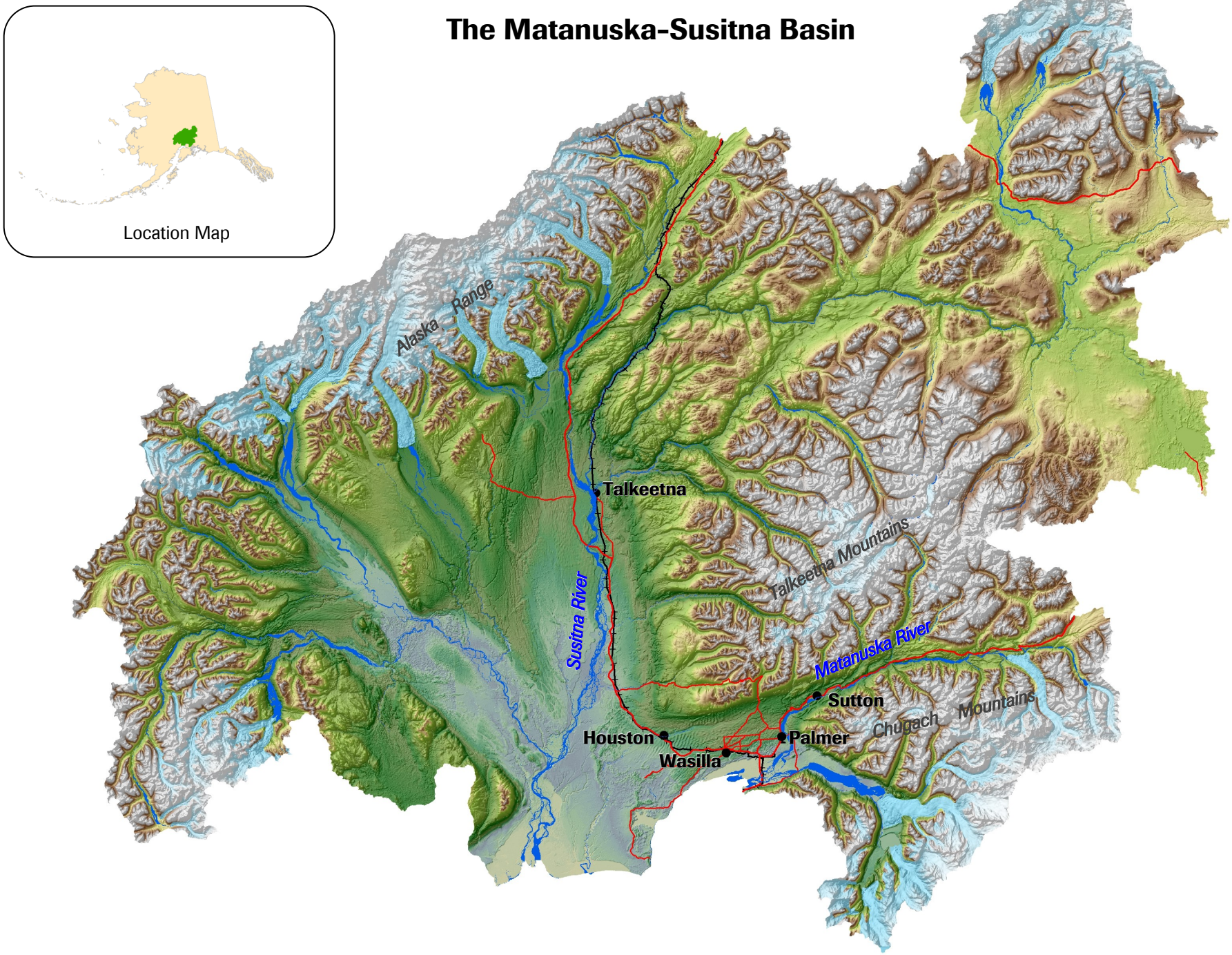
2014
MAT-SU SALMON
SCIENCE & CONSERVATION SYMPOSIUM

November 18-19
Palmer, Alaska

Mat-Su salmon PARTNERSHIP

The Matanuska-Susitna Basin



Welcome to the 7th annual

Mat-Su Salmon Science and Conservation Symposium

Hosted by the Mat-Su Basin Salmon Habitat Partnership

Thank you for attending the 7th annual Mat-Su Salmon Symposium. We're glad you're here to share and learn about the great project work in salmon and salmon habitat science, conservation, and restoration in the Mat-Su, to collaborate, and to participate in good discussion.

We're excited to share two internationally-recognized keynote speakers this year - Mary Colligan and Dr. Kate Myers. Ms. Colligan will be sharing a case study on Atlantic salmon recovery through local and international partnerships, while Dr. Myers will be talking about the life-history, ecology and potential threats to Mat-Su and Cook Inlet Chinook salmon in the marine environment. Although very different talks, both illustrate the importance of working together across salmon habitats and life stages in both fresh and marine waters to sustain wild salmon populations into the future.

The Partnership believes that thriving fish, healthy habitats and vibrant communities can co-exist in the Mat-Su Basin. Thank you for your part in keeping wild salmon abundant in the Mat-Su today and into the future.

Special thanks to the Symposium Planning Committee and to our Symposium supporters for making this event possible.

We hope you enjoy the Symposium,

Mat-Su Salmon Partnership Steering Committee:

Jessica Speed, Partnership Coordinator
Erika Ammann, NOAA Fisheries
Frankie Barker, Mat-Su Borough
Jeff Davis, Aquatic Restoration & Research Institute
Roger Harding, Alaska Department of Fish & Game
Bill Rice, US Fish & Wildlife Service
Liz Robinson, Envision Mat-Su
Corinne Smith, The Nature Conservancy
Arni Thomson, Alaska Salmon Alliance
Jessica Winnestaffer, Chickaloon Village Traditional Council

Learn more about the Partnership and Symposium at the Mat-Su Salmon Partnership website at www.matsusalmon.org.

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Symposium Planning Committee:

Jessica Speed, Partnership Coordinator
Amy O'Connor, Symposium Coordinator
Erika Ammann, NOAA Fisheries
Frankie Barker, Mat-Su Borough
Jon Gerken, U.S. Fish and Wildlife Service
Suzie Hayes, Alaska Dept. of Fish and Game
Catherine Inman, Mat-Su Conservation Services
Chuck Kaucic, Wasilla Soil and Water Conservation District
Katrina Mueller, U.S. Fish and Wildlife Service
Terry Nininger, Local resident
Kim Sollien, Great Land Trust
Jessica Winnestaffer, Chickaloon Village Traditional Council

Cover photos (clockwise from top): Great Land Trust, Katrina Mueller, and 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
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Great Land Trust
HDR Alaska, Inc
Knik River Watershed Group
Matanuska River Watershed Coalition
****Matanuska-Susitna Borough***
Mat-Su Anglers
Mat-Su Conservation Services
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
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
Wasilla Soil and Water Conservation District

Mat-Su salmon PARTNERSHIP

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.

