

Matanuska-Susitna Basin Salmon Habitat Partnership

Site Tour, July 25, 2018

Matanuska River Watershed

Chickaloon Native Village and Ya Ne Dah Ah School Moose Creek Campus

Presenter: Doug Wade (Chickaloon Village Traditional Council), Angie Wade (Chickaloon Village Traditional Council Cultural Program)

Description: Chickaloon Native Village is a federally-recognized Alaska Native Tribe governed by the nine-member Chickaloon Village Traditional Council (CVTC). CVTC is tasked to reassert the Tribe's identity and cultural traditions and create economic self-sufficiency for the Tribe. CVTC



operates seven (7) departments: Health and Social Services, Housing, Education, Environmental Stewardship, Justice, Transportation, and Accounting/Administration, to serve the needs of our Tribal citizens and another estimated 2,373 Alaska Natives and Native American Peoples living in our service area, as well as the non-native community members living in Glacier View, Chickaloon, Sutton, Palmer, and Butte.

Ahtna youth at Culture Camp

Salmon are a crucial source of food and culture for Ahtna people. CVTC partners with federal and state agencies, non-profits and the local community to restore fish passage, enhance habitats and fish populations, study salmon populations and habitats, and educate the community.

Founded in 1992, Ya Ne Dah Ah School is the first and only Tribally-operated school in Alaska. With a focus on Ahtna language and culture in addition to standard academics, this one-room schoolhouse is leading Chickaloon Village's Tribal efforts of cultural preservation, rejuvenation and celebration! Receiving no federal or state school funding, this educational program is dependent upon foundation grants and donations to teach, preserve, and rejuvenate the Ahtna language, culture, songs, dances, traditional values, ethics, earth stewardship, and history of Chickaloon Village.

Presenter: Jessica Winnestaffer (Chickaloon Village Traditional Council)

Project Description: Moose Creek begins in the Talkeetna Mountains and runs through the ancestral tribal territory of Chickaloon Village, an Ahtna Dene/Athabascan Tribe. Moose Creek is called Tsidek'etna in Ahtna which means 'grandmother's place creek' and it was an important source of salmon for hundreds of years. In 1923, a railroad spur was constructed to bring coal out of the Moose Creek valley. To minimize the number of railroad bridges and make room for the railroad, the railroad workers straightened and diked Moose Creek which led to the creation of several waterfalls along its length. These falls soon became barriers to fish passage, the largest waterfall completely inhibiting upstream fish migration. What was once a meandering salmon stream with all five species of Alaskan salmon, became a straightened, impounded, fast-flowing creek with limited salmon habitat.

In the early 2000s, prompted by a Chickaloon Village Elder's traditional knowledge of unimpeded salmon runs on Moose Creek, the Chickaloon Village Traditional Council and its partners, including the US Fish and Wildlife Service, began planning the restoration of Moose Creek fish passage. The work was completed in three phases. The first phase, completed in 2005, reconstructed the creek channel into its original meander bend around the largest and only completely impassable waterfall, opening upper Moose Creek to salmon runs once again. The second phase, funded partially by the Mat-Su Salmon Habitat Partnership, included the creation of quality salmon habitat through the reconstruction of a complex river channel and floodplain and the bypassing of three remaining man-made waterfalls. The final phase, completed in 2007, involved the creation of two log jams to stabilize the streambank, maintain fish passage around the largest waterfall, and create salmon habitat. Today, Chinook and Coho Salmon make their annual run to upper Moose Creek after an 80-year hiatus.



Moose Creek preceding restoration (left), and following restoration (right).

Presenter: Jessica Winnestaffer (Chickaloon Village Traditional Council)



Minnow trapping

Project Description: In 2017 and 2018 Chickaloon Village Traditional Council Fisheries Technicians are collecting data to understand Moose Creek juvenile Chinook and Coho Salmon movements and growth rates. Using baited minnow traps in 6 reaches of Moose Creek and 2 tributaries, juvenile salmon are caught and measured. Once salmon reach 55 mm in length (just over 2 inches), they are tagged with a passive integrated transducer (PIT) tag, which provides a unique identification for each fish. Through salmon recaptures in the minnow traps and with the use of a stream-wide PIT tag antennae array near the mouth of Moose Creek, we are beginning to understand patterns of juvenile migration, habitat use, and growth.

Restoring Fish Passage

Eska Creek

Presenter: Gillian O'Doherty (Alaska Department of Fish & Game), Brian Winnestaffer (Chickaloon Village Traditional Council) and Alex Senta (Mat-Su Borough)

Project Description: The Eska Creek drainage is one of several Matanuska River tributaries modified to support coal mining operations in the early 1900's. It was rerouted and dyked, yet still has maintained populations of four salmon species, including sockeye, chum, coho, and Chinook.



