

2016 MAT-SU SALMON SCIENCE & CONSERVATION SYMPOSIUM



A FUTURE WITH SALMON

**NOVEMBER 17-18
PALMER, ALASKA**

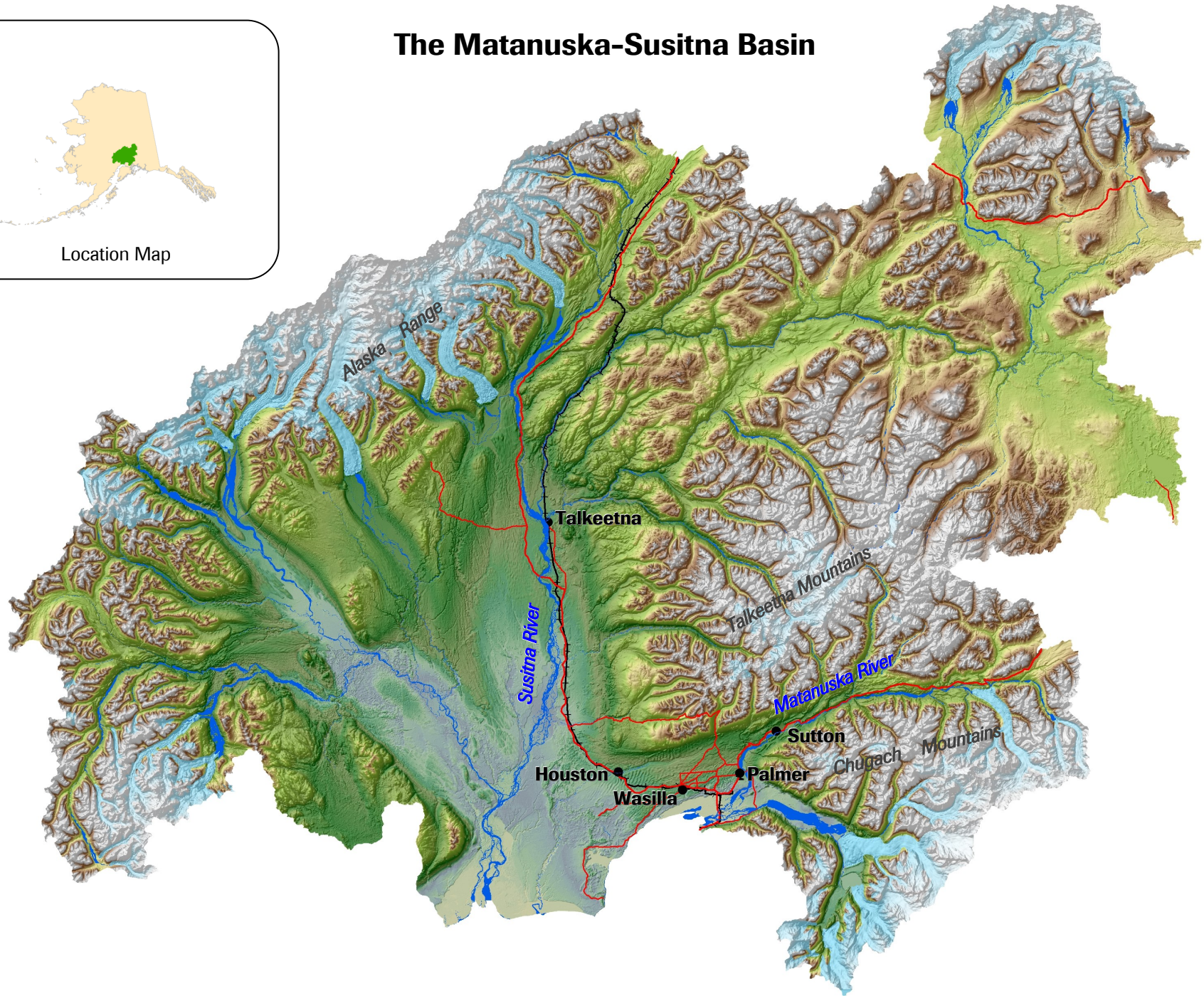


**Mat-Su
salmon**
PARTNERSHIP

The Matanuska-Susitna Basin



Location Map





Welcome to the 9th annual Mat-Su Salmon Science and Conservation Symposium Hosted by the Mat-Su Basin Salmon Habitat Partnership

Thank you for attending the 9th annual Mat-Su Salmon Symposium. We're glad you're here to share information and exchange ideas about salmon science and conservation in the Mat-Su Basin. With over 60 members, the Partnership is diverse. The Symposium reflects this diversity with a range of perspectives and ideas that are as varied as our partners and may not be shared by all partners.

What everyone does share, however, is a belief that **thriving fish, healthy habitats and vibrant communities can co-exist in the Mat-Su Basin**. This year's Symposium theme is "A Future with Salmon." Thank you for your part in keeping wild salmon abundant in the Mat-Su today and into the future.

We have a suite of over 20 presentations, a panel on the Alaska Fish Habitat Partnerships, time for sharing through Tidbits, and the film "The Super Salmon" at this year's symposium. Our keynote speaker is Daniel Schindler from University of Washington's School of Aquatic Fishery Sciences. Daniel Schindler is lead author of the 2010 study on the "portfolio effect." Through his research in Bristol Bay, Dr. Schindler and collaborators have documented this "portfolio effect" whereby the diversity of salmon streams and salmon stocks that return to them leads to overall enhanced stability of annual salmon returns to the region. Schindler will present research findings from Southwest Alaska and discuss them in the context of the Mat-Su. Dr. Schindler will be available to symposium participants and the general public on Thursday evening to answer the question "What Makes Alaska's Salmon Rivers Resilient?"

