

Are Salmon Colonizing Northeast Alaska?

Tracking colonization using environmental DNA

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Coastal plain of the Hulahula River

Methods

1. Collected 155 passive eDNA samples from the Hulahula, Kongakut and Firth rivers.
2. Extracted DNA from the samples.
3. Conducted polymerase chain reaction (PCR) targeting chum, pink and Dolly Varden
4. Conducted digital PCR testing (dPCR)
5. Analyzed the results



Map of the sampling sites along the Hulahula, Kongakut and Firth Rivers

Background

- ❖ It is not known if salmon are successfully reproducing on the North Slope of Northeast Alaska
- ❖ As climate change continues to increase temperatures in the Arctic, the North Slope rivers may become successful spawning grounds for salmon
- ❖ Environmental DNA (eDNA)- Is DNA that is released from an organism into the environment such as feces and skin flakes.
- ❖ Using eDNA samples allows gathering potential DNA without having to see or physically handle the salmon
- ❖ I aim to detect *Oncorhynchus keta* (chum salmon) and *Oncorhynchus gorbuscha* (pink salmon) on three rivers using environmental DNA (eDNA) extracted from water samples. *Salvelinus malma* (Dolly Varden) is abundant in these rivers and will be used as a positive control.



Metaprobe replicates deployed at the mouth of Firth River

Oncorhynchus gorbuscha
(Pink Salmon)

Oncorhynchus keta
(Chum Salmon)



Salvelinus malma (Dolly Varden)



Metaprobe

- ❖ A low cost and simple way for sample collection.
- ❖ 3D-printed and contains sterile gauze to trap DNA
- ❖ The metaprobe was deployed between 8-13 hours per sample site

The 3D-printed Metaprobe

Results

- ❖ Tests of amplification using positive controls for the three target species have been successful.
- ❖ Preliminary results are in progress.