Alaska Fisheries & Habitat NEWS

U.S. Fish & Wildlife Service ◆ Fall 2015 Issue 3

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Working with others to conserve, protect and enhance fish, wildlife, plants and their habitats for the continuing benefit of the American people

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Welcome to the third issue of Alaska Fisheries & Habitat News!

Steve Klosiewski
Deputy Assistant Regional Director
Fisheries and Ecological Services
U.S. Fish & Wildlife Service, Alaska

A Q&A session with our outgoing Deputy Assistant Regional Director, Steve Klosiewski, who retires September 30, 2015 after nearly three decades working for the U.S. Fish & Wildlife Service in Alaska:

What do you hope people take away after reading Alaska Fisheries & Habitat News?
SK: That Alaska is a great place to live and work. Also, that public support for conserving Alaska's fish and aquatic habitats continues. That support comes from not just those people that live and work in the state, but also from those that have visited, plan to visit, or may never have the opportunity to visit. Some readers may simply enjoy reading about Alaska's fish or eating them at home or restaurants. We use the News as a vehicle for generating awareness about and support for fish and habitat conservation in Alaska, as well as recruiting a highly qualified and diverse workforce.

What do you think our biggest challenge is when it comes to conserving Alaska's fish?
SK: The immense size of the state, the lack of roads and resulting difficulty and costly logistics to mount any kind of field effort required to conserve fish and their habitats. Continuing to prioritize what, when and where to work is paramount!

What is something people who haven't been to Alaska might be surprised to learn?
SK: Despite Alaska's reputation as a wild land of pristine waters, its fish populations are subject to the same threats impacting fishes in the rest of the U.S.

This issue features Cook Inlet Coho Salmon...why are Coho Salmon a priority?
SK: We frequently use Coho Salmon as a design species for our habitat conservation efforts. For example, if we design road-stream crossing to ensure that weak-swimming juvenile Coho can pass through unimpeded then we pretty much have all the bases covered for the rest of Alaska's fishes. Coho Salmon are also fun to catch and, in many cases, provide the last opportunity to wet a fly till next summer!

Any parting words of wisdom?
SK: Do good and have fun, both at home and at work!

Katrina Mueller
Fisheries Outreach Coordinator

From managing America's National Wildlife Refuge System to jointly administering the Endangered Species Act with NOAA Fisheries, combatting illegal wildlife trafficking, and working with willing landowners to conserve fish and wildlife habitat, the U.S. Fish and Wildlife Service wears many conservation hats!

Alaska Fisheries and Habitat News highlights the unified conservation efforts of our Fisheries Program, Habitat Restoration and Conservation Partnerships Programs, and Alaska's network of Fish Habitat Partnerships. It also provides information about Alaska's fish, their habitats, and uniquely Alaska conservation challenges and opportunities. We hope it gives you a flavor for the ways we're helping conserve fish and their habitats in Alaska and, more importantly, why that conservation matters! Contact me with suggestions, questions, or if you'd like to subscribe: katrina_mueller@fws.gov / (907) 786-3637.

ON THE COVER:
Cook Inlet Coho Salmon (Trent Liebich)

ON THE BACK:
Coho and Sockeye Salmon flanked by Dolly Varden Char (Jeffry Anderson)

Alaska Fisheries and Habitat News is a publication of the Fisheries and Ecological Services Division of the U.S. Fish and Wildlife Service - Alaska Region

by Katrina Mueller

Cook Inlet Coho Salmon

Oncorhynchus kisutch

Why Coho?
I've put my underwater camera in a lot of creeks that flow through Southcentral Alaska and eventually make their way into Cook Inlet. And the faces I almost always see are those of juvenile Coho Salmon.

Of all the Pacific salmon, Coho Salmon juveniles spend the longest time in freshwater—we've documented them spending as many as four years in the Big Lake area of Mat-Su before migrating to sea where they will reach adulthood (*see feature article on p 5*).

Because they spend so much time in freshwater, juvenile Coho also tend to move farther upstream than other salmon in search of nursery habitats that stay unfrozen in winter, cool in summer, and provide adequate food and cover year-round.

From a conservation standpoint, if we meet the extensive habitat connectivity needs of juvenile Coho Salmon, we tend to meet the connectivity needs of other salmon. That's why juvenile Coho Salmon are one of our "conservation design species." It's also why much of our work is aimed at understanding and conserving habitat for juveniles.

Why Cook Inlet?
Over sixty percent of of Alaska's entire human population lives in the Cook Inlet watershed. This land area encompasses growing population centers in Anchorage and the Kenai Peninsula and Mat-Su Boroughs.

Here, salmon populations support commercial, sport, personal use and subsistence fisheries. But they're vulnerable to the stressors, like habitat fragmentation, that come with living alongside humans.

In the Wasilla-Palmer core area of Mat-Su (the "Valley"), located in upper Cook Inlet, few lands are in conservation protection status and development occurs in close proximity to salmon spawning and nursery habitats. This area is one of the fastest growing in the United States.

On the Kenai Peninsula, a 175-mile interface of private lands extends along the Kenai National Wildlife Refuge boundary. These private lands include several communities, residential areas, and primary roads. The result: almost every anadromous stream originating on the western Kenai Peninsula must pass through a developed area that includes culverts, homes, boat launches, altered streambanks, and urban runoff enroute to the sea.

Cook Inlet
This saltwater body stretches roughly 180 miles from Anchorage to the Gulf of Alaska. Its watershed drains well-known rivers like the Susitna and Kenai and covers over 38,000 square miles (if it was a state it would rank in size between Indiana and Kentucky).

To help address these habitat threats, two formally-recognized partnerships (the Mat-Su Basin Salmon Habitat Partnership and the Kenai Peninsula Fish Habitat Partnership) have formed to help sustain Cook Inlet Coho Salmon and other fishes.

Above: a male Coho Salmon returns to Campbell Creek in Anchorage to spawn while last year's young swim nearby. Click ***here*** to see the video. **Right:** A juvenile Cook Inlet Coho Salmon. USFWS/Katrina Mueller

- 2014 -

The 2nd Annual ***Chena River Watershed Summit*** focused attention on the river and its Chinook salmon run.

Bill Rice received the Service's ***National Fish Passage Program Field Biologist of the Year*** award.

The ***Southeast Alaska Fish Habitat Partnership*** became the nation's 19th Partnership to receive formal recognition by the National Fish Habitat Partnership Board.

Fisheries Program biologists Ray Hander, Jon Gerken, and Steve Miller were recipients of ***Regional Director's Excellence Awards*** (Fostering Partnerships, Innovation in Conservation, and Diversity Champion, respectively).

David Hoskins and ***Kari Duncan*** from our headquarters office in Falls Church, Virginia visited with Alaska staff and visited project sites around Alaska.

The 1st annual ***Alaska Fish Film Festival*** was held in Juneau in October during a joint annual meeting of the Alaska Chapters of the American Fisheries Society and American Water Resources Association.

Over 125 people attended the 7th annual ***Mat-Su Salmon Science and Conservation Symposium*** in Palmer this past November.Jon Gerken, a Fish Biologist with our Anchorage Field Office, was one of several "King Makers" crowned by Great Land Trust.

- 2015 -

Kachemak Bay Science Conference, with support from Kenai Peninsula Fish Habitat Partnership, was held in Homer March 4-7.