Special thanks to the Symposium Planning Committee, this year's presenters, volunteers and collaborators, and to our Symposium supporters.

We hope you enjoy this year's event!

Mat-Su Salmon Partnership Steering Committee:

Erika Ammann, NOAA National Marine Fisheries Service
Frankie Barker, Matanuska-Susitna Borough
Christy Cincotta, Tyonek Tribal Conservation District
Jonathon Gerken, U.S. Fish and Wildlife Service
Tracy Smith, Alaska Department of Fish and Game
Corinne Smith, The Nature Conservancy
Lee Stephan, Native Village of Eklutna
Arni Thomson, Alaska Salmon Alliance
Jessica Winnestaffer, Chickaloon Village Traditional Council
Jessica Speed, The Nature Conservancy, Partnership Coordinator

Learn more about the Partnership and Symposium at the Mat-Su Salmon Partnership website at www.matsusalmon.org and follow us on Facebook!



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Symposium Planning Committee:

Erika Ammann, NOAA National Marine Fisheries Service
 Jonathon Gerken, U.S. Fish and Wildlife Service
 Susie Hayes, Alaska Department of Fish and Game (Retired)
 Catherine Inman, Mat-Su Conservation Services
 Katrina Liebich, U.S. Fish and Wildlife Service
 Terry Nininger, Mat-Su Borough Fish and Wildlife Commission
 Adam St. Saviour, Alaska Department of Fish and Game
 Jessica Speed, The Nature Conservancy, Partnership Coordinator
 Jessica Winnestaffer, Chickaloon Village Traditional Council

Cover photos (clockwise from top) by:

Amy Vitale, Erika Nortemann, Frankie Barker





Mat-Su Basin Salmon Habitat Partners

** Steering Committee Members*

Alaska Department of Commerce, Community and Economic Development

Alaska Department of Environmental Conservation

**Alaska Department of Fish and Game*

Alaska Department of Natural Resources

Alaska Department of Transportation & Public Facilities

Alaska Center for the Environment

Alaska Outdoor Council

Alaska Pacific University

Alaska Railroad Corporation

**Alaska Salmon Alliance*

Alaska Trails

AlaskaChem Engineering

Alaskans for Palmer Hay Flats

Aquatic Restoration & Research Institute

Bureau of Land Management

Butte Area Residents Civic Organization

**Chickaloon Village Traditional Council*

City of Palmer

ConocoPhillips Alaska, Inc.

Cook Inlet Aquaculture Association

Cook Inletkeeper

Eklutna Tribal Conservation District

Environmental Protection Agency

Envision Mat-Su

Fishtale River Guides

Glacier Ridge Properties

Great Land Trust

HDR Alaska, Inc.

Knik River Watershed Group

Knik Tribal Conservation District

Matanuska River Watershed Coalition

**Matanuska-Susitna Borough*

Mat-Su Anglers

Mat-Su Conservation Services

Mat-Su Trails and Parks Foundation

Montana Creek Campground



** National Marine Fisheries Service
National Park Service
*Native Village of Eklutna
Natural Resources Conservation Service
Palmer Soil and Water Conservation District
Pioneer Reserve
Pound Studio
SAGA
Sierra Club
Sustainable Design Group
The Conservation Fund
*The Nature Conservancy
The Wildlifers
Three Parameters Plus, Inc.
*Tyonek Tribal Conservation District
United Cook Inlet Drift Association (UCIDA)
United Fishermen of Alaska
Upper Susitna Soil & Water Conservation District
U.S. Army Corps of Engineers
*U.S. Fish and Wildlife Service
U.S. Geological Survey
U.S. Forest Service, Chugach National Forest
Wasilla Soil and Water Conservation District*

**The partnership includes 59 organizations and two private individuals.*



The Matanuska-Susitna Basin Salmon Habitat Partnership believes that thriving fish, healthy habitats, and vital communities can co-exist in the Mat-Su Basin. Because wild salmon are central to life in Alaska, the partnership works to ensure quality salmon habitat is safeguarded and restored. This approach relies on collaboration and cooperation of diverse stakeholders to get results.

Learn more about the Partnership and Symposium at the Mat-Su Salmon Partnership website at www.matsusalmon.org and follow us on Facebook!



Thursday November 17, 2016

Palmer Community Center (Depot), 610 S. Valley Way, Palmer

8:30 Registration

9:00 Symposium Welcome

Christy Cincotta (Mat-Su Basin Salmon Habitat Partnership Steering Committee member, Executive Director, Tyonek Tribal Conservation District)

Lee Stephan (Mat-Su Basin Salmon Habitat Partnership Steering Committee member, President, Native Village of Eklutna)

Ralph Renzi (Executive Director, Greater Palmer Chamber of Commerce)

9:30 Keynote Address: *What Makes Alaska's Salmon Rivers Resilient?* – Daniel Schindler

Introduction: Adam St. Saviour (Alaska Department of Fish and Game)

10:30 Networking Break

11:00 Improving our Knowledge of Salmon and Their Habitat

Moderator: Sue Mauger (Cook Inletkeeper)

