

PROPOSAL 72

5 AAC 52.023. Special provisions for seasons, bag, possession, and size limits, and methods and means for the Upper Copper River and Upper Susitna River Area.

Close sport fishing for salmon based on water temperature in the Gulkana River, as follows:

5AAC 52.023 (9)(x) Close Gulkana River to fishing for Chinook and sockeye salmon by emergency order when water temperature at the Sourdough station exceeds 18 degrees Celsius (C) at any time during a 24-hour period for 3 consecutive days or exceeds 20 degrees C. Fishing may resume when stream temperature recedes and does not reach 18 degrees C at any time for 2 consecutive days.

What is the issue you would like the board to address and why? Protect Gulkana River salmon from excessive effects of heat stress.

It is generally understood that heat stress causes increased en route, pre-spawn mortality of salmon when stream temperatures rise above 18 degrees Celsius (C) (von Biela et al. 2020). The following is largely based on studies conducted in the neighboring Yukon River drainage, a thermal, geomorphic regime that closely resembles the precipitation driven Gulkana River system. Not only does heat stress largely affect Chinook, female Chinook are susceptible to pre-spawn mortality at a rate approximately twice that of male Chinook (Hinch et al. 2021).

In Alaska, weir operations have already restricted handling of fish when critical water temperature thresholds are met. For example, at the Andreafsky Weir (a tributary to the Yukon River), sampling activity is suspended when daily mean water temperature readings are greater than or equal to 17 degrees Celsius for three consecutive days, or if high water temperature readings exceed 20 degrees Celsius (Shink, 2020).

The Gulkana River is a non-glacial, clearwater, precipitation driven river with pools, riffles, and runs. When stream temperatures rise, en route fish seek refuge and congregate in deep pools where they are targeted by fisherman. Once ready to spawn, fish seek suitable conditions typically in shallow water tail outs of pools to build redds. At this point they are subject to jet boats and rafts routinely interrupting the process and amplifying the effects of stress. When salmon become stressed they may die before successfully spawning.

In recent years the Gulkana River has seen increased fishing pressure. With closures around the state, this river will most likely witness increased fishing in future years. With Copper River Chinook failing to reach escapement goals in four out of the past 10 years, and a large population contribution from the Gulkana stock (19-27% based on telemetry studies) (Schwanke & Piche, 2023), it is imperative we be proactive to protect populations during times of environmental stress.

The USGS already has a 10-year index of real-time stream temperature with precision to 0.1 degree Celsius at the Gulkana River Sourdough station. Implementation of this proposal will not require additional resources. Link to USGS Gulkana River Station: <https://waterdata.usgs.gov/monitoring-location/15200280/#parameterCode=00010&period=P365D&showMedian=false>

Did you develop your proposal in coordination with others, or with your local Fish and Game Advisory Committee? Explain. No

PROPOSED BY: Ahtna Intertribal Resource Commission, Fisheries Dept. (HQ-F24-105)
