

# Investigating the Impacts of *Ichthyophonus* on Yukon River Chinook Salmon

## WHAT IS ICHTHYOPHONUS?

- *Ichthyophonus* is a fish pathogen that can infect Chinook salmon while feeding in the ocean. Fish infected with *Ichthyophonus* can become diseased, and the disease intensifies as the fish migrate upriver towards their spawning grounds.
- *Ichthyophonus* infects major organs, especially the heart. It can have little impact on the fish's health, or it may have extreme impact resulting in pre-spawning mortality.
- *Ichthyophonus* cannot infect people, but the fillets of heavily infected fish can be of poor quality for consumption. Many subsistence and First Nation fishers have observed "mushy" flesh, white spots in and on the organs, and notice a "sweet" or "tangy" smell when infected fish are processed.

You can also call it 'ich' (sounds like ick!)



*Ichthyophonus can display as white spots or streaks in a salmon fillet*

## BACKGROUND

- In 2020 and 2021, subsistence fishers reported concerning levels of *Ichthyophonus* infections in Yukon River Chinook salmon. Those concerns were further supported by the Alaska Department of Fish and Game (ADF&G), the U.S. Fish and Wildlife Service (USFWS), and partners through limited sampling and laboratory analysis in 2021.
- *Ichthyophonus* has been implicated as one possible explanation contributing to the unprecedented low run abundance of Canadian-origin Chinook salmon observed at the U.S./Canada border and for the unexplained difference between Pilot Station and Eagle sonar abundance estimates for Canadian-origin Chinook salmon.
- Fishery management agencies have identified this research as a top priority to address the concerns from stakeholders and better inform conservative management of Yukon Chinook salmon.
- After completing outreach, ADF&G, USFWS, and several non-agency partners conducted field sampling during the 2022 season at Pilot Station, the Rapids, and Eagle. Preliminary findings from 2022 strongly suggest *Ichthyophonus* may be contributing to large-scale pre-spawning mortality, and a multi-year investigation is warranted.

## PROJECT OBJECTIVES

- ✓ Develop an annual *Ichthyophonus* monitoring program, build support to increase community based *Ichthyophonus* monitoring and build new tools capable of estimating annual disease-associated mortality to provide a more complete assessment of the fate of Canadian-origin Chinook salmon migrating up the Yukon River mainstem.
- ✓ If this project is successful, it will provide necessary information to encourage precautionary management when disease levels are high and allow for better management and protection of Chinook salmon for years to come.

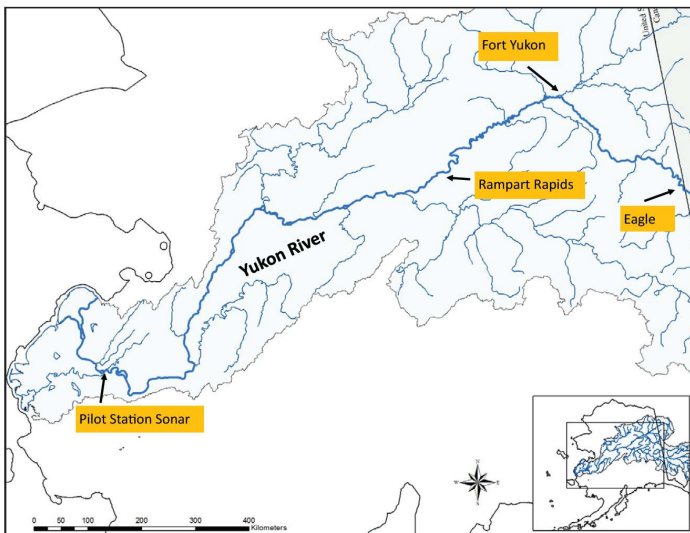


A collaboration between ADF&G, USFWS, and non-agency partners



## PROPOSED PLAN 2023/2024

- ADF&G and USFWS are committed to addressing the project objectives, are pursuing funding support, and building partnerships to provide actionable advice to stakeholders and managers.
- Success will require outreach and research in 4 key locations (Pilot, the Rapids, Fort Yukon, and Eagle). Locations will compliment past research and align with where local knowledge or disease severity data indicate mortality may be occurring. Fort Yukon expands upon the 2022 efforts to gain insight into where upriver mortality may be occurring and provide more flexibility to the study design.
- 180-200 Chinook salmon samples are required annually from each location in order to achieve the project objectives. Steps have been taken to minimize this study's impact on low runs.
- Each sampled Chinook salmon provides multiple opportunities to support Chinook salmon studies and then is given unprocessed to communities for subsistence use.
- Implementing a new Chinook salmon radio tagging project in 2023 could provide additional insight on the impacts of *Ichthyophonus* on pre-spawning mortality.



*Proposed sampling locations along the Yukon River*

## TIMELINE OF NEXT STEPS

**2022:** Fall/winter: Complete data analysis and report findings.

**2023-2024:** Plan to continue *Ichthyophonus* sampling, pending outreach and funding.



**RC005**  
*Ichthyophonus* infection of Yukon River Chinook salmon hearts encountered in the subsistence fishery in 2020. The small white dots indicate where the parasite resides.

*Unfortunately, non-lethal sampling options are not available. Sacrificing Chinook salmon to answer a research question is not something fishery management agencies consider lightly. We believe a short-term sacrifice of Chinook salmon to collect samples is a necessary step to address public concern, improve inseason assessment information, and better inform precautionary management for years to come.*

## BENEFITS TO COLLABORATIVE MANAGEMENT OF CANADIAN-ORIGIN CHINOOK SALMON

- Sampled fish can be sent to Canadians for their use, and could support First Fish Culture Camps, or other community or cultural events.
- Learning more about a possible source of Chinook salmon mortality along the Yukon River will provide a more comprehensive accounting of what happens to Canadian-origin Chinook salmon as they migrate upriver. It could improve our assessment program and increase our ability to predict the number of Canadian fish to reach the border.
- A large proportion of the total Yukon River Chinook salmon run are of Canadian-origin

## Contact us if you have any comments or questions!

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