

**Juvenile Chena River Salmon Project 2014**  
**Juvenile Chinook salmon (*Oncorhynchus tshawytscha*) in the Chena River corridor through Fairbanks, AK: Using citizen scientists to build community stewardship.**

Project RM#: 32-14

Award **F14AP00489**

**Project Proponent:** : Jewelz Barker, Tanana Valley Watershed Association, 516 2<sup>nd</sup> Avenue, Suite 412, Fairbanks AK 99701, [tvwatershed@gmail.com](mailto:tvwatershed@gmail.com)

**Project Partner:** Jeff Adams, FFWFO, 101 12th Ave, Fairbanks AK 99701, [jeff\\_adams@fws.gov](mailto:jeff_adams@fws.gov)

**Introduction:** The Chena River Salmon Project has used citizen scientists to study juvenile Chinook salmon in conjunction with an outreach campaign targeted at residents and visitors to increase their awareness of the importance of Chinook salmon in the Chena River. TVWA built support of the Chinook salmon population, by focusing on outreach and education efforts using social media and at major community events to build community knowledge about the Chena River Chinook salmon population.

**Summary:** The primary goal of this project was to increase the Fairbanks community's stewardship of the Chena River Chinook salmon population; more specifically, to build the public's awareness of out-migrating juveniles, juvenile salmon use of the Lower Chena River's stream bank habitats, the characteristics of stream banks that are beneficial to juvenile survival, and the individual and collective actions that can be taken to conserve, restore, and promote healthy stream banks in the Lower Chena River.

**Objectives:** The objectives of the project were as follows:

- Engage the community; through information booths at 5 or more public events, conducting at least 4 on river project demonstrations, and coordinate current Chena Chinook information available on the internet.
- Build awareness of Chena River Chinook salmon; in addition to the success we encountered at the Outdoor Show and Chena River Summit, we will expand our awareness efforts to host a booth at the Alaska Fish and Game's Kids Day as well as hosting a booth at the Summer Solstice downtown in an effort to reach many of the 30,000 attendees.
- Increase public participation in complementary efforts such as Green Infrastructure practices, stormwater management and design, riparian zone regulations and other stewardship programs. Which we will document though increased participating in the US Fish & Wildlife's Partners program, Fairbanks' Green Infrastructure Group projects and increased participation in TVWA's Adopt a Stream Program.
- Incorporate awareness of Chena River Chinook salmon in local environmental education in schools and summer camps. Coordinating with the multiple agencies and resources available and creating a user friendly guide to help teachers, parents and educators access educational materials.

## Study Area:

The study area is the Lower Chena River, with the geospatial location of 64.797527, -147.19288.

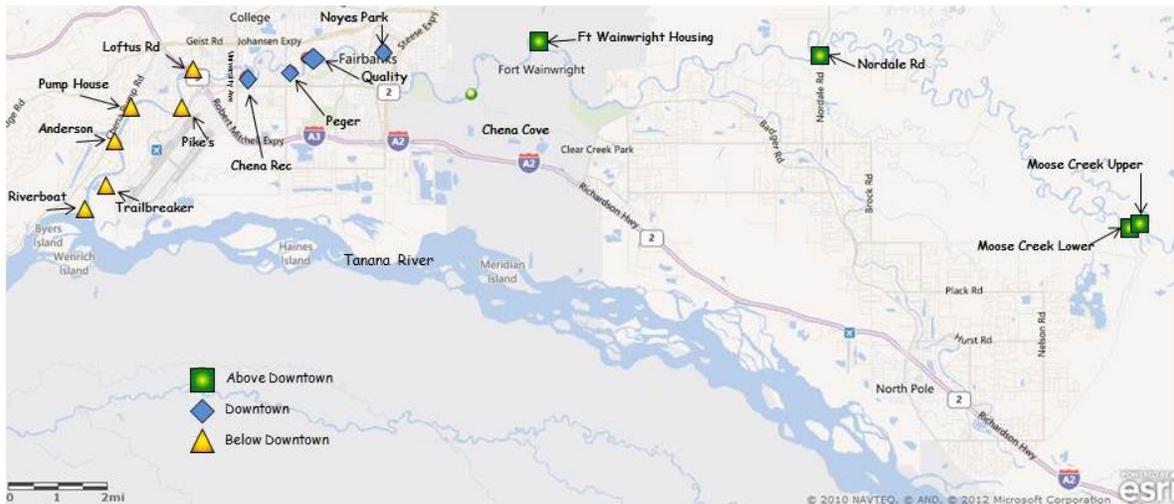


Figure 1: Sample locations along the Lower Chena River from Moose Creek Dam to the confluence at the Tanana River.

**License and Permits:** AKDFG Fish Resource Permit SF2014-105

## Methods Include:

Our sampling took place between May 2014 and October 2014. Sampling procedures involve three areas, which are water quality, fish monitoring, and habitat assessment. Water quality used a Hanna meter to record water pH and conductivity and a thermometer to record ambient temperatures. This instrument was standardized before every reading and after to ensure accuracy, using standards of pH 4, pH 10, and 1413 conductivity solutions. The sampler collected a sample of water to use the Hanna meter to record the water's pH, conductivity, and temperature onto a water quality datasheet. The sampler also documented weather, ambient temperature, and field observation, such as wildlife or erosion. Conductivity, pH, temperature and habitat conditions recorded provided insight to the overall water quality of the river area sampled. Datasheets were collected for database entry and analysis by TVWA staff.

The fish monitoring technique used included baited minnow traps that followed a protocol of a 24-hr soak period to capture fish and record quantity, species type, and other information on a datasheet. The minnow traps were 23 x 45 cm, 0.6 cm wire mesh, with 2.5 cm diameter openings holding salmon roe bait in order to maximize the probability of encountering as many fish species in different life stages as possible. A fish viewer and mesh net was also used in conjunction with a bucket in order to access the fish from the minnow trap, observe, and record the information. The fish, once recorded quantitative parameters (e.g. quantity per species, Chinook length, dead fish) was completed, were released back into the river. Fish handling required the fish to be in the river water at the sampling site location and with minimal contact with the fish. The datasheet were collected for database entry and analysis by TVWA staff.

The final monitoring will include habitat assessment done at the beginning of sampling season, mid-season, and at the end of the season to gather information throughout the monitoring project. The datasheet captured the habitat, river, and streambank conditions, which were collected for database entry and analysis by TVWA staff. All datasheets from habitat, fish, and water quality were used in reporting and graphical depiction of the results from the Chena Salmon Citizen Science program.

***Operations:***

We held outreach events at:

- 4.13.14 Spring Migration/Outdoor Kids Day @ Creamers Field
- 4.25-4.27 Outdoor Days @ the Carlson Center
- 5.7.14 Chena River Summit @ the Carlson Center
- 5.10.14 AAS Training
- 5.17.14 AKDF&G Kids Day @ Creamers Field
- 6.14.14 Riverwalk Event @ Carlson Center
- 6.22.14 Solstice Street Fair @ Downtown Fairbanks
- 7.12.14 AAS Training – Moose Creek
- 7.20.14 Golden Days @ Pioneer Park
- 7.27-8.2 Week on the River – the Folk School
- 8.8.14 Tanana Bridge Crossing Dedication
- 8.17.14 Renewable Energy Fair @ Chena Hot Springs
- 10.3.14 Rain 2 Rivers Resource Center Open House

***Data Analysis:***

We handed out the following materials:

- 600+ of the Alaska Fish ABC's coloring books
- 550+ of the Chena River Salmon project branded coloring crayons
- 300+ USF&W Salmon of the Pacific Coast pamphlets
- 300+ Chena Salmon Citizen Scientists Handout

***Results Include (Minimum):***

TVWA continued to talk to thousands of people throughout 2014. We provided a wide range of information on everything salmon related and Chena River related. We had highlighted central aspects of salmon and Chena related topics, which include:

- Salmon life cycle as it pertains to the Chena river
- Healthy habitat information
- Types of fish that live in the Chena river
- Value of the Chena to the Chinook salmon
- How many fish we caught and where
- Reasons as to why the numbers vary from year to year
- Some of the changes we saw over the course of the project
- The methods we used in catching them and why

We also created a handout with all of the collected information over the past 3 years (Appendix A). This year, for 2014 we had collaboratively recorded the 24 collected fish, which average lengths were between 53 and 55 mm (Table 1). Our highest fish species count was the slimy sculpin (14) with chum salmon following (9) (Figure 2).

