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. Infected fish that are also under stress 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 can weaken the body resulting in the premature death of the fish.
- *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 noticed a "sweet" or "tangy" smell when infected fish are cut open.

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

BACKGROUND

- In 2020 and 2021, subsistence fishermen 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 some 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 differences between Pilot Station and Eagle sonar abundance estimates. However, we do not know if, or to what degree, *Ichthyophonus* disease is associated with enroute mortality.
- ADF&G, USFWS, and the Department of Fisheries and Ocean (DFO) have identified a need for focused research to address the concerns expressed by stakeholders and inform conservative management of Yukon Chinook salmon.

PROJECT OBJECTIVES

√ Develop an annual *Ichthyophonus* monitoring program and build a new predictive tool capable of providing timely information about the level of Chinook salmon mortality associated with *Ichthyophonus* disease.

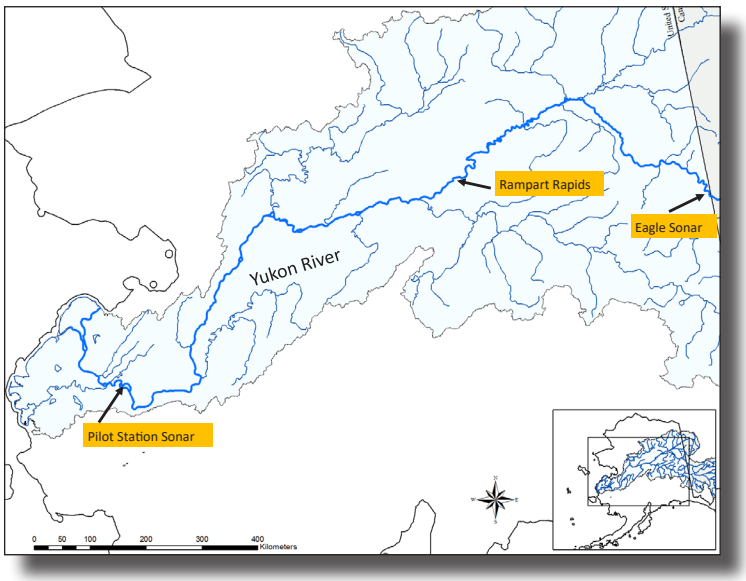
√ If after years of development this project is successful, it will provide necessary information to encourage precautionary management when disease levels are high and allow for a better management and protection of Chinook salmon for years to come.

Fisheries and Oceans Canada

A collaboration between ADF&G, USFWS, and DFO

PROPOSED PLAN

- This project will require community outreach and focused research in 3 key locations where *Ichthyophonus* has been monitored in the past, or where disease severity data may indicate mortality.
- Together, ADF&G, USFWS and DFO are considering options to sample 180-200 Chinook in each selected location in the Alaskan portion of the Yukon River. Samples will be sent to the lab for testing.
- Sampling may begin as early as 2022 after all consultation and outreach is complete. We will provide further updates well in advance of beginning field studies.
- Sampled fish will be distributed as equitably as possible. ADF&G will be working with DFO to explore options for sending some of the sampled fish to Canada.



Proposed sampling locations along the Yukon River

PROJECT TIMELINE

2021: Opportunistic sampling to assess the feasibility of lab procedures

2022: Proposed first year of full investigation funded by ADF&G and USFWS

2023-2024: Two additional years of data collection anticipated, pending funding

Heavy 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 to answer a research question is not something ADF&G, USFWS, or DFO considers lightly. We believe a short-term sacrifice of Chinook salmon to collect samples is a necessary step to address a 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 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.

Contact us if you have any comments or questions!

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