADNR to evaluate whether or not the agency should seek approval to assume the Section 404 program from the EPA. **Ben White and Andrew Sayers-Fay, Alaska Department of Environmental Conservation, Juneau AK**

10:30-10:45 **Break**

10:45-11:45 Examples of efforts in Washington and Oregon working to ensure effective mitigation of valuable aquatic resources

November 6th

10:45-11:15 The role of the WA Department of Ecology in the development of policies tools, and programs to support effective wetland mitigation in the state. **Kate Thompson, Wetland Banking Lead, Washington State Department of Ecology, WA**

11:15—11:45 The role of the Willamette Partnership in building the policy, tools, and science to support a watershed-based approach to the mitigation of aquatic resources in Oregon. **Nicole Robinson-Maness, Ecosystem Services Project Manager, Willamette Partnership, OR**

11:45-12:15 Joint Panel: Question and Answer

12:15-1:15 Lunch: Sponsored by Southeast Alaska Watershed Coalition (SAWC)

1:15-2:14 How current and proposed In Lieu Fee programs strive to mitigate important aquatic resources in Southeast Alaska

1:15-1:45 How SEAL Trust prioritizes mitigation projects and an overview of WESPAK-se Wetland Assessment Methodology. **Gretchen Kaiser, Southeast Alaska Land Trust, Juneau AK**

1:45-2:15 An update on SAWC's proposed Southeast Alaska Mitigation Fund In Lieu Fee Program, including an overview of how the program will be operated. **Jessica Kayser, Southeast Alaska Watershed Coalition, Haines AK and Karen Johnson, The Nature Conservancy, Virginia Aquatic Resources Trust Fund, Mitigation Program Manager**

2:15-2:30 Break

2:30-3:30 **Workshop: What aquatic resource restoration/enhancement/creation projects qualify for funding under the proposed Mitigation Fund?**
This workshop will teach participants what constitutes a mitigation project under the 2008 federal rule and how to nominate these potential restoration projects to be considered for mitigation dollars under the Southeast Alaska Mitigation Fund.

3:30-4:30 Symposium Assessment and Next Steps

Beyond Stream Class (AHMU): Improving Fish Distribution Maps on the Tongass National Forest

Emil Tucker, Hydrologist, USFS - Tongass National Forest
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The Tongass National Forest uses the Stream Class (aka the Anadromous Habitat Management Unit (AHMU) model) to designate fish habitat. AHMU is a tool that meets FS business needs for stream protection in relation to forest management activities, but its broad brush stroke is an oversimplification of actual fish distribution and doesn't make effective use of current data collection techniques. In our current era of GPS-based sampling, we have the ability to capture and maintain fish (and habitat) sampling locations and outcomes to improve our field planning and to better feed terrain-based predictive models.

A brief bio:
Emil Tucker is a member of the watershed program group on the Tongass National Forest. Emil has been working on measuring and mapping the extent and quality of fish habitat on the Tongass National Forest for more than 17 years. Beginning with a field-going position working on the original Road Condition Survey project to his current position as GIS data steward for the aquatics program Emil has been involved with an assortment of projects evaluating physical and biological aspects of aquatic systems. Emil lives with his family in Petersburg but can be found seasonally measuring streams throughout the region.

Navigating the Anadromous Waters Catalog: What the AWC Can and Can't Tell Us About Fish Distribution

Matt Kern and Tess Quinn, Alaska Department of Fish and Game-Habitat Division
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The Anadromous Waters Catalog (AWC), or "Catalog" specifies waterbodies with documented anadromous fish presence and provides legal protection for those water bodies under Alaska Statute 16.05.871, the "Anadromous Fish Act". Protection of anadromous fish habitat in Alaska precedes statehood, and has undergone several changes since. The Catalog is a useful tool for managers, researchers, and developers looking for baseline information on fish presence including species composition and life stage use to the extent known. Challenges include integrating new mapping and data collection technologies, changing policies, and the immense number of anadromous waterbodies statewide, making it difficult to thoroughly and accurately document all fish habitat in the state. On-the-ground efforts and a collaborative approach are needed to maximize the Catalog's coverage and accuracy. We will be presenting a brief historical background, current efforts being made by ADF&G Division of Habitat, challenges and limitations of the Catalog, and requirements for submitting new streams and other information to the Catalog.

Brief bios:
Matt Kern has worked for ADF&G since 2009, beginning with the Sport Fish Division's: Resource Mapping and Inventory Group, and has worked in the Division of Habitat since 2011. Matt works on a variety of projects including AWC field surveys, Greens Creek and Kensington aquatic bio-monitoring, and permit reviews. Matt enjoys the opportunity to work in southeast Alaskan communities with a wide range of resource managers and developers.

Tess Quinn has worked for Fish and Game since 2009 leading a project to survey fresh water habitats in several Southeast Alaskan communities to update and expand the Anadromous Waters Catalog. Tess's crews have surveyed streams in Juneau, Haines, Sitka, Wrangell and Petersburg, which have resulted in 153 route

corrections and additions to the Catalog through 2013, and another 92 nomination submissions to be included in the 2014 Catalog update. She also assists with biomonitoring projects at Greens Creek and Kensington mines.

Brief Background on ADF&G Surveys to Estimate Relative Abundance, Catch, and Harvest of Salmonids in Freshwater Habitats (Steelhead snorkel surveys, SWHS, USFS recreational cabin surveys) and Where to Find this Information

Roger Harding, Alaska Department of Fish and Game-Sport Fish Division
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This presentation will give an overview of various data sets that the Department of Fish and Game, Sport Fish Division uses to develop and support management strategies for trout, char, and steelhead populations in Southeast Alaska. Information available to resource managers includes: fish counts and estimates from stock assessment projects (i.e., steelhead snorkel surveys); estimates of angler effort, catch, and harvest generated via the ADF&G statewide harvest survey (SWHS); and system specific estimates of angler harvest generated by surveys of USFS recreational cabin users. Much of this data is easily accessible to the public via the internet in the form of published reports but some of it exists on the state intranet where access is limited. This presentation will provide information on how to access more of this information to hopefully better inform partners working to protect and restore fish habitat. Sources of other potentially useful data to partners will also be covered.

A brief bio:
Roger Harding (Department Coordinator for FHP, Alaska Department of Fish & Game): B.S. Humboldt State University; M.S. Fisheries University of Alaska Fairbanks. Roger has worked as a fisheries biologist with ADF&G for 30 years serving as the Trout Research Supervisor for the last 12 years where he focused on research and stock assessment programs for trout, char, and steelhead. Roger has also been the department coordinator for the Fish Habitat Partnerships in Alaska since May 2013 and has been involved with Western Native Trout Initiative since 2006 and the candidate Southeast Alaska FHP for several years. Roger currently serves as a steering committee member on WNTI, SEAKFHP, Southwest Salmon FHP, and the Mat-Su Basin Salmon FHP.

Instream Flow Protection through Reservations of Water

Jarrod Sowa, Alaska Department of Fish and Game – Sport Fish Division
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The Fish and Game Act requires the Alaska Department of Fish and Game (ADF&G), to "...manage, protect, maintain, improve, and extend the fishery resources of the state in the interest of the economy and general well-being of the state. One mechanism ADF&G uses to fulfill its mandate is to reserve water in rivers and lakes for fish and wildlife. An appropriation of water that remains within a river is legally defined under Alaskan law and regulations as a reservation of water. Since 1984 ADF&G has filed reservations of water applications on 66 river systems and 3 lakes in Southeast Alaska. During this time the Alaska Department of Natural Resources (ADNR) has issued certificates of reservation on 11 of these rivers. The ADNR recommends a minimum of five years of continuous streamflow or lake level data to support reservation of water applications; therefore, if there is not sufficient hydrologic data available, ADF&G will install and maintain streamgages to collect the needed data. Since 2004, ADF&G has collected hydrologic data on 15 rivers and lakes in Southeast Alaska to support reservations of water applications. The filing of reservation of water applications in the future is dependent on the continued installation of new streamgages in Southeast streams and rivers.

A brief bio:
Jarrod Sowa received a bachelor's degree in Civil Engineering from Colorado School of Mines 1998. He has worked at the ADF&G for the past 11 years as a fishery and habitat biologist. Jarrod is responsible for installation and maintenance of stream gages throughout the state, as well as preparing, filing and adjudicating reservation of water applications.

Reach Based Stream Assessment – Tools and Strategies Used by the Tongass National Forest

Katherine (K.K.) Prussian, Hydrologist, USFS - Tongass National Forest
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This presentation is a snapshot overview of the tools and strategies used by the Tongass National Forest to assess stream form, function, and condition. While some of these tools have been developed on the Tongass using long term datasets, others were developed at a national level and are used nation-wide. The tools and strategy are supported in the Forest Plan and are documented in Watershed Assessments, Watershed Restoration Plans, NEPA documents, and at various levels of monitoring.

A brief bio:
Katherine (K.K.) Prussian is a Hydrologist for the Forest Service in Sitka, Alaska. Katherine (K.K.) has worked as a hydrologist on Prince of Wales Island and in northern Idaho, was a hydrologist with URS Consulting in Anchorage, and worked with the PNW Research Station out of Juneau. She has a BS in Geology (BS) an MS in Forest Hydrology. Her interests include skiing, hiking, flying, and spending time outdoors with her 2 kids.