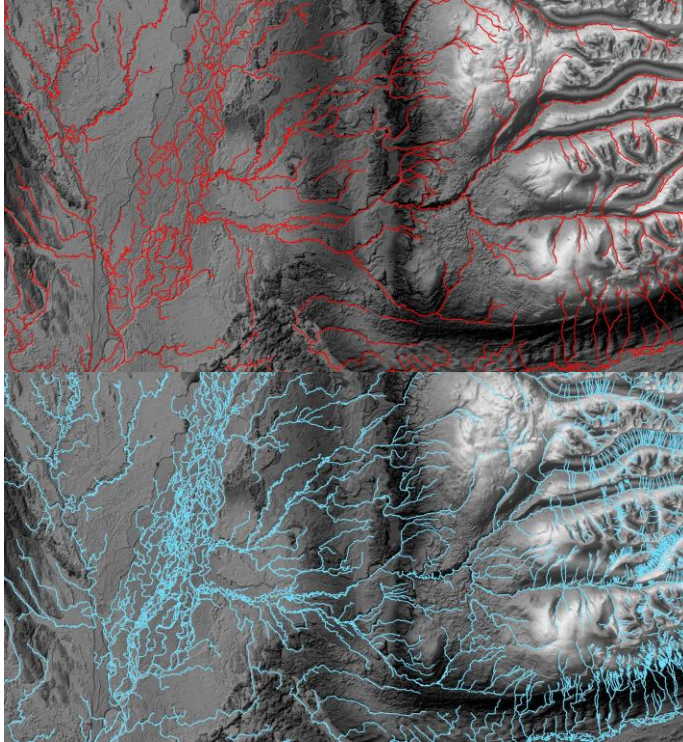
Undersized and perched culverts

Upstream of the Glenn Highway bridge on Eska Creek there are two more road crossings. Both impaired adult and juvenile fish passage, with the second set of culverts a complete barrier to salmon. Addressing the upriver barriers opened up over 5 miles of potential upriver habitat. Today Eska Creek is free its entire length to fish passage. Fish-friendly, or stream simulation culverts, have been constructed so that the channel inside the culvert is virtually indistinguishable to the natural stream channel up and downstream.

This allows fish and other aquatic organisms to freely pass up and downstream. Since 2005 partners have worked together to improve passage for fish at over 100 of the nearly 400 identified partial or complete barriers to adult and juvenile salmon in the Mat-Su.

Presenter: Taunnie Boothby (Mat-Su Borough)

Project Description: In December of 2015 The Nature Conservancy and partners completed an update to the U.S. Geological Survey (USGS) National Hydrographic Database. This doubled the number of mapped streams in the Mat-Su Basin, increased the accuracy of stream maps, and



Maps of Willow Creek, based on the existing data, (top), and new LiDAR source data, (bottom). The new Mat-Su Basin maps show a stream network of roughly 53,000 miles, doubling the previous map standard of roughly 25,000 miles.

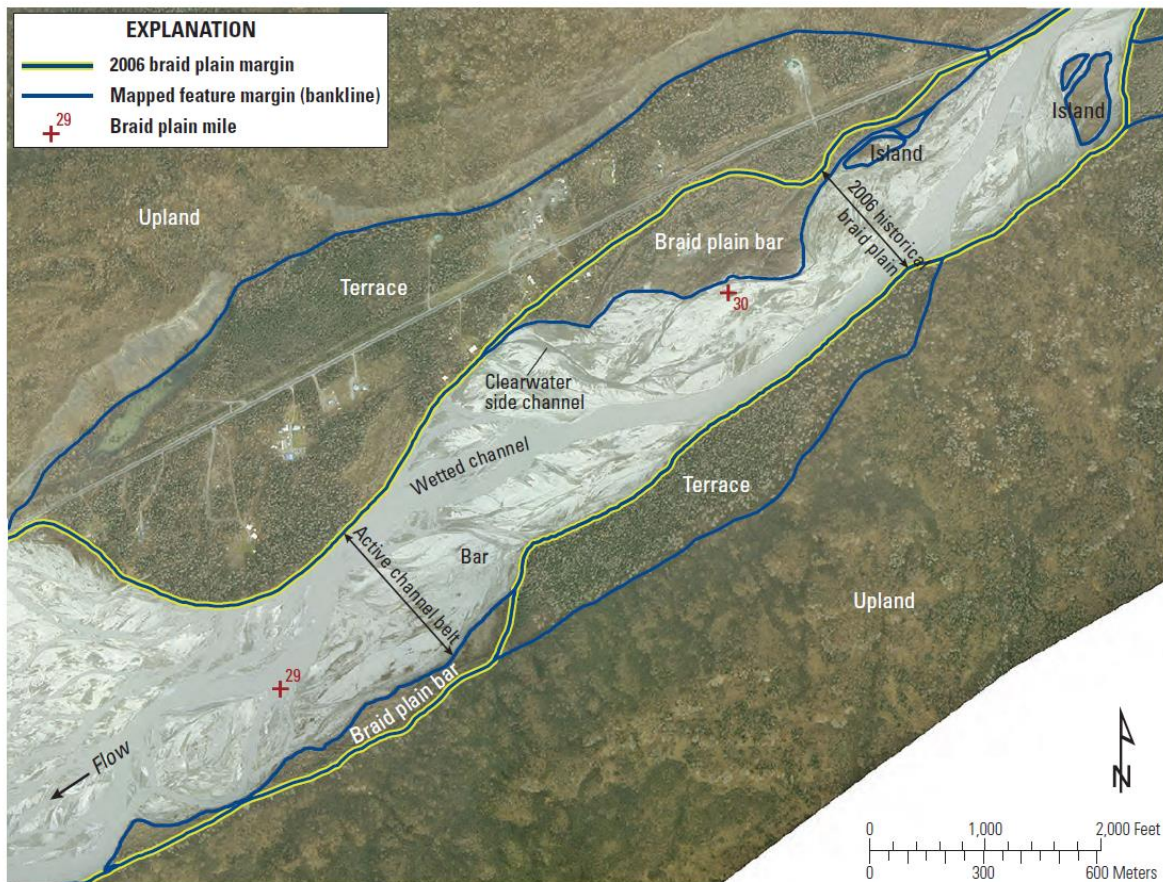
brought them up to national standards. Subsequently, the USGS updated all watershed and sub-watershed boundaries in the Mat-Su using the newly mapped stream network. Having the many smaller tributary streams in which juvenile salmon mature before swimming to the sea now mapped accurately for the first time, will help us all make salmon-friendly decisions about how to manage and develop our lands and waters.

