

Broodstock technology needed to restore depleted Pacific salmon stocks

Problem Statement

Captive rearing is one of the most promising means by which to preserve and restore some depleted wild salmon stocks, but research is needed to minimize loss of captive-reared fish from disease, low adult reproductive rates, and poor offspring viability, as well as avoid harm to wild populations. The contribution of captive-reared salmon to increases in population abundance also requires additional study. Without captive rearing, critically endangered stocks such as Redfish Lake sockeye salmon will become extinct.

Critical Factors

- Efficient, standardized techniques for rearing Pacific salmon in captivity require further development.
- The importance of captive broodstock technology increases as more fish are listed or proposed for listing under the Endangered Species Act.
- Gene pools of Snake River salmon must be maintained to ensure species survival.

Status of Research

The Northwest Fisheries Science Center (NWFSC) has begun a long-term, interdisciplinary research program designed to improve captive broodstock rearing techniques and gauge the potential of hatchery salmon to alter the genetics of wild populations. Center scientists are studying a wide range of problems with respect to captive-reared fish, including poor health, low survival rates, poor egg quality, and abnormal timing of sexual maturity.

New vaccines are being tested for their effectiveness in combating one of the major mortality agents in captive-reared salmon, bacterial kidney disease (BKD). Researchers are testing new diets and feeding regimes in attempts to reduce the incidence of asynchronous sexual maturation between males and females. Research is also

aimed at improving the spawning success of salmon reared full-term to adulthood, through a combination of endocrine (hormone) and environmental (exercise) manipulations. These studies directly support captive-rearing projects on the two Columbia Basin fish stocks for which captive broodstock programs are critically needed: Snake River sockeye and Snake River spring/summer chinook.

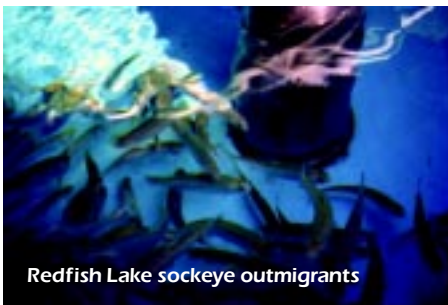
Currently, prespawning adults, eyed eggs, and juveniles from captive broodstocks for listed Snake River sockeye native to Redfish Lake and spring/summer chinook salmon from the Grand Ronde and Salmon River are being returned to Idaho and Oregon to aid recovery. Adult returns from these releases are showing signs that the Center's research efforts are ensuring survival.

Future Considerations

NWFSC scientists will evaluate the reintroduction success of captive-reared salmon in an attempt to improve chances of restoring wild runs, with minimal impact on wild salmon. A technical manual to be used by other captive broodstock programs wishing to restore wild salmon stocks will be compiled. Programs for the most critically endangered stocks must be sustained over the long term to prevent extinction.

Key Players

Resource Enhancement and Utilization Technology (REUT) Division, NWFSC
Bonneville Power Administration
Columbia Basin Fish and Wildlife Authority
Columbia River Inter-Tribal Fish Commission
National Biological Service, U.S. Geological Survey
Northwest Power Planning Council
Pacific Fishery Management Council



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U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
University of Idaho
Long Live the Kings
NWFSC Manchester Field Station, Manchester, WA
Biological Review Team, NMFS
Stanley Basin Sockeye Technical Oversight Committee
Snake River Chