

# 2024 Yukon River Chinook Salmon Radio Telemetry - Program Update

YRDFA Board Meeting  
Anchorage, Alaska  
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Presented by Josh Clark  
Contributions by Adam O'Dell (DFO-Whitehorse) and  
Elizabeth MacDonald (CYFN-Whitehorse)



# Objective (Alaska)

**Determine the proportion of Canadian-origin Chinook salmon tagged near the mouth of the Yukon River that fail to reach U.S./Canada border due to suspected natural enroute mortality.**

Specific research topics that will be addressed during this study:

- Describe where suspected natural enroute mortality occurs along the Yukon River mainstem.
- Evaluate differences in the proportion of fish that likely died enroute by stock of origin, age, sex, and size.
- Evaluate the potential correlations between suspected enroute mortality and potential biological and environmental stressors (e.g., disease, river discharge, water temperature, etc.)

# Methods for Tagging & Tracking 2023 – 2025

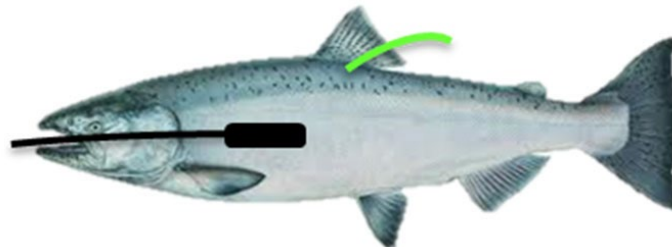
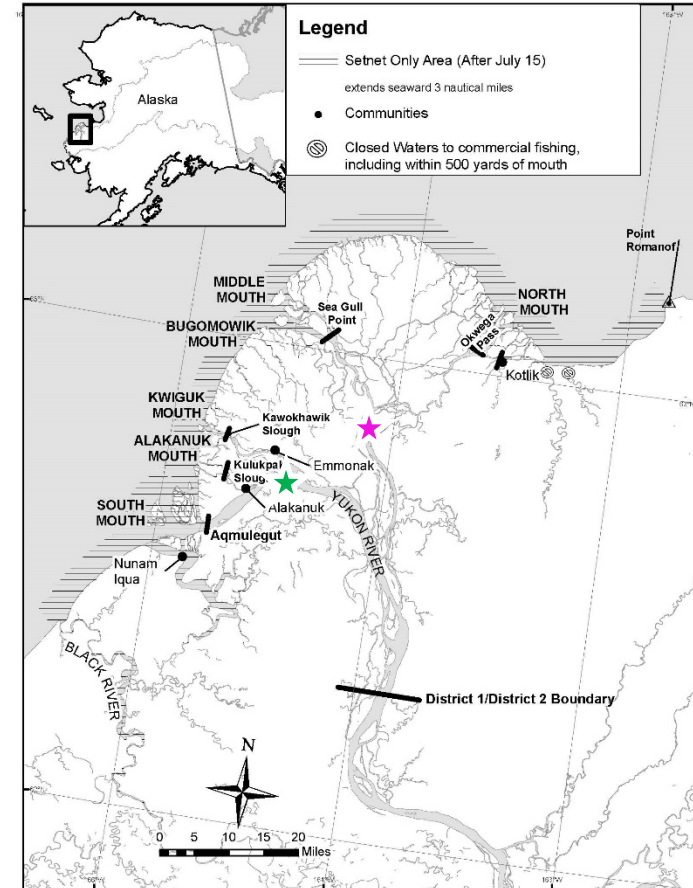
- Tagging operations are planned for three years 2023 – 2025, from early June through early July annually.
- Up to 500 tags will be deployed annually in the lower Yukon River mainstem near Emmonak.
- Genetic methods are being used to assign tagged fish to the Lower, Middle, or Canada stock group using individual assignment methods and the 2020 updated genetic baseline (R&E funded project URE 163-19).
- A combination of ground-based tracking stations and aerial surveys are being used to monitor the upriver migration and survival of each fish.

Typical  
tracking  
station and  
aerial setup →



# Tagging Methods

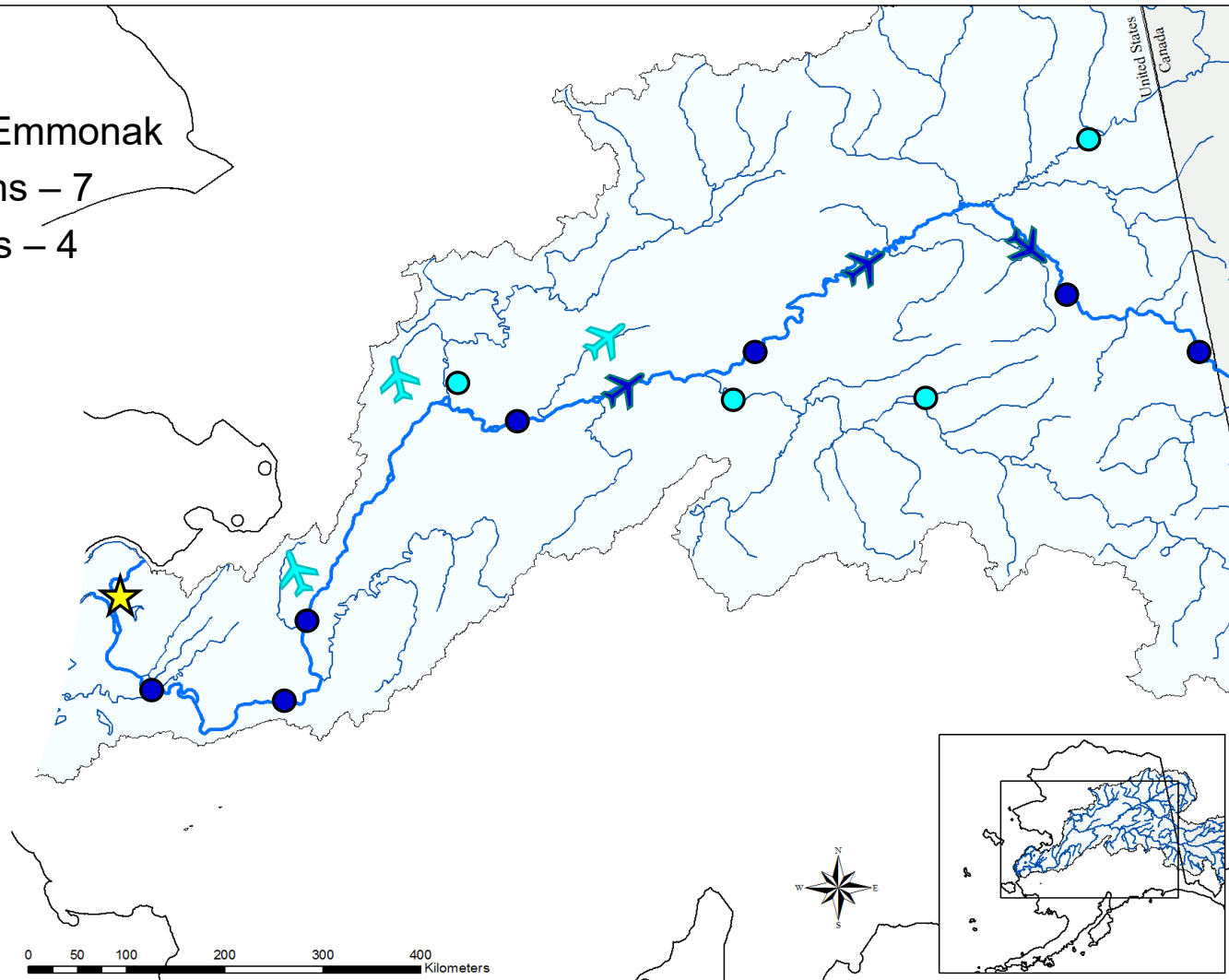
- Fish are being tagged in the Yukon River delta near Emmonak.
- Multiple tagging crews are being used to distribute tags between the South Mouth (Big Eddy) and Middle Mouth sites. Effort is being distributed according to run strength in each location.
- Proven safe fish handling methods are being used to ensure the health of each fish.
- Identification of each fish is made by uniquely coded esophageal radio tags and external spaghetti tags.
- Age, sex, length, and genetic tissue samples are also collected from each fish.






# Tracking Locations

- ★ Tagging Location near Emmonak
- Mainstem tower locations – 7
- Tributary tower locations – 4
- ✈ Mainstem aerial survey
- ✈ Tributary aerial survey



# 2023 Summary – Canadian Chinook

Location	Number of Tags
Total Tags Deployed	47
Migrating Canadian Origin Tagged	33
Recovered Canadian Origin Tagged	2
Tracking Locations	Remaining Percentage of Canadian Fish
Pilot Station 	94%
Raven Ridge (near Rapids)	91%
Porcupine River	3% (of total Canadian tagged)
Circle	73%
Eagle	67%
Dawson, YT	64%

# Collaboration



- En-route natural mortality has been identified as a bilateral management concern within both countries and this effort is part of a multi project approach to investigate what may be happening to these fish.
- ADF&G will share tag frequencies and codes along with any other pertinent information with DFO and First Nation partners in Canada.
- The JTC facilitated a planning meeting between ADF&G, DFO and Yukon First Nations to develop strategies for collaboration between parties to track fish as they move upriver.

