Al Martin HCTF Conservation Fellowships
Recipient 2023

Zachary Sherker

Zachary Sherker is a PhD student at the University of British Columbia working with Dr. Scott Hinch. Originally from Maryland, USA, Zack has always been passionate about aquatic systems. From a young age he would study the ecosystems around Chesapeake Bay, and quickly became passionate about the “Save the Bay” campaign, raising funds door to door, creating pamphlets, and spreading awareness.

Zacks research focuses on the effect of man made culverts on juvenile pacific salmon. Pacific salmon are currently barred from thousands of kilometers of spawning and rearing habitat in BC by ill-fitting culvert and floodgate barriers. Initially installed to rapidly transport water past roads, culverts quickly became the most ubiquitous barrier to fish movement globally. Floodgates remain closed for weeks to months at a time, blocking access to over half the traditional floodplain nursery habitat for juvenile fish.

Failed culverts and floodgates have culminated to form an intricate network of barriers to fish in BC, with the strongest impacts being felt by salmon. Tens of millions of dollars have been spent to remediate barrier sites and reopen invaluable stream and floodplain habitats, though surprisingly little effectiveness monitoring has been done. The research will evaluate the efficacy of various culvert remediation strategies, by assessing fish passage at 30 culvert remediations exhibiting an array of barrier mitigation techniques (e.g. installation of baffles, weirs, fishways, removal, replacement with bridges).

Zack has found that full culvert removal and replacement with bridges is the only effective remediation strategy to ensure habitat access long-term. Zack collaborated with biologists from InStream Fisheries Research to develop a novel PIT antenna design that works in close proximity to metal. This new PIT telemetry technology will be used to assess juvenile salmon passage through floodgates. This is the first study to directly document the effects of floodgates on juvenile salmon habitat access.

Thanks to the stakeholders and decision-makers brought together for this research, there has been rapid uptake of the improvements suggested by Zack and the team. This research will be used to improve passage by synchronizing automated floodgate operations with the timing of fish movements, and will provide concrete evidence for the need to replace aging floodgates and reintroduce imperiled salmon populations to their historic habitat. Zack hopes the data will be used to optimize the timing of fish movements to adapt the operations of a fish-friendly, automated floodgate to maximize floodplain access and provide rationale for implementing these improved gates on a large scale.

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