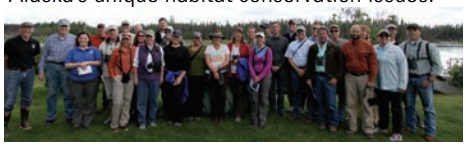
March 31 annually - Entries for Wildlife Forever's ***State-Fish Art Contest*** are due. *http://alaska.fws.gov/fisheries/fish/contest_art.htm*

May 18 - Cara Lewis, Suresh Sethi, and Bill Spearman received ***Regional Director's Excellence Awards*** for Innovations in Conservation, Science Excellence, and Workplace Improvement, respectively. Jim Jenson (Mat-Su Borough), Robert Ruffner (Kenai Watershed Forum), Tim Troll (Southwest Alaska Salmon Habitat Partnership) received "Outstanding Partner" awards. Nominees included Fred Bue (External Customer Service); Neil Stichert, David Wigglesworth, Bill Rice (Fostering Partnerships); Jeremy Carlson, Aaron Martin, Jeremy Mears, Jeff Melegari (Innovations in Conservation); Cara Lewis (Science Excellence), Laurel Devaney (Youth in the Outdoors).

May 24 annually - ***World Fish Migration Day***. A one day global event to call attention to open rivers and migratory fish.

June 12, 2015 - The 3rd ***Chena River Watershed Summit*** took place in Fairbanks. A draft Watershed Resources Action Plan for the Chena and Salcha Rivers was presented (story on p 13)

July 27-31, 2015 - USFWS Partners for Fish & Wildlife and Coastal Program Coordinators from around the U.S. met in Alaska to share conservation strategies and learn about Alaska's unique habitat conservation issues.



August 16-20, 2015 - The 145th meeting of the ***American Fisheries Society*** was held in Portland, Oregon. A number of our Alaska staff presented and/or were involved with organizing symposia and its 1st Annual Fish Film Festival.

September 24, 2015 - ***Laurel Devaney*** will be recognized by the Alaska Conservation Foundation. She is a 2015 Conservation Achievement Award recipient.

October 13-15 - The Southeast Alaska Fish Habitat Partnership will coordinate and host a ***Southeast Alaska Fish Passage Meeting*** to examine the state of the science and practice of maintaining and restoring fish habitat connectivity where roads cross streams. Contact *neil_stichert@fws.gov*.

Recent Publications

Brown RJ and DW Daum (2015). Spawning Distribution of Bering Ciscoes in the Yukon River. *Transactions of the American Fisheries Society*, 144:2, 292-299.

Worldwide, three rivers are known to support Bering Cisco: Yukon, Kuskokwim, and Susitna, all in Alaska. These fish are taken commercially and have a market in New York City. (photo: New York Times)

Crane P, Walsh P, Lewis C and JK Wenburg (2015). Origin and genetic diversity of lake trout in the Togiak National Wildlife Refuge, Alaska. *Journal of Fish and Wildlife Management*, 6:1, 130-144.

Cavileer TD, Hunter SS, Olsen J, Wenburg J and JJ Nagler (2015). A sexdetermining gene (sdY) assay shows discordance between phenotypic and genotypic sex in wild populations of Chinook salmon. *Transactions of the American Fisheries Society* 144, 423-430.

Clark SC, Tanner TL, Sethi SA, Bentley KT and DE Schindler (2015). Migration timing of adult Chinook salmon into the Togiak River (Alaska) watershed: Is there evidence for stock structure? *Transactions of the American Fisheries Society* 144:4, 829-836.

Olsen JB, Lewis CJ, Massengill RL, Dunker KJ and JK Wenburg (2015). An evaluation of target specificity and sensitivity of three qPCR assays for detecting environmental DNA from Northern Pike (*Esox lucius*). *Conservation Genetics*.

Sethi SA and TL Tanner (2014). Spawning distribution and abundance of a northern Chinook population. *Fisheries Management and Ecology* 21,427-438.

November 2015 - Stay tuned for an announcement of our 2016 seasonal fisheries technician and crew leader positions on *www.usajobs.gov*.

November 2-6, 2015 - The 42nd annual meeting of the ***American Fisheries Society Alaska Chapter*** will be held in Homer.

November 18-19, 2015 - The 8th annual ***Mat-Su Salmon Science and Conservation Symposium*** will be held in Palmer.

by Katrina Mueller

BIG LAKE
life of salmon

Feature

Aerial photograph of a portion of Big Lake and some of the many interconnected small lakes and streams that provide nursery habitat for juvenile Coho Salmon. Carl Johnson

Big Lake—This aptly named lake and its tributaries stretch across a nearly 100 square mile watershed near Wasilla, Alaska. With over 90 miles of creeks and over 300 lakes, this wetland-dominated system is rated extremely high for both biological value and vulnerability to development, the entire drainage is among the top conservation priorities for the Mat-Su Basin Salmon Habitat Partnership and its partners, including the U.S. Fish and Wildlife Service.

I sat down with four of our Fisheries and Habitat staff who have been studying salmon movement and habitat use throughout the watershed to learn about how the project is informing the conservation of a regionally-important fish—Cook Inlet Coho Salmon.

WHAT'S THE GOAL OF THIS STUDY?

JG: We wanted to understand the seasonal movement patterns and habitat preferences of juvenile Coho Salmon in the Big Lake drainage. And how they fared in different habitats growth-wise.

SS: Ultimately we want to be able to inform efforts that help juvenile salmon reach their preferred nursery habitats by improving fish passage where roads cross streams.

Did you know? *Sixty-four percent of the 79 culverts documented in the Big Lake watershed have been identified as potential or partial barriers to juvenile salmon by the Alaska Department of Fish and Game.*

WHY BIG LAKE?

SS: Alaska benefits from largely intact aquatic ecosystems, but development in Southcentral Alaska's Mat-Su Valley is happening quickly, particularly around Big Lake. Salmon that live here are experiencing many of the same stressors that have caused population declines and extirpations in other parts of the country.

BR: Across Mat-Su and Cook Inlet, the Big Lake watershed is unique in that it's got a huge network of small creeks and wetlands that intersect a relatively dense network of roads and culverts that pass water under those roads. This study provides an unprecedented look at the impacts of road crossings within such a wetland stream dominated watershed. And this is important in a state that's over 40% wetland.

Jon Gerken
Fish Biologist

Josh Ashline
Fish Biologist

Bill Rice
Fish Passage Engineer

Suresh Sethi
Statistician

Below: Meadow Creek where it flows under the Parks Highway before flowing into Big Lake. Sockeye Salmon struggle to pass a culvert along a migration route to upstream spawning grounds. USFWS/Katrina Mueller

SS: While roads can cause fish passage barriers where they cross streams, they also make it tractable to implement a large-scale field effort to study both adult and juvenile Coho Salmon ecology.

JG: Big Lake is also a good study area because we already know where Coho Salmon spawn—we tracked them to their spawning grounds using radio telemetry in 2009 and 2010. Thanks to thermal infrared remote sensing and our 2015 work with Cook Inlet Keeper, we also have an idea where the springs and seeps are that may provide critical coldwater refuge for salmon in summer and warmwater refuge in winter.

Did you know? *Our Fisheries staff have documented five major spawning areas in Meadow Creek that are interspersed between approximately 30 culverts.*

WHAT MAKES THIS STUDY UNIQUE?

JA: We tracked Coho Salmon over the course of their entire life cycle—from juveniles only about as long as your finger to 8-12 lb adults returning to spawn!!! This is extrememly difficult to do and hasn't been done before in a wetland dominated system in Alaska.

WHAT HAVE YOU LEARNED ABOUT COHO SALMON OR FISH PASSAGE THAT YOU DIDN'T ALREADY KNOW?

JG: We found that some juveniles spend four years in freshwater before migrating to sea—this is longer than we expected.