November 18, 2014

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

8:30 Registration

9:00 Symposium Welcome

Kim Sollien (Mat-Su Salmon Habitat Partnership Outreach Committee member, Great Land Trust)

Larry DeVilbiss (Mayor, Mat-Su Borough)

9:30 Keynote Address: Atlantic Salmon Ecosystem Recovery: It Takes a Village, State, Country and World - Mary Colligan (US Fish & Wildlife Service)
Introduction by (Trent Liebich, US Fish & Wildlife Service)

10:15 Networking Break

10: 45 Mapping Mat-Su Waters & Salmon Habitat

Moderator: Matthew LaCroix (Environmental Protection Agency)

Mapping Alaska's Water - Kacy Krieger (University of Alaska Anchorage)

Creation of a Complete, Accurate, and Versatile GIS-based Stream Layer and Hydroscape for the Matanuska-Susitna Basins - Dan Miller (Terrain Works)

Systematic Validation of Modeled Hydrography in the Mat-Su Basin Using Field Reconnaissance and Image Interpretation to Meet USGS NHD Standards – Andrew Robertson (Saint Mary's University of Minnesota)

Salmon Habitat Mapping in the Mat-Su Basin - Christine Woll (The Nature Conservancy)

11:45 LUNCH

12:30 Collective & Individual Efforts of Partners

Moderator: Frankie Barker (Mat-Su Borough)

Mat-Su Basin Salmon Habitat Partnership Updates and Discussion – Jessica Speed (Mat-Su Basin Salmon Habitat Partnership) & Partnership Steering Committee

There Are "King Makers" Among Us - Kim Sollien (Great Land Trust)

1:30 Tidbits

Moderator: Terry Thompson (Alaska Department of Fish & Game)

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.

1:45 Break

2:00 Potential Impacts to Salmon

Moderator: Lisa Ka'aihue (Cook Inlet Aquaculture Association)

Elodea, Alaska's First Submersed Aquatic Invasive Plant Takes Root in the Mat-Su's Remote Alexander Lake - Heather Stewart (Alaska Department of Nature Resources)

Elodea on the Kenai Peninsula and What We're Doing About It - John Morton (US Fish & Wildlife Service)

Shell Lake Salmon and Pike - Andy Wizik (Cook Inlet Aquaculture Association)

ATV Salmon Stream Crossing Assessment Project: The Intersection of People & Salmon! - Chuck Kaucic (Wasilla Soil & Water Conservation District)

Clean Boating Outreach in Mat- Su Valley - Heather Leba (Cook Inletkeeper)

3:15 Poster Session

Introductions: Arni Thomson (Alaska Salmon Alliance)

Poster authors will be on hand to answer questions about their project, and are encouraged to stay with their posters for the first half hour of the evening social.

Off-road Vehicle Stream Crossing Assessments in Anadromous Fish Habitat, Matanuska-Susitna Borough, Alaska - Elizabeth (Libby) Benolkin, Casey Smith, and William Rice (US Fish & Wildlife Service)

2014 Matanuska-Susitna Basin Hydrographic Mapping Program: Field Validation of Elevation-derived Streams and Fish Passage Barriers - Louisa Branchflower (Palmer Soil & Water Conservation District)

Riparian Impact Evaluation of Priority Streams in Matanuska-Susitna Borough - Louisa Branchflower (Palmer Soil & Water Conservation District)

Monitoring Juvenile Salmon in Mat-Su Streams – Jeff Davis (Aquatic Restoration & Research Institute)

Elodea in High Priority Mat-Su Lakes - Emily Heale & Matthew Smukall (Cook Inlet Aquaculture Association)

Waterfront Riparian Area Restoration Challenges & Successes in the Mat Su – Chuck Kaucic (Wasilla Soil & Water Conservation District)

Funding Mechanisms for Restoring and Maintaining Healthy Ecosystems - Maya Kocian (Earth Economics)

I'm a King Maker: Video Project - Kim Sollien (Great Land Trust)

Outlying Landfill Waste: How Is It Affecting Our Environment? - WynnD Renzi (University of Alaska Anchorage)

Baby Salmon Live Here - Brian Winnestaffer (Chickaloon Village Traditional Council & Envision Mat-Su)

3:55 Announcements & Adjourn

Jessica Speed (Mat-Su Salmon Habitat Partnership)

4:00- Evening Social
6:00 Palmer Community Center (Depot), 610 S. Valley Way, Palmer
Come visit with your colleagues and our keynote speakers. The Mat-Su Salmon Partnership is providing appetizers from Turkey Red, and a cash bar will be available.

November 19, 2014

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

8:30 Registration

9:00 Symposium Welcome

Frankie Barker (Mat-Su Salmon Partnership Steering Committee Member, Mat-Su Borough)

DeLena Johnson (Mayor, City of Palmer)

9:15 Keynote Address: Life-history, Ecology, and Potential Threats to Mat-Su/Cook Inlet Chinook Salmon in the Marine Environment - Kate Myers (University of Washington (retired))

Introduction by (Erika Ammann, NOAA Fisheries)

10:00 Networking Break

10:30 Salmon Studies

Moderator: Jon Gerken (US Fish & Wildlife Service)

Chinook Salmon Research Initiative: Research To Gain A Better Understanding of the Causes for Chinook Salmon Declines in Alaska – Terry Thompson (Alaska Department of Fish & Game)

Distribution and Abundance of Susitna River Chinook Salmon 2012 and 2013 - Pete Cleary (Alaska Department of Fish & Game)

Management of Chinook Salmon Sport Fisheries in Northern Cook Inlet During a Period of Low Production - Sam Ivey (Alaska Department of Fish & Game)

Operation of a Resistance Board Weir for Counting Chinook Salmon on the Little Susitna River - Daryl Lescanec (Alaska Department of Fish & Game)

Abundance Estimates of Juvenile Sockeye Salmon Emigrants from Meadow Creek Alaska, 2013 - Kevin Foley (US Fish & Wildlife Service)

11:45 LUNCH

12:45 Interactive Session with Mary Colligan (US Fish & Wildlife Service) **and Kate Myers** (University of Washington (retired))

Moderator: David Wigglesworth (US Fish & Wildlife Service)

1:45 Water Temperature Trends

Moderator: Catherine Inman (Mat-Su Conservation Services)

Where we are and Where we Need to be to Understand Regional Water Temperature Trends: AKOATS and Minimum Data Collecting Standards - Marcus Geist (University of Alaska Anchorage) & Sue Mauger (Cook Inletkeeper)

Cold Water Mapping and Salmon Habitat Characterization Guide Land Conservation and Restoration in Cook Inlet Watersheds - Sue Mauger (Cook Inletkeeper)

2:15 Networking Break

2:30 Tidbits

Moderator: Polly Bass (University of Alaska Anchorage, Matanuska-Susitna Campus)

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 Susitna Studies & Resilience of Salmon

Moderator: Roger Harding (Alaska Department of Fish & Game)

Ecological Risk Assessment for Large-scale Hydropower – Corinne Smith (The Nature Conservancy)

An Update on Fish and Aquatic Studies for Susitna-Watana Hydroelectric Project – MaryLouise Keefe (R2 Resource Consultants, Inc.)

