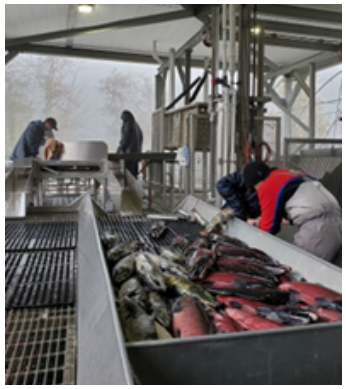
A decision-support tool that considers harvest, hatchery, and habitat management levers to support implementation of the *Fisheries Act* for Pacific salmon

Conservation and Stewardship



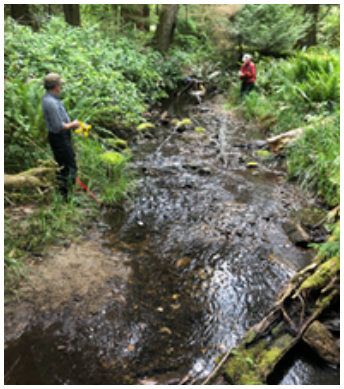


Photo credit: DFO Salmonid Enhancement Program.

Take-aways

- Resource managers rely on modelling tools to predict the outcomes from different fisheries management actions. However, often these tools fail to include hatchery or habitat parameters.
- This project is developing an open-source, risk-based tool that simulates population dynamics stochastically into the future to support decision making, incorporating harvest, hatchery, and habitat management levers. A case study is proposed for West Coast Vancouver Island Chinook though the tool is broadly relevant across species and areas.

West Coast Vancouver Island

This project's goal is to develop a salmon-specific, open-source, decision-support tool, **salmonMSE**, for use in the development of science advice for Integrated Management Plans, Rebuilding Plans under the Fisheries Act, Salmon Enhancement Plans, and the SARA listing process. In particular, the tool will be used to address strategic questions about prioritizing management actions among harvest, hatchery and habitat levers. It will expand on tools previously developed by explicitly accounting for risk and uncertainty, simulating population dynamics of salmon in freshwater and marine life-stages, and including mark-selective fisheries, impacts of changes to habitat, differential survival and exploitation of wild and hatchery origin fish, and interactions among populations.

The underlying model will be parameterized from available data, meta-analyses, and/or expert opinion where data are limited, and will be modular and flexible allowing for reduced complexity to simpler model forms when data are limited and increased complexity to address emerging threats when data are available.

As an illustrative example, **salmonMSE** will be applied to a case study on WCVI Chinook, a stock management unit for which a rebuilding plan is in development.

Modelling

Timeline

✓ Oct 2023-Mar 2024 (year 1): Technical Advisory Group development. Preliminary code and documentation for a tool prototype.

🔄 Apr 2024-Mar 2025 (year 2): Prototype extension to a multiple population framework; conditioning model development.

🔄 Apr 2025-Mar 2026 (year 3): Application to case study on WCVI Chinook to address management questions on the prioritization of harvest, hatchery, and harvest levers. Knowledge transfer through workshop(s), open-access code, technical reporting, and peer-reviewed publication(s).

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Locations
Region-wide (West Coast Vancouver Island case study)

Species
All (Chinook case study)

Project ID
2449

Back to Top