SS: One of the more interesting things we discovered is that juvenile Coho Salmon—even young of the year (born this year)—move widely, and often in synchronous pulses.

JG: We also discovered that there are only five dominant overwintering areas in the entire drainage—particularly lakes in the upper reaches of the watershed. During the summer we find juveniles in mainstem and tributary habitats.

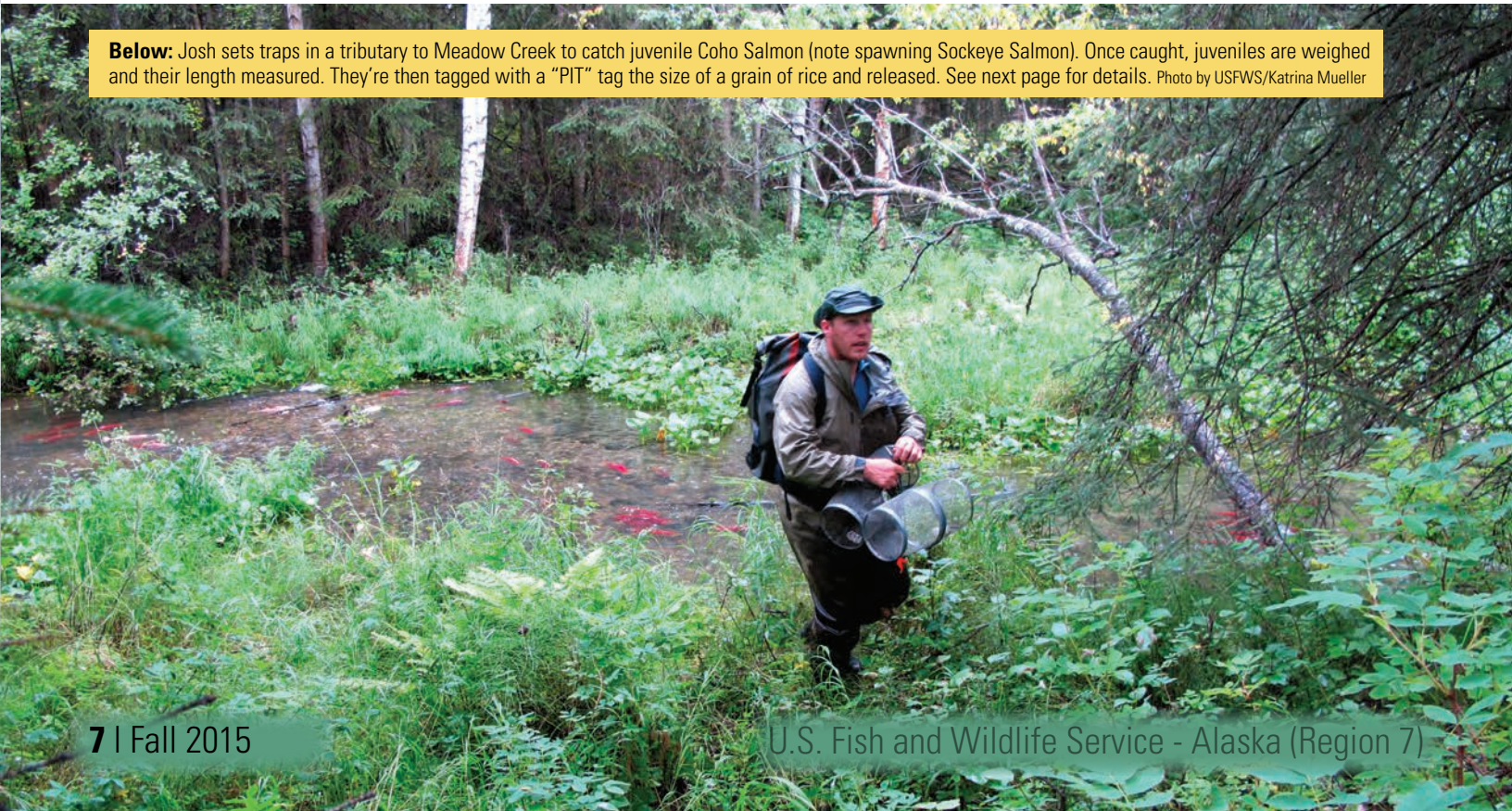
We also learned that fish actively move under the ice, especially when the air temperature is above zero...and that they're stopped by culverts previously thought to provide adequate fish passage when ice freezes inside.

BR: That blockages in winter occur makes sense because these small wetland streams are prone to layered masses of ice forming below 0ºC from the freezing of successive flows of ground water over previously formed ice layers.

JA: I was suprised how much variation we documented in Coho Salmon life history. The Coho within Fish Creek [Big Lake's outlet] and Meadow Creek [the major upstream tributary] were very different with respect to growth rates and migration patterns. They even looked different.

SS: We have preliminary results that young of the year juveniles and juveniles that have remained in freshwater for a year or more have distinct movement and habitat use patterns.

JA: As we dig deeper into our dataset I'm sure we'll continue to learn new things about Coho Salmon. One thing that I've learned is it's very difficult to accurately sex adult Coho Salmon as the females also develop a kype [hooked snout]. You can't necessarily rely on the appearance of the kype to determine if the fish is a male or female.



Below: Josh sets traps in a tributary to Meadow Creek to catch juvenile Coho Salmon (note spawning Sockeye Salmon). Once caught, juveniles are weighed and their length measured. They're then tagged with a "PIT" tag the size of a grain of rice and released. See next page for details. Photo by USFWS/Katrina Mueller

Spotlight on Technology: *tracking PIT-tagged fish*

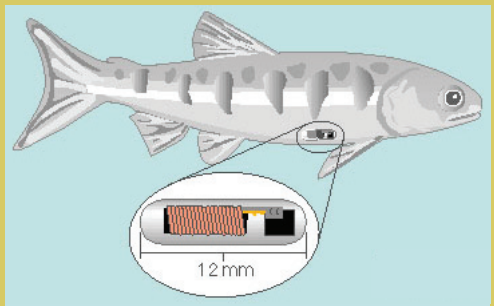
To track a salmon over the course of its entire life cycle—as it moves among its preferred freshwater habitats, migrates to sea, and returns as an adult to spawn—a few things need to happen!

Step 1. Catch juvenile salmon
We bait minnow traps with cured salmon eggs (they're placed in a film canister with holes to attract yet prevent the fish from actually eating the cured eggs). We then set them in good juvenile salmon habitat (for example, along the bank where there is good cover provided by wood—*see below*). Once fish enter the trap they have difficulty finding their way back out.

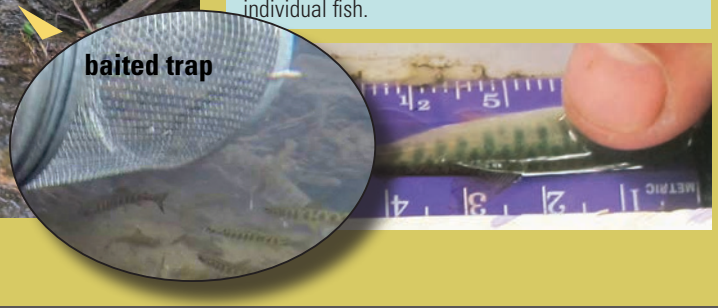
Step 2. Tag juvenile salmon
Because of tag size, we only tag juvenile Coho Salmon 55 milimeters in length or longer. Trained field biologists briefly anethesize juveniles to implant a tiny passive integrated transponder (PIT) tag into their abdominal cavity (like the microchip inserted under the skin of a pet dog). Then the fish are released after full recovery (usually a few minutes).