Susitna-Watana Hydroelectric Study Program: Salmon Escapement Update - Bryan Nass (LGL Alaska Research Associates)

Salmon Resilience in the Face of Natural and Human-caused Catastrophes **–** John O'Brien (ERM Alaska, Inc.)

3:45 Conclusions

Jeff Davis (Aquatic Restoration & Research Institute)

4:00 Adjourn

Presentation and Poster* Abstracts

Arranged in alphabetical order by presenter last name

Elizabeth (Libby) Benolkin, U.S. Fish and Wildlife Service
Casey Smith, U.S. Fish and Wildlife Service
William Rice, U.S. Fish and Wildlife Service

**Off-Road Vehicle Stream Crossing Assessments in Anadromous Fish Habitat, Matanuska-Susitna Borough, Alaska*

The Matanuska and Susitna (Mat-Su) river watersheds meet freshwater life history needs of all five species of Pacific salmon (*Oncorhynchus spp.)* and support populations of other salmonids including rainbow trout (*O. mykiss)*, and Dolly Varden (*Salvelinus malma).* The Mat-Su is also one of the most rapidly developing areas of the state, and land managers have concerns that intense recreational use in this area could impact salmon production. The objectives of the project were to map off-road vehicle (ORV) trails, develop a simple method to assess and rank degradation levels at stream crossings, and evaluate the effectiveness of this methodology and its potential to inform future habitat restoration projects. The spatial distribution of ORV trails were assessed using satellite imagery, photographic flights, and on-the-ground surveys to verify locations where ORV trails intersected with salmon bearing waters. At each ORV stream crossing, we collected basic characteristics of the stream crossing using evaluation methods, a data dictionary, and ranking weights developed by modifying existing methods for trail condition assessments. Seven attributes of the trail stream crossing (Track type, Stream bank impact width, Trail impact width, Trail Surface/Substrate, Rutting, Mud/Muck, and Trail grade) were recorded and assigned a ranking weight, which was then used to rank each crossing relative to each other based on the level of degradation. Over 200 km of ORV trails were mapped, and thirteen ORV trail stream crossings were assessed for degradation level and ranked in 2012. All crossings were degraded to some degree and most ranked as "extremely degraded". This methodology provided a simple and efficient assessment of ORV trail impacts at simple (2 entry point) stream crossings, and may be applicable elsewhere in Alaska where ORV use has degraded fish habitat. The method will be further evaluated for application in complex (braided) trail systems. Continued investigations will provide information needed to determine how these stream crossing assessments may be applicable in effectively prioritizing future habitat restoration projects.

Louisa Branchflower, Palmer Soil and Water Conservation District

**2014 Matanuska-Susitna Basin Hydrographic Mapping Program: Field Validation of Elevation-derived Streams and Fish Passage Barriers*

During the summer of 2014, Palmer Soil and Water Conservation District assisted with the field validation phase of the Mat-Su Hydrographic Mapping Program. The Mapping Program, coordinated by The Nature Conservancy and created by Terrain Works contracting service, utilized the 2011 Mat-Su LiDAR and IfSAR elevation data to create an elevation-derived, synthetic network of hydrologic flowlines, or streams. The validation phase consists of a third party, independent photogrammetric review of modeled streams (done by contractors at St. Mary's University of Minnesota) coupled with field observations (by Palmer Soil and Water Conservation District staff) which ensure that modeled streams best reflect actual ground conditions. Once validated through these processes, the Mat-Su stream network will be conflated to the USGS NHD and AK Hydro dataset.

Louisa Branchflower, Palmer Soil and Water Conservation District

**Riparian Impact Evaluation of Priority Streams in Matanuska-Susitna Borough*

The Matanuska-Susitna Borough's large land base contains a dense network of salmon-bearing waters. Twenty-four of these salmon-bearing water bodies have been identified by The Great Land Trust with help from experts around the area with an additional 11 streams added in 2013 including: Goose Lake, Horseshoe Lake, Cache Creek, Goose Creek, Lake Creek, Sheep Creek, Sunshine Creek, Susitna River Channel, Sloughs, & Clearwater Side Channels, Trapper Creek, Willow Creek and Jim Creek. Palmer Soil and Water Conservation District has been working with the U.S. Fish and Wildlife Service and project partners to create a geographically accurate stream profile dataset of these high priority water bodies as well as create a dataset of impacted riparian habitat on these water bodies. Data incorporated into the dataset consists of existing field-verified stream data from the past few years as well as from using aerial imagery collected by the Mat Su Borough in 2011 and 2012. The purpose of these datasets is to develop a comprehensive map showing impacted vs. non-impacted riparian areas along streams and provide basic descriptive statistics and baseline data that can be used to track performance measures of partners through the Mat-Su Salmon Habitat Partnership Strategic Action Plan. One of the goals of this strategic action plan is to restore 5% of all impacted priority riparian habitat in priority streams by 2018.

Pete Cleary, Alaska Department of Fish and Game

Distribution and Abundance of Susitna River Chinook Salmon, 2012 and 2013

Susitna River Chinook salmon assessment projects were conducted during May and June in 2012 and 2013. In 2012, a distribution study was completed while both distribution and mark-recapture studies were conducted in 2013. In 2012 and 2013, at river mile 30, Chinook were captured and radio tagged using gill nets and two fish wheels and tracked to final spawning sites. In 2012, 336 radio tags were deployed from two fish wheels and 104 were deployed using gill nets. In 2013, 553 radio tags were deployed from fish wheels and 118 from gill nets. Radio tag mark-recapture data was collected in 2013 via radio tag stationary receivers and escapement counts at the Deshka River weir, Montana Creek weir and at a sonar site on middle fork of the Chulitna River. The 2013 Chinook abundance estimate was 89,463 (SE 9,523; (CI): 77,700 – 114,954) for the Mainstem Susitna River drainage. Susitna River Chinook spawning distribution maps will be presented

Jeff Davis, Aquatic Restoration and Research Institute

**Monitoring Juvenile Salmon in Mat-Su Streams*

The Aquatic Restoration and Research Institute, with Mat-Su Salmon Habitat Partnership support, has been monitoring the relative abundance of juvenile Chinook and coho salmon in area streams. Juvenile salmon monitoring began in 2008 and was conducted consistently in 2010-2011 and 2013-2014 at 13 stream locations that represent three stream types: wetland streams, upland streams, and lake-stream systems in urban and rural settings. Concurrent measures of water quality parameters have been collected to evaluate trends in juvenile salmon relative abundance. Wetland and lake-stream systems are warmer with lower concentrations of dissolved oxygen and pH, while upland streams are cooler and saturated with dissolved oxygen. Coho salmon are present in all stream types, with higher relative abundance in wetland streams. Juvenile coho salmon fork lengths are positively related to maximum stream temperatures. Chinook salmon are generally absent from the wetland streams and lake-stream systems where sampling occurred. No coho salmon have been captured recently in Nancy Creek at the outlet of Nancy Lake, most likely due to an increase in Northern Pike. The abundance of Chinook and coho salmon has generally decreased at all sampling locations, with the lowest numbers in 2013

Kevin Foley, US Fish and Wildlife Service

Abundance Estimates of Juvenile Sockeye Salmon Emigrants from Meadow Creek, Alaska, 2013