The utility of this publicly-available dataset goes beyond salmon to potentially include enhanced flood preparedness, emergency response, and community and development planning. For the Partnership, it improves our ability to effectively participate in the national fish habitat assessment looking at the status of fish habitat across the nation and helps partners prioritize conservation and fish passage restoration efforts.

Presenter: Janet Curran (US Geological Survey)

Project Description: The glacially-fed Matanuska River channel moves frequently, and swiftly. The relatively steep river has an abundant sediment supply and glacially-fed hydrology in a locally wide valley, leading to an active channel that rapidly abandons and reestablishes channels. Over the past 150 years, surfaces within the river’s broad, braided floodplain, or braid plain, have been stable on average for only a few decades. This natural channel migration can provide salmon habitat within the braid plain where a clearwater tributary or groundwater flows through abandoned mainstem channels, creating a clearwater side channel. When an active river channel flows against erodible areas at the edge of the braid plain, however, bank erosion can damage or threaten houses, roadways, and public facilities. Complicating this problem for homeowners and land managers is the swift onset, extensiveness, and localized nature of the erosion.

A 2006 USGS study analyzed historical erosion, mapped bank materials and heights, and described river processes, generating resources to provide a basis for better understanding the river and addressing issues like salmon habitat change and bank erosion. The study found that from 1949-2006, severe erosion (bank retreat of about 200-1,000 ft) occurred at 20 separate hotspots totaling only 8 percent of banks (11 mi) but accounting for 64 percent of all erosion. Mapping products from the study are available online and provided to the public via the Matanuska – Susitna Borough.



Imagery: USGS orthophotograph, 1-foot pixels, 2006 photography. Projection: UTM zone 6, North American Datum of 1983

Matanuska River valley bottom and braid plain features.

Presenter: Janet Curran (US Geological Survey)

Project Description: Conventional understanding of salmon spawning habitat in glacial river basins envisions the mainstem as a transportation corridor, used by fish to access clearwater habitats in tributaries and lakes. A pair of federal studies provided evidence of clearwater habitats for spawning salmon within the otherwise turbid Matanuska River braid plain and quantified the relevance of these habitats for the basin.



Spawning salmon entering a clearwater side channel.

A USGS study conducted in cooperation with the U.S. Fish and Wildlife Service and the Chickaloon Village Traditional Council used aerial photography to map over 100 km of clearwater side channels within the wide, gravelly braid plain of the Matanuska River mainstem. Often located within abandoned mainstem channels, some channels were fed by tributaries, but most were fed by springs within the braid plain. From overwinter water

temperature measurements and observations of channel characteristics, it was apparent that these clearwater side channels are viable salmon spawning habitats and likely rearing habitats. A parallel U.S. Fish and Wildlife radio-tracking study of Matanuska River salmon found that 90 percent of chum salmon, 98 percent of sockeye salmon, and 44 percent of coho salmon selected spawning locations in the clearwater side channels within the mainstem braid plain rather than farther up tributaries or in the basin's lakes.

Given the dynamic nature of the Matanuska River, these critical clearwater side channel habitats are likely to change, move, disappear, and reappear over time, a natural cycle of disturbance that is considered an important component of healthy habitats for Pacific salmon. Previously largely ignored as fish habitat, the Matanuska River is part of the focus of the Matanuska-Susitna Basin Salmon Habitat Partnership on defining the distribution of salmon habitats in the Matanuska-Susitna Basin.