Salmon Habitat Mapping for Landscape-scale Planning in the Matanuska-Susitna Basin – Christine Woll (The Nature Conservancy)

Cataloging Anadromous and Resident Fish in Previously Unmapped Streams Identified During Fish Passage Assessments in the Matanuska-Susitna Borough (MSB) – Mark Eisenman (Alaska Department of Fish and Game)

Mat-Su Salmon Research Plan – Howard Delo and Andrew Couch (Matanuska-Susitna Borough Fish and Wildlife Commission)

11:45 Climate Change and Juvenile Salmon Habitat Use

Moderator: Marcus Geist (University of Alaska Anchorage)

Spatial and Temporal Patterns of Growth and Consumption in Three Geomorphically Distinct Sub-basins of the Kenai River – Benjamin Meyer (University of Alaska Fairbanks)

Cold Water Habitat Use by Juvenile Coho Salmon in the Big Lake Basin – Heather Leba (Cook Inletkeeper)

Juvenile Chinook and Coho Salmon Winter Habitat in the Middle Susitna River – Jeff Davis (Aquatic Restoration and Research Institute)

In-stream Movements and Seasonal Habitat Use of Juvenile Chinook and Coho Salmon in the Montana Creek Watershed, Alaska – Jonathon Gerken (U.S. Fish and Wildlife Service)

12:45 LUNCH



1:45 Invasive Species

Moderator: Aaron Martin (U.S. Fish and Wildlife Service)

Towards an Understanding of Population Structure and Adaptation by Invasive Northern Pike: An Overview of an Emerging Research Program – Jeff Falke (University of Alaska Fairbanks)

Elodea in Alexander Lake and Alaska: Learning Lessons and Eradication Successes – Heather A.M.S. Lescanec (Alaska Department of Natural Resources)

2:15 Tidbits

Moderator: Kim Sollien (Great Land Trust)

Please sign up at the registration desk to present a 3-minute project summary or announcement. If you have a slide or two to project (maximum 2 slides), please load them by the end of lunch.

2:45 Break

3:15 Hatcheries and Salmon

Moderator: Erika Ammann (NOAA National Marine Fisheries Service)

The Vital Role of Hatchery Programs in Conserving Susitna Salmon Stocks – Andrew Wizik (Cook Inlet Aquaculture Association)

3:30 Barriers to Fish Movement

Moderator: Erika Ammann (NOAA National Marine Fisheries Service)

2016 Status Update on Fish Passage Barriers in the Mat Su Borough – Gillian O'Doherty (Alaska Department of Fish and Game)

Removing the Lower Eklutna River Dam: A Progress Report – Brad Meiklejohn (The Conservation Fund)

4:00 Announcements and Adjourn for Daytime Portion of Symposium

Moderator: Arni Thomson (Alaska Salmon Alliance)

4:00– Evening Social

6:00 Palmer Community Center (Depot), 610 S. Valley Way, Palmer

Come visit with your colleagues and our keynote speaker. The Mat-Su Salmon Partnership is providing appetizers from Turkey Red and a cash bar will be available.

6:30– Evening Public Presentation: *What Makes Alaska's Salmon Rivers*

7:30 *Resilient?* – Daniel Schindler

Palmer Community Center (Depot), 610 S. Valley Way, Palmer

Introductions: Jeff Davis (Mat-Su Basin Salmon Habitat Partnership Science and Data Committee Co-chair, Aquatic Restoration and Research Institute)

Vern Halter (Mayor, Matanuska-Susitna Borough)

Everyone is welcome to come hear Daniel Schindler share his Symposium talk about what makes Alaska's salmon rivers resilient. This talk is intended for a general public audience.



Friday November 18, 2016

Palmer Community Center (Depot), 610 S. Valley Way, Palmer

8:30 Registration

9:00 Symposium Welcome

Suzanne Hayes (Mat-Su Basin Salmon Habitat Partnership Symposium Planning Committee, Retired, Alaska Department of Fish and Game)
Richard Porter (Executive Director, Knik Tribe)

9:15 Conservation Strategies and Protections for Salmon

Moderator: Matthew LaCroix (Environmental Protection Agency)

Salmon and Society Workshop – Milo Adkison (University of Alaska Fairbanks)

An Introduction to the Division of Habitat, Who We Are and What We Do – Ron Benkert (Alaska Department of Fish and Game)

Tyonek Area Watershed Action Plan Updates – Christy Cincotta (Tyonek Tribal Conservation District)

Instream Flow Water Reservations in the Mat-Su Basin: Update on Progress – Franklin Dekker (U.S. Fish and Wildlife Service)

Mat-Su Borough Stormwater Analysis Projects on Cottonwood Creek and Vine Creek – Mike Campfield, P.E. (Matanuska-Susitna Borough) and Laura Eldred (Alaska Department of Environmental Conservation)

10:30 Networking Break

11:00 Alaska's Fish Habitat Partnerships

A panel discussion with Alaska's fish habitat partnerships.

