Al Martin HCTF Conservation Fellowships
Recipient 2024

Adam Kanigan

Adam Kanigan is a Ph.D. candidate at the University of British Columbia, working under the supervision of Dr. Scott Hinch (UBC) and Dr. Nathan Furey (University of New Hampshire). Adam's research is focused on predator-prey interactions between bull trout and sockeye salmon, and how such interactions between these species may be influenced by climate change.

The bull trout is a temperature-sensitive fish that requires cold-water habitats to complete its life cycle and has a narrow temperature range for growth, making it particularly vulnerable to climate change. Thus, identifying factors that would allow bull trout to persist in the face of future climate change is essential. While most studies focus on the influence of habitat quality or environmental conditions, food subsidies (short-lived, infrequent, and high-magnitude pulses in prey availability) may provide bull trout resilience to climate change by allowing them to feed and grow at exceptional rates, buffering them from times when growth may be slow due to low food availability or high water temperatures.

Adam's work in Tŝilhqox Biny (also known as Chilko Lake) and the Chilko River suggests that the eggs of sockeye salmon that spawn in the river during the fall and juvenile sockeye salmon smolts that migrate from the lake in the spring likely represent important subsidies for resident bull trout. By examining bull trout stomach contents, he found that bull trout can consume sockeye salmon eggs and smolts at substantial rates, with several bull trout eating up to 20-times more than they can theoretically digest in a single day. Furthermore, Adam tracked the movements of adult bull trout throughout the system for three years and found that some individuals will move up to 70 km to exploit sockeye salmon eggs and smolts. Currently, Adam is using the data he has collected on bull trout movements, diet composition, and feeding intensity to develop bioenergetics models that will be used to simulate bull trout growth and survival under current and future climate conditions.

Understanding the factors that will influence bull trout persistence is crucial to its conservation. The bioenergetics models Adam is developing for bull trout in the Chilko system will be adaptable for any system with information about bull trout movements, diet composition, and water temperatures to predict the impacts of climate change on their growth and survival, and he hopes that managers in BC and elsewhere will be able to use this information to prioritize conservation actions for bull trout that may exploit salmon migrations.