Table 1: Lengths (average) of the salmon caught for 2014 per species in millimeters (mm).

| Species        | Average Length (mm) |
|----------------|---------------------|
| Chinook Salmon | 55.00               |
| Chum Salmon    | 53.78               |

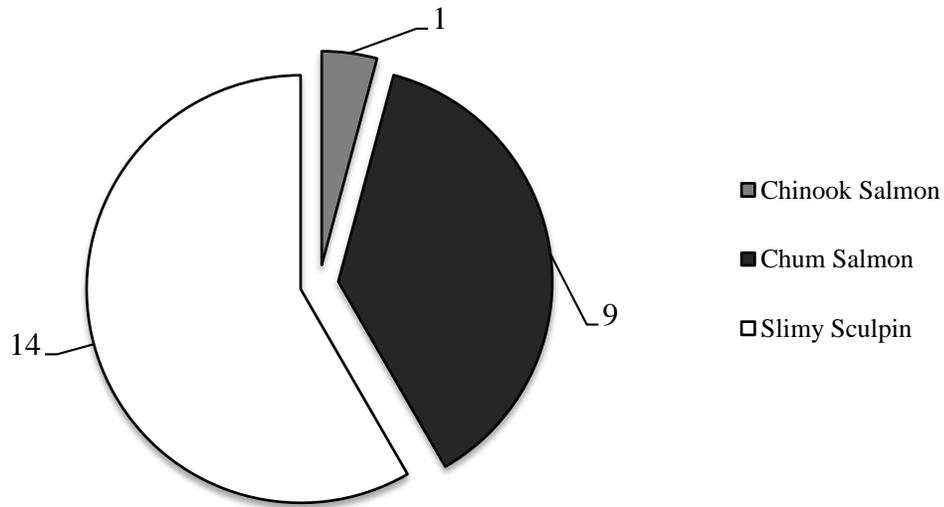


Figure 2: Number of fish caught per species in 2014.

**Discussion:**

The open water season for 2014 was faced with high water. Given abnormally high water during the setting season, our results are very low because of unfavorable conditions for setting traps and checking.

**References:**

N/A

**Appendices:**

Appendix A: CSCS Handout Sample

Appendix B: Data of Fish Samples 2014

# Appendix A: CSCS Handout Sample

## Project Overview:

During the summers of 2011, 2012 and 2013, studies were conducted of the Chinook Salmon on the lower Chena River. A true community-based project, over the three years, 268 people helped with this sampling project. Over the 3 years, we caught 4485 fish in minnow traps, 3238 of which were Chinook salmon. Over 5,000 people were educated about salmon in the Chena River at local events.



|                      | 2011                 | 2012              | 2013              | Total or average    |
|----------------------|----------------------|-------------------|-------------------|---------------------|
| Total Fish Caught    | 779                  | 1511              | 2195              | 4485                |
| Chinook by %         | 24%                  | 56%               | 51%               | 43.6%               |
| Slimy Sculpin by %   | 61%                  | 37%               | 21%               | 39.6%               |
| Lake Chub by %       |                      |                   | 25%               |                     |
| # Chinook            | 194                  | 849               | 2195              | 3238                |
| # Species Caught     | 9                    | 7                 | 7                 | 7.6                 |
| Sampling Period      | April 26- October 26 | May 15- October 1 | June 1- October 1 | Varied due to water |
| # Sites sampled      | 7                    | 13                | 14                | 11.3                |
| # Volunteers Engaged | 57                   | 124               | 87                | 268                 |
| # Public Educated    | 1000                 | 2000              | 3000              | 5,000               |



**What kind of fish were caught?** 9 Species of fish were caught over the course of this project: Chinook Salmon, Chum Salmon, Slimy Sculpin, Lake Chub, Longnose Suckers, Burbot, Alaska Blackfish, Arctic Lamprey and Round Whitefish.