Making Sense of Restoration Activities, Effectiveness Monitoring, and the Response of Fish

Hal Geiger, St. Hubert Research Group and Jeff Nichols, ADFG-Sport Fish Division
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Those proposing restoration projects today have much to learn from the successes and failures of those who proposed restoration and enhancement projects in the past. One consistent deficiency of many older (and some recent) projects in Alaska and the Pacific Northwest, unfortunately, has been an attitude that effectiveness monitoring was not necessary because the effectiveness was obvious. We argue that the effectiveness should always be questioned to some degree, and that a science-based approach to restoration requires (1) goals for the project stated in terms of the response of fish or habitat parameters; (2) a sampling plan with components for spatial design, temporal design, response design, and inference design; (3) a plan for data collection, management, and processing; (4) a plan for reporting; and (5) a component for revision and modification. This evidence-based approach to effectiveness is in parallel to a movement towards evidence-based medicine and an evidence-based movement in other technology fields. The benefits are better use of resources, increased effectiveness, and a greater professionalism.

Brief bios:
Hal is a biologist and biostatistician who has lived in Juneau since 1982. He is married to Sigrid Dahlberg, and they have two children, Will and Beth. He has a long-term interest in jazz and blues, as well as traditional archery, scuba diving, and the outdoors. He worked for the Alaska Department of Fish and Game from 1982 until 2006. Fortunately, he now works for the St. Hubert Research Group, in downtown Juneau, where is is allowed to bring his dog, Hunna, to work every day.

Jeff Nichols is a Habitat Biologist with the Alaska Department of Fish and Game, Sport Fish Division. Jeff has lived in Juneau for nearly 20 years, working throughout Southeast Alaska as a wildlife biologist and researcher and over the past 10+ years as a habitat biologist with the ADF&G focusing on salmonid habitat issues, abundance, restoration and evaluation. Jeff has been an active participant in strategic planning efforts of the Southeast Alaska Fish Habitat Partnership and currently co-chairs the Science and Data subcommittee of the Partnership. Jeff currently serves on the steering committee of the Southeast Alaska GIS Library and a panel member of the Habitat and Restoration Technical Committee of the Pacific Salmon Commission. Outside of work, Jeff enjoys many outdoor activities and pursuits with his family and friends.

Forest Service Watershed Condition Framework (big picture assessment of watershed condition); Priority Setting

Julianne Thompson, Hydrologist, Watershed Program Manager, USFS - Tongass National Forest
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The Watershed Condition Framework provides a road map for collaborative watershed restoration. The Tongass National Forest completed comprehensive watershed condition assessments for over 900 6th level HUC watersheds following national Forest Service protocols. Twelve core watershed condition indicators were evaluated and ranked. Cumulative scores were used to establish condition classes in terms of geomorphic, hydrologic and biotic integrity relative to potential natural condition. About seventy watersheds have been impacted by past land management practices and need restoration. Overall condition ratings, along with use and aquatic value criteria, were used to develop a short list of candidate "Priority Watersheds" for restoration planning. Following a review by Forest Staff, District Rangers and key stakeholders, the Forest Supervisor formally established seven Priority Watersheds in 2011 (Harris River, Twelvemile Creek, Staney Creek, Eagle-Luck Creek, Saginaw Creek, Sitkoh River, and Sitkoh Creek). Watershed Restoration Action Plans (WRAPS) were completed to identify essential restoration projects and facilitate an integrated program of work. All essential restoration work has been completed in the Harris River and Twelvemile Creek watersheds. Iris/Shelikof Creek (Kruzof Island) is proposed as a new Priority Watershed.

A brief bio:
I was educated in California and Colorado, and began my Forest Service career in southern Utah. I've been a hydrologist in the Tongass National Forest for over 20 years, working out of Petersburg and Wrangell. I am the Watershed Program Manager for the Tongass, very pleased to work with an outstanding group of soil, water, and fisheries professionals.

Using Aquatic Habitat Survey Information to Guide Restoration Efforts: A Case Study Twelvemile Creek

Sarah Brandy, USFS – Tongass National Forest, Craig, Alaska
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This presentation will review past management activities in the Twelvemile Creek watershed that lead to its classification as a priority watershed for restoration on the Tongass National Forest. Inventory and habitat surveys used to examine the existing conditions of the watershed and the way this information was interpreted and utilized in defining objectives and identifying restoration projects will be discussed. This case study will illustrate the watershed approach taken to prioritize habitat driven restoration projects specific to Twelvemile Creek.

A brief bio:
Brandy is a professional fisheries biologist on the Tongass National Forest for 7 years, including four with the Prince of Wales Fish Watershed Wildlife and Subsistence program. She has been the fish and aquatic resource specialist on a variety of projects on the Tongass including fishpass enhancement projects, road maintenance and aquatic organism passage, timber sales, and watershed restoration projects. She has been the lead fisheries biologist for a total 85.8 miles of stream and 773 acres of lake habitat enhanced/restored between 2009-2013 on Prince of Wales Island. She has provided fisheries support in the development, planning, design, implementation and monitoring in key watershed restoration projects on Prince of Wales Island including Staney and Twelvemile tributary work, Twelvmile mainstem Phase I and II restoration, Harris River, and Luck Lake. She has been the lead on agency coordination, permitting, and consultation for fish and aquatic resources on all Prince of Wales FWWS projects.

Design and Implementation of Large Wood Structures to Restore Hydrological Functions to Twelvemile Creek: A Case Study

Sean Claffey, Hydrologist, USFS – Tongass National Forest, Prince of Wales
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This presentation will concentrate on the restoration that took place on the mainstem of Twelvemile Creek. It will review how the data collected lent itself to establishing restoration objectives and will discuss the elements considered for the design of large wood structures to meet those objectives. The presentation will then jump into the implementation phase including the logistics and the methodology of putting the design on the ground. The second and final phase of this project was recently completed in July, 2013.

A brief bio:
Sean holds the position of Hydrologist at the Craig Ranger District on Prince of Wales Island. Though he is new to the Forest Service, Sean's entire career has been devoted to river and stream restoration with an extensive background in designing, overseeing, and managing implementation of numerous in-stream restoration projects across the western United States. Immediately upon joining the Tongass, he was instrumental in the successful completion of the Twelvemile Creek restoration. To date, his experience includes on-site supervision of 21 restoration projects including 17 miles of river and stream and over 25 acres of wetland and pond habitat.

Tongass National Forest Watershed Restoration Effectiveness Monitoring Program (WREM) Overview

Sheila Jacobson, Forest Fish Biologist, USFS – Tongass National Forest
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Emphasis on stream restoration projects has been increasing in recent years throughout SE Alaska. The increasing number of projects has raised questions regarding the monitoring of these efforts. There is a critical need for informing practitioners on the effectiveness of projects or techniques aimed at restoring aquatic and riparian habitats. The Tongass recently developed a forest-wide Watershed Restoration Effectiveness Monitoring (WREM) program in collaboration with the Pacific Northwest Research Station aimed at detecting trends in biota and channel conditions over time within a strategic sampling panel. Initial stream habitat and riparian condition assessment data and pre- and post-treatment data are collected during project design and project-level monitoring and will be available for long-term comparisons. A suite of physical habitat and biotic metrics will be used to quantify trends and results will be compared to conditions in similar unmanaged (reference) and managed but untreated reaches to evaluate Tongass-wide trends. Metrics were selected through expert guidance and literature review to ensure capture of ecosystem

processes and functions given realistic time frames and limited funds for restoration monitoring.

A brief bio:
Sheila Jacobson is a Fish Biologist with the Forest Service in the Alaska Region on the Tongass National Forest. She has worked in the fisheries field for over 23 years. She holds a B.S. in Fisheries and Wildlife Management with additional graduate level fisheries coursework through UAF-Juneau. She currently serves as the Forest staff assistant for fish habitat planning, protection, restoration, and enhancement within the framework of multiple-use management, providing technical assistance to program personnel.

Fish Passage Assessments in Southeast Alaska

Gillian O'Doherty, Habitat Biologist, Alaska Department Fish and Game-Habitat Division
gillian.odoherty@alaska.gov

Culverted road crossings often delay, impede or block fish movement with the potential to affect fish populations. The Alaska Department of Game's Fish Passage Improvement Program has been inventorying and assessing Southeast Alaskan road crossings and their potential impact on fish passage since 2011. This talk will present preliminary results of that work as well as an outline of future assessments in the region.

A brief bio:
Gillian O'Doherty has been a Habitat Biologist with the ADF&G Fish Passage Program since January 2009. During that time she has overseen inventory/assessment projects in the Matanuska-Susitna Borough, the Elliott, Dalton & Steese Highways, the Copper River Basin and in Southeast Alaska.

