Yukon Fisheries News

Protecting and promoting all healthy wild fisheries and cultures along the Yukon River drainage

Special Fall/Winter Edition

Read about Sheefish Migration and Spawning in the Yukon River on page 5

Special Edition 2024

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News from the Director

Serena Fitka

YRDFA Executive Director

When things go wrong, we often tend to assign blame. We need the justification of the wrong that has been done. The issue at hand pertains to the management of our salmon. In times of distress, reflecting on our past mistakes can guide us down two distinct paths. Staying in the past and focusing on past wrongs is a common occurrence. Unfortunately, many people remain mired in the past, unable to move forward until it consumes them. The alternative approach involves acknowledging that past actions are irreversible and striving to improve current circumstances. What can we do differently so we don't repeat the same mistake and fall back into the same situation? What needs to change?

These questions lay a foundation for change and action. In a world where we want to be right or in control, we need flexibility to overcome our control. With all the issues we are facing on the Yukon River in regards to our salmon declines, we must continue to move forward in an actionable way. Despite our complaints, finger-pointing, and blame-placing, what tangible progress has been made? Nothing.

Let's look at the issues our Yukon River salmon are facing, work on the issues we can control, and ask those questions. As we implement plans to rebuild the Yukon River salmon stocks, we must remain vigilant in addressing not only the river but also adopting a holistic approach to the Yukon River salmon lifecycle. Working together, upriver communities, lower river communities, state, and federal agencies can provide efficient and innovative ways to move forward. Effective meetings facilitate the transition from discussion to action. I will leave you with a quote from Carl B. Cook: "As we unite to serve one another, we accomplish much more together than we could on our own."

Serena Fitka

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THE OFFICIAL PUBLICATION OF THE
YUKON RIVER DRAINAGE FISHERIES ASSOCIATION

Victoria Gold Eagle Mine Heap Leach Failure

As of November 11, 2024, it has been 140 days since cyanide-contaminated debris and solution leaked into a stream that eventually drains into the Yukon River. It has many fishers in Yukon communities concerned about the future of Chinook and Chum salmon that spawn in these waters and their own health. They have voiced that they are caught in the middle of the politics within the Yukon Headwaters and the Bering Sea and are starting to get very concerned about their future food security as they have lived through many years of tough regulations and conservation efforts for the Chinook and Fall Chum salmon species.

On June 24, 2024 a landslide at Victoria Gold's Eagle Mine swept into a heap leach facility releasing 4 million tons of crushed ore that contained cyanide solutions used to extract gold from ore into Dublin Gulch which empties into Haggart Creek, upriver from the Yukon River on the Traditional territory of the First Nation of Na-Cho Nyak Dun.

The Heap Leach Failure at Victoria Gold Eagle Mine
Photo courtesy of the Yukon Goverment

To read and keep up-to-date on the Victoria Gold Heap Leach Failure:

https://yukon.ca/en/victoria-gold-updates

Update on Salmon Monitoring in the Eagle Gold Mine Disaster Aftermath

First Nation of NA-CHO Nyäk Dun

October 15, 2024

After the June 24, 2024 Heap Leach Facility (HLF) failure at the Eagle Gold Mine in central Yukon, the First Nation of Na-Cho Nyäk Dun (FNNND) raised immediate concerns about the cyanide solution used in the heap leach process coming into contact with the land, surface waters, and groundwaters. Immediately following the failure, FNNND created a technical team to lead investigative efforts, clean up initiatives and to monitor environmental impacts to the watershed.

As a keystone species, the First Nation of Na-Cho Nyäk Dun is taking extra precaution to monitor the health and wellbeing of salmon in the aftermath of the Eagle Gold Mine crisis. As FNNND maintains a voice in how and what on-site work is being carried out, taking caution to mitigate against harm to salmon is a priority.

While contamination resulting from the Eagle Gold Mine HLF failure still presents serious risks to the environment, effects on water quality to date have been very localised to the Haggart Creek area. As of early October 2024, there have not been any measurable effects on surface water quality beyond about 5 km down Haggart Creek from the mine site. Water quality in the South McQuesten River (about 27 km downstream of the mine) has not yet been measurably affected.

FNNND has summarized the results of the monitoring efforts below to provide clarity on the impacts of the Eagle Gold Mine crisis on salmon.

Haggart Creek: Concern

About: Known rearing and spawning ground. Eggs and juvenile fish will overwinter; eggs hatch in the spring and 1-year-old juveniles migrate down to the ocean.

Status Info: Ongoing monitoring of surface water in Haggart Creek shows contaminants of concern (COC) such as cyanide are well below discharge standards. On September 24 and 25, however, mercury levels exceeded the water quality objective at one monitoring station on Haggart Creek. As contaminated groundwater from the Eagle Gold Mine site emerges into the creek, there is concern that levels of contaminants will rise. This concern is further impacted by the coming winter weather and anticipated drop in water levels. On-site work is prioritizing contaminated groundwater collection in order to mitigate harmful impacts on the salmon and other fish species in Haggart Creek.

McQuesten River (27 km downstream): Caution

About: The MCQuesten River is the most important known Chinook salmon spawning grounds and rearing water courses in the Stewart River watershed. Haggart Creek flows into the South McQuesten River which joins the North McQuesten to make up the mainstem McQuesten River.

Status Info: To date, salmon and salmon habitat downstream of Haggart Creek have not been affected by the Victoria Gold heap leach pad failure. COCs not detected.

Stewart River (177 km downstream): Caution

About: The Stewart River Chinook salmon run totals about 6-10% of the total run of Canadian-origin salmon.

Status Info: To date, salmon and salmon habitat downstream of Haggart Creek have not been affected by the Victoria Gold heap leach pad failure. COCs not detected.

Yukon River (329 km downstream): Caution

About: The Chinook salmon run in the Yukon River has sustained First Nations for generations. The run has declined drastically in the last 8 years and there were record low runs in 2022 and 2023. Climate change-related changes in habitat, water conditions, and prey communities and competition from hatchery fish are likely the most important factors related to the decline.

Status Info: To date, salmon and salmon habitat downstream of Haggart Creek have not been affected by the Victoria Gold heap leach pad failure. COCs not detected.

As remediation work continues at the Eagle Gold Mine site, the biggest risk to salmon health at the moment is contaminated groundwater seeping into Haggart Creek. Work is actively being done to collect as much of this groundwater as possible and mitigate the contamination of the water system. Since the management of the site was transferred to the court-appointed receiver, PricewaterhouseCoopers,, management of contaminated water at the mine site has so far been successful in avoiding a large surface release of cyanide that would likely lead to extensive damage to fish and other aquatic organisms.

For more information on the status of salmon, and the ongoing impacts and remediation work at Eagle Gold Mine, please visit:

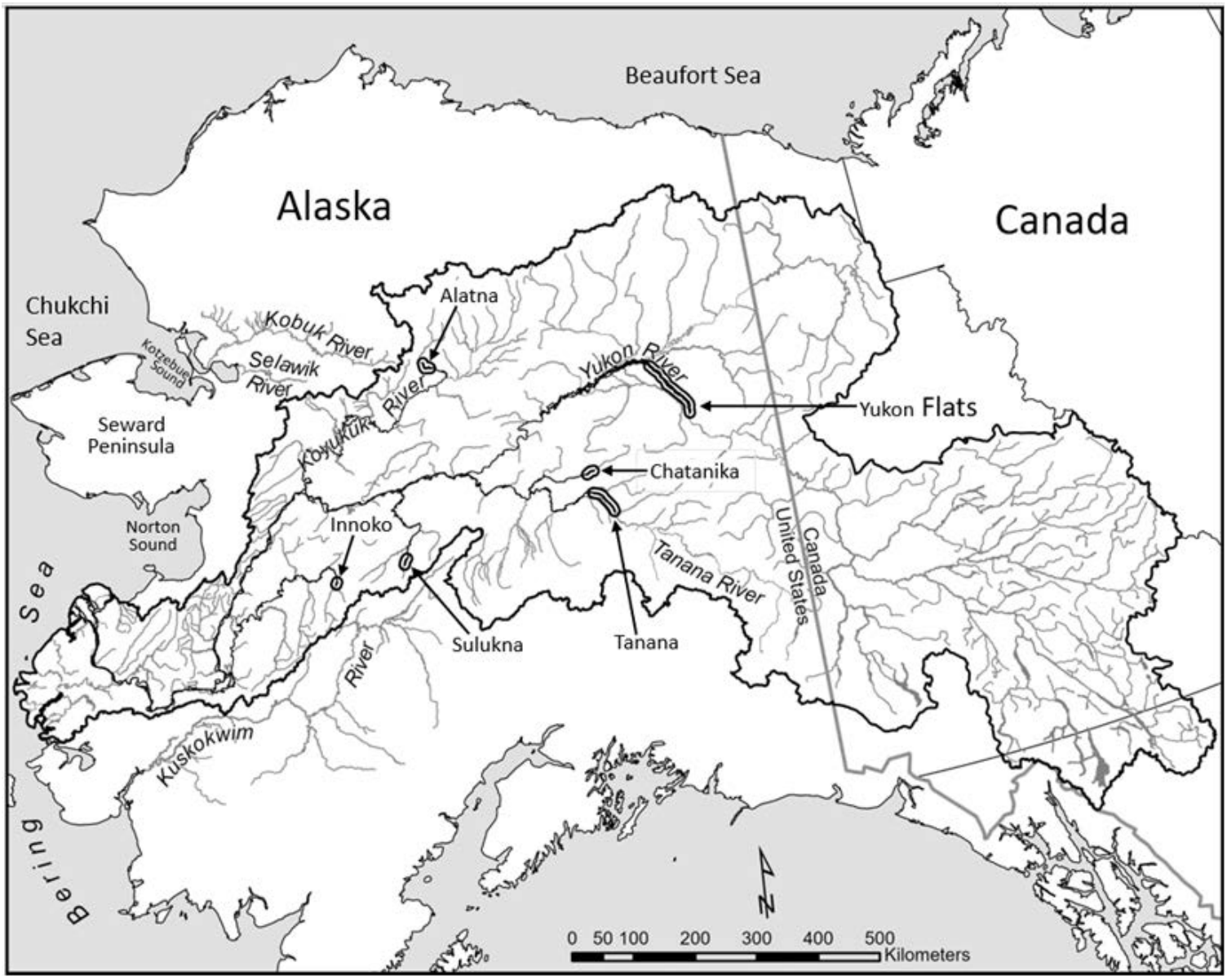
https://emergency-response.nndfn.com/

Migration & Spawning of Yukon River Sheefish

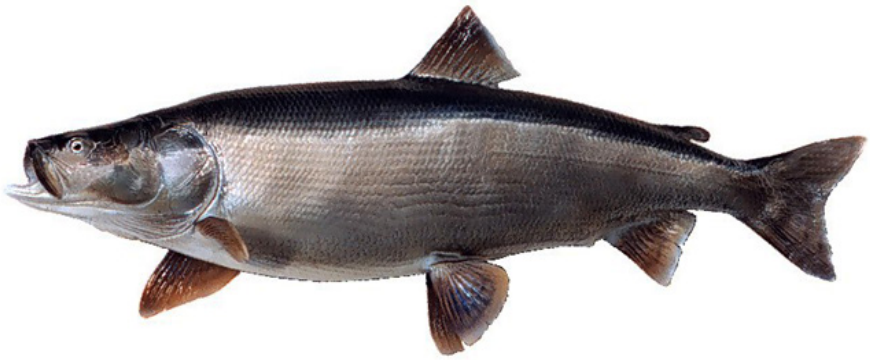
Randy J. Brown, USFWS Fisheries Biologist