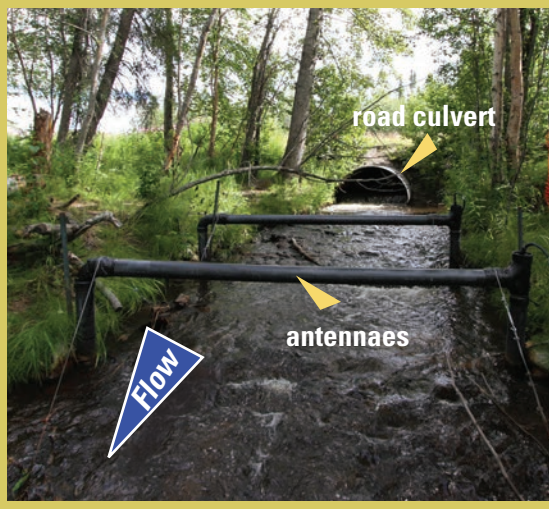
Step 3. Track their movement
To figure out where tagged juveniles go and when, we set up and maintained seven fixed antenna arrays that spanned different streams in the Big Lake drainage. These arrays "read" tagged fish that pass through, letting us know which fish were moving (thanks to the unique code in each PIT tag), which direction they were going, and when. We also recaptured a portion of juveniles in minnow traps and checked if they were tagged by swiping a hand-held reader over their abdomen (if a tag is present the reader identifies its unique code).

USFWS/Katrina Mueller



PIT tags are very small glass tubes containing an antenna and integrated circuit chip. Each PIT tag carries a unique code to enable identification of individual fish.





USFWS/Katrina Mueller

APPROXIMATELY HOW MANY COHO HAVE YOU HAD YOUR HANDS ON OVER THE COURSE OF THIS STUDY?

JA: Easily over 10,000. I couldn't even come close to pinpointing a number. The coolest part about fish handling during this study was wondering if individual fish remembered me when we captured them as smolts and again as adults. I know that I handled the same fish multiple times throughout its life. First when tagging it as a 55mm juvenile, again a year or two later as a 130mm smolt, and again a year later as a 500mm adult returning from the ocean. I'd like to think these fish said "*oh boy, not you again!!*"

WHAT'S BEEN THE MOST CHALLENGING ASPECT OF FIELD WORK OR THE TECHNOLOGY BEING USED TO TRACK THE COHO?

JA: Tagging fish is easy even if they are only 55 millimeters long and the tag is 1/3 the length of the fish. Maintaining the PIT tag technology and all the associated systems such as the solar panels and thermometric generators was the challenging part. In order to track tagged Coho Salmon we needed to ensure everything at each of the antenna sites was functioning properly.

I went from "fish biologist" to electrictican, carpenter, and control wiring expert pretty quickly. I've joked with my supervisors that if fish biology doesn't work out, I'm a shoe in for a position as an electrical repair technician.

JG: There have been three major categories of challenges: human, environmental, and technological. On the environmental side, our antennaes have been lost during ice up and cold is particularly hard on batteries (temperatures can reach -30). We've had our solar panels shot at and equipment stolen, people have built rock dams across the streams we're assessing fish movement on, and one of our thermal generators exploded due to propane freezing/gelling and blocking ventilation.

BR: We did a geomorphic study which required walking 17 miles of creek. The major challenges were mosquitos, brush, and the dreaded floating mats of vegetation that you can fall through.

JA: Yes, there have been many waders topped with water.

JG: Tags are passive and don't emit any signal until they pass through antenna. We've tagged over 6,000 fish. Recapturing the fish is time consuming. We spent a lot of time setting traps.

JA: The winter field work is cold and exhausting. We found that the best way to get 100lb propane tanks into sites to power the antennae arrays was on our backs in a pack frame. Sleds just bulldozed the snow, and when we finally got snowmachines to do the hard work for us Mother Nature didn't cooperate and it didn't snow, which meant more 100lb propane tanks hauled on our backs in the cold and over snow and ice.

SS: All of the moving parts of the project have called for substantial field effort and technical capacity in the field, but the crews, crew leaders, and field biologists have shown great skill in making it work.

THERE'S A MODELING COMPONENT TO THIS STUDY. HOW WILL THE COMBINATION OF FIELD WORK AND MODELING INFORM FISH PASSAGE RESTORATION?

SS: Aquatic ecosystems are complex, and we simply don't have the resources to study all parts of all of the Big Lake system. So we design targeted field efforts to answer questions about salmon ecology and produce enough data such that we will have the ability to generalize from our sample data to the system as a whole. We'll then use statistical modeling to make inference about the larger system as a whole.

BR: Basically the fishery and habitat fieldwork will inform the statistical model that will let us know how big of an impact each culvert is having on salmon. We can then use it to estimate the cost to replace each barrier based on the past eight years of fish passage restoration in the Mat-Su Valley. Given a set amount of funding, say $1 million, the model will then optimize a list of priority culverts for replacement to get the most benefit out of working in the watershed. This type of model can be run with many cost scenarios to see if there is truly a cost inflection point where there is little habitat gain per salmon benefit.

WHAT'S NEXT?

BR: The project is finishing up with modeling scheduled for this winter. The results of this project will hopefully inform culvert replacements starting in 2016!

JA: This year we are finding out what is so special about specific overwintering lakes. Next is data analysis and report writing...and then taking our PIT tagging knowledge on to bigger and more remote systems to investigate the juvenile life histories of Chinook Salmon, maybe in some Susitna River tributaries!!

SS: For me? Lots and lots of data analysis!

A big thank you to the many seasonal fisheries technicians that have helped carry out this study and to the landowners who allowed our staff access to sites throughout the Big Lake drainage. Special thanks to the Alaska Sustainable Salmon Fund, Alaska Department of Fish & Game (Mark Willette and Bob DeCino - Commercial Fisheries/Soldotna; Gillian O'Doherty - Sportfish/Anchorage; Daryl Lescanec - Sportfish/Palmer; Susie Hayes - recently retired from ADF&G), Burkeshore Marina, and Brad Harris (Alaska Pacific University).

ALL BIG FISH START SMALL We mostly think about salmon when they're returning to spawn but should really be thinking of the tiny camoflagued juveniles living in our creeks year-round. What we do to the creeks they inhabit, like putting in a culvert that they can't pass through, can take away options for them...and the options for us as well to continue living with and benefiting from salmon in Mat-Su and other fast developing areas in Alaska.

A suspected 4-year-old juvenile Coho Salmon caught in Cloudy Lake upstream of Big Lake in August 2015. Photo by USFWS/Katrina Mueller

- WELCOMES -

Trevor Fox joined the Fisheries and Ecological Services Division as the Alaska Regional Subsistence Coordinator in October 2014. This is a key position for the Service's participation in the federal subsistence management process in Alaska. Trevor has previously served as a fish and wildlife biologist with the U.S. Fish & Wildlife Service's Wildlife and Sport Fish Restoration Program and as wildlife biologist with Alaska's Office of Subsistence Management.

Franklin Dekker, a Pathways Recent Graduates Program Hydrologist, joined the Anchorage Fish & Wildlife Field Office Habitat Branch in ***fall of 2014. His focus is streambank and fish passage restoration. He was previously a Wilderness Fellow at Arctic and Selawik National Wildlife Refuges in Alaska.***

Catherine "Cat" Bradley Dr. Bradley joined us as a Pathways Program Student Intern Biometrician in 20***14. Cat is pu***rsuing a Master's degree in Statistics at the University of Alaska Fairbanks and helping our biologists design field studies and analyze data. Before becoming a full-time number cruncher, she worked in the field with salmon, songbirds, and butterflies. She enjoys backpacking, kayaking, and music in her free time.