Fish Passage Inventory and Prioritization in the Haines Borough

Brad Ryan, Takshanuk Watershed Council, Haines
brad.ryan@takshanuk.org

Small rivers and streams in Southeast Alaska provide the building blocks for strong anadromous fisheries. However the ability of anadromous fish to migrate freely and complete their life cycle in these small systems is often impeded at road crossings where culverts and bridges have been improperly installed. The Takshanuk Watershed Council (TWC), as the stewards of the watersheds surrounding Haines, AK would like to remove all barriers to fish passage. This however is not possible due to the fact that restoration funds are limited. Due to the limitation in funds TWC collaborated with the USFWS to survey fish passage culverts in the Haines Borough and develop a prioritized list of restoration opportunities based on the quantity, type, and quality of habitat that would become available to migrating fish if passage conditions were improved. Of the 37 culverts surveyed 21 were 'red' (insufficient for fish passage) and 7 were 'gray' (marginal or indeterminate for fish passage without further analysis) for a total of 28 crossings potentially impeding fish passage. Upstream habitat assessments have been conducted for all of these crossings and prioritization is ongoing.

A brief bio:
After years as a research scientist for the National Oceanic and Atmospheric Administration Brad sold his house and traveled the world looking for a place to call home. After a year and half on a motorcycle Brad and his wife Jolanta decided Haines had the perfect mix of mountains, rivers, and sea. Brad has always had an interest in nature and still remembers reading Ranger Rick Magazine as a kid. Brad received a B.S. in Biology from the University of Portland in 1994 and Ph. D. in Environmental Science and Resources from Portland State University in 2005. As a research biologist who spent twelve years working in the highly impacted Columbia River Basin Brad relishes the idea of working to preserve and restore the relatively pristine Chilkat, Chilkoot, and Ferebee rivers.

Identifying Restoration Opportunities in the MatSu Valley Through Inventory, Assessment and Prioritization

William J. Rice, P.E., Hydrologist, US Fish and Wildlife Service, MatSu Salmon Habitat Partnership.
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The MatSu Salmon Habitat Partnership is a partnership of over 50 agencies, nonprofits and businesses whose purpose is to help keep salmon runs sustainable and healthy through maintaining fish habitat. The Partnership's strategic action plan identifies performance metrics over a 10 year timeframe for the conservation, protection and restoration of salmon habitat. To reach these goals a robust program of inventories, assessments and prioritizations by many members of the partnership have been implemented in conjunction with actual conservation and restoration projects. This talk will highlight integrated projects associated with the goals of 10% of riparian areas in conservation status, 5% of impacted riparian habitat restored, and opening upstream habitat above human-created barriers. Additionally, this talk will showcase how the past decade of focus on fish passage barriers set the stage for "no new barriers" policy creation within the Matanuska-Susitna Borough and inclusion of fish passage in Federal Emergency Management Agency (FEMA) funding to restore crossings after floods.

A brief bio:
Bill Rice, P.E. and Habitat Restoration Branch Chief, U.S. Fish and Wildlife Service
Bill serves as steering committee member for both the Mat-Su and South West Salmon Habitat Partnerships, having been involved with both Partnerships since inception. He has almost 20 years of experience in fisheries conservation, watershed planning and habitat restoration. He has an M.S. in Watershed Science from Colorado State University and a B.S. in Geotechnical Engineering from the Colorado School of Mines.

Using a Community Survey to Integrate Social Priorities with Ecological Needs for Restoring Watersheds

Scott Harris, Sitka Conservation Society, Sitka, Alaska
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I will present how the Sitka Conservation Society used a community-based, local survey to integrate social priorities with ecological needs for prioritizing watershed restoration areas, and are using these results to focus our capacity to support and develop projects. Involving communities in prioritization efforts and integrating social with ecological criteria have the potential to increase the success of on-the-ground work. Community participation has the potential to increase "ownership" in restoration efforts, provide stewardship and outreach opportunities, minimize controversy, and bring additional resources to the table such as: place-based knowledge, funding support, and workforce capacity. For the areas surrounding Sitka, we utilized three existing and well-vetted watershed-scale ecological assessments to identify the places with the highest restoration needs. Then we gave community members the opportunity to prioritize these places through a survey. With a minimal investment, this tool can be replicated in other communities.

A brief bio:
Scott is the Conservation Science Director for the Sitka Conservation Society. His responsibilities include developing partnerships and adding capacity for watershed restoration projects, as well as restoration effectiveness monitoring and adaptive management. He also develops these all activities as opportunities for community involvement and environmental stewardship.

How do we use Collaboration and Coordination to Increase the Collective Impact of Watershed Restoration Activities in Southeast Alaska?

Bob Christensen, SEAWEAD (501 c-3) & Living Systems Design (LLC), Gustavus, AK 99826
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Inventory and Assessment, Prioritization, Action Planning, Partnerships and Grant Management, Workforce Capacity Development, Implementation, Research and Monitoring, Outreach and Storytelling – There can be many pieces in the watershed restoration puzzle. This session is about reflecting on where various partner groups are at with collaboration and coordination of habitat restoration efforts and to pose the question of what can be done to increase the collective impact of the work being done.

A brief bio:
Bob Christensen has been working as an environmental consultant in Southeast Alaska for 15 years and has worked on a wide variety of projects in collaboration with government agencies, conservation groups and businesses. For the past 2 years Bob has been coordinating the development of an Alaska Conservation Foundation program whose aim is to empower rural communities in Southeast Alaska to become more ecologically, socially and economically sustainable. Habitat restoration is a core element of this new program, especially as it engages Southeast Communities to participate in community-based natural resource management and when the projects can be implemented by the local work force.

The Southeast Alaska Fish Habitat Partnership – Overview and Update on Strategic Action Plan

Deborah Hart, Coordinator, Southeast Alaska Fish Habitat Partnership
coordinator@sealaskafishhabitat.org / www.seakfhp.org 907-723-0258

The Southeast Alaska Fish Habitat Partnership (SEAKFHP), a candidate partnership under the National Fish Habitat Action Plan, works to foster cooperative fish habitat conservation in freshwater, estuarine and marine ecosystems across southeast Alaska. The partnership formed under the belief that many benefits result when multiple partners come together to share resources, align strategic actions, and speak with a united voice about the conservation and value of productive and intact fish habitats at both local and regional scales. Partner expertise and focus is currently on populations of resident species and anadromous salmonids in freshwater systems as well as anadromous and marine species in estuarine and nearshore habitats. Our mission is to foster and facilitate regionally relevant strategies that will conserve and sustain the region's fish habitat, fisheries-based economy, and culture. To achieve this broad mission the partnership is working to develop a strategic action plan. In this presentation we share a general overview of the partnership and introduce our draft strategic action plan.

A brief bio:
Debbie Hart is the Coordinator for the Southeast Alaska Fish Habitat Partnership. She comes to this position after a 20-year career with the Alaska Department of Fish and Game where she worked in a variety of capacities mostly focused on commercial fisheries. She has both applied research and fisheries management experience and has a strong interest in the role stakeholders and partnerships play in the development of natural resource policy decisions. Debbie has a M.S. degree in Fisheries from the University of Alaska Fairbanks, a B.S. degree in Oceanography from Humboldt State University and is a fellow of the National Conservation Leadership Institute.

Southeast Alaska GIS Library: Services, Applications and Geospatial Partnerships for Southeast Alaska

Kim Homan, GIS Coordinator, Southeast Alaska GIS Library, University of Alaska Southeast
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The Southeast Alaska GIS Library is a cooperative project sponsored by the Alaska Department of Environmental Conservation, the Alaska Department of Fish and Game, the Alaska Department of Natural Resources, the Alaska Department of Transportation and Public Facilities, the Geographic Information Network of Alaska, The Nature Conservancy of Alaska, the National Marine Fisheries Service of NOAA, the US Forest Service, the US Fish and Wildlife Service, the US Geological Survey and the University of Alaska Southeast. The project operates under the terms of a Memorandum of Understanding.

Our goal is to promote the use of regional geospatial data and applications to further research and improve management of public resources in Southeast Alaska.

In addition, the GIS Library provides a framework for coordinating the acquisition and sharing of spatial data, through services and applications, between the public, researchers, educators, and managers. It also provides a forum for discussing regional data standards, future data needs, and opportunities for collaboration.

A brief bio:
Kim is the Coordinator for the Southeast Alaska Geospatial Library, hosted at the University of Alaska Southeast. With almost 20 years of Geographic Information Systems (GIS) experience, she has worked for federal, tribal, state, county and city governments, as well as a private consultant. Kim is an enthusiastic supporter of data sharing and collaboration. She also plays the role of "Metadata Coach" in Southeast Alaska. Kim is an alumna of Western Washington University's Huxley College of the Environment.

SEAKHYDRO—Unified Representation of Hydrography and Fish Distribution - How it's been Developed and Applications for Users

Becci Anderson, USGS Alaska Region Geospatial Liaison
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The mapping of Alaska's surface waters has recently taken a step forward with the creation of the Alaska Hydrography Technical Working Group and movement toward comprehensive statewide coordination. This talk will give a broad overview of current hydrography mapping in Alaska and the move to utilize AK Hydro (formerly SEAK Hydro) statewide, as well as a demonstation of two methods of accessing the Southeast Region database of AK Hydro, through ArcGIS Desktop and on the web through ArcGIS online. We'll explore the fish habitat attributes of the multi-agency data to show the benefits of the collaborative database.