# Legend

## Towers



Canada (11)



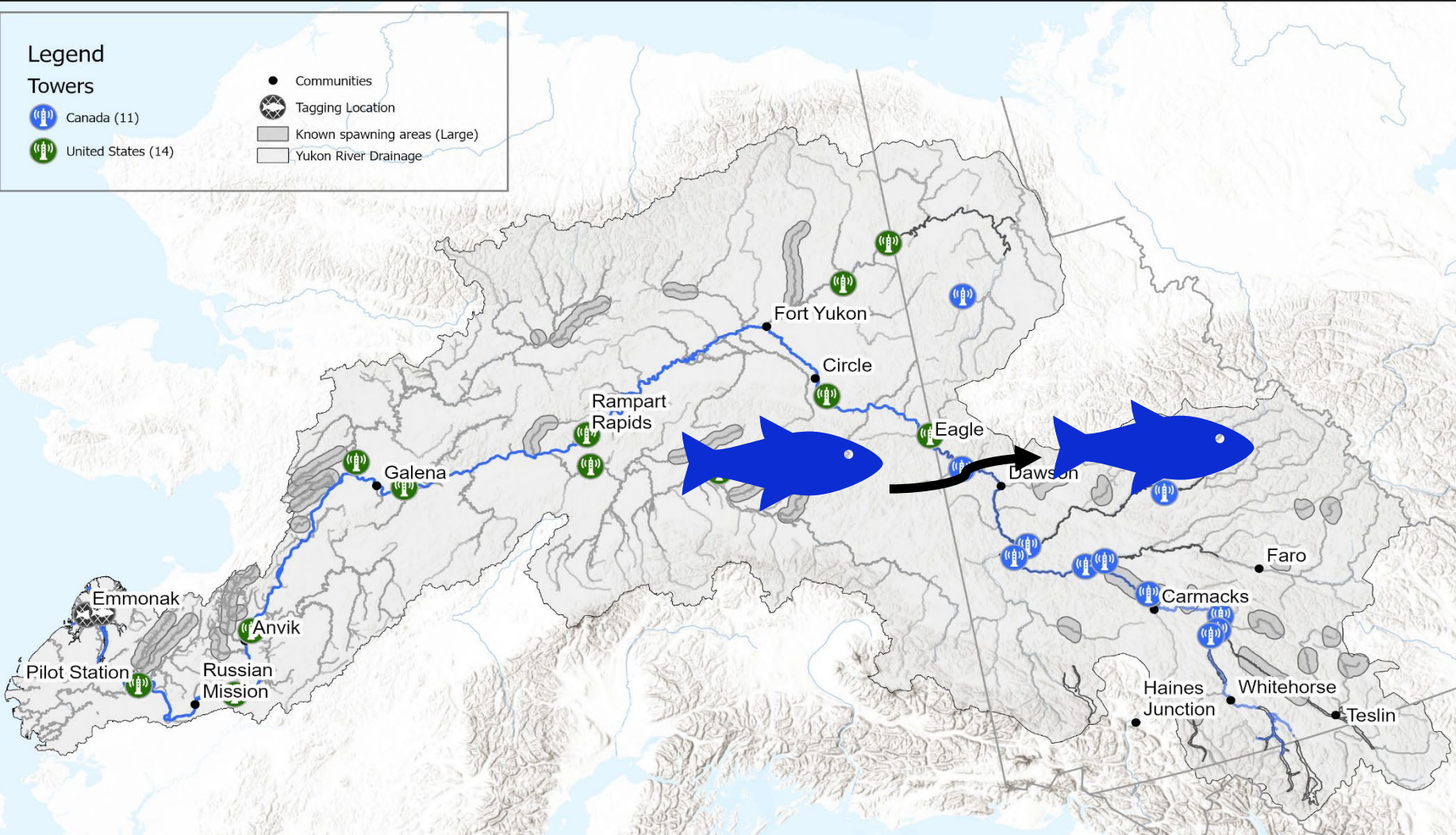
United States (14)

● Communities



■ Known spawning areas (Large)

□ Yukon River Drainage



# As Chinook Salmon move into Canada...

0 75 150 300 Miles

0 125 250 500 Kilometers



Credits: State of Alaska, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS, Esri, USGS



# Objective (Canada)

## **Describe natural enroute mortality of tagged Chinook salmon in Canada**

Specific research topics of interest:

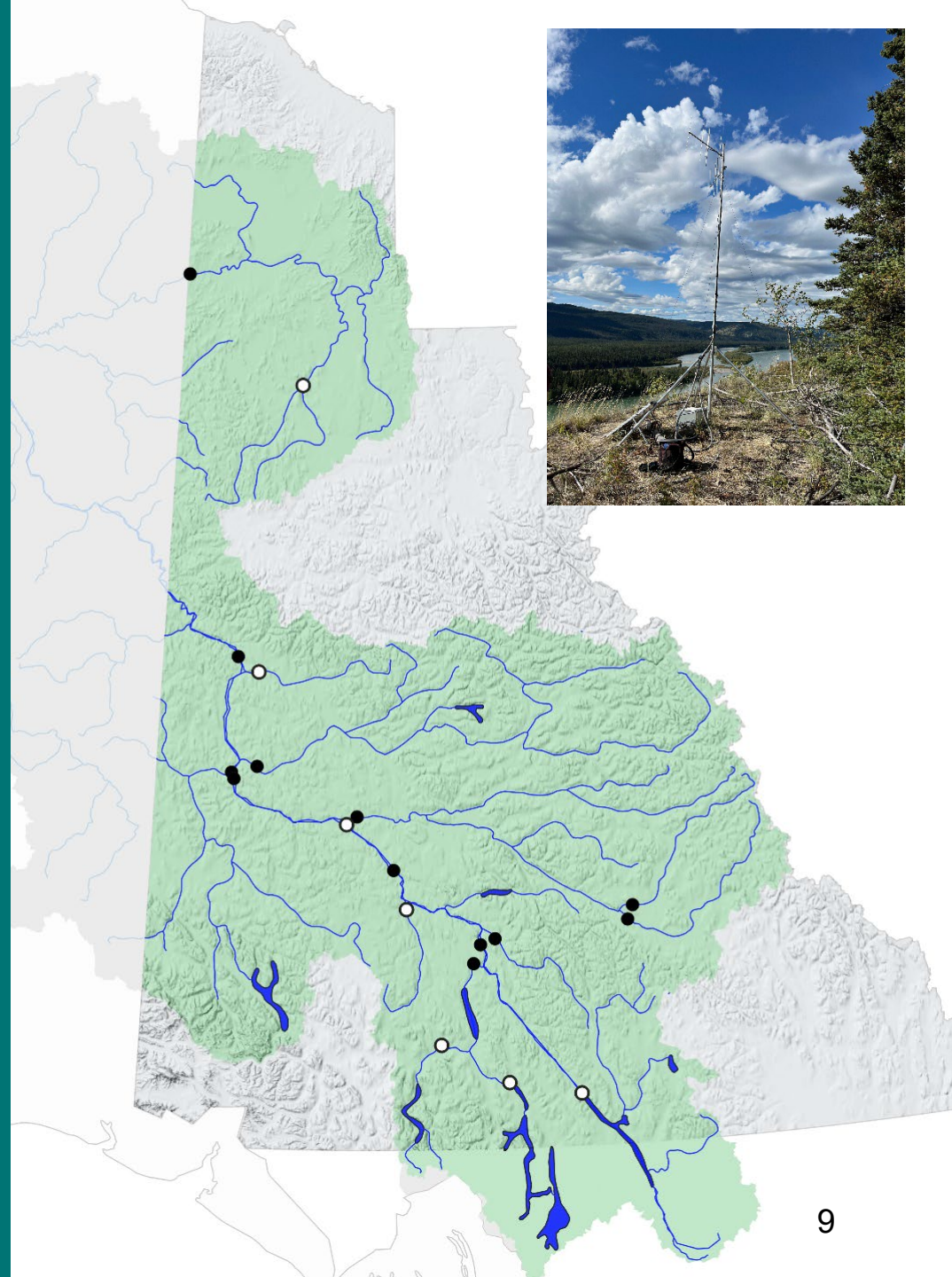
- Location of suspected mortality within Canada.
- Evaluate differences in the proportion of fish that likely died enroute by stock of origin, age, sex, and size.
- Evaluate potential correlation between suspected enroute mortality and biological and environmental factors.

*Supplemental inquiries:*

- Better understand current Chinook salmon distribution in Canada.
- Verify Chinook salmon genetic baseline and reporting units.

# Stationary Towers

- Up to 12 stationary ground-based towers (**black dots**)
  - Located on Yukon River or main tributaries
  - Current location are preliminary
- Installed in late June and data recovered in late September
  - No real-time data
- Yukon First Nations (**white dots**)
  - Seven stationary ground-based towers



# Aerial Surveys

- Conduct up to 14 flights
  - Supplement stationary tower locations to improve upriver coverage
  - Better detect tag-emitted mortality signals
  - 2 flights on YR, Porcupine and Pelly rivers
  - Opportunistic surveys
  - Initial flights occurring early to mid-august
  - Secondary flights early to mid-September
- Yukon First Nations aerial surveys



# Acknowledgments

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- Madison Hardwig (ADF&G-DCF-Yukon)
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- Nick Smith (ADF&G – DSF-HQ)
- Matt Albert (ADF&G-DSF-Fairbanks)
- Randy Brown (USFWS)



# Questions

