Incorporating Science into Fishery Management and Recovery Programs in the Pacific Northwest



Charles C. Krueger and Christian E. Zimmerman, editors

"Failures to Incorporate Science into Fishery Management and Recovery Programs: Lessons from the Columbia River." by Jim Lichatowich & Richard Williams

American Fisheries Society Symposium 70

Four Impediments to the Incorporation of Science

Inadequate conceptual foundation
Fragmented institutional structure
Political interference
Lack of historical perspective





Bonneville Dam

Dworshak Dam



Estimated total number of salmon and steelhead entering the Columbia River (1970-2010)



1. Develop a policy to protect wild spawning populations.

- 2. Evaluate salmon survival in the rivers and estuary to understand the ecology and capacity of the basin.
- 3. Adjust hatchery releases to river carrying capacity.
- 4. Collect baseline data on population status and life history of wild populations.

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- 5. Conserve genetic diversity.
- 6. Review procedures for conducting population vulnerability analyses.
- Evaluate system wide and cumulative impacts of existing and proposed artificial production projects.
- 8. Establish a biodiversity institute.

Fish and Wildlife Program Section 7 - 1994



The Conceptual Foundation

- A conceptual foundation is a set of beliefs and assumptions about salmon production systems that give direction to management and research activities, including restoration programs.
- It determines what problems (e.g., limitations on fish production) are identified, what information is collected and how it is interpreted, and as a result, establishes the range of appropriate solutions
 - \checkmark it influences the interpretation of information
 - ✓ it can be a powerful scientific element of management and restoration plans
 - ✓ it can determine the success or failure of those plans

"After reviewing the science behind salmon restoration and the persistent trends of declining abundance of Columbia River salmon, we concluded that the FWP's [recovery program] implied conceptual foundation did not reflect the latest scientific understanding of ecosystem science and salmonid restoration."

> The Columbia River Independent Scientific Advisory Board, 1999

Existing Conceptual Foundation

- River corridor acts primarily as a conduit for smolt migration
- Increasing the numbers of smolts in the river will result in more returning adult salmon
- Hatcheries can be used to increase the number of salmon smolts
- Barging of juveniles can circumvent in-river mortalities
- Emphasizes technological solutions











"We firmly believe there is no hope of success without historical perspective."

J. Jackson, K. Alexander and E. Sala



Total Harvest of Hatchery and Wild Coho Salmon in Oregon and Southwest Washington State 4500.0 4000.0 Total Number (thous.) 3000.0 2500.0 2000.0 1500.0 1000.0 **Hatcherv** Wild 500.0 0.0 Year

Total Harvest of Hatchery and Wild Coho Salmon in Oregon and Southwest Washington State



Total Harvest of Hatchery and Wild Coho Salmon in Oregon and Southwest Washington State





Defining a fishery problem strictly as the failure to achieve the desired number of fish focuses attention on symptoms rather than underlying causes.



There was a lag of 30+ years between the decisions made in the 60's and their ultimate consequence: The listing of Oregon's coastal coho in 1998