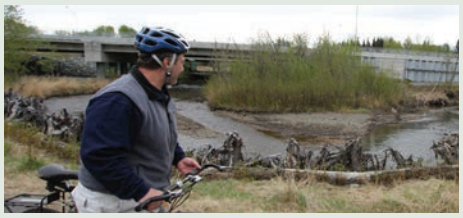
Aaron Webber joined the Kenai Field Office Fisheries Team in May 2015 by way of the Wildlife and Sport Fish Restoration Program in Albuquerque, New Mexico. Prior to that he spent six years as a Fisheries Biologist with t***he Colorado*** Ri***ver Fish Proj***ect where he investigated life history and population dynamics of endangered Colorado River fishes. He spent considerable time in the field coordinating projects and logistics for remote field work on several large Western rivers and is ready to run our field program on the ground in western Alaska. He reported for duty in Bethel on May 26th. Aaron's an avid outdoorsman and is excited for the opportunity to experience the last major unroaded river system in North America, and we are excited to welcome him and his family to Alaska!

Kyle Graham, Partners Program Biologist from Nebraska, did a one month detail in the Anchorage Field Office in March 2015. He liked Alaska so much he accepted a position as a Fish and Wildlife biologist in our Kenai Field Office's Habitat Branch. Kyle comes to us from the Nebraska Sandhills Partners for Fish and Wildlife Program where he worked for 12 years.

Mary Colligan starts as Assistant Regional Director for Fisheries & Ecological Services in September 2015. She has served as the Polar Bear Lead and most recently as Chief of Marine Mammals Management in Anchorage. Prior to that she worked for the National Marine Fisheries Service for 22 years where she implemented the Marine Mammal Protection and Endangered Species Acts from Maine to Virginia for species including the North Atlantic right whale, humpback whale, harbor porpoise, sea turtles, Atlantic and shortnose sturgeon and Atlantic salmon.

Aaron Martin moves to Anchorage in October 2015 to become our Regional Fisheries and Aquatic Conservation Coordinator. He is currently a Supervisory Fish Biologist in the Fairbanks Fish and Wildlife Field Office's Subsistence Fisheries Branch.

- DETAILEES -



Mark Bellis, Biologist/CITES Policy Specialist for International Affairs in our headquarters office in Falls Church, Virginia, did a one-month detail with our Anchorage Field Office's Habitat Branch in May 2015.

Liz Jozwiak with the Mexican Wolf Recovery Program in Arizona and New Mexico detailed with the Kenai Field Office's Habitat Restoration Branch from May 11-June 12, learning about and helping implement our Fish Passage and Partners for Fish and Wildlife Programs and working with the Kenai Peninsula Fish Habitat Partnership.

Jonathan Gerken, Fish Biologist for our Anchorage Field Office, is currently detailing as its Fisheries Branch Chief.

Katrina Mueller, Alaska's Fisheries Outreach Coordinator, did a 1-month detail in February 2015 with with the Coastal and Partners for Fish and Wildlife Programs at our headquarters office in Falls Church, Virginia. She begins a 60 day detail with the Anchorage Field Office's Fisheries Branch on September 9, 2015.

Libby Benolkin and ***Neil Stichert*** are filling in behind Bill Rice (our former Anchorage Field Office Habitat Restoration Branch Chief) until the position is filled.

- FAREWELLS -

Steve Klosiewski retires from the Service on September 30, 2015 after coming to Alaska more than 27 years ago for a 1-year term position in Migratory Bird Management. He served as the Region's first biometrician for the Fisheries Program, followed by stints as Fisheries Program Branch Chief, Division Chief of Fisheries & Habitat Conservation, and, for the past ten years, Deputy Assistant Regional Director for Fisheries & Ecological Services. He plans to spend more time enjoying Alaska, fishing, cycling, and traveling around the world.

Theresa Tanner joined the U.S. Forest Service in Cordova on August 24, 2015 after 15 years with the the Service. Theresa worked out of both our Fairbanks and Anchorage Field Offices on fisheries projects around the state from the Arctic to Mat-Su to Togiak National Wildlife Refuge.

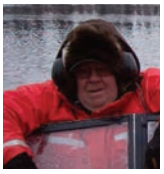
Doug McBride joined the Service's Wildlife and Sportfish Restoration Program in Anchorage on August 24, 2015 where he'll be administering Pittman-Robertson funds to ADF&G to assess and manage wildlife populations. For the last eight years Doug has served as Fisheries Program Branch Chief for the Anchorage Field Office.

Bill Rice left Alaska in July 2015 after 17 years for Colorado where he replaced Scott Roth as Region 6's Fish Passage and National Fish Habitat Partnership Coordinator. Bill will also help the Bozeman Fish Technology Center shape and fund fish passage research. Bill was Region 7's Fish Passage Engineer and, most recently, the Habitat Restoration Branch Chief at our Anchorage Field Office.

Heather Fuller left Alaska in July 2015 after six years as a Habitat Biologist with our Kenai Field Office. Heather now serves as an Endangered Species Act biologist for the Eastern Washington Field Office.

Cecil Rich, our former Fisheries Program and Aquatic Invasive Species Coordinator, left Alaska in May 2015 after 15 years to join the U.S. Forest Service as a fish biologist in Santa Fe, New Mexico.

Tim Jennings, Assistant Regional Director for Fisheries & Ecological Services, retired in April 2015 after nearly 30 years with the Service. He plans to stay in Alaska and do a lot more sailing, hiking and traveling with his wife.



Steve Miller retired from a 25+ year Federal career this spring, most recently as a Fishery Biologist for the Kenai Field Office stationed in Bethel where he led the Office's field program in Western Alaska.

Cheryl Anderson retired in January 2015 from our Kenai Field Office. As a Fish Biologist, Cheryl led field investigations on salmon populations in streams near Cold Bay, directed spawning telemetry studies on Togiak River Chinook Salmon, and investigated Rainbow Smelt population dynamics. More recently, she led education and invasive species eradication efforts on the Kenai Peninsula.

Meg Perdue left our Anchorage Field Office Habitat Branch to join the National Wildlife Refuges' Water Resources Branch as Water Quality Specialist in October 2014. In her new role she is developing a water temperature monitoring program to help staff consolidate and manage data both on and off National Wildlife Refuge lands in Alaska.