Sockeye salmon *Oncorhynchus nerka* require a diversity of habitat types for completion of their various freshwater life stages. Maintaining connectivity to sensitive areas is of vital importance for the long term stewardship of the species within the Matanuska-Susitna basin. At present, approximately 75 culvert road crossings occur within the waterways of the Meadow Creek drainage with 80% assessed as impediments to juvenile salmonid migration. Restoration activities to improve fish passage have been ongoing for the past 15 years; however, current fish passage engineering is designed with juvenile coho salmon O kisutch as the target species. The goal of this project was to evaluate the importance of the Meadow Creek drainage as a rearing and overwintering location for juvenile sockeye salmon. A total of 8,184 juvenile sockeye salmon were captured in the fyke net with fry comprising 89% of the total sockeye salmon catch. Two distinct size classes among juvenile sockeye salmon were observed; 29–54 mm and 69–124 mm, suggesting the presence of two sockeye salmon cohorts within the Meadow Creek drainage. We found little evidence to suggest that Meadow Creek and its tributaries support significant numbers of summer stream rearing forms of sockeye salmon or smolt production. Fish passage designs of restoration activities in the Meadow Creek drainage need not further consider sockeye salmon as fish passage design criteria are adequate and changes to include sockeye salmon are not warranted at this time.

Marcus Geist, Alaska Natural Heritage Program
Sue Mauger, Cook Inletkeeper

Where We Are and Where We Need To Be To Understand Regional Water Temperature Trends: AKOATS and Minimum Data Collecting Standards.

As Alaskans continue to feel the impacts of a changing climate, the need for resource managers to understand how these changes will alter aquatic systems and fisheries resources grows. Water temperature data collection has increased in recent years to begin to fill our gaps in knowledge about current thermal profiles. Many entities are collecting temperature data for a variety of purposes to meet project or agency specific goals. AKOATS, the Alaska Online Aquatic Temperature Site, is a comprehensive statewide inventory of current (n=413, n=12 in MatSu Basin) and historic (n=398, n=71 in MatSu Basin) continuous monitoring locations for stream and lake temperature using a common set of attributes. Data were gathered from fish biologists, hydrologists, water resource managers, ecologists, and engineers. The inventory is fully accessible via an online, interactive map or it can be viewed directly within commercial GIS software. Statewide interest in thermal patterns and increasing data collection efforts provides Alaska's scientific and resource managing community an opportunity to meet broader regional-scale data needs. A basic set of stream temperature monitoring standards are needed for Alaskans to begin building robust datasets suitable for regional analyses. By identifying minimum data standards, our objective is to encourage rapid, but structured, growth in comparable stream temperature monitoring efforts in Alaska that will be used to understand current and future trends in thermal regimes. These trends will inform efforts to develop strategies for maintaining ecosystem resilience. This work is supported through a grant from the US Fish and Wildlife Service on behalf of the Western Alaska Landscape Conservation Cooperative (WALCC).

Emily Heale, Cook Inlet Aquaculure Association
Matthew Smukall, Cook Inlet Aquaculture Association

**Elodea Surveys of High Priority Lakes in the Mat-Su Valley*

In 2014 Cook Inlet Aquaculture surveyed for the presence of Elodea in high priority lakes in the Matanuska-Susitna Valley. This project was funded by a grant from the Mat-Su Salmon Habitat Partnership and National Fish Habitat Partnership. Surveys were conducted at Judd, Chelatna, Larson, Whiskey, Hewitt, Shell, Redshirt, Nancy, Caswell, Big, and Wasilla lakes. No incidences of Elodea were found and follow-up surveys at the same lakes will be conducted in the summer of 2015.

Sam Ivey, Alaska Department of Fish and Game

Management of Chinook Salmon Sport Fisheries in Northern Cook Inlet During a Period of Low Production

Runs of Chinook salmon in Northern Cook Inlet (NCI) have been depressed since 2007. Fisheries are managed to achieve escapement goals; escapement goals are expressed as a range of escapements that will provide the greatest potential for achieving sustainable yields in the future. Currently 17 goals exist within NCI; 16 goals are assessed by post season aerial survey and 1 goal is weir based. To address the Chinook salmon downturn, sport fisheries were restricted or closed in regulation by the Alaska Board of Fish in 2011 to reduce harvest. These changes were only partially effective and further reductions were warranted in order to achieve desired escapement levels in subsequent years. Since 2011, the department has developed management strategies, implemented through Emergency Order (EO) authority, to reduce harvest by as much as 80% across the Susitna drainage in order to attain a majority of escapement goals while maximizing sport fishing opportunity throughout the duration of the season. In previous years, maximization of opportunity had become a priority for stakeholders, which in turn led to crafting management strategies that took into account identifying sport fishing areas that could support harvest, areas that might only support catch-and-release, and adjustments to offset anticipated shifts in angler effort between areas in order to provide for a full fishing season. Results of these efforts suggest continuing with a conservative by-area approach to fisheries management.

Chuck Kaucic, Wasilla Soil and Water Conservation District

**Waterfront Riparian Area Restoration Challenges/Successes in the Mat Su*

The session will review the various riparian areas restored by the District crew this past summer. Despite working in the field on restoration projects since 1997, there are unexpected nuances that still occur! Supplementing project site photos/descriptions, highlighted challenges will include: partnering with private property owners & volunteers, lake/boat wave action pre/post construction, waterfowl, logistics, local government contacts/assistance, & follow up results

Chuck Kaucic, Wasilla Soil and Water Conservation District

ATV Salmon Stream Crossing Assessment Project: The Intersection of People & Salmon!

Solutions for accommodating ATV Trail crossings at salmon streams is a long-term Partnership challenge. The session will introduce project intent & review the various sites visited in 2014. Primary focus: user patterns, site conditions & salmon. The technicalities of current popular machines, economics & rider perspectives will enable participants to better understand the challenges of providing land managers with practical solutions that are intended to support best management practices. Collaborative efforts with government & non-profit partners to reach out to riders will be examined. 2015 plans will be unveiled.

Dr. Mary Louise Keefe, R2 Resource Consultants, Inc.

An Update on Fish and Aquatic Studies for Susitna-Watana Hydroelectric Project

Three field seasons have been completed as of October 2014. Fish surveys in the Upper River have documented over 15,000 fish from nine species. In 2013, surveys occurred at 150 sites representative of 12 tributaries and approximately 47 miles of the Upper Susitna River; 2014 added 52 sites to increase sampling of rare habitats. Small groups of Chinook salmon were found in the Oshetna River, Black River, and Kosina Creek. Arctic grayling and sculpin were the most widely distributed and abundant species in the Upper River. Middle River surveys were extensive in 2013, with additional sampling in 2014 on private property that was previously inaccessible. Over 45,000 fish from 16 species were documented from 184 sites covering more than 85 miles of the Middle Susitna River. Juvenile coho salmon, threespine stickleback, adult pink salmon, and sculpin were the most abundant. The 2013 surveys in the Lower River documented over 11,900 fish at 44 sites across 70.1 miles of river. Threespine stickleback was the most abundant species. Northern pike were observed only in one Lower River reach (PRM 32.3-PRM 44.6). Overall 7,000 fish were tagged for biotelemetry studies of fish movement in all river segments. Mapping of aquatic habitats was completed in 2014 and covered the extent of the Project Area. Habitats were mapped to the macrohabitat level (side slough, side channel), and where feasible, to mesohabitat type (pool, riffle, run). Field surveys ground-truthed remote mapping and further characterized habitats.