A brief bio:
Becci Anderson is the USGS Alaska Region Geospatial Liaison and is based in Anchorage. Becci has over ten years of experience working in mapping and geographic information systems with expertise in cartography, data analysis, database management, and program coordination. She holds an MS in Geography from Oregon State University, focused on geographic techniques, biogeography and landscape ecology. Prior to joining the USGS, Becci worked with the US Air Force, Oregon Watershed Enhancement Board, a small environmental consulting company, and provided project management and cartography for a joint United Nations-Oregon State University atlas. Becci is a Certified Geographic Information Systems Professional (GISP), the secretary of the URISA Alaska Chapter, participates on the Planning Committee for

the Alaska Surveying and Mapping Conference and is currently chair of the Alaska Hydrography Technical Working Group (AHTWG).

NetMap in Southeast Alaska - Tongass: A Community Based Environment Analysis System

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NetMap is an advanced environment analysis and decision support system that includes a terrain model (Digital Landscape) where all terrestrial and riverine surfaces are characterized and connected along physically and biologically relevant pathways. Digital Landscapes are coupled to a set of 75 user-friendly analysis tools operating in ESRI ArcMap (10.x) and displayed in online tools designed to support decision making in resource use planning, watershed restoration and conservation. NetMap represents the future in applied watershed science since it addresses resource planning at large spatial scales involving multiple interacting agencies and stakeholders, each with overlapping objectives, questions, and data and analysis needs. 'Community based' refers to NetMap's consistent digital landscapes and analysis tools that are shared among users, promoting increased communication, collaboration and problem solving.

The Tongass National Forest commissioned NetMap across southeast Alaska that utilized 20m DEMs which were merged with SRTM 30m to create seamless coverage. An attributed and routed analytic stream layer was derived from flow accumulation using the composite DEM; 'drainage wings' connect the segmented fluvial network (~100 m) to the terrestrial environment facilitating information transfer across them. Data and analysis tools cover a broad range of topics including fluvial processes, fish habitat, floodplain delineation, slope stability, road impacts, riparian management and climate change. Riparian management planning, particularly within second growth forests, utilize NetMap to evaluate erosion potential, thermal loading, in-stream wood recruitment and aquatic habitats, tools for designing streamside protection and for supporting spatially explicit management. Road analyses include road density (subbasin and stream segment scales), road drainage diversion, road surface erosion and sediment delivery to streams, road stability, roads in floodplains, and cumulative habitat length above all road crossings.

In the Tongass-NetMap, we collaborated with Colorado State University to develop vegetation classification in the near shore environment using multispectral Landsat 8 to support estuary mapping. Estuaries were combined with other watershed attributes including fish habitat density, floodplain area, and basin shape-network geometry driven confluence size and density to develop a prototype watershed ecological classification.

NetMap in southeast Alaska can aid in resource use, watershed restoration and conservation planning. It can obtain data from, or provide data to, other stream layers including the NHD+, thereby value adding and strengthening all systems. The Digital Landscapes analytical capabilities could be enhanced with higher resolution DEMs. NetMap in southeast Alaska, as in other areas in the lower 48 (western US), is accessed via annual Support & Maintenance subscriptions to ensure its long term sustainability.

A brief bio:
Dr. Lee Benda earned a Masters and Ph.D. degree from the University of Washington (Seattle) in 1997 focusing on hillslope and fluvial geomorphology (Dept. of Geological Sciences). Dr. Benda's research has focused on the stochastic sediment supply characteristics of low-order, headwater streams, and their relationship to the sediment transport and storage dynamics of larger river systems (e.g., disturbance

ecology). Other research interests and publications include the role of tributary confluences in structuring aquatic habitats at the scale of watersheds and the dynamics of wood recruitment in streams (wood budgeting). In 1997, Lee cofounded Earth Systems Institute, a not for profit organization, with the mission of expanding access to scientific information and tools to users outside of academia. Since 2007, Lee has been involved with the creation of NetMap, a community based system of tools and digital landscapes (www.netmaptools.org). The goal of NetMap is to provide consistent analytic stream layers and digital landscapes, coupled to analysis tools, across the western United States. Partnering organizations include US Forest Service, BLM, EPA, and conservation NGOs.

Salmon and People in Alaska: Toward an Integrated Approach to Salmon Habitat Assessment and Resource Planning

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Wild salmon populations have declined throughout much of North America, yet remain widespread and abundant in Alaska, and continue to support local economies, cultures, and ecological systems. Nonetheless, as Alaska continues to develop natural resources, better information and tools may be needed to plan for growth while also maintaining the productivity and diversity of wild salmon for current and future generations. In May 2013, we convened a workshop of salmon biologists, land managers and land owners to discuss strengths and weaknesses of existing salmon conservation systems in Alaska, as well as information tools and needs to support decision-making. Participants expressed strong support for continued investment in field surveys to expand the Anadromous Waters Catalog, modernization of information and permitting systems, and better incorporation of watershed context into salmon habitat decision-making. Here, we propose a conceptual framework for integration of information on salmon habitat, as well as economic and social values associated with salmon production, to support planning for economic and other development while maintaining long-term health of Alaska's salmon resources.

A brief bio
Dave Albert is Director of Conservation Science for The Nature Conservancy in Alaska. He received his graduate degree in Wildlife Management from the University of Alaska Fairbanks. For the past 18 years he has been working with local organizations and developing GIS applications to improve conservation and management of forests, fisheries and wildlife habitat in Alaska.

Alaska ShoreZone Data

Steve Lewis (Presenter), NOAA National Marine Fisheries Service, steve.lewis@noaa.gov;
Mandy Lindeberg, NOAA Fisheries, Alaska Fisheries Science Center, Auke Bay Laboratories, mandy.lindeberg@noaa.gov; and
Cindy Hartmann Moore, NOAA National Marine Fisheries Service, cindy.hartmann@noaa.gov

ShoreZone is a coastal marine habitat mapping system, in which spatially referenced aerial imagery is collected specifically for classification. The resulting dataset includes imagery with mapped geomorphic and biological attributes in a searchable geospatial dataset. The imagery provides a useful baseline and visual reference. The mapped features include: shoreline morphology, substrates, and biotic resources such as eelgrass, canopy kelps, salt marshes and other habitat descriptors. There are many applications for this data including: oil spill contingency planning, habitat research, and coastal resource evaluations.

Approximately 104,200 km of ShoreZone imagery exists for the Pacific Northwest coastline including the entire shoreline of Oregon (1,795 km), Washington (4,933 km), British Columbia (37,619 km), and

approximately 60,800 km of the Alaskan coastline (~80%). The Alaska ShoreZone imaging and mapping project is on-going with 75% of the coastal imagery mapped or with mapping in progress and ~20% (~15,000 km) of the coastline remaining to be imaged. The Alaska imagery and mapping data can be viewed online at http://alaskafisheries.noaa.gov/shorezone/. Various on-line ShoreZone data and access tools will be demonstrated. The Alaska ShoreZone program is built on a foundation of multiple funding and contributing partners, including state and federal governmental agencies, nonprofit organizations, and private industry, as well as resource managers, scientists, and spatial data specialists. The program goal is to have all of the Alaskan shoreline imaged and mapped using the ShoreZone protocol and to make this data web accessible.

A brief bio:
Steve Lewis is with NOAA Fisheries, Alaska Region. His position is GIS Coordinator, Analyst and Data Manager. He has been with NOAA Fisheries since 1998. Steve works with Habitat Conservation Division on the ShoreZone and EFH programs, Sustainable Fisheries and Protected Resources on Steller Sea Lion analyses, and is the data architect on the Catch-In-Areas database.

Food Webs and Fish Habitat Quality in Glacially-influenced Estuaries of Southeast Alaska

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In Southeast Alaska, climate-driven changes in the delivery of freshwater and nutrients to the coast could affect the habitat quality of estuaries and their suitability as foraging areas for anadromous and marine fishes. Due to low temperatures and high turbidity, proglacial streams are generally less productive than clearwater streams. Lower productivity in the stream may translate into less organic matter of freshwater origin (e.g., aquatic insects and zooplankton) delivered to the estuary. In this talk, I will discuss the goals and preliminary findings of a new project that aims to: (1) characterize the structure of fish and invertebrate communities in glacially-influenced estuaries along Lynn Canal, and (2) determine the relative importance of organic matter (energy and nutrients) delivered from adjacent terrestrial and freshwater systems to estuary fishes. We will identify and enumerate fishes and invertebrates to characterize community structure at three estuaries adjacent to watersheds with different degrees of glacial coverage. Gut contents and stable isotopes will be used to evaluate the contribution of terrestrial, freshwater, and marine sources of organic matter to diets of estuarine species. This project contributes to a collaborative research initiative supported by the Alaska EPSCoR program to examine climate-driven changes in biological, physical, and socioeconomic attributes of Southeast Alaska's icefield-to-estuary ecosystems. I will outline the broad goals of this program and highlight opportunities for collaboration.

A brief bio:
Anne Beaudreau is an Assistant Professor at the University of Alaska Fairbanks Fisheries Center in Juneau. Her research focuses on the ecology of marine and anadromous fishes and the human dimensions of fisheries in the northeast Pacific. She received a Ph.D. in fisheries from the University of Washington and has been a Southeast Alaska resident for two years.