A Brief Introduction to Current Research on Biology, Distribution, and Migration

This introduction was written for the Yukon River Drainage Fisheries Association by Randy J. Brown, U.S. Fish and Wildlife Service. It is based on material in a formal manuscript co-written by Randy J. Brown, Katie A. Drew, Bureau of Land Management, and Jeffrey B. Olsen, U.S. Fish and Wildlife Service



This map, created by Bob Henszey (USFWS), illustrates the locations of six verified sheefish spawning areas in the Yukon River drainage in Alaska as encircled reaches and identified by name. Genetic analyses indicate that the Alatna, Yukon Flats, and Tanana populations are more closely related to each other than to the Innoko or Sulukna River populations, which are most closely related to each other.



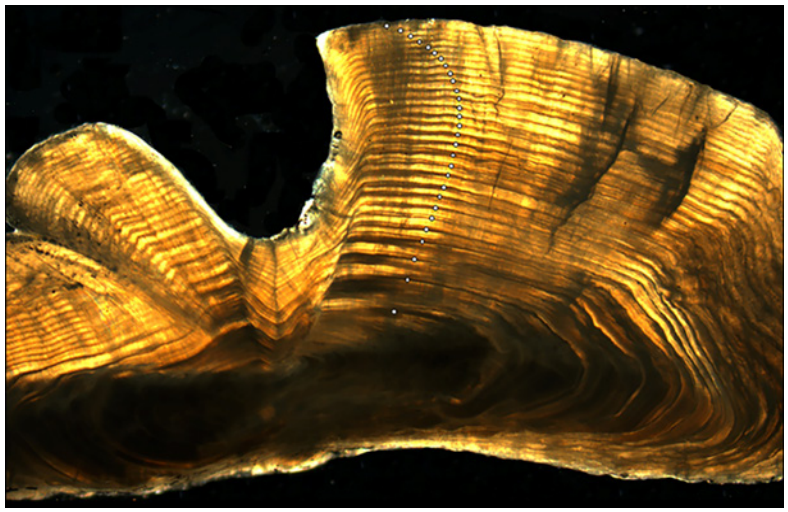
Sheefish, formally known as Inconnu Stenodus leucichthys, is a large, fish-eating whitefish species common to several northern rivers in Asia and North America, including the Yukon River. The Yukon River flows more than 2,000 miles from its headwaters in British Columbia and Yukon Territory, Canada, through Alaska to the Bering Sea. While sheefish are widely distributed through the Yukon River and its larger tributaries, our understanding of population level details including spawning origins, migrations, age structure, and tendencies to migrate to sea to feed, a migratory behavior referred to as anadromy, have only recently been explored. The advent of several new technologies over the last 30 years, including those associated with otolith aging and chemistry, genetics, and radio telemetry, have expanded our

understanding of sheefish longevity, anadromy, migration patterns, population structure, and more. Here we review and synthesize several recent research efforts on sheefish within the Yukon River in Alaska. Radio telemetry studies were used to locate spawning areas in turbid mainstem reaches of the Yukon River and certain tributaries. Six spawning areas, including three that had not been previously identified, were located and verified in the Alaska part of the Yukon River drainage (see map). Once spawning areas were identified, population specific sampling programs were initiated to collect size and age data, genetic tissue, demographic information, spawning timing, and for one population, abundance. Sequential year spawning occurred for some individuals, most commonly from populations with the greatest tendency for anadromy. Genetic relationships among populations indicated two major groupings in the Yukon River. Otolith chemistry studies indicated variable levels of anadromous tendency among populations that spawn as far as 1,000 miles upstream from the sea including individuals that migrate between salt and freshwater annually and those that remain in freshwater throughout life. Age structure data from some populations revealed significant differences in annual survival, most likely because of different levels of exploitation.