The River Productivity study sampled, at 20 sites across 5 stations, algae, periphyton, and benthic and drift macroinvertebrates, and organic matter. In addition, 1400+ samples were collected for trophic and fish diet models. A total of 271 Hess, 70 petite Ponar grab, 92 drift net, and 85 plankton tow samples were collected and submitted for taxonomy identification. Preliminary results indicated differences between main channel/side channel habitats versus tributary mouths, side sloughs, and upland sloughs.

Maya Kocian, Earth Economics

**Funding Mechanisms for Restoring and Maintaining Healthy Ecosystems*

The public value and benefits of restoring the health of a landscape provide a strong economic justification for expenditures to secure biodiversity and enhance natural capital throughout a region. A number of these services are provisioned at the watershed level and are key components to economic development and to securing high quality of life for those within the watershed, as well as people outside the watershed. It is in the interest of all beneficiaries of watershed services, such as clean and abundant water supply, healthy food, energy, raw materials, and recreation and tourism to maintain the production of these services through sustainable management practices.

In 2013 Earth Economics estimated the value of the Mat-Su Basin's community assets to be between $20 billion and $51 billion each year. Improving this sizable asset increases the cultural, economic, and ecological benefits the Watershed provides, justifying tens of millions of dollars in ongoing investment. This investment is required to restore salmonids, as well as ensure and enhance the continued provision of other valuable ecosystem services. Achieving a high quality of life for present and future generations entails attaining a prosperous economy, social equity, tribal cultural values and objectives, and environmental sustainability across the region. This can only be achieved if ecosystems—which house people, an economy and natural systems—are healthy, and sufficient funding is provided for restoration and maintenance. This poster will highlight possible funding mechanisms for community assets within the Mat-Su Basin.

Kacy Krieger, University of Alaska Anchorage

Mapping Alaska's Water

Current, accurate and useful mapped water resources are valuable tools used by resource managers, scientists and the public for analysis, mapping and recreation. However, many of Alaska's water resources were originally mapped 50 years ago. Since then, landscapes have changed and mapping technologies improved, but a lack of statewide coordination has led to numerous disparate, diverging and error-prone hydrography datasets. Federal and State agencies, recognizing the need for a common and accurate hydrography dataset, have come together to coordinate and update Alaska's hydrography by forming the Alaska Hydrography Technical Working Group. This committee adopted the Alaska Hydrography Database, or AK Hydro, as the stewardship model best suited to address local needs and generate hydrography updates for the National Hydrography Database. AK Hydro is a regional, collaborative stewardship model that uses familiar GIS tools to edit, maintain and improve hydrography data in areas where partners are most knowledgeable and have the greatest investment. Updated hydrography from AK Hydro are passed on to the NHD while agency specific attributes remain linked to the NHD in the AK Hydro database. The simplified workflow means that a diverse group of GIS users throughout Alaska have the ability to maintain and update an authoritative hydrography dataset while users benefit from current and accurate hydrography data that meets their needs.

Heather Leba, Cook Inletkeeper

Clean Boating Outreach in the Mat-Su Valley

Since 2010, Cook Inletkeeper has been involved in a program designed to educate boaters in the Mat-Su Valley about the importance of clean boating practices. Staff and volunteers visit boat launches at Big Lake, the Little Susitna River, and Deshka Landing, locations popular for sport fishing and recreational boating. Big Lake was listed by DEC as an impaired water body in 2006, and since then, the Little Susitna and Deshka Rivers have experienced hydrocarbon pollution and are at risk for being listed. The main source of these pollutants is older two-stroke carbureted boat motors. Boaters are asked to participate in voluntary surveys and are given a clean boating kit, which consists of educational materials, stickers, floating key chains, and free oil absorbent pads or bilge pillows. We also reach boaters through radio public service announcements, local business partners, and print media. Results of this summer's surveys indicate that many boaters originate from Anchorage and most are aware that these water bodies are impaired or at risk of impairment. In order to reduce hydrocarbon pollution, we are developing a framework for a two-stroke engine buy-back program to remove those older engines from the water.

Daryl Lescanec, Alaska Department of Fish and Game

Operation of a Resistance Board Weir for Counting Chinook Salmon on the Little Susitna River

The Alaska Department of Fish and Game began monitoring Chinook salmon (*Oncorhynchus tshawytscha*) escapements on the Little Susitna River by helicopter survey over spawning salmon in 1979. Aerial counts were eventually used to establish an escapement goal for management of the fishery; currently, the aerial based sustainable escapement goal (SEG) of 900-1,800 fish, established in 2002, is used for management. The first floating resistor board weir in Alaska was developed by the Department for use on the Little Susitna River in the late 1980s. This design is more adaptable to changing river conditions and operation within high use sport fisheries than other weir designs. The weir was used to successfully count the Chinook escapement in 1988, 1989, 1994 and 1995 at river mile (rm) 32.5. Though aerial counts can be used as an index of spawning escapement and assessing achievement of the SEG, weir counts represent the actual escapement. Starting in 2013, the Department again installed a floating resistor board weir at river mile 32.5 on the Little Susitna River to count Chinook salmon. Successful operation of the weir over a number of seasons to count Chinook salmon and collect biological data could lead to the development of the spawner-recruitment relationship and a weir-based SEG over time. Its immediate use provides the Department a tool for in-season management of the fishery.

Sue Mauger, Cook Inletkeeper

Cold Water Mapping and Salmon Habitat Characterization Guide Land Conservation and Restoration in Cook Inlet Watersheds

As stream temperatures rise in the years ahead, cold water refuges – areas within a stream which are persistently colder than adjacent areas during the summer – will be critical to the survival and persistence of salmonids and other fish species. Recent advances in remote sensing techniques allow researchers to map cold water variation within stream channels using thermal infrared sensors. These high resolution maps can then be integrated with reach-scale salmon habitat and density information to create a picture of current fish use as well as potential future fish use. In numerous Cook Inlet watersheds, we are using these tools to assist land managers as they seek to conserve and/or restore land for the benefit of salmon. On the lower Kenai Peninsula, we have identified key cold-water habitats to guide parcel-level prioritization for Kachemak Heritage Land Trust based on thermal imagery and output from the Anchor River RIPPLE model. On the Ninilchik River, we have identified one degraded cold-water habitat that State Parks will restore in 2015. In the Mat-Su, results from extensive juvenile salmon studies in the Big Lake basin by USWFS are being integrated with thermal imagery interpretation to create a parcel level tool for Great Land Trust. By linking remotely-derived and field data for conservation planning, we aim to improve landscape-scale resilience for salmon in Southcentral Alaska.