Predicting Distributions of Estuarine-Associated Fish and Invertebrates in Southeast Alaska

Katharine Miller, NMFS Alaska Fisheries Science Center
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Estuaries in Southeast Alaska provide habitat for juveniles and adults of several commercial fish and

invertebrate species; however, because of the area's size and challenging environment, very little is known about the spatial structure and distribution of estuarine species in relation to the biotic and abiotic environment. This study uses advanced machine learning algorithms with landscape and seascape-scale environmental variables to develop predictive models of species occurrence and community composition within Southeast Alaskan estuaries. Species data were obtained from trawl and seine sampling in 49 estuaries throughout the study area. Environmental data were compiled and extracted from existing spatial datasets. Individual models for species occurrence were validated using independent data from seine surveys in 88 estuaries. Prediction accuracy for individual species models ranged from 94% to 63%, with 76% of the fish species models and 72% of the invertebrate models having a predictive accuracy of 70% or better. The models elucidated complex species-habitat relationships that can be used to identify habitat protection priorities and to guide future research.

A brief bio:
Katharine Miller, PhD Fisheries Oceanography. Katharine is a research fishery biologist for the National Marine Fisheries Service's Alaska Fishery Science Center in Juneau, Alaska. Her research focuses on species/habitat relationships of estuarine-associated fish and invertebrates. She is very interested in community ecology and how estuarine communities, in particular recover, from anthropogenic and natural stresses. Examples of research in this area include investigating the impact of log transfer facilities on estuarine communities, and modeling the potential spread of the invasive tunicate Didemnum vexillum in relation to environmental factors. She is currently the principal investigator on research to understand factors influencing the condition and survival of juvenile Chinook salmon in the Yukon River estuary.

Climate Change Implications in the Northern Coastal Temperate Rainforest of North America

Michael Goldstein, US Forest Service, Alaska Region, Juneau, Alaska
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We synthesized an expert review of climate change implications for hydroecological and terrestrial ecological systems in the northern coastal temperate rainforest of North America. Our synthesis is based on an analysis of projected temperature, precipitation, and snowfall stratified by eight biogeoclimatic provinces and three vegetation zones. Average projections for three global greenhouse gas emission scenarios for the whole region by the year 2080 suggest mean annual temperature will increase from a current average (1961-1990) of 3.2°C to 6.5 °C (5.7-7.0 °C emission scenario range), mean annual precipitation will increase from 313.4 cm to 368.4 cm (354.8-379.9 cm; 13.2-21.2% increase), and total precipitation as snow will decrease from 119.1 cm to 77.4 cm (71.7-86.6 cm; 27.3-39.8% decrease). These projected changes will likely result in a cascade of ecosystem-level effects including: increased frequency of flooding and rain-on-snow events; an elevated snowline and reduced snowpack; changes in the timing and magnitude of streamflow, freshwater thermal regimes, and riverine nutrient exports; shrinking alpine habitats; altitudinal and latitudinal expansion of lowland and subalpine forest types; a shift in suitable habitat boundaries for vegetation and wildlife communities; adverse effects on species with rare ecological niches or limited dispersibility; and a shift in anadromous salmon distribution and productivity. Our collaborative synthesis of potential impacts highlights the coupling of social and ecological systems that characterize the region as well as a number of major information gaps to help guide assessments of future conditions and adaptive capacity.

A brief bio:
Mike Goldstein serves the Forest Service Alaska Region out of Juneau, AK, working on long-term landscape level planning and monitoring. Mike formerly led the Alaska Region's Terrestrial Ecology Program, was

instrumental in the formation of the Alaska Coastal Rainforest Center at the University of Alaska Southeast, and served as the Center's first director. He assists partners in working with the Forest Service to develop planning, inventory, and monitoring strategies. Mike has a background in environmental toxicology and systems ecology, with a focus on wildlife and fisheries sciences.

Hydroclimatic Vulnerability Index for Pacific Salmon Research and Conservation in Southeast Alaska

Colin Shanley, The Nature Conservancy
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Global climate change may become the most significant challenge to Pacific Salmon conservation and management for southeast Alaska in the 21st Century. Predicted hydrologic change associated with climate change will likely challenge specific stocks ability to adapt to new flow regimes and resulting shifts in spawning and rearing habitats. Current research suggests egg-to-fry survival rates may be one of the most significant freshwater limiting factors in Pacific Salmon's northern range due to more frequent flooding events scouring eggs from stream gravel. We developed a spatially-explicit hydroclimatic vulnerability index to map this hypothesis using a historical gauge station dataset and monthly multiple regression-based discharge models, quantifying the relative change from present to future watershed conditions predicted for the spawning period. The model results show the regions dynamic physiography and climatology interact under future climate scenarios to cause increased stream flows in a relatively predictable pattern at the landscape level. The hydroclimatic vulnerability index was then combined with an index of current salmon habitat and species diversity to develop a research and conservation priority matrix of potentially vulnerable to resilient high-value watersheds. The resulting matrix and observed trends is put forth as a framework to prioritize long-term monitoring plans, mitigation strategies, and finer-scale climate impact and adaptation studies.

A brief bio:
Colin Shanley has been a Conservation Planner and GIS Analyst for the Alaska Chapter of The Nature Conservancy for the past four years in Juneau. Prior to that, he was a Research Associate at the University of Alaska Southeast. He received a Masters in Wildlife Biology through the Resilience and Adaptation Program at UAF. Throughout his time in southeast, he has conducted fieldwork from Prince of Wales Island to Yakutat with an emphasis on landscape modeling and the development of decision-support tools.

Spatiotemporal Analysis of Regional Climate Effects on Stream Temperatures in Southeast Alaska

Sanjay Pyare (presenter) and Eran W. Hood,
Environmental Science & Geography Programs
University of Alaska Southeast, 11120 Glacier Hwy, Juneau AK 99801 sanjay.pyare@uas.alaska.edu

Climate models for northern latitudes in North America predict that the largest air temperature changes will occur in the temperate zone of Southeast Alaska. Streamwater temperatures are expected to change due to atmospheric energy receipt, reduced thermal capacity, and changes in glacial runoff as well as shifts in the proportion of precipitation received as rainfall compared to snow. The cumulative effects of changes in these variables could affect aquatic food webs by altering the thermal conditions of freshwater environments as well as stratification in nearshore estuarine environments. However, across Southeast Alaska, watersheds are highly variable with respect to factors like glacial composition and it's unlikely that patterns will be generalizeable. Unfortunately, the general disarray, inaccessibility, and fragmentation of stream temperature

datasets across the region has to date prohibited retrospective analysis of stream temperatures, let alone long term forecasting. To address this issue, in 2012, we began a "data rescue" effort to compile and produce a historical stream temperature database (n=42 with at least 2 yrs). Relative to the typology of different watersheds, we are currently using these data to evaluate (1) patterns in stream temperature trends and variability; (2) fit with meso-scale retrospective climate models; and (3) modeling approaches to assess future ranges of stream temperature conditions. We'll present preliminary results from these ongoing analyses and discuss connections with hydrographic map data, future research, and regional monitoring and assessment efforts.

A brief bio:
Dr. Sanjay Pyare is a UAS Associate Professor of Geography and Environmental Science. His research interests include digital cartography, ecosystem modeling, biogeography and supporting the needs information of resource managers. He is leading a multi-disciplinary effort to understand climate impacts on ecosystem services of the "icefield to estuary" system of Southeast Alaska. He lives in Juneau, AK with his wife and two children.

Assessing Ecologic Function Metrics in Second-Growth Riparian Forests in Southeast Alaska

Adelaide Johnson (Presenter) and Rick Edwards, USDA Forest Service, PNW Research Station
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Light, invertebrate litterfall, total chlorophyll, and hydrologic retention are ecological function metrics (EFM) influencing input and production of food in stream channels. Understanding variation in these metrics within young-growth riparian forests may be useful in two ways: (1) developing relevant measures of stream food web production and (2) detecting changes resulting from stream restoration efforts aimed at improving stream ecological function. We assessed variability of EFM in thinned young-growth riparian forests of southeast Alaska. For six channels, we assessed differences in light, litterfall, and total chlorophyll. For three of the six channels, we evaluated effects of in-stream wood placements on hydrologic retention by conducting salt tracer tests. Sites containing greater than 60% alder had greater percent photosynthetically active radiation (PAR) reaching the channel (PAR measured under canopy/ambient PAR, $p < 0.005$). Estimated total daily chlorophyll accumulation on tiles, which was not significantly different between sites, averaged 29.96 ug m-1 d-1, overall. Sites with a greater history of disturbance (i.e. landslides, forest harvest operations in channels), had greater alder, more light and periodically, greater chlorophyll levels than other streams lacking disturbance history. Sites with more alder had significantly more invertebrate litterfall by weight. The time elapsed from salt tracer input to peak salt concentration found 100 m downstream was the most informative measure associated with salt tracer tests. We found that in-stream placements of wood did not significantly change the time to maximum salt concentration ($p < 0.75$).

A brief bio:
Adelaide (Di) Johnson has worked as a hydrologist for the PNW Research Station for 20 years. Among other research projects, she has examined water in soils to better understand landslide generation and has observed changes in stream hydrologic retention to assess stream restoration practices. For her dissertation research, she examined plant-water relationships to decipher the role of substrates on facilitating upward advance of alpine timberlines as influenced by climate warming. She recently completed her Ph.D. at Portland State University.