Fisheries & Habitat Staff & Pathways Students

In Alaska, we are based in various U.S. Fish and Wildlife Service offices around the state including three Fish and Wildlife Field Offices, one satellite office, two National Wildlife Refuges, and our Alaska Regional Office in Anchorage (where our state-of-the-art Conservation Genetics Lab is co-housed)

Anchorage Field Office

Josh Ashline
Libby Benolkin
Franklin Dekker
Jon Gerken
Soch Lor

Juneau Satellite Office

John Hudson
Neil Stichert

Fairbanks Field Office

Jeff Adams
Fred Bue
Randy Brown
Jeremy Carlson
Sarah Conn
Laurel Devaney
Ray Hander
Gerald Maschmann
Jeremy Mears
Jeff Melegari
Mitch Osborne

Kenai Field Office

Jeff Anderson
Jim Boersma
Ken Gates
Kyle Graham
Ken Harper
Aaron Webber

Conservation Genetics Lab

Catherine Bradley
Geoffrey Cook
Penny Crane
Rachel DeWilde
Jason Everett
Blair Flannery
Cara Lewis
Randal Logues
Jeff Olsen
Ora Schlei
Suresh Sethi
Bill Spearman
John Wenburg

Alaska Regional Office

Mike Buntjer
Mary Colligan
Trevor Fox
Jenifer Kohout
Aaron Martin
Katrina Mueller
David Wigglesworth

Seasonal Staff, Interns, & Volunteers

Amanda Adams
Melanie Bakker
Ian Buchta
Chelsea Clawson
Willow Cohn
Chanice Davies
Becca Dillon
Dan Donnelly
Olivia Edwards
Chad Gabreski
Alison Gardell
Adam Grunwald
Kimberly Giroux
Taylor Gregory
Jillian Jablonski
Jamie McGuire
Jennifer Morella
Matt Olson
Bonnie Ricord
Timothy Rovinelli
Jared Siegel
Otis Sipary
Jarred Stone
Seth Sullivan
Caroline Walls

eDNA shows promise for Environmental Detectives...bad news for invasive species!

by Katrina Mueller

"Detect early and respond rapidly!" When it comes to aquatic invasive species, that's the motto we live by here in Alaska, where we pride ourselves as stewards of America's last true wild places that offer an unparalleled and vast array of fish, wildlife, and lands for people to live with, live from, discover and enjoy.

While detection is the first step in eradicating harmful invasive species, it can be tricky. Especially in a largely roadless state where planes are like cars and invasives can hitchhike on or be introduced unintentionally by float planes or boats (or their passengers) headed for remote waterbodies.

Because of this, potentially infested waterbodies can be extremely costly and/or logistically infeasible to survey adequately for invasive species presence. If, say, a potentially invasive fish species has just been introduced, low numbers may make the likelihood of detection even more difficult.

Traditional methods such as gillnetting have a number of drawbacks including requiring tremendous allocations of time and effort, possibly impacting non-target species and having questionable effectiveness when fish abundance is low.

Enter eDNA, or environmental DNA. If you like crime shows, this technique should pique your interest. All species shed skin cells (skin, fecal, urine) in their environment and scientists from our Conservation Genetics Lab and the Alaska Department of Fish and Game are honing their ability to detect Northern Pike DNA.

Their motivation? Pike have been illegally introduced to southcentral Alaska where they aren't native. Costly monitoring and control programs are now underway to stop the negative impacts these top predators are having on popular salmon and trout fisheries.

So, how is eDNA detected? First you have to collect a water sample that has a fragment of the target species' unique DNA. Then you have to isolate it (it's tiny beyond comprehension) and make lots of copies of it so you can read it—on the order of thousands to millions.

The molecular technique used to do this is called polymerase chain reaction, or PCR. Once you find the DNA you also have to be sure it's not from some other co-occurring freshwater fish. Muskellunge are not found in Alaska but were included in the study since they're a closely related species.

The study authors tested their ability to isolate and amplify pike eDNA in a laboratory setting (a 20 gallon aquarium containing one pike) and their confidence that it wasn't from Muskellunge or other Alaska fishes. Were they successful? Yes on both counts. Now testing in the field begins.

Reference

Olsen JB, Lewis CJ, Massengill RL, Dunker KJ and JK Wenburg (2015). An evaluation of target specificity and sensitivity of three qPCR assays for detecting environmental DNA from Northern Pike (*Esox lucius*). *Conservation Genetics.*

Aquatic Invasive Species - the latest on Elodea

RECENTLY CONFIRMED INFESTATIONS
June 2015 - Lake Hood (Anchorage)
August 2015 - Totchaket Slough (Tanana River downriver from Nenana)

ERADICATION EFFORTS (HERBICIDES)
July 2015 - Lake Hood was treated with Diquat; August 2015 - Anchorage Lakes (Sand, DeLong, Little Campbell) were treated with Fluridone. Monitoring of Kenai Peninsula Lakes (Stormy, Daniels, Beck) treated in 2014 & 2015 indicates herbicide treatment is working and long-term monitoring will continue.

YOU CAN HELP
Don't release aquarium plants; remove all plant fragments from boats, trailers, and float planes before entering new waters; report sightings (1-877-INVASIV)

Plan Coming to Life Strives to Keep the Chena and Salcha Havens for Chinook Salmon

by Jimmy Fox and Katrina Mueller

Did you know? Alaska's Chena (below) and Salcha Rivers are two of the most productive Chinook Salmon nurseries in the U.S. waters of the Yukon River.

Fairbanks' Chena River waterfront.
USFWS/Katrina Mueller

Our Fairbanks staff are lucky enough to work across a huge swath of arguably the most remote and wild lands in the country—including Alaska's Interior, northwest, and North Slope.

With such a sizeable geography, however, comes a constant need for them to be very deliberate and thoughtful about how to best leverage their unique skills and limited conservation dollars with partners to make the biggest positive and long-lasting difference for fish.

One such fish is Yukon River Chinook Salmon, an internationally-important species and priority for the U.S. Fish and Wildlife Service.

As Chinook Salmon return from the Bering Sea, they have traditionally fed thousands of rural residents from the mouth of the Yukon to their spawning grounds located as far inland as far inland as Canada—1,000+ miles from sea. Recent returns are roughly half of the historic average. Understandably there is growing desire to do everything possible to help Chinook Salmon make a comeback including addressing threats to important freshwater habitats.

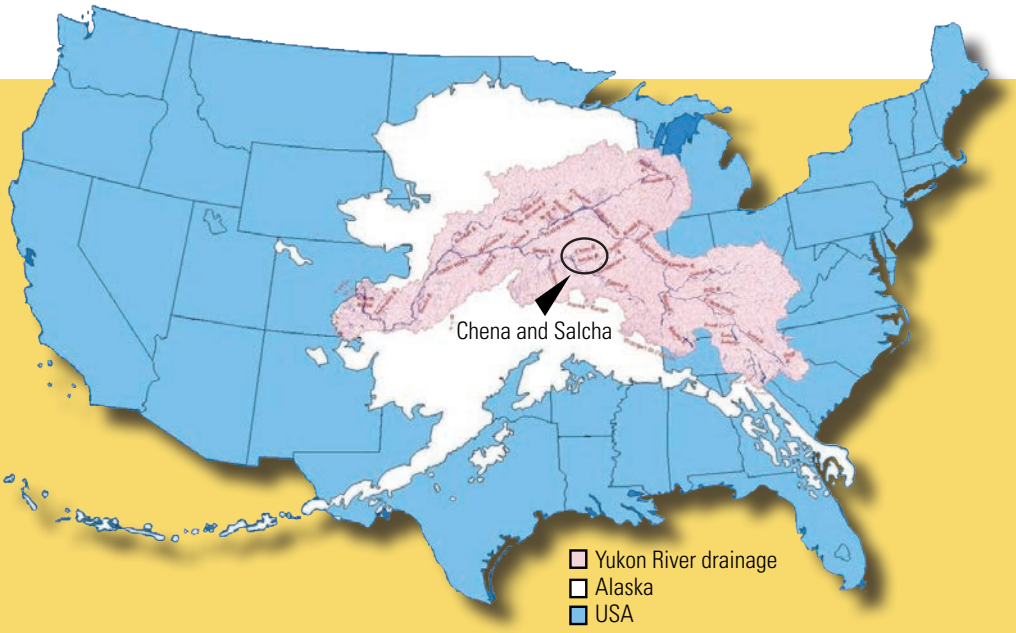
Two rivers that provide really important habitat for Yukon River Chinook are the Chena and Salcha. They are top producers of Chinook salmon in the U.S. waters of the Yukon River.