Moderator: Robert Ruffner (Former Coordinator, Kenai Peninsula Fish Habitat Partnership)

Tim Troll (Southwest Alaska Fish Habitat Partnership Coordinator, Bristol Bay Heritage Land Trust)

Jack Sinclair (Kenai Peninsula Fish Habitat Partnership Coordinator, Kenai Watershed Forum)

Deborah Hart (Southeast Alaska Fish Habitat Partnership Coordinator, Trout Unlimited)

Jessica Speed (Mat-Su Basin Salmon Habitat Partnership Coordinator, The Nature Conservancy)

Tracy Smith (Western Native Trout Initiative Steering Committee member, Alaska Department of Fish and Game)

12:00 LUNCH



1:00 Community and Salmon Habitat Conservation

Moderator: Catherine Inman (Mat-Su Conservation Services)

Salmon Advocacy in Alaska: Value Based Public Engagement – Amy O’Conner (Alaska Center)

Salmon Conservation Ideas for the Classroom – Ryan Viola

Engaging Alaskan Anglers in Conservation and Science – Sam Snyder (Trout Unlimited)

Matanuska-Susitna Valley Streambank Rehabilitation and Habitat Protection Cost Share Program: Lending a Hand in the Community to Help Salmon Habitat – Tracy Smith (Alaska Department of Fish and Game)

Landscape Scale Conservation: Caring for Salmon as a Shared Community Asset – Kim Sollien (Great Land Trust)

2:15 Tidbits

Moderator: Daniel Rinella (U.S. Fish and Wildlife Service)

Please sign up at the registration desk to present a 3-minute project summary or announcement. If you have a slide or two to project (maximum 2 slides), please load them by the end of lunch.

2:45 Networking Break

3:00 Story Telling: The Super Salmon Film

Moderator: Jonathon Gerken (U.S. Fish and Wildlife Service)

Mike Wood (Susitna River Coalition) and Ryan Peterson (Alaskanist Stories)

3:50 Conclusions

Moderator: Laura Eldred (Alaska Department of Environmental Conservation)

4:00 Adjourn



Presentation Abstracts

Arranged in alphabetical order by presenter's last name.

Milo Adkison, University of Alaska Fairbanks

Salmon and Society Workshop

The University of Alaska along with numerous partners, including the Mat-Su Salmon Habitat Partnership, held a workshop on long term challenges to Alaska's salmon and salmon-dependent communities. Participants examined salmon habitat protection and habitat-friendly development practices, along with a variety of salmon-related challenges to community well-being and sustainability. Breakout groups tackled each topic, outlining important next steps for stakeholders and decision-makers.

Ron Benkert, Alaska Department of Fish and Game

An Introduction to the Division of Habitat, Who We Are and What We Do

Discussion of statutes and regulations including how the Habitat Division applies our authority through Fish Habitat Permits, coordination with other divisions and departments, and negotiations with project proponents. Identification of data gaps that could be filled by Partnership participants and others that would assist the Division of Habitat in assessing proposed projects.

Mike Campfield, P.E., Matanuska-Susitna Borough

Mat-Su Borough Stormwater Analysis Projects on Cottonwood Creek and Vine Creek

The on-going project is part of the Matanuska-Susitna Borough's (MSB) Stormwater Program, which implements components outlined in the Assembly-adopted Stormwater Management Plan (2013). The proposed project implements the Plan on Cottonwood Creek, an impaired waterbody for fecal coliform, by mitigating current and preventing future pollution from public and private stormwater infrastructure and other stormwater sources. The project intent is to identify, prevent, and mitigate stormwater pollution and sources of fecal coliform on Cottonwood Creek by completing a Stormwater Analysis. The first step, which was recently completed, mapped the stormwater system along Cottonwood Creek tracing drainage paths upstream to their sources and identified stormwater inflow points and locations of runoff with potentially high concentrations of fecal coliform. The Stormwater Analysis will also identify inadequate storm drain collection and treatment systems and suggest solutions for preventing and addressing stormwater based sources of fecal coliform.



Christy Cincotta, Tyonek Tribal Conservation District
Tyonek Area Watershed Action Plan Updates

Tyonek Tribal Conservation District (TTCD) is committed to a locally driven, cooperative approach to protecting natural resources. In 2014, TTCD began developing a Tyonek Area Watershed Action Plan, encompassing drainages from Nikolai Creek north to the Beluga River on western Cook Inlet. The overall goal of this plan is to provide a framework to restore, enhance, and protect the freshwater systems in this area. The project includes the following objectives: 1. Monitor the overall health of the Tyonek Area Watershed, 2. Identify current and future threats to the health of the Tyonek Area Watershed, 3. Work with landowners to address current watershed issues (i.e. pike, fish passage, invasive plants, etc.) and 4. Develop best practices to maintain watershed health. This presentation will cover TTCD's progress on the Tyonek Area Watershed Action Plan and progress to date to address threats to salmon habitat.

Jeff Davis, Aquatic Restoration and Research Institute

Juvenile Chinook and Coho Salmon Winter Habitat in the Middle Susitna River

Juvenile Chinook and coho salmon overwinter in off-channel sloughs, side channels, and tributary mouths of the Susitna River. However, little is known about the distribution of juvenile coho and Chinook salmon during the winter months or the characteristics of those habitats. Winter sampling has been conducted over the past 4 years to evaluate juvenile overwinter habitat preferences at multiple spatial scales. Coho salmon catch per trap was higher at locations with low water velocity (< 5 cm/s), cover provided by wood, shrubs, low pH and dissolved oxygen. Juvenile Chinook salmon relative abundance was highest in traps that were associated with cover provided by wood, shrubs or macrophytes. Juvenile coho salmon were most abundant in off-channel beaver ponds which contained 78.7% of the juvenile coho salmon captured. Juvenile Chinook salmon tended to be more abundant at sites close to tributaries that support Chinook salmon spawning. Juvenile Chinook and coho salmon were absent from sites unprotected from disturbance caused by mainstem ice development, even if those sites contained preferred habitat conditions during mid-winter.