Dan Miller, Terrain Works

Creation of a Complete, Accurate, and Versatile GIS-based Stream Layer and Hydroscape for the Matanuska-Susitna Basins

A key component for land-use planning, whether the focus is on utilization, protection, or restoration of natural resources, is accurate and complete mapping of the river systems, including in the Mat Su basin. The recent availability of high-resolution elevation data for the Mat Su Basin provides the foundation for creating a complete and accurate as possible synthetic channel network based on flow paths inferred from the high-resolution DEMs. The mapped channel network must also meet requirements for incorporation into the NHD. In addition to an accurate and complete stream layer, we add functionality in the form of a virtual riverine-terrestrial environment, with features and functions reflective of real watersheds (a 'digital hydroscape'). This integrated system (that can be coupled to a set of tools, e.g., NetMap) can support hydrologic and ecological applications including channel classification, fish habitat potential, flood plain extent, sediment sources, organic debris sources, and everything else that potentially affects or helps characterize the resources of interest and human interactions. We will show the steps involved in creating the synthetic network and hydroscape: the data used, the algorithms employed for estimating channel extent and location, the data structure that can meet all requirements, and the methods for validating and correcting mapped channel locations.

John Morton, US Fish & Wildlife Service

Elodea on the Kenai Peninsula and What We're Doing About It

Elodea canadensis x nuttallii was first detected on the Kenai Peninsula in September 2012. By June 2014, the first of four planned herbicide treatments over 3 years was applied in Stormy, Daniels and Beck Lakes, the only three water bodies known to be infested with elodea on the peninsula. The goal of this treatment program is to eradicate elodea from the peninsula. Here we present how partners in the Kenai Peninsula Cooperative Weed Management Area quickly coalesced around this threat, conducted additional surveys at coarse- and fine-scales, identified the appropriate treatments (fluridone, diquat), developed an Integrated Pest Management Plan, raised funds ($800K), secured permits, garnered public support, and implemented prescriptions. Preliminary effects of the first herbicide application on elodea distribution and abundance are also presented. We believe our approach is a model for others in the State who are trying to respond to early infestations of elodea.

Brian Nass, LGL Alaska Research Associates

Susitna-Watana Hydroelectric Study Program: Salmon Escapement Update

A third field season for the Salmon Escapement Study was completed in 2014. Chinook salmon continue to be the only salmon species tracked upstream of passage impediment 3 at the top of Devils Canyon. Seven tagged Chinook salmon had destinations upstream of the proposed dam site during the study, with 6 in 2012, 0 in 2013, and 1 in 2014. None of the 2,100 Chinook salmon radio-tagged in the Lower River were tracked into the Upper River. Each year, tagged Chinook salmon were documented moving upstream into Devil's Canyon and then turning around and swimming downstream into Middle River habitats. This study documented the timing and flows at the time when fish moved upstream of Devils Canyon (14-19 kcfs). Sonar was operated at the proposed Watana dam site from July 6 to August 22, 2014. A total of 24 Chinook salmon targets were recorded making a directed migration upstream of the proposed dam site. Aerial spawning surveys were also flown annually. Peak counts were consistent in the mainstem Middle River habitats over the 3 seasons, but were variable in the Upper River (ranging from 0 to 16 fish). A majority of tagged salmon, from all species, were tracked to spawning locations within the Middle and Lower River. The percentage of tagged fish spawning in tributaries varied from 21 to 99 percent depending on species and river segment. Sockeye salmon in the Middle River had the lowest proportion of tributary spawners at 21 and 48 % in 2012 and 2013, respectively. On the other hand, more than 97% of the tagged Chinook salmon in the Lower River, and more than 90% of the tagged Chinook salmon in the Middle River, consistently spawned in tributaries. Potential mainstem river spawning locations were documented for all species. Major spawning tributaries included the Yentna, Deshka, Chulitna, Talkeetna, and Indian rivers, as well as Willow, Montana, Fourth of July, Lane and Portage Creeks. All spawning locations were similar to those observed in the 1980s.

John O'Brien, ERM Alaska

Salmon Resilience In The Face of Natural and Human-Caused Catastrophes

On May 18, 1980 the Mount St. Helens eruption buried Spirit Lake and seriously impacted the Lewis and Toutle Rivers and other fish-bearing streams. On April 4 2014 a major mudslide damned a portion of the North Fork of the Stillaguamish River near the town of Oso in the North Cascade region of Washington State. On August 4, 2014 a large tailings pond dam breached at the Mt. Polley mine in the Cariboo region of British Columbia releasing 10 cubic meters of water and 4.5 million cubic feet of slurry into Polley Lake and severely impacting Hazeltine Creek and the formerly pristine and deep Quesnal Lake. The characteristics of salmon and other fish species that allow them to persist in the waters affected by these catastrophes in spite of widespread environmental devastation are discussed. The recovery timeline of the Mount St. Helens-affected watersheds is examined for insights into the anticipated recovery timelines following the more recent catastrophes.

WynnD Renzi, University of Alaska Anchorage, Mat-Su Campus

*Outlying Landfill Waste: How Is It Affecting Our Environment?

It is known that debris is blown outside the confines of landfills creating a deposit of unregulated refuse. It is not known how many meters and hectares of debris exist in individual locations. When plastics are left to deteriorate, they form leachates that enter the soil, surface and ground water. It is not known if the affected areas adjacent to the landfills contain pollutants that leach into the aquifer. There are 217 landfills in Alaska, including those in the Mat Su Borough. There is little published data or information available on the affect of waste outside the confines of landfills, locally or nationally, on the local biota, habitats and related natural resources. Awareness is the first step. This project proposes to objectively investigate the extent of plastic beyond the limit of landfills and to ultimately propose means of preventing and mitigating the related problems.

Andrew Roberston, Saint Mary's University of Minnesota

Systematic Validation of Modeled Hydrography in the Mat-Su Basin Using Field Reconnaissance and Image Interpretation to Meet USGS NHD Standards.

Encompassing over 20,000 lakes and thousands of miles of streams and rivers, the Matanuska-Susitna basin is a community rich in aquatic resources. However, current mapping of surface hydrography and associated floodplains and watersheds is inadequate to support critical needs in community and development planning, flood mapping and public safety as well as recreational, commercial and subsistence use of Mat-Su freshwater resources.In recent years, significant investments have been made in the Mat-Su basin to secure high resolution topographical data and aerial photography, largely through the Mat-Su LiDAR and Orthoimagery project and the Alaska Statewide Digital Mapping Initiative. These projects make available, for the first time, highly detailed topographic information which can be used to map hydrogeomorphic conditions at a fine scale over the 25,500 square mile basin. In the fall of 2013, The Nature Conservancy initiated a hydrographic mapping and analysis program in the Mat-Su basin using these newly available data to map all lakes, rivers and streams to a level of quality suitable for ingestion into the USGS National Hydrography Database. By meeting federal standards, this mapping program is available for use by government agencies, private and public organizations to support decisions which affect Mat-Su freshwater resources. The Mat-Su hydrographic mapping program consists of two phases; a modeling phase and a validation phase. The modeling phase employs newly-available LiDAR and IfSAR elevation data to create an elevation-derived, synthetic network of hydrologic flowlines, or streams. The validation phase consists of a photogrammetric review of modeled streams coupled with field observations to ensure that the hydrography best reflect actual ground conditions. Once validated, the Mat-Su stream network is conflated to the NHD and AK Hydro data schemas following USGS specifications.

