

## Executive Summary

Worldwide, many salmonid populations have been extirpated, many more are declining, and overall distribution throughout their natural range is shrinking. The management, conservation, monitoring, and research regarding salmonids (salmon, trout, and chars) around the world require detailed data that have been reliably and consistently gathered. This book reflects the advancement of scientifically rigorous techniques for assessing salmonid populations in freshwater and estuarine environments. While based largely upon work conducted in the Pacific Northwest of the United States and western Canada, the materials within this book can be used for salmonids anywhere.

Government agencies, fisheries resource managers, and scientists depend on reliable, consistent, high-quality data to make informed management decisions and test hypotheses. State of the Salmon's inventory of long-term assessment, research, and monitoring efforts across the North Pacific reveals that an estimated 8,000 individual activities are underway in the United States and Canada, with an additional but unknown number of activities in Russia and Japan. This considerable geographic scope of activities presents a challenge and an opportunity for the salmonid management community. International treaty organizations such as the Pacific Salmon Commission need to be able to connect and compare numerous independent research efforts across great distances and multiple jurisdictions to characterize status or trends regarding particular salmonid species and stocks.

Our research and salmonid management questions are increasingly complex. For instance, determining key aspects of regional and species-wide population status and distributions and the reasons behind changes in status is critical for effective management. The effects of hatchery fish or habitat changes on wild stocks, the impacts of marine-derived nutrients on ecosystem health, and basic salmonid life history and genetic characteristics are also key considerations for researchers and managers. All these questions require well-structured and well-planned data acquisition programs.

The standardized methods for collecting salmonid data detailed in this book represent an opportunity for scientists and managers to link independent monitoring efforts and improve the quality and consistency of data gathered during fieldwork. Common protocols allow scientists to compare results among projects more reliably and will give managers greater confidence in data collected to adjust harvest levels or prioritize research and conservation efforts. Funding institutions supporting field research will be more inclined to do so if monitoring is grounded in proven techniques that yield the most useful data.

During this three-year project, we reviewed and drew from more than 375 published and unpublished techniques and guidelines. Herein, fisheries managers, scientists, and students will find 13 principle techniques for assessing salmonid populations in the wild. These scientifically rigorous, peer-reviewed methods are carcass counts, cast nets, dam counts, boat and backpack electrofishing, hydroacoustics in rivers and lakes, redd counts, seining, rotary screw and inclined plane traps, snorkeling, tangle nets, counting towers, and weirs. We have included five additional techniques—aerial surveys, fyke nets, gill nets, foot-based spawner counts, and video surveys—that can be used with any of the 13 principle methods to supplement information gathered. The prefatory chapters explain the book's

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genesis and goals and include instructive essays on the importance of sampling design and data management.

We encourage fisheries agencies, funding organizations supporting salmonid research, and educational programs involved with these important fishes to embrace these protocols in the spirit of the advancement of scientifically based conservation.