Franklin Dekker, U.S. Fish and Wildlife Service

Instream Flow Water Reservations in the Mat-Su Basin: Update on Progress

The rivers and lakes in the Mat-Su Basin, Alaska support some of North America's most viable and productive salmon fisheries, but these fisheries depend on sufficient seasonal quantities of water. Since 2008, the Mat-Su Basin Salmon Habitat Partnership in partnership with the U.S. Fish and Wildlife Service (USFWS) and Alaska Department of Fish and Game (ADF&G) have partnered to secure instream flow water reservations. In this effort, the Partnership, USFWS and ADF&G have worked together to fund stream discharge data collection required for water reservation applications. The Partnership would benefit from an overview of reservations that have been secured on an initial set of priority streams, and the strategy for where we go next for future reservations. The strategy for what reservations are pursued next required a prioritization of remaining streams because of the high cost of data collection. Also, not all streams are equally valuable or threatened so data on biological value and vulnerability were collected for the remaining waterbodies. Using Geographic Information System (GIS) data layers of salmon habitat quality and vulnerability mapping created by The Nature Conservancy, 39 potential streams were prioritized for future reservations. The prioritization provides a new list of waterbodies that will help guide the Mat-Su Basin Salmon Habitat Partnership's water reservation program for years into the future.

Howard Delo and Andrew Couch, Mat-Su Borough Fish and Wildlife Commission

Mat-Su Salmon Research Plan

The Mat-Su Borough Fish and Wildlife Commission developed a Mat-Su Salmon Research, Monitoring and Evaluation Plan for Upper Cook Inlet to guide research funding for salmon management and protection. Included in the plan is a prioritization of research needs as identified by an interagency working group. From this plan, the FWC selected 11 projects for funding including coho genetics, pike eradication, stream temperatures and juvenile salmon monitoring. Projects are underway and due to be completed by 2018. Fish and Wildlife Commissioners are preparing for the 2017 Upper Cook Inlet Board of Fisheries meeting and have suggested changes to stocks of concern designations. Currently Mat-Su has 8 of 14 stocks of concern. They will present testimony to BOF at the 2017 meeting to support changes in fishery management policies to protect and enhance Mat-Su salmon runs.



Mark Eisenman, Alaska Department of Fish and Game

Cataloging Anadromous and Resident Fish in Previously Unmapped Streams Identified During Fish Passage Assessments in the Matanuska-Susitna Borough (MSB)

Between 2009 and 2011 the Alaska Department of Fish and Game conducted a borough-wide fish passage assessment of stream crossings. The Department located 124 crossings that were on unmapped streams (not in the National Hydrography Dataset, NHD) and did not have any fish information. The subsequent culvert replacement prioritization and optimization models both depend on knowing how much potential upstream habitat exists above a barrier and fish usage. This project proposed to help fill fisheries data gaps by sampling 50 to 60 previously unmapped sites and other sites of interest and use the new NHD stream network, from the 2001 MSB Lidar project, to provide accurate stream courses.

**Jeff Falke, U.S. Geological Survey, Alaska Cooperative Fish and Wildlife Research Unit,
University of Alaska Fairbanks**

Peter Westley, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Andrés López, College of Fisheries and Ocean Sciences and Museum of the North, University of Alaska Fairbanks

Chase Jalbert, College of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Towards an Understanding of Population Structure and Adaptation by Invasive Northern Pike: An Overview of an Emerging Research Program

The northern pike invasion to Southcentral Alaska simultaneously represents a pressing conservation crisis and opportunity to learn about the ecology and evolution of the invaders in novel environments. In this talk we give a brief overview of a series of recently initiated complementary projects that seek to i) understand the structure of existing populations, the source population(s) of the invasion, and the potential for contemporary evolution using RAD Sequencing approaches, ii) use environmental DNA techniques to identify established invasive populations in the Yentna River basin, and iii) elucidate patterns suggestive of coexistence or exclusion of salmonids by northern pike. Although much of this work is in its infancy, emerging results from a comparative diet study suggest that northern pike prey more heavily on salmonids in the invasive range compared to the native range. However, it is not clear whether the current abundance of salmonids in the diet represents a path towards extirpation of salmonids by northern pike or long-term sympatry of the species as seen throughout the native range.



Jonathon Gerken, U.S. Fish and Wildlife Service

In-stream Movements and Seasonal Habitat Use of Juvenile Chinook and Coho Salmon in the Montana Creek Watershed, Alaska

High-gradient, clear-water tributaries such as Montana Creek are important spawning and rearing habitats for Susitna River Chinook and Coho Salmon, yet little is known about juvenile movements and habitat selection within these systems. Juvenile salmon in-stream migrations are based upon selection of preferred habitats, which maximize survival and growth rates. Overwintering habitat, typically composed of slower moving water that reduces metabolic cost, is hypothesized to be the limiting factor for juvenile salmon in northern latitudes, yet this type of habitat is limited within many clear water Susitna River tributaries. In an effort to better understand movement to and selection of overwintering habitats, the Fish and Wildlife Service's Anchorage Conservation Office deployed 2,384 passive integrated transponder (PIT) tags in juvenile Chinook (n=1,185) and Coho Salmon (n= 1,199) throughout the Montana Creek watershed and tracked individual level movements using in-stream antenna arrays and recapture events during the summer of 2016 (June-November). This presentation provides a preliminary descriptive analysis on the movements of tagged juvenile Coho and Chinook Salmon within Montana Creek with an emphasis on overwintering habitat selection. To date, tagged juveniles have been observed moving to two potential overwintering areas: Buddy Creek, which is the sole tributary stream to Montana Creek, and downstream to the Susitna River.

