

Apply extinction risk estimates to salmonid populations

Problem Statement

The most basic questions to be asked of any threatened or endangered species are: How much at risk are the component populations? How much improvement is needed to mitigate that risk? Which populations are in the “worst shape” (or “best shape”)? Only after these questions are answered can recovery goals be rationally set, and priorities established.

Critical Factors

- Develop simple, standardized risk measures that are robust to sampling error and can be widely applied. The key words here are simple, standardized and robust.
- Apply these measures to all available data and identify which fish populations need the most dramatic and rapid management actions.
- Develop approaches to deal with critical uncertainties such as impacts of hatchery fish on risk assessments.
- Because statistical analyses generally require assumptions about data that may easily be violated, perform basic research to test the results of risk analyses if major assumptions underlying the methods are violated.
- Determine whether these violations are so severe that they could be leading scientists to make the wrong decisions.

Status of Research

Standardized methods for risk assessment have been developed and applied to almost 100 salmonid stocks in the Columbia River Basin. However, in making these calculations, data regarding hatchery fish and their relative fitness were found lacking because hatchery fish were poorly marked. Refinements to these methods currently under development will address this problem.

Exhaustive computer simulations have shown that risk measures developed by the Cumulative Risk Initiative (CRI) Team can withstand huge sampling errors and statistical biases, but much work is needed to incorporate global environmental (or ocean) cycles into our risk calculations.

Future Considerations

Additional analysis needs to be done to determine the range of uncertainty in risk assessments due to poor marking of hatchery fish. In addition, standardized risk methods will be applied to salmonids outside the Columbia Basin (i.e., in Washington, California, coastal Oregon). As these methods are applied over a broader geographic range, additional data quality issues will arise. Future work will involve development of statistical tools and approaches for addressing the problems of poorly marked hatchery fish and poor-quality data, as well as extending these methods to non-salmonid candidate species.

Key Players

Cumulative Risk Initiative (CRI) Team, Science Directorate (SD), NWFSC

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