These rivers also happen to flow through the most heavily-populated area in northern Alaska, with over 100,000 people calling Fairbanks and its surrounding area home.

With people have come riverfront homes and businesses that have unintentionally degraded the streamside habitats that are important for juvenile salmon, and other habitat threats, like *Elodea* (this non-native invasive aquatic plant is a prolific grower and great at spreading to new areas—it's been shown to degrade Chinook spawning habitat).

Yukon River Salmon Conservation: U.S Fish & Wildlife Service Role

While our Fairbanks Fisheries and Habitat Branch is currently most active in the Chena River where a large population center coincides with salmon habitat degradation, our Fairbanks Subsistence Fisheries Branch plays a lead role ensuring subsistence needs and spawning salmon escapement goals are met on federal public lands in the U.S. portion of the Yukon River drainage as mandated through the Alaska National Interest Lands Conservation Act (or ANILCA). This Branch also works alongside the Alaska Department of Fish and Game to meet treaty obligations with Canada as laid out in the 2001 Yukon River Salmon Agreement.



The Nature Conservancy's Conservation Action Planning (CAP) Process is a powerful instrument for helping practitioners get to effective conservation results. There are three key steps: 1) developing strategies, 2) taking action, and 3) measuring success. Applied Conservation (a consulting and facilitation service established by retired Nature Conservancy veteran Greg Low and Henry Little) helped facilitate the Chena and Salcha River Watershed Resource Action Planning Process described below.

To develop a path forward, our Fairbanks staff initiated a formal Conservation Action Planning process last November in partnership with the Tanana Valley Watershed Association to have subject matter experts identify important habitats for Chinook and then identify and prioritize the actions needed to address the primary threats to those habitats in the Chena and Salcha river watersheds.

This coalition of experts rated the current health of key habitats, and then identified threats that may impair those habitats in the next ten years—threats including the loss of natural vegetation along stream banks, filling of wetlands, high levels of sediment and other pollutants in the water, and aquatic invasive species.

They then prioritized actions to avoid, minimize or mitigate those threats. For example, restoring stream bank habitat using bioengineering; protecting and restoring wetlands; minimizing water pollutants; and removing *Elodea*, from the Chena River and Slough while preventing its spread to the Salcha River. Finally the group evaluated return-on-investment for those various actions and how to go about evaluating if they were successful.

A draft *Watershed Resources Action Plan for the Chena and Salcha Rivers* was presented at the 3rd Annual Chena River Summit on June 12, 2015.

A coalition of interested parties, *Engaging Salcha and Chena Area Partners for Ecosystems (ESCAPE)*, will be hosted by the Tanana Valley Watershed Association. This coalition will meet quarterly to ensure the plan is implemented.

As residents of other developing areas of Alaska (like the Kenai Peninsula and Mat-Su Valley) have experienced, collaboration is key to conserving and restoring important fish habitat. We are confident Interior residents love their salmon and local rivers just as much, and the final plan will benefit Chinook who call Chena and Salcha rivers home.

Left: King salmon spawning in the upper Chena River. **Above:** In addition to U.S. Fish and Wildlife Service staff from our Fairbanks Field Office (like Aaron Martin and Jeff Adams, pictured), representatives from the following organizations participated in a three session planning effort around conserving the Chena and Salcha Rivers: Alaska Departments of Environmental Conservation, Fish and Game, and Natural Resources; City of Fairbanks, Fairbanks North Star Borough, Fairbanks Soil and Water Conservation District, Tanana Chiefs Conference, Tanana Valley Watershed Association, U.S. Army Corps of Engineers, U.S. Army Fort Wainwright, and University of Alaska Fairbanks Cooperative Fish and Wildlife Research Unit.

Chena River Film Project
Coming summer 2016!
#ChenaRiverFilm

Photo: Pink Salmon migrating up Prince of Wales Island's Harris River. Amy Modig

Investing in Fish Habitat: the value of restoration in southern coastal Alaska

The southern coastal area of Alaska stretches north from British Columbia through Southeast Alaska, and across the Copper River Delta and Prince William Sound to the tip of the Kenai Peninsula.

This area ranks as one of the largest, most complex, and intact estuarine and temperate rainforests on earth. From towering mountains and glacial valleys flowing seaward through rivers and streams to the Pacific Ocean, the remote watersheds of the region contain an amazing array of micro-climates and geological features that support an abundant array of fish and wildlife.

Here, Pacific Salmon, steelhead, trout, and char drive local economies, draw visitors from around the world, and are central to many residents' ways of living. Many small, vibrant fishing communities dot this coastal landscape.

Although southern coastal Alaska still has many largely intact watersheds it has not been immune from the effects of human development and resource extraction. Habitat degradation is the #1 cause of fish declines in the U.S.

Many salmon streams impacted by past logging, mining, and road construction practices are in need of restoration and to regain the functions and instream habitat complexity required to support all life stages of salmon.

Numerous road-stream crossings not designed with fish passage in mind block or delay adult and/or juvenile fish from reaching important upstream spawning and nursery habitats.

Thankfully, investments in fish habitat restoration in southern coastal Alaska have immediate returns—improved and/or reconnected habitats are almost immediately re-occupied because there are generally viable fish populations adjacent to degraded areas. In fact, it is not uncommon to see juvenile salmon using habitat upstream of roads within days of restored fish passage.

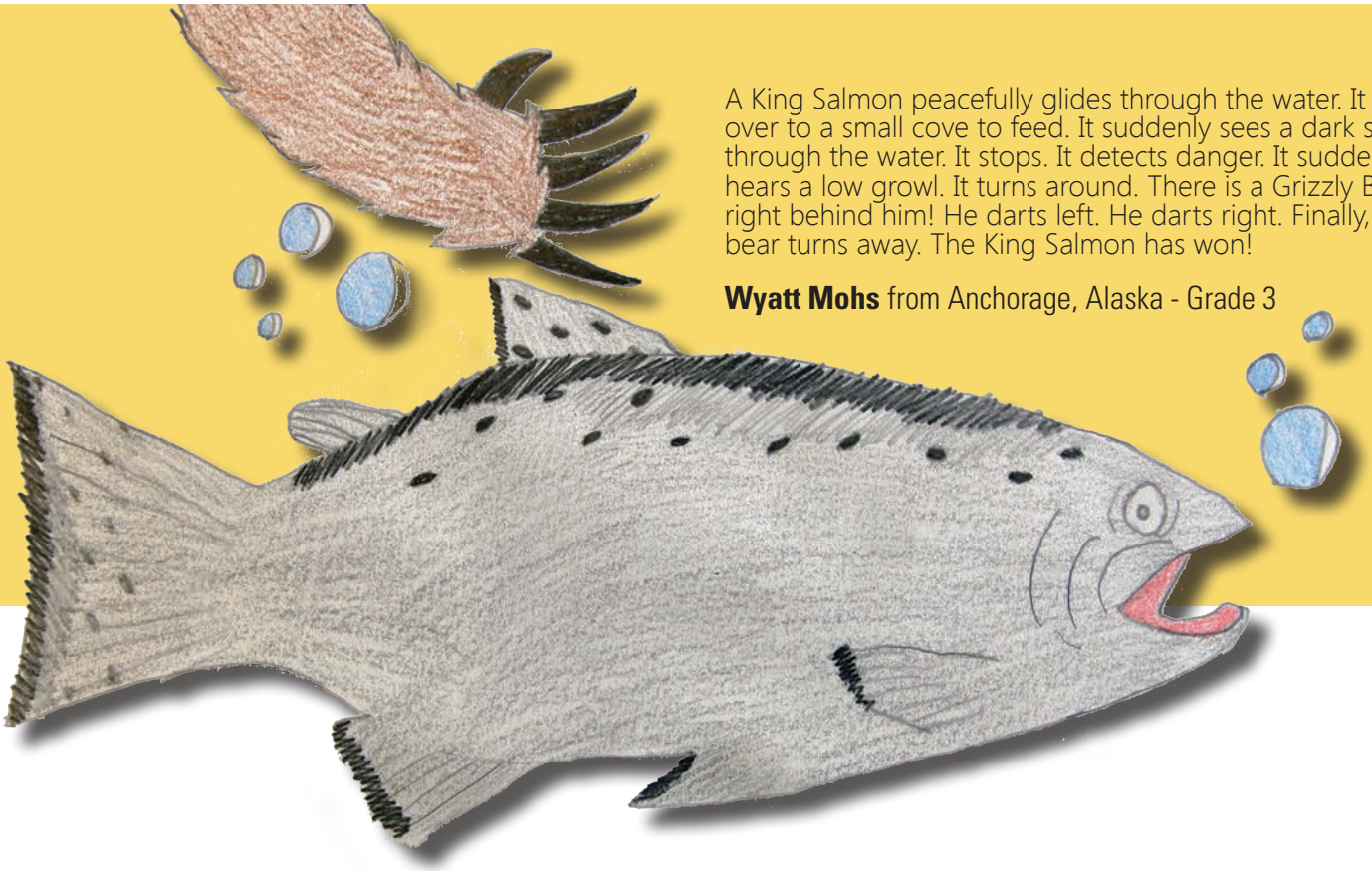
These fish eventually migrate to and spend time at sea before returning to their natal streams to perpetuate Alaska's salmon success story. Along the way, they are caught and sold in domestic and international markets, end up on the dinner tables of Alaska residents and visiting sport fishermen, and support jobs in the region.