Heather Leba, Cook Inletkeeper

Jonathon Gerken, U.S. Fish and Wildlife Service
Sue Mauger, Cook Inletkeeper

Cold Water Habitat Use by Juvenile Coho Salmon in the Big Lake Basin

We used thermal infrared imagery to guide site selection within the Big Lake basin to determine if Coho Salmon preferentially select cold-water habitats for summer rearing. We selected sites in Fish, Herkimer and Lucille creeks and sampled reaches with measurable influence from cold water inflows and compared them with control reaches. We installed data loggers in each control and cold-water influenced reach to measure seasonal water temperature. We collected data on substrate type, water velocity, and benthic macroinvertebrate communities in both reaches at all three sites. We estimated juvenile fish abundance using minnow trap CPUE in each reach. Mean monthly temperatures between control and influenced reaches of Fish Creek were significantly different during June, July, and September. In Herkimer Creek, mean monthly temperatures were significantly different in all months sampled except October. Mean monthly temperatures between reaches in Lucille Creek were significantly different in all months except July when discharge from the cold-water inflow was lowest. Water temperatures in all three control reaches were homogenous with little variability across all data loggers; the opposite was true in the influenced reaches where each site exhibited high variability around the mean. No significant differences in juvenile Coho Salmon CPUE estimates were found between the control and influence reaches of any sample stream; however, juvenile Coho captured in the influenced reach in Herkimer Creek were significantly larger than those from the control reach. Further, juvenile Coho found in Lucille Creek were significantly larger than Coho sampled from the two other streams. Our results offer some insight for prioritizing habitats within the Big Lake basin that should be targeted for protection in the face of rising stream temperatures.



Heather A.M.S. Lescanec, Alaska Department of Natural Resources, Plant Materials Center

Elodea in Alexander Lake and Alaska: Learning Lessons and Eradication Successes

After its first detection in Alaska, Elodea was discovered to have infested ~22 waterbodies by 2014. To date, Alaska has ~16 waterbodies infested with Elodea; 7 waterbodies without Elodea, and one new discovery in 2016. On the Kenai Peninsula, 2 lakes have not had Elodea detected since 2015, after the first herbicide treatments started in 2014. The other Kenai infested lake only received a spot, partial-lake treatment in 2015. Anchorage was the second region to use herbicide in 2015 to reach eradication. Both the Kenai and Anchorage efforts did not find Elodea present in the treatment areas during their 2016 surveys; early eradication success.

Learning lessons of 2016 include the importance of timely management for budgeting and availability of resources, why responding to emergency situations isn't ideal, and understanding more of the distribution of Elodea in the Mat-Su. Elodea was documented for the first time in the Mat-Su basin in Alexander Lake in August 2014, covering a total of 10 acres. In 2016, before the first implementation of eradication efforts, Elodea was documented to have spread in Alexander Lake to cover a total of 500 acres. This alarming and unanticipated growth rate has not only increased the urgency for management, but increased the original project costs. With the use of a DEC approved emergency exemption, a new Environmental Assessment put out for public commenting, and the generous donation of extra product from the Kenai National Wildlife Refuge, Alexander's entire infestation was treated by September 2016. Monitoring of herbicide concentrations during the winter and a spring survey will determine if Alexander Lake is on its way to another Alaskan Elodea eradication success.

Brad Meiklejohn, The Conservation Fund

Removing the Lower Eklutna River Dam: A Progress Report

The lower Eklutna River dam is being dismantled to restore fish passage and natural river processes. This presentation will provide an update on progress to date including sediment transport modeling, design and engineering, permitting, site preparation and the current work schedule. We expect the dam removal work to be completed in 2017.



Benjamin Meyer, School of Fisheries and Ocean Sciences, University of Alaska Fairbanks

Daniel Rinella, U.S. Fish and Wildlife Service

Erik Schoen, Alaska Cooperative Fish and Wildlife Research Unit, University of Alaska
Fairbanks

Mark S. Wipfli, U.S. Geologic Survey, Alaska Fish and Wildlife Research Unit, University of
Alaska Fairbanks

Spatial and Temporal Patterns of Growth and Consumption in Three Geomorphically Distinct Sub-basins of the Kenai River

Changes in air temperature and precipitation as a result of ongoing climate warming in South-central Alaska will impact juvenile salmon freshwater rearing habitat differently on the basis of local watershed conditions. Some South-central Alaskan salmon streams already experience water temperatures above Alaska Department of Environmental Conservation's maximum thermal criteria of 15°C during summer months, however the degree of future warming will vary by individual watershed. We selected three focal Kenai River tributaries – Beaver Creek, Russian River, and Ptarmigan Creek – to represent a lowland to montane spectrum of catchment types with differing potential levels of sensitivity to warming air temperatures. Water temperature along with food resources are considered to be significant controls on somatic growth of juvenile salmon, however the influence of temporal and spatial patterns in these variables on growth is not well characterized. We collected diet samples (2015, n=452; 2016, n=504) and length/weight measurements (2015, n=1442; 2016, n=3520) from juvenile Chinook and Coho Salmon along with water temperature data from throughout the three focal watersheds. Temperature, diet, and growth data are being incorporated into bioenergetics models that will allow us to determine the degree to which growth rates of juvenile salmon are limited by food consumption rates and water temperature. As water temperature regimes respond to climate change, conditions may shift towards or away from optimal conditions for somatic growth of juvenile Chinook and Coho Salmon. Such changes may have long-term implications for the productivity, maturation timing, and other aspects of their populations including size-selective mortality and fitness. Identification and conservation of different habitats that provide trade-offs in growth and survival may be important for long-term viability of populations in the context of climate change.