Corinne Smith, The Nature Conservancy

Ecological Risk Assessment for Large-scale Hydropower

The State of Alaska is in the licensing process to build a 735-foot dam on the Susitna River. The decisions made about the design and operation of the dam, and whether or not to build it, will set precedence in Alaska for how large-scale hydropower is implemented in large, glacially-fed, braided rivers with largely intact habitat and large runs of Pacific salmon in light of climate change. The Nature Conservancy is developing an ecological risk assessment (ERA) for wild salmon systems for large-scale hydropower. The ERA methodology has become an essential tool for evaluating the likelihood that adverse ecological effects may occur as a result of exposure to one or more stressors. The ERA will articulate relationships among potential risk factors, key ecological attributes of salmon habitat, and life stages of five species of Pacific salmon. Key ecological attributes include water quality, water quantity, habitat structure, and connectivity throughout the watershed from ocean to headwaters and into tributaries. The risk factors include direct loss or alteration of habitat; alteration of surface and groundwater water; changes in ice or sediment processes; changes to the daily, seasonal or inter-annual flow and thermal regimes; impacts to trophic chain; changes in migration cues; and alteration of habitat due to changes in flows and ice. The ERA will attempt to characterize the potential scope, timing, severity, irreversibility, duration and likelihood of impacts to salmon and their habitats associated with each risk factor individually and cumulatively. The ERA will also describe potential for cumulative effects, including those due to climate change. The ERA is being developed in two phases. Phase 1, completed in spring 2014, provides a preliminary framework for the risk assessment. Phase 2 will be a case study of the Susitna-Watana project.

Kim Sollien, Great Land Trust

**I'm a King Maker - Video Project*

For this session we are proposing to take 30 secons iphone videos of participants telling their king maker story to highlight the diversity of actions people taking to support sustainable salmon populations in the Mat-Su. We will invite people to sign up to give their story throughout the first day and do the filming during the poster session, social hour and during lunch on the second day.

Kim Sollien, Great Land Trust

There are "King Makers" Among Us

This light hearted presentation will crown five or more individual community members, landowners, business owners and agency staff as *King Makers* to acknowledge and celebrate the actions they have taken to enhance, restore, or conserve salmon populations and their habitat in the Mat-Su.

Jessica Speed, Mat-Su Basin Salmon Habitat Partnership

Mat-Su Basin Salmon Habitat Partnership Updates and Discussion

As the one time per year we come together as a Partnership, the Symposium offers an opportunity to provide an update on some of the recent work and activity of the Partnership and to talk with the Partnership Steering Committee. Formed in 2005 to address increasing impacts on salmon habitat from human use and development, the Partnership has brought together a diverse group of 55 organizations and individuals. All are bound by the belief that thriving fish, healthy habitats and vibrant communities can co-exist in the Mat-Su. We are part of a broader network of fish habitat partnerships across the U.S. and one of four Alaska partnerships. Developed by a wide range of interests, our efforts are guided by a strategic action plan, which the Partnership recently updated. Key updates include four new threats: aquatic invasive species, large-scale industrial development, off-road recreational vehicles, and climate change; a new organizational section describing governance, operations and communications; and creation of annual metrics that track status of Mat-Su habitat, organizational health, and progress toward achieving partnership goals. The Partnership recently formed a Science and Data Committee to support the Partnership's science needs including identification of Index Watersheds which will be areas for long-term, standardized study. National Fish Habitat Partnership funds have been used since 2006 to support local projects and are now part of a competitive process. The Outreach Committee completed a Partnership Progress report that reflects on the first nine years of the Partnership looking at science, conservation, restoration and the human side of our efforts. The Mat-Su Salmon Symposium highlights these many accomplishments in the efforts to conserve and restore salmon habitat and celebrates how partnership makes us all more effective in those endeavors.

Heather Stewart, Alaska Department of Natural Resources

Elodea, Alaska's First Submersed Aquatic Invasive Plant Takes Root in the Mat-Su's Remote Alexander Lake

Alaska is valued for its natural resources, pristine environment, and outdoor activities. However, it is not immune to invasive species despite its geographic isolation, relatively cold climate and extensive undeveloped landscape. *Elodea spp.* is Alaska's first submerged aquatic invasive plant species. In optimal growing conditions, *Elodea spp.* is able to form dense single-species stands and becomes a dominant species in water up to 2m deep, while reducing temperature and oxygen concentrations, and increasing sedimentation. Studies have shown that *Elodea spp.'s* aggressive growth and vegetative propagation is responsible for the loss of aquatic habitat biodiversity, displacing rare and aquatic species, and degrading salmon spawning grounds. The first documented occurrence of *Elodea spp.* in Alaska was found near Cordova within Eyak Lake in 1982. In 2009, *Elodea spp.* was found near Fairbanks in the Chena Slough, and in 2010 it was discovered thriving in three of Anchorage's lakes. In 2011 it was discovered in Stormy Lake on the Kenai Peninsula and later in Daniels and Beck Lakes. It has since been discovered in a total of 18 lakes, rivers and sloughs in both populated and remote areas throughout the State. For the first time since its discovery in Alaska, *Elodea spp.* has been found in the Mat-Su in remote Alexander Lake. In September of 2014, a collaborative Alaska Department of Fish &Game and Department of Natural Resources aquatic vegetation survey of Alexander Lake suggests that the *Elodea spp.* infestation is isolated and could easily become eradicated with rapid response management. Should *Elodea spp.* become established in the Alexander drainage basin, including side-channel sloughs, it would provide excellent habitat for invasive Northern Pike and hinder on-going efforts to bolster salmon. Future efforts to move with eradication include implementation of a management plan, acquiring funding, and communication to high-risk vector populations.

Terry Thompson, Alaska Department of Fish and Game

Chinook Salmon Research Initiative: Research To Gain A Better Understanding Of The Causes for Chinook Salmon Declines in Alaska

In 2012, as a result of recent declines in Chinook salmon productivity and abundance the Alaska Department of Fish and Game initiated a statewide comprehensive planning effort with a goal of identifying knowledge gaps in Chinook salmon life histories and stock assessments. This effort resulted in a draft gap analysis document, *Alaska Chinook Salmon Knowledge Gaps and Needs.* Building on this analysis, the department hosted a Chinook salmon research symposium in late October 2012 to "identify key knowledge gaps and assemble a list of research priorities" to better understand the many factors affecting Chinook salmon abundance. Over 450 stakeholders participated in the two-day symposium which addressed downturns in Chinook salmon abundance, discussed statewide research and management needs, and provided perspectives on how best to address key information gaps. Public comments, in conjunction with input from state, federal, and academic biologists and scientists were used to develop the *Chinook Salmon Stock Assessment and Research Plan, 2013*. Today, the Research Plan has been put in to action as the Chinook Salmon Research Initiative. At a projected cost of $30 million over five years, the Initiative is a stock-specific, life history-based approach to research that focuses on twelve indicator stocks from the Arctic to Southeast Alaska representing diverse life histories and migratory characteristics over a broad geographic range.