The **Southeast Alaska Fish Habitat Partnership** (*http://seakfhp.org*) provides coordination support for partners operating across this island-dominated landscape and helps to facilitate a coordinated delivery of on-the ground habitat restoration and conservation.
Under the direction of the Anchorage Field Office, our **Juneau Satellite Office** provides financial support and technical assistance to partners working to conserve and restore habitat in Southeast Alaska through three U.S. Fish and Wildlife Service conservation assistance programs: Partners for Fish and Wildlife, Fish Passage Program, and Southeast Alaska Coastal Program.

by Neil Stichert (USFWS), Deborah Hart (Southeast Alaska Fish Habitat Partnership), Mark Kaelke (Trout Unlimited), and Roger Harding (Alaska Department of Fish and Game). Edited by K.Mueller

2015 State-Fish Art Contest

More results at: ***http://www.wildlifeforever.org/contest***
2016 entries due March 31, 2016



A King Salmon peacefully glides through the water. It swims over to a small cove to feed. It suddenly sees a dark shape through the water. It stops. It detects danger. It suddenly hears a low growl. It turns around. There is a Grizzly Bear paw right behind him! He darts left. He darts right. Finally, the bear turns away. The King Salmon has won!

Wyatt Mohs from Anchorage, Alaska - Grade 3

Icey Lyman from Crooked Creek, Alaska - Grade 11

In the heart of the Great Land
Flows the mighty Kuskokwim
Where we pick berries by hand
And the King Salmon swim

We catch them in summer
The fish gives us strength
While swimming they shimmer
Like the whole river's length

They are so important
To all of our lives
The great fish, a brilliant
Effort to survive

The spirit of Alaska
So vibrant and free
Is found in the 'King'
For all to see

from Jeff Anderson

Project Previews

Kenai River juvenile Chinook Salmon genetics

We are cooperating with the Kenai National Wildlife Refuge, Conservation Genetics Lab, and Alaska Department of Fish and Game to investigate habitat use and freshwater life history of juvenile Chinook Salmon in the Kenai River watershed. Fisheries staff will capture juvenile Chinook Salmon using minnow traps, beach seines, and other methods, and use ADF&G's mixed-stock genetic information as a "mark" for all fish captured throughout the watershed to infer movement, seasonal habitat use, and abundance by distinct reporting groups.

Testing of weir alternative on the Funny River

Electronic fish guidance arrays may be a good tool for managers monitoring escapement of Chinook and Coho Salmon in rivers that are unsuitable for weirs. The technology, which is already used extensively in North America and can be used to guide migrating salmon through a fish trap and video counting chute using a mild field of non-lethal, pulsed DC electricity, is being developed on the Funny River in conjunction with the existing weir. If successful, other possibilities include the Kisaralik, Kwethluk, and Killey Rivers.

Kuskokwim River rotary screw trap

Our Office, along with the Yukon Delta National Wildlife Refuge, are investigating freshwater life history and estimate smolt abundance and egg-to-smolt survival for Chinook and Coho Salmon on the Kwethluk River. The Yukon Delta NWR purchased a rotary-screw trap in 2013 which will allow us to estimate smolt abundance for the first time on the Kuskokwim River. Knowing how many smolts are in the river will provide valuable information to managers and researchers to partition survival estimates for fresh and salt water environments. The project will also serve as a pilot project to inform future basin-wide efforts.

Chickaloon River weir

The Chickaloon River is a remote river on the Kenai Peninsula with a mostly unexploited stock of Chinook Salmon. This is unique to Cook Inlet and most other systems in Alaska. Working with the Kenai National Wildlife Refuge and the Alaska Department of Fish and Game, we will assess run timing, abundance, and age, sex, and length characteristics of Chinook Salmon (and other species) returning to the Chickaloon River. The dynamics of this unexploited stock will provide comparison information to other heavily-utilized stocks in Cook Inlet (i.e., Kenai and Kasilof rivers) with similar run timing and to other heavily-utilized stocks throughout Alaska. Information from this project will be valuable for managers when considering conservation actions and future management on the Kenai Peninsula and beyond.

There are a few things in life that connect us all—one of those things is food! That's probably even truer in Alaska, where we take great pride in the wild resources in our backyard, and our roles—personal and professional—as stewards.

#ShareYourPlate

#akwildfoods

In Alaska, our staff work alongside partners to steward the fish, wildlife, and millions of acres of National Wildlife Refuge lands that people live from—these resources provide wild foods that are central to the Alaskan way of life and draw visitors from around the world.

We invite you to share your experience harvesting, preparing and eating Alaska's wild foods through photos, recipes and stories of stewardship on social media using the hashtags #ShareYourPlate and #akwildfoods.

2015

Photo Categories:
fish
birds
berries/flora
engaging the next generation
family favorites

Recipe Category:
Original family favorite

Above: filleted whitefish cooks on willow sticks "until crispy" while the intestines simmer in a frying pan. This was shared at a culture camp in Arctic Village. USFWS/Joanne Bryant

Left: Eclectic plate with several wild foods including a strip of baked Sockeye Salmon, King Salmon mixed with cream cheese on a cracker, salmonberry and crowberry agutuk, moose and beef spaghetti, a dried salmon strip, and macaroni. USFWS/Susanna Henry

Also called “silvers” for their bright chrome coloring at sea and early in their spawning migration, Coho Salmon develop a broad red streak and darken as spawning time approaches. Distinguishing features are white gums and irregular black spots on their backs and upper lobe of their tail. Adults typically weigh 8-12 pounds. Peak returns of Cook Inlet coho salmon to their spawning ground generally occur between mid-July and early September.