Amy O'Connor, The Alaska Center

Salmon Advocacy in Alaska: Value Based Public Engagement

Science and research is not enough to spur people to take action or enough to influence decision makers on its own. The public need to provide pressure on decision makers to support and protect salmon habitat in order to effect change. By showing how the science supports the VALUES Alaskans have around wild salmon we can build a robust culture of salmon supporters.



Gillian O’Doherty, Alaska Department of Fish and Game, Division of Sport Fish
2016 Status Update on Fish Passage Barriers in the Mat Su Borough

To date over 80 culverts have been replaced in the Mat Su Borough by a consortium of partners. These fish passage efforts have opened up stream, lake and wetland habitat to unimpeded fish passage, representing a significant improvement in habitat connectivity. This talk will provide an overview of current and former efforts to assess and prioritize fish passage replacements and the results of those efforts.

Tracy Smith, Alaska Department of Fish and Game

Matanuska-Susitna Valley Streambank Rehabilitation and Habitat Protection Cost Share Program: Lending a Hand in the Community to Help Salmon Habitat

The Matanuska-Susitna Streambank Rehabilitation and Habitat Protection Cost Share Program provides funding, technical project design assistance and project construction oversight. This program sustains and enhances valuable salmon habitat in the Mat-Su Basin through a financial incentive program directed towards private landowners and public land managers. The Alaska Department of Fish and Game (ADF&G) and program partner United States Fish and Wildlife Service (USFWS), has worked with nonprofit organizations, local government, and landowners to conduct projects to rehabilitate and sustain salmon habitat, provide technical planning, permitting assistance and project construction oversight. Since the program inception in 2008 the Cost Share Program has completed approximately 60 projects in the Mat-Su Basin.

Sam Snyder, Trout Unlimited

Engaging Alaskan Anglers in Conservation and Science

Join Trout Unlimited for an engaging 12-minute presentation to learn more about our work to engage Alaskan anglers in conservation and science. We’ll highlight several local efforts we are working on, upcoming partnership opportunities, pilot programs (for example the Bristol Bay Fly Fishing & Guide Academy) that have been done elsewhere and might be a good fit for the Mat Su, and the possibilities of launching an Angler Science program especially designed to meet Alaska’s stream science needs.

Kim Sollien, Great Land Trust

Landscape Scale Conservation: Caring for Salmon as a Shared Community Asset

In this presentation, GLT staff will highlight how they have used National Fish Habitat Action Plan funding to work with State and Borough land managers, ADF&G habitat biologists, Native Corporations and private landowners to educate community members about important salmon habitat in the Mat-Su Borough while stewarding existing conservation easements. They will also introduce our most current salmon habitat conservation project the "Settlers Bay Natural Area."



Ryan Viola

Salmon Conservation Ideas for the Classroom

In this presentation, Ryan will discuss how educators and parents can motivate people to perform salmon conservation efforts. There are three ways used to talk about salmon conservation in the classroom. First, the importance of cleaning up after your pet. A few chemical analysis numbers will be shared showing the difference between wild animal droppings and domesticated animal droppings that may be surprising. Second, different books and TV can share about recycling and conservation efforts. These include: *The Recycler's Handbook*, *Silent Spring*, *The Sea Around Us*, *Unstoppable*, *King of Fish*, and the PBS Nova special, *Running the Gauntlet*. Finally, the importance of enjoying the great outdoors is key to sharing salmon conservation.

Andrew Wizik, Cook Inlet Aquaculture Association

The Vital Role of Hatchery Programs in Conserving Susitna Salmon Stocks

Sockeye salmon stocks in the Susitna watershed are currently facing threats from invasive species such as northern pike, disease, warming stream temperatures, and human development. Although solutions to these problems may be difficult to obtain, hatcheries can provide a valuable role for preserving genetically distinct salmon stocks. In addition to the genetic preservation of salmon stocks, hatchery rearing of salmon eggs enables improved egg-to-fry survival over natural spawning, prevents predation by invasive northern pike from the fry-to-smolt stage, and may break the cycle of diseases by removing the offspring from waters containing diseased carcasses of expired adults. The overarching goal of these types of hatchery programs is to return the affected lakes back to sustainable natural production. Cook Inlet Aquaculture Association is currently working to restore the Shell Lake sockeye salmon stock that has experienced a precipitous decline over the past decade. In 2012 eggs from 35 pairs of Shell Lake sockeye salmon were reared at the Trail Lakes Hatchery. This was the last time natural spawning produced enough returning fish to allow for the taking of eggs. The 2012 Shell Lake egg collection resulted in the release of 80,000 sockeye salmon smolt back into Shell Lake in 2014 of which 20,000 smolt were able to emigrate. This year, 2016, marked the first adult sockeye return from the 2014 release, which is expected to continue in 2017 because some smolt may spend an additional year in the ocean. Another egg-take took place in 2016 from 33 spawning sockeye pairs and 90,067 eggs were collected. The resulting progeny are scheduled for release in 2018. This work is being done as part of a larger program that includes: invasive northern pike suppression via the use of gill nets; beaver dam monitoring to assist with adult escapement; adult and juvenile salmon enumeration; and a rigorous program of disease screening of adult salmon and smolt reared at Trail Lakes Hatchery. It has been documented that 14 of the 24 known sockeye salmon producing lakes in the Susitna drainage now contain invasive northern pike and many Susitna streams are also facing rising temperatures and other factors that further threaten salmon production. Hatcheries can play an integral role in preserving these stocks while also helping to preserve the genetic diversity of Susitna sockeye salmon.