An Overview of the Section 404 Program in Alaska

Randy Vigil and Matthew Brody, US Army Corps of Engineers, Juneau Feild Office

The U.S. Army Corps of Engineers (Corps) has been delegated regulatory authority for the implementation of Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. Section 301 of the Clean Water Act makes it unlawful to discharge fill material into waters of the U.S. without obtaining authorization from the Corps of Engineers. The Environmental Protection Agency's 404(b)(1) guidelines require that unavoidable impacts to waters of the U.S. be mitigated for through Avoidance, Minimization, and Compensation. As part of the Corps' permitting process evaluation is required to determine compliance with other federal laws such as: The Endangered Species Act, Magnuson-Stephens Act, National Historic Preservation Act, National Environmental Policy Act of 1969, and etc. In 2008 the Final Mitigation Rule was codified prescribing how compensatory mitigation shall be implemented. In an effort to achieve consistency in the implementation of mitigation requirements, a statewide Interagency Review Team has been established.

Brief bios:
Randal Vigil is a Project Manager in the South Branch of the Alaska District Regulatory Division. His 17-year Corps career has been entirely with Regulatory in the Juneau Field Office. He has worked in all functional areas of the Corps Regulatory Program; permitting, enforcement and compliance, and mitigation. He has a BA in History from the University of Oregon and attended Thomas Cooley Law School. Randal lives in Juneau. His interests include photography, music, and hunting.

Matthew Brody is a Regulatory Specialist with the U.S. Army Corps of Engineers (Corps) stationed in Juneau, Alaska. As a student employee for the Corps he worked towards a Bachelors of Science in Environmental Science at the University of Alaska Southeast. After graduation he accepted a Department of the Army Internship in Anchorage where he rotated through various branches of the Corps, EPA, and USFWS. Matthew enjoys skiing, playing hockey, and spending time exploring the outdoors of Southeast Alaska.

An Overview of the State-wide Inter Agency Review Team Being Developed for Alaska

Matthew LaCroix, Environmental Protection Agency, Region 10, Anchorage

In 2008, EPA and the Corps jointly adopted new regulations entitled Compensatory Mitigation for Losses of Aquatic Resources; Final Rule("2008 Mitigation Final Rule"). The 2008 Final Mitigation Rule established new standards to promote no net loss of wetlands by improving wetland restoration and protection policies, increasing the effective use of wetland mitigation banks and strengthening the requirements for the use of in-lieu fee ("ILF") mitigation. These new compensatory mitigation standards emphasize best available science, promote innovation and focus on results. The 2008 Mitigation Final Rule follows the recommendations of the National Research Council report entitled Compensating for Wetland Losses Under the Clean Water Act, by establishing equivalent and effective standards for all forms of compensatory mitigation projects under the CWA.

As defined in the 2008 Mitigation Final Rule, Interagency Review Team ("IRT") means an interagency group of federal, tribal, state, and/or local regulatory and resource agency representatives that reviews documentation for, and advises the Corps district engineer on, the establishment and management of mitigation banks and ILF programs. IRT members assist in the development of the mitigation banking or ILF program instruments and provide input to the Corps regarding whether proposed mitigation banks and ILF programs should be approved. The IRT also advises the district engineer in assessing monitoring reports,

recommending remedial or adaptive management measures, approving credit releases, and approving modifications to mitigation bank and ILF instruments. The Alaska District has convened Individual IRTs to review each proposed mitigation bank and ILF mitigation program. The purpose of the Alaskan Statewide IRT (SIRT) is to address compensatory mitigation issues of broad or statewide applicability (e.g., implementation of a watershed approach, credit calculation and the use of functional assessments), in order to provide consistency between the Individual IRTs. The SIRTwill recommend certain processes, guidance, or guidelines, consistent with the 2008 Mitigation Final Rule, to provide clarity and predictability to bank/ILF sponsors, IRT members, and the public.

A brief bio:
Matthew LaCroix is EPA's program lead for mitigation issues in Alaska. He represents EPA on the various Interagency Review Teams (IRTs), including the Statewide IRT. He co-leads the EPA Region 10 (Alaska, Washington, Oregon, & Idaho) Mitigation Team, and represents Region 10 on EPA's national mitigation work group.

An Update of Alaska Senate Bill 27"404" Primacy

Andrew Sayers-Fay and Ben White, Alaska Department of Environmental Conservation, Juneau, AK

In the 1977 amendments to the federal Clean Water Act (CWA or Act), Congress provided a legal mechanism for states to assume the Act's Section 404 dredge and fill permit program, which covers discharges of dredge and fill material into wetlands and other waters of the U.S. With over 174 million acres of wetlands in Alaska, Alaska's stake in administering the Section 404 Program is unlike that of any other state. Approximately 65% of the Nation's wetlands are located in Alaska. Earlier this year, the Alaska legislature passed Senate Bill (SB) 27, which gives the Alaska Department of Environmental Conservation (DEC) and Alaska Department of Natural Resources (DNR)the statutory authority to evaluate and seek assumption of the federal regulatory program for dredge and fill activities in wetlands and other waters of the U.S. under Section 404 of the CWA. This presentation will provide an overview of SB27; the current Section 404 Program; state assumption of the 404 Program, including the application process and components; the benefits and barriers to state assumption; alternatives to state assumption; and future decision points.

Brief bios:
Andrew Sayers-Fay is Deputy Director of the Alaska Department of Environmental Conservation's Division of Water. He has a Ph.D. in environmental chemistry from University of California, Davis from a multidisciplinary program addressing environmental toxicology; transport and fate of contaminants in air, soil, and water; and drinking water and wastewater treatment. Andrew previously worked for six years as an environmental consultant. His water quality areas of expertise include analytical methods, monitoring, permitting, and criteria development.

Ben White is the Environmental Program Manager for the Wetlands Program within the Alaska Department of Environmental Conservation's Division of Water. He has a MS in environmental management, with an emphasis in water resources from Portland State University, and a BS in Fisheries Science from the University of Alaska Fairbanks. Ben previously worked for the last four years as the statewide environmental manager for the Alaska Department of Transportation and Public Facilities. His experience with wetlands involves developing a rapid functional assessment method for the DOT&PF as well as conducting site assessments, and delineations. He was also the permit coordinator for the Department.

The Role of the WA Department of Ecology in the Development of Wetland Mitigation Support Policies, Tools, and Programs

Kate Thompson, Washington State Department of Ecology, Wetland Banking Lead

The complexity of federal, state, and local wetland regulations in the State of Washington has led the Department of Ecology (Ecology), which serves as lead state agency in wetland protection and management, to develop tools and guidance to support effective wetland mitigation. In 1998 the Washington State Legislature created the Wetland Bank Program and directed Ecology to develop a rule for a wetland bank certification program. This presentation will focus on what we have learned during the development of our wetland banking program and highlight key elements including streamlining, collaboration, and program consistency that have collectively contributed to our success.

A brief bio:
Wetland Banking Lead, Washington State Department of Ecology, provides technical assistance to local, state, and federal agencies and the public on wetland mitigation banking. She Co-Chairs the Interagency Review Team that reviews and approves proposed wetland mitigation banks. Ms. Thompson's other duties include technical review and writing, field investigations, mitigation policy development, and implementation and training on the state wetland mitigation bank rule (WAC 173-700).

The Role of the Willamette Partnership in Supporting a Watershed-Based Mitigation Approach in Oregon

Nicole Robinson-Maness, Willamette Partnership, OR, Ecosystem Service Project Manager

Willamette Partnership, a non-profit organization, is working with agencies to develop a science-based Mitigation Framework for the Section 404 regulatory program to provide function-based mitigation for unavoidable impacts to the stream and wetland resources in Oregon. The Partnership is building from their experience in ecosystem service markets to help develop the science, policy and tools needed for a transparent, credible approach to watershed-based mitigation. This includes the development of a stream function assessment methodology, performance standards, site selection criteria based on watershed goals, and accounting and verification structures to ensure conservation benefits generated through mitigation are real. This presentation will focus on current efforts, challenges and lessons learned in developing the necessary program elements for a more function, and watershed, based compensatory mitigation program. It will also highlight the application of these tools to the Half Mile Lane pilot project in Oregon which is actively selling wetland, salmon habitat, and water quality credits using the functions-based systems developed by agencies and Willamette Partnership.

A brief bio:
Nicole Maness is the Ecosystem Services Project Manager with Willamette Partnership (a small, Portland, OR-based nonprofit). Her work focuses on building the science-based tools to support conservation incentive programs for aquatic and terrestrial habitat. Until January of 2013, she was also a faculty research assistant at Oregon State University working on policy issues related to private landowner involvement with voluntary carbon markets. Prior to moving to Oregon, Nicole was the executive director of a think tank at the University of British Columbia that dealt with forest land-use policy in BC.

Presenter Bios and Abstracts

An Update on SAWC's Proposed Southeast Alaska Mitigation Fund In Lieu Fee Program

Jessica Kayser, Southeast Alaska Watershed Coaltion, Haines, AK and Karen Johnson, The Nature Conservancy, Virginia Aquatic Resources Trust Fund, Mitigation Program Manager

Brief bios:
Jessica Kayser
Over the past several years, working and living in Alaska, Jess has had the opportunity to support the capacity of villages along the Yukon, Koyukuk and Kuskokwim Rivers and communities and tribes throughout Southeast to be active participants in promoting and stewarding their watershed resources. For the past five years- as Director of the Southeast Alaska Watershed Coalition- Jess has focused her work on supporting informed local natural resource management and sustainable development initiatives throughout Southeast Alaska. Currently Jess has taken on a new role at the Coalition as the Mitigation Specialist and will be dedicating her time and efforts to build the proposed Southeast Alaska Mitigation Fund In Lieu Fee Program. Jess has a BS in Human Development from Cornell University and a Masters in Sustainable Development from the School for International Training, Graduate Institute.