## What were some changes that you saw over the course of the project?

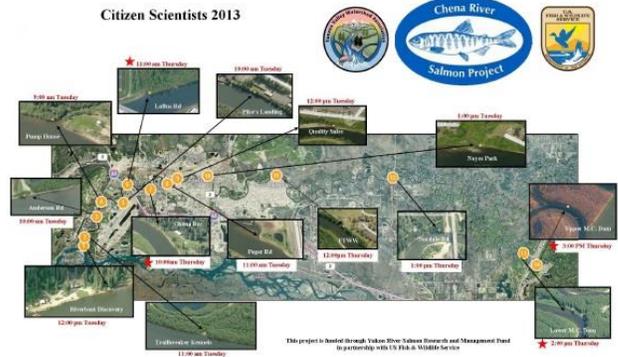
Each year we experienced different weather patterns; this affects the water hydrology, the velocity and volume of water. In 2013 we had to delay sampling for an entire month due to a late break up and flooding. We also noted that the diversity of some sites changed, one year Noyes Park had the lowest species diversity. However, in 2013 Noyes Park was our most diverse sampling site. That may have been caused by a change in water flow or quality in that area.



Chena Salmon Citizen Scientists Program  
516 2nd Avenue, Suite 412  
Fairbanks, AK 99701  
www.tvwatershed.org



## Citizen Scientists 2013



## Where were most of the fish caught?

We found the most fish at Moose Creek Dam and Riverboat discovery sites. These sites hosted the best habitat for small fish, with natural riverbanks and ample low-hanging woody debris.



**How did you catch fish?** We used four Gee-type minnow traps (23 x 45 cm, 0.64 cm bar mesh, with 2.5 cm diameter opening) baited with disinfected salmon roe and set for 24 hours for each sampling event. Sampling events occurred once per week per site.



## Why do the number of fish caught each year vary?

There are several factors that may have contributed to the number of fish caught. Fish populations are always growing and shrinking over time. Four main factors that affect population size are birth rate, death rate, emigration or immigration. Recruitment is the term used for the number of new fish entering a population. This number can fluctuate each year; Chinook for example have to make it through two of their life stages before they could be caught in a trap. Another factor was the consistency of the data collection. Years one and two some volunteers were allowed to sample on their own, however they were not always able to sample their sites, causing some sites to not be sampled every week. In 2013, year three, staff from TVWA accompanied volunteers into the field every week to ensure that every site was sampled every week.

The Chena River is home to the 2nd largest Chinook salmon run in the Alaskan portion of the Yukon River Basin.

Chinook salmon migrate 920 miles up the Yukon and Tanana Rivers to spawn in the Chena River (yellow line).

Chinook salmon arrive in the Fairbanks area in late June to early July and spawning is complete by early August.

It is thought that all spawning occurs in the upper Chena River. (ADF&G Brose, 2009)

### How do YOU use the river?

Fish diversity is important to river health, as it indicates that different resources within the river, together with the natural and human-made environment, are being used by the fish. The more diverse the fish community, the more resilient the river is to change.

Fish populations are always growing and shrinking over time. Four main factors that affect population size are birth rate, death rate, emigration or immigration. Recruitment is the term used for the number of new fish entering a population. This number can fluctuate each year; Chinook for example have to make it through two of their life stages before they could be caught in a trap.

Funding provided by Yukon River Salmon Research & Management Fund RM 32-12

**Chena River Salmon Project**

**Noyes Park highest diversity 2011**

**Parks Highway highest diversity in 2012**

**Noyes Park highest diversity 2013**

**The Chena Salmon Project - is a citizen scientist study of juvenile Chinook salmon on the Chena River. To carry out this project, TVWA field technicians partnered with local volunteers to collect data vital to the understanding of Chinook salmon including:**

1. Numbers & size of juvenile fish (including Chinook)
2. Water quality testing
3. Habitat conditions

These partnerships connect the community with nature in a different way, helping to generate a 'stakeholder' attitude toward the Chena River, resulting in long-term demographics of stewardship for local salmon resources.

**Chinook size at the Moose Creek Dam 2012**

**Chinook caught at each site**

Funding provided by Yukon River Salmon Research & Management Fund RM 32-12

## Appendix B: Data of Fish Samples 2014

| Date    | Observer name (first name, middle initial, last name) | Fish collection method | Species        | Life stage | Length (mm)<br>No estimates/ranges | Length method |
|---------|---|------------------------|----------------|------------|------------------------------------|---------------|
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chinook salmon | juvenile   | 55                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 55                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 60                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 50                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 52                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 50                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 50                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 60                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 57                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Chum Salmon    | juvenile   | 50                                 | fork          |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |
| 7/12/14 | Jenna E Hertz   | Minnow Trap            | Slimy Sculpin  | juvenile   |                                    |               |