During the 2013-14 legislative session, the Alaska legislature supported Governor Parnell's request to fund initial efforts of the Chinook Salmon Research Initiative and provided $7.5 million to the department. As a result, in 2014 the department put 35 Initiative funded projects in the water. These efforts along with additional projects over the next several years will facilitate more timely and informed abundance-based management decisions, both in season and post season, allowing for sustained harvests and healthy levels of spawning abundance over time.

Brian Winnestaffer, Chickaloon Village Traditional Council and Envision Mat-Su

**Did you know Baby Salmon Live Here? That Little Stream You've Been Walking or Driving by Everyday Has Salmon in it!*

Envision Mat-Su has teamed up with the Mat-Su Salmon Habitat Partnership and others to get the word out that Baby Salmon Live Here! A community effort to educate folks that certain waterbodies house baby salmon is being conducted by placing signs in areas where human traffic and salmon rearing habitat co-exist. Fifteen waterbodies in the Mat-Su Borough received signage indicating that Baby Salmon Live Here with links to information on how we can help baby salmon survive and return as adults to continue the salmon cycle or to stock up our freezers. Learn what waterbodies have been signed and what we plan to do in the future. Give feedback to what waterbodies you think should be included in the Baby Salmon Live Here movement.

Andy Wizik, Cook Inlet Aquaculture Association

Shell Lake Salmon & Pike: The Need for Developing New Methods in the Fight against Invasive Pike

Since their introduction into the Susitna River Watershed, northern pike *(Esox lucius)* have negatively impacted salmon populations. On Shell Lake, a historically significant contributor to the sockeye production in the watershed, Cook Inlet Aquaculture Association (CIAA) has documented the near total collapse of the sockeye salmon return. Through investigation and cooperation with the Alaska Department of Fish and Game, it was determined that invasive pike, a disease caused by the microsporidian *Loma salmonidae*, and another parasite known to cause kidney disease were all having a negative impact on the sockeye salmon population. To circumvent the loss of sockeye fry by northern pike and to break the disease cycle, in 2012 CIAA began a project that involved capturing and harvesting northern pike in Shell Lake. This was coupled with the collection of eggs from Shell Lake spawning pairs of salmon. The eggs were fertilized, incubated, and reared at the Train Lakes Hatchery in Moose Pass and released as smolt back into Shell Lake in 2014. Although catch per unit effort and the size structure data indicate that CIAA is having an impact on pike, age data indicates that young pike are escaping nets during their first year of development to the continued detriment of salmon. This demographic data has led CIAA to begin research on alternative methods of controlling pike early in development to alleviate their negative impacts on juvenile salmon. Research on the adhesion mechanism of larval pike as well as the potential for lake mixing to prevent hatch is being investigated to determine if one or both methods could be used to further decrease pike numbers in Shell Lake—potentially changing the face of future pike control efforts in the Susitna basin.

Christine Woll, The Nature Conservancy

Salmon Habitat Mapping in the Mat-Su 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. In order to move "beyond" the state of Alaska's Anadromous Waters Catalog as a data source for landscape-scale planning in the Mat-Su basin, we are working on a project that seeks to better understand and describe the distribution and relative abundance of salmon and their habitats. This project describes current spatially explicit information on salmon habitat and salmon abundance by species and life stage for the entire Mat-Su basin, including a synthesis of previously completed studies enumerating adult salmon spawning patterns. 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 qualitative model predicting relative distribution and abundance of Coho, Chinook, and Sockeye salmon rearing habitats across the Mat-Su Basin. This project will culminate in a summary of information gaps and potential future research activities that will further understanding of landscape-scale patterns of salmon habitat distribution and abundance by species and life stage and move the science towards more quantitative models.

KEYNOTE SPEAKERS

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Mary Colligan worked as staff to the U.S. Commissioners to the North Atlantic Salmon Conservation Organization (NASCO) and then served as President of NASCO from 2010-2014. NASCO is an international organization established by an inter-governmental Convention in 1984, whose objective is to conserve, restore, enhance and rationally manage Atlantic salmon through international cooperation taking into account the best available scientific information. Before moving into her current position with the U.S. Fish and Wildlife Service (USFWS) Polar Bear Program, Mary Colligan worked for the National Marine Fisheries Service (NMFS) Protected Resources Program in the Northeast Region for over 20 years. For the last 12 years, she served as the Assistant Regional Administrator for NMFS' Protected Resources program.

ABSTRACT:

Atlantic Salmon Ecosystem Recovery: It Takes a Village, State, Country and World

Due to the complex life history of diadromous species, conservation and recovery requires coordinated efforts in freshwater, estuaries and the marine environment. Moving past blame and litigation and towards shared goals and objective is challenging, but is essential to efficient and effective use of available resources and to achieving meaningful results. Identifying the broad range of threats to Atlantic salmon and their ecosystems at all levels and scales and establishing partnerships with industries, agencies, conservation organizations and other countries has been identified as the appropriate prescription and is being implemented. A commitment to obtain and utilize scientific information in decision-making, to be explicit about uncertainties, and to implement adaptive management was seen as vital to maintaining partnerships and buy-in. Unfortunately, Atlantic salmon populations in the United States remain at very low levels and are dependent upon hatchery contributions. While these actions may be too late for some wild Atlantic salmon populations, they serve to benefit the broader diadromous fish community and ecosystem and perhaps serve as lessons learned to apply to the conservation of other species.

Kate Myers, Ph.D.

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Recently retired, Dr. Katherine Myers is an internationally recognized fisheries scientist who has been with the University of Washington's High Seas Salmon Research Program since 1980. She has filled many roles over the years from research aid in 1980, to the High Seas Salmon Program Principal Research Scientist from 2004 to retirement. She received her Ph.D. in Fisheries at Hokkaido University in Japan, and received the 2014 North Pacific Anadromous Fish Commission Award in recognition of her long-term leadership in scientific research and conservation, her extensive body of published work on Pacific salmon and steelhead, and for fostering international cooperation among researchers. Her scientific specialties include salmon and steelhead ocean distribution and migration patterns, age and growth research, and marine food habits studies of salmon. In addition, her service to the field of salmon science includes substantial contributions to studies of Prince William Sound pink salmon and her continuing scientific advisory work on Columbia River and Yukon River salmon.

Abstract:

Life-history, Ecology, and Potential Threats to Mat-Su/Cook Inlet Chinook Salmon in the Marine Environment

Are recent declines in adult returns of Mat-Su/Cook Inlet Chinook salmon due to reduced marine survival? This presentation provides a general overview of what is known and needs to be known about the life history, ecology, and potential threats to Mat-Su/Cook Inlet Chinook salmon in the marine environment. Leading hypotheses linking changes in marine and freshwater habitats to recent synchronous declines in Chinook salmon populations around the Pacific Rim are briefly introduced. The presentation concludes with some suggestions for steps needed to advance our understanding of connections between Mat-Su/Cook Inlet Chinook salmon productivity and the marine environment.

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