Sheefish spawning areas in the main-stem Yukon River, upper Yukon Flats (left), and main-stem Tanana River (right).. The spawning area in the upper Yukon Flats extends for over 60 miles and is over 1,000 miles upstream from the sea. Sheefish from the Yukon Flats population have a strong tendency to migrate to the mouth of the Yukon River to rear as young fish and feed during winter. The spawning area in the Tanana River extends for about 30 miles and is over 900 miles upstream from the sea. Some sheefish from the Tanana River population migrate to the Yukon Delta to rear and feed, but many do not. Both of these populations tend to spawn in mid-October. These two spawning areas had not been discovered prior to the use of modern radio telemetry technology.

Sheefish spawning areas in the Sulukna River, Nowitna River drainage (left), and the Alatna River, Koyukuk River drainage (right). The spawning area in the Sulukna River extends for about 12 miles and is about 840 miles upstream from the sea. Dave Esse, a biologist with the Bureau of Land Management, used an imaging sonar to count the number of Sheefish spawning in the Sulukna River during 2008 (2,079) and 2009 (3,531). Some sheefish from the Sulukna River migrate to sea to rear and feed, but most do not. The spawning area in the Alatna River extends for about 20 miles and is about 1,000 miles upstream from the sea. Similar to the upper Yukon Flats population, the Alatna population exhibits a strong tendency to migrate to sea to rear as young fish and feed during winter. Sheefish in the Sulukna River spawn in late September and early October, while sheefish in the Alatna River spawn in early to mid-October. The Chatanika and Innoko River spawning areas are most similar in appearance to the Sulukna River spawning area, but both appear to be small populations.

While many sheefish in the six spawning populations occupy similar habitats along the Yukon River main stem at times, as well as in the estuary for those that migrate downstream that far, they don't all behave the same. For example, most Sulukna River sheefish overwinter in the Yukon River near the mouth of the Nowitna River and downstream for about 100 miles. They then migrate back into the Nowitna river after breakup to feed.



We use otoliths, or ear bones, to age sheefish. The aging method is illustrated here with a thin-section of sheefish otolith viewed with a microscope. Twenty-nine annuli, opaque zones similar to tree rings, are indicated with white spots. The oldest sheefish we've observed was an age-42 fish from the Selawik River in NW Alaska.

By doing so, they avoid the under-ice fishery in the Yukon River delta and the salmon fisheries along the Yukon River in normal years during summer as the sheefish migrate upstream on their way to spawning areas. Most sheefish in the Alatna and Yukon Flats populations are vulnerable to both of those fisheries and are thought to experience lower survival than the Sulukna River population. Additionally, the Alatna River population experiences some level of harvest in the spawning area, which is not an issue for either of the other populations.

As far as we know, all of the spawning populations are remaining productive and capable of producing new fish each year. The only population that has had recent estimates of the annual spawning population is the Sulukna River population during 2008 and 2009. But sheefish populations are very challenging to count because only some of the adult population spawn on any given year, the rest just feed on non-spawning years and prepared for the next time they spawn, which could be only once in 3-4 years.

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YOUNG FISHERS REPS

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ALTERNATES

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Y-3, Alt. 1	Basil Larson	Russian Mission
Y-4, Alt. 1	Tommy Kriska	Nulato
Y-4, Alt. 2	VACANT	-
Y5, Alt. 1	Janessa Newman	Rampart
Y-6, Alt. 1	Phillip Titus	Minto
Y-6, Alt. 2	Kathleen Demientieff	Nenana
Koyukuk Alt.1	VACANT	-
Flats, Alt. 1	Rochelle Adams	Fort Yukon/Beaver
Canadian, Alt 1	VACANT	-

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