Karen Johnson has worked for the Nature Conservancy and the Virginia Aquatic Resources Trust Fund for nearly nine years. As manager for one of the oldest, largest and most successful ILF programs in the country, Karen is often sought after for her expertise and input on existing or conceptual programs. She has presented at a number of workshops and webinars, including: TNC Mitigation Trainings (2008, 2012), Land Trust Alliance Mitigation Workshop (2012), Virginia Association of Land Trust Annual Meeting (2012), Environmental Law Institute's ILF Seminar Series (2013 – two sessions). She has also been asked to collaborate with a variety of partners and interested agencies on expanding or developing mitigation opportunities across the country, and the world. This has included presentation, meetings, field trips and conference calls. States consulted include: Hawaii/Guam (marine/coral impacts - TNC/partner), Arkansas (TNC, FHWA, DOT, Corps), Washington (HCCC-ILF), Wisconsin (state), Ohio (TNC), South Carolina (Corps), Montana (MARS-ILF), Tennessee (ILF), Minnesota (state). Additionally, Karen has presented to and lead site visits with Mongolian officials and TNC staff, twice, in their research for developing mitigation options in their country related to increased and active mining activities.

Poster Abstracts

Sitka Sound Science Center: Interpretive Signs

Contact: Christopher Mertl, Corvus Design. 907-988-9000. www.corvus-design.com

The Sitka Sound Science Center is dedicated to increasing the understanding and awareness of terrestrial and aquatic ecosystems of the Gulf of Alaska through education and research. To support this mission the science center facilities includes a laboratory, classrooms, aquarium, and the Sheldon Jackson hatchery that is utilized by visiting scientists, fisheries managers, students, and the general public . As part of the public outreach and education program a series of interpretive panels were developed for the center and the newly created Sitka SeaWalk that highlights the relationship between salmon and the Tongass National Forest. These graphically rich panels discuss how salmon and their life cycle is interwoven and supports the Tongass while creating healthy riparian ecosystems, which in turn supports the salmon. The panels includes artwork by Ray Troll and each panel has a segment dedicated to children allow them to interact and understand the relationship between salmon and the Tongass National Forest. The panels were developed and designed by Corvus Design – Landscape Architects, for the Sitka Sound Science Center.

Pullen Creek StreamWalk – Designing a Trail to Connect People to Nature

Chris Mertl, Corvus Design, John Hudson, USFWS, and Rachel Ford, Taiya Inlet Watershed Council

Each summer more than 800,000 tourists depart cruise ships and ferries to visit historic Skagway – Gateway to the Klondike. Most of these visitors walk over Pullen Creek, a spring-fed urban salmon stream on their way into town. This intersection of stream and pedestrian corridors offers an excellent opportunity to connect people to fish habitat as well as the natural and cultural history of Pullen Creek and the community.
In 2011, the Taiya Inlet Watershed Council (TIWC), Municipality of Skagway (MOS), Klondike Gold Rush National Historical Park (KLGO), Alaska Power and Telephone, U.S. Fish and Wildlife Service (USFWS), and Skagway citizens began working together to develop a community-based conceptual plan for a pedestrian interpretive trail along the lower reaches of the stream. The Pullen Creek StreamWalk, will consist of a 0.6 mile long accessible walking trail with interpretive signage and overlooks that ties together historical and natural history points between the Broadway Dock and the City Museum. Through the implementation of the StreamWalk the project will:

- Expose pedestrians to salmon, their riparian habitats, and the natural history of the area;
- Rehabilitate stream and riparian habitats along the lower Pullen Creek corridor for the benefit of fish, wildlife, and the public;
- Provide an interpretive pedestrian route for Skagway visitors and residents while creating facilities for environmental education and recreation.

After a year of planning and public consultation, Corvus Design-Landscape Architects completed the conceptual StreamWalk master plan in December 2012. This year, the firm completed the Phase 1 construction documents for priorities between the Broadway Dock and Congress Way, with construction to begin in the spring of 2014. Using the 2012 master plan as a funding tool, this project was recently awarded a major grant from the US Federal Highways Administration to design and construct the entire project from the Broadway Dock to City Hall. Support for this project has been provided by USFWS, MOS, KLGO, the National Park Service's Recreation Trails and Conservation Assistance Program, and the Western Federal Lands Highways Division.

Predicting Potential Habitat for Didemnum vexillum in Southeast Alaska

Katharine Miller1, Scott Miller2, Linda Shaw2
1NMFS Alaska Fisheries Science Center, 2NMFS Alaska Regional Office

D. vexillum, an invasive tunicate, was found on and near an abandoned aquaculture facility in Whiting Harbor (Sitka, Alaska) during the 2010 Invasive Species Bioblitz. The Whiting Harbor population is the only known population of this species in Alaska. It is unclear whether D . Vexillum will be able to expand its population in Alaska. This research modeled potential distribution of D . Vexillum in relation to temperature, salinity and substrate in Southeast Alaska. Results suggest that the highest vulnerability for invasion occurs in southern Southeast Alaska adjacent to the U.S.-Canada Border and at the entrance to Clarence Strait. Because so little is known about the synergistic effects of chronic combined low temperature and low salinity, the results of this analysis are considered to be very conservative estimates of potential available habitat.

Authors:Katharine Miller, PhD Fisheries Oceanography. Katharine is a research fishery biologist for the National Marine Fisheries Service's Alaska Fishery Science Center in Juneau, Alaska. Her research focuses on species/habitat relationships of estuarine-associated fish and invertebrates. She is very interested in community ecology and how estuarine communities, in particular, recover from anthropogenic and natural stresses. Examples of research in this area include investigating the impact of log transfer facilities on estuarine communities, and modeling the potential spread of the invasive tunicate Didemnum vexillum in relation to

environmental factors. She is currently the principal investigator on research to understand factors influencing the condition and survival of juvenile Chinook salmon in the Yukon River estuary.

Scott A. Miller, Industry Economist, NMFS Alaska Region, Analytical Team. BA Economics and Mathematics, MS Agricultural and Natural Resource Economics. Scott currently conducts economic analyses of fishery management actions for NMFS and the North Pacific Fisheries Management Council. He also has worked on socio-economic aspects of recreational and subsistence fisheries, and agriculture as a resource economist for Battelle Pacific Northwest National Laboratories, and for the Commonwealth of the Northern Mariana Islands. Scott has worked as a commercial fisherman and seafood processing plant manager in Alaska.

Linda Shaw is a Habitat Biologist with the National Marine Fisheries Service in Juneau.

Components of the Alaska Region Stream Classification System

Emil Tucker, Hydrologist, USFS - Tongass National Forest

The Alaska Region of the US Forest Service uses a locally developed stream classification system to classify stream channels by their fluvial processes. The processes describe the interrelationship between watershed runoff, landform relief, geology, and glacial or tidal influences on the fluvial erosion or deposition process. This classification system is an integral part of the framework by which management activities near stream channels are regulated.

University of Alaska Center for Salmon and Society

Megan McPhee, University of Alaska Fairbanks, Assistant Professor mvmcphee@alaska.edu

Megan McPhee is an assistant professor in Fisheries at the University of Alaska Fairbanks (but located in Juneau). She is presenting the poster on behalf of a team.

Ocean Products Cluster

The poster concept was a collaborative effort of the innovative Juneau Economic Development Council staff and designed by local graphic designer Annie Kincheloe.

Juneau Economic Development Council's Southeast Cluster Initiative builds partnerships between businesses, suppliers and associated institutions committed to addressing needs and seizing opportunities in a particular industry. Each of the Industry Clusters develops pertinent and achievable initiatives to tackle as a group. This Ocean Products Cluster infographic poster, developed for the 2013 Innovation Summit, conveys in a simple way the group's initiatives. Five Southeast Industry Clusters: Visitor Products, Renewable Energy, Ocean Products, Mining Service & Supply and Research & Development. For more info visit JEDC.org/innovation

Auke Lake Watershed Sockeye Salmon Distribution Assessment

James Ray, U.S. Fish and Wildlife Service, Juneau, Alaska

Increasing development in the Auke Lake Watershed may encroach on areas of high adult sockeye salmon use; however, little is known about sockeye use of the lake. During the summer of 2012, the Juneau Fish and Wildlife Field Office studied the habitat use and movements of adult sockeye salmon in the Auke Lake Watershed. Adult sockeye returning to the Auke Lake Watershed were captured and fitted with esophageal implant transmitters. Eighty radio transmitters were deployed between June 20 and August 18. Fish were tracked with portable radio receivers and fixed receiver arrays. Sockeye pre-spawning distribution was not random; most fish were distributed at four discrete aggregations. SCUBA surveys concluded no lake spawn-

ing was occurring at three of these high use locations. Lake spawning was identified in another area of the lake, as well as spawning in a previously undocumented inlet stream. Using the fates of successfully tracked sockeye salmon as a sample from the general population, 99% (67 of 68; 95% CI: (94%, 100%)) of sockeye entering Auke Lake Watershed in 2012 spawned in creek environments, whereas only 1% (1 of 68; 95% CI: (0.1%, 6.0%)) spawned in the lake. This study showed that adult sockeye rely on lake habitat for several weeks prior to spawning and that the spawning population is dominated by creek spawners. High use areas of the lake and lakeshore spawning sites should be given high priority for protection during land and lake planning processes.