Christine Woll, The Nature Conservancy

Salmon Habitat Mapping for Landscape-scale Planning in the Matanuska-Susitna Basin

Landscape-scale planning and prioritization for sustainable development, conservation, and restoration activities requires spatially explicit, landscape-scale information on the distribution and abundance of resources. Likewise, landscape-scale planning that seeks to prioritize protection of salmon habitats and salmon populations seeks spatially explicit information detailing the quality and quantity of these habitats and the distribution of fish abundance by species and life stage. To supplement the state of Alaska's Anadromous Waters Catalog (AWC) as a datasource for landscape-scale planning, we sought to better understand and describe the distribution and relative abundance of salmon and their habitats in the Matanuska-Susitna basin. This project compiled the best available spatially explicit information on salmon habitat and salmon abundance by species and life stage for the entire Mat-Su basin. It also seeks to improve understanding of juvenile salmon rearing habitats by using locally derived salmon-habitat relationships and a NetMap terrain model to propose a conceptual model describing potential distribution and abundance of coho, Chinook, and sockeye salmon rearing habitats across the Mat-Su Basin. Results showcase the diversity of habitats likely utilized by salmon throughout the basin, the abundance and locations of streams likely to produce anadromous fish that are currently not listed in the AWC, and research needs still required to properly document habitat use by all species and life stages. The results of this work have been published and being aligned with relevant, institutionalized datasets to support use of these new data in landscape-scale planning and prioritization efforts.



Keynote Speaker: Dr. Daniel Schindler



Dr. Daniel Schindler is the Harriet Bullitt Endowed Chair of Conservation in the School of Aquatic and Fishery Sciences at the University of Washington. Most of his research focuses on understanding the functioning of watersheds that support Pacific salmon in western Alaska, and the dynamics of fisheries that operate in these ecosystems. He is a principal investigator of the UW-Alaska Salmon Program that has studied salmon ecosystems in Alaska since the 1940s, and he spends several months of the year in the field in the Bristol Bay region. Schindler has been a recipient of the Distinguished Research Award from the UW College of Ocean and Fishery Sciences, the Carl R. Sullivan Fishery Conservation Award that was awarded to the UW-Alaska Salmon Program from the American Fisheries Society in 2012, and the Frank Rigler Award from the Canadian Society of Limnologists in 2015. He has provided service to a wide variety of governmental and non-governmental organizations, and serves on the editorial board of the journals *Ecology*, *Ecosystems*, *Climate Change Responses*, and *Facets*. He earned a B.Sc. with Honours from the University of British Columbia (1990), and a M.S. (1992) and Ph. D. (1995) from the University of Wisconsin-Madison. He was hired onto the faculty at the University of Washington in 1997 and teaches undergraduate and graduate students in Limnology, Aquatic Sciences, and Ecology.

Abstract

What Makes Alaska's Salmon Rivers Resilient?

Most of Alaska's rivers remain free-flowing. Absence of dams and other infrastructure allows rivers to meander across their floodplains, producing complex mosaics of aquatic habitat generated by erosion and deposition of sediments. It is increasingly recognized that fishes and wildlife actively exploit the variety of habitats in active floodplains and that their resilience to environmental change depends on their ability to access a wide variety of habitat options. Much like diversification in investment strategies provides more reliable returns than simplified portfolios, fish stocks using complex landscapes provide more reliable resources to wildlife and to fisheries than those inhabiting rivers that have been homogenized by human development. The experience from the lower 48 states demonstrates that development of floodplains depresses the flows of ecosystem services provided by rivers, and that restoration is exceedingly expensive and often not possible once infrastructure is in place. Assessments of the risks to the functioning of Alaska's rivers must embrace their complexity and dynamism to fully capture what might be lost under different development scenarios.



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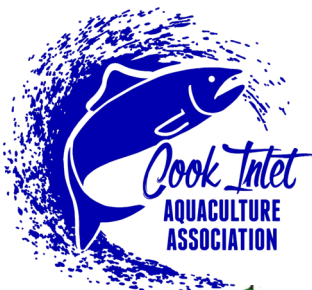
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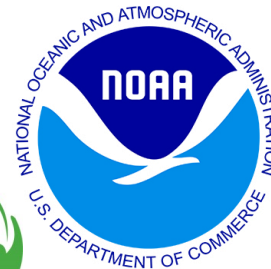


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AND OUR HOSTS:

**PALMER COMMUNITY CENTER (DEPOT),
TURKEY RED, AND RICK MILLER PRODUCTIONS**