Author: James Ray is a former fish biologist with the Juneau Fish and Wildlife Field Office Conservation Planning and Assistance Program. He currently resides in Arcata, CA.

Inventory, Assess, Prioritize, Eradicate – A Strategy for Protecting Fish Habitat From Invasive Plants in The Montana Creek Watershed

John Hudson1, Brian Maupin2, Dana White2, David Evans1
1U.S. Fish and Wildlife Service, 2Alaska Association of Conservation Districts

Non-native invasive plants can displace native plant communities in wetland and riparian areas that provide important fish habitat. Invasive plant infestations have the potential to affect stream bank stability; cover, food, and shade availability; large wood recruitment; flow velocity; and carbon and nutrient cycling. In 2011, the Juneau Fish and Wildlife Field Office partnered with the Alaska Association of Conservation Districts to survey and manage invasive plants in the Montana Creek Watershed, a 10,000 acre watershed in Juneau that supports four species of salmon, steelhead, Coastal cutthroat trout, and Dolly Varden char. The inventory documented 18 invasive plant species in 562 infestations covering 6.7 acres. Each species was assessed for its level of invasiveness and cumulative infestation size. Individual species were evaluated for control efforts based on their invasiveness rank and the size of the infestation. Four plant species considered highly to extremely invasive (invasiveness rank, R >70 out of 100) and occupying a relatively small area (8,000 sq. ft.) were targeted for eradication: reed canarygrass (R83), ornamental jewelweed (R82), Bohemian knotweed (R87), and orange hawkweed (R79). In 2012, Bohemian knotweed plants were injected with herbicide and ornamental jewelweed and orange hawkweed plants were removed by hand-pulling. Reed canarygrass infestations were sprayed with herbicide in 2013. When resources for control efforts are limited, priority eradication focused on incipient populations of highly invasive plants is an efficient means of protecting fish habitat.

Author: John Hudson is a fish and wildlife biologist with the U.S. Fish and Wildlife Service (FWS) Habitat Restoration Program in Juneau. John works with NGOs and government entities throughout Southeast Alaska to manage invasive plants, restore riparian functions, and improve fish passage. He has nearly 20 years of experience working in the region for the Pacific Northwest Research Station, Alaska Department of Fish and Game, National Marine Fisheries Service, FWS, and as a private consultant.

Interactions Between the Invasive Tunicate Didemnum Vexillum and Pacific Herring Eggs.

Dr. Sarah Cohen, San Francisco State University Romberg Tiburon Center for Environmental Studies
Marnie Chapman, University of Alaska Southeast
Linda Shaw, National Marine Fisheries Service, Habitat Biologist

Describes in-progress research and findings on the potential impacts of the invasive colonial tunicate, Didemnum vexillum (Dvex) to Pacific herring eggs. Dvex was discovered in Whiting Harbor, Sitka in 2010. Whiting Harbor is a periodically used by herring as a spawning site.

Quantifying Windthrow over time within Riparian Buffers Adjacent to Clearcuts on Proximal and Distal Moraine Outwash Plains in the Yakutat Forelands, Ak

Bill Lucey, City and Borough of Yakutat, Biologist

Riparian buffers are necessary to maintain stream health by providing erosion control, preventing sedimentation, providing food and cover for fish and wildlife, aquatic thermoregulation and controlling cumulative watershed effects. Ineffective riparian buffers can pose a threat to salmonid spawning and rearing habitat. The private land riparian buffers in the Yakutat Forelands, AK were left at 66 feet following clearcut logging per mandate of the Alaska Forest Resources and Practices Act. The purpose of our study was to quantify the change in riparian buffer canopy density before and after harvest over three decades. Ten, one hundred meter transects were used in each of four streams with sixty-six foot timber harvest buffers on private lands and four streams within unharvested control areas of the Tongass National Forest to study the effects of windthrow on riparian buffers. Basal measurements were used to measure timber density. The basal area loss between the experimental and control streams was highly significant. GIS spatial analysis with georectified aerial photos describe the loss incrementally from 1974-2008. These declining buffers have a sixty-two percent average loss of standing canopy and an excess of instream large woody debris (LWD), potentially blocking low-flow salmon migration, trapping sediment and exposing stream water to greater temperature fluctuations. Future forest management in the Yakutat Forelands should consider modeling the local wind driven ecology and larger buffers.

Author: Lucey holds a B.S. in Fisheries and Wildlife Biology from the University of Vermont and is currently in graduate school at Oregon State University. He began his career working as a natural resource instructor for the Vermont Fish & Wildlife Department in 1987 and went on to work in salmon research and habitat restoration. Upon graduating he worked as a fisheries extensionist with the Peace Corps in Guatemala. Bill reached Alaska in 1995, working as a federal fish and wildlife biologist, banding birds, tagging salmon, collaring moose and surveying everything form mountain goats to sea lions. He is now working with the local community on a wide variety of sustainable resource issues from commercial fishing policy, beluga ecology and sustainable forestry to salmon genetics, cleaning up marine debris and running a place-based science education program in the local school system.

Removing a Wood Chip Road and Restoring aWetland on Wrangell Island

Jacquiline Foss and Dennis Landwehr, Tongass National Forest, Soil Scientists

In 1992 a 150 meter long wood chip spur road was constructed across a wetland to access a timber sale. In 1999 it was determined the road was no longer needed and as compensatory mitigation for a local road improvement project the wood chip road was removed. The removal of wood chips and planting of native vegetation was completed by a local contractor. Photo point monitoring was used to document recovery of the wetland after 3 years. After three years the site is well vegetated and looks similar to the adjacent undisturbed wetland. Communication between the contractor and the Forest Service was key to the success of this project.

Authors: Jacquiline Foss and Dennis Landwehr are Soil Scientists on the Tongass National Forest. Combined the authors have over 30 years experience on the Tongass National Forest. The Soils Program on the Forest includes soil inventory and monitoring and wetland monitoring. Both are involved in soil and vegetation inventory and analyzing effects of a variety of ground disturbing activities on the forest.

Soil Disturbance Related to Old Growth Root-Wad Tree Collection for the Harris River Stream Restoration project

Jacquiline Foss and Dennis Landwehr, Tongass National Forest, Soil Scientists

Stream restoration often requires the use of Large Woody Debris. For the Harris River Project on Prince of Wales Island Large Woody Debris came from several sources including old-growth and young-growth tree harvest. Both cut logs and 60 foot logs with root-wads attached were used. Root-wad harvest has the potential to export productive soil from the harvest site and leave a site susceptible to erosion. Transects and photo point monitoring are being used to document the soil and vegetation recovery at one of the early root-wad removal sites. Lessons learned from the Soda-Nich monitoring are being used to guide current and future root-wad harvest on the Tongass National Forest.

The Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes (AWC) - Updates and Corrections

Tess Quinn, Alaska Department of Fish and Game

The Alaska Dept of Fish and Game, Division of Habitat received funding from the Alaska Sustainable Salmon Fund to conduct fieldwork in Northern Southeast Alaska. This fieldwork focuses on field-verifying both cataloged and noncataloged streams to determine use by anadromous fish. Streams found to support anadromous fish are nominated for inclusion in the Anadromous Waters Catalog (AWC), which is updated yearly. Nominations include route corrections for presently cataloged streams, and additions of noncataloged streams to be listed. This presentation illustrates the process and results of this cataloging effort.

Author: Tess Quinn has worked for Fish and Game since 2009 leading a project to survey fresh water habitats in several Southeast Alaskan communities to update and expand the Anadromous Waters Catalog. Tess's crews have surveyed streams in Juneau, Haines, Sitka, Wrangell and Petersburg, which have resulted in 153 route corrections and additions to the Catalog through 2013, and another 92 nomination submissions to be included in the 2014 Catalog update. She also assists with biomonitoring projects at Greens Creek and Kensington mines.

Watershed Restoration Planning Process – Tongass National Forest

Julianne Thompson, US Forest Service, Hydrologist

The 6-Step Forest Service Watershed Condition Framework is displayed. Forest-wide watershed condition classification was completed in 2011, followed by establishment of seven Priority Watersheds for focused collaboration and integrated planning. At the watershed scale, detailed field assessments provide the basis for restoration action plans. Essential projects are identified as actions which will improve condition class. Planning, design and environmental analysis follow. A variety of projects are implemented in a holistic context, considering logistical complexities. Corporate databases provide accountability for tracking accomplishments. Project-level and forest-level monitoring evaluates restoration success and promotes learning and adaptive actions.

Author: Julianne Thompson was educated in California and Colorado, and began her Forest Service career in southern Utah. She has been a hydrologist in the Tongass National Forest for over 20 years, working out of Petersburg and Wrangell. She is the Watershed Program Manager for the Tongass, and very pleased to work with an outstanding group of soil, water, and fisheries professionals.

Thank You to the Sponsors of the 2013 Southeast Alaska Watershed Symposium

http://alaskawatershedcoalition.org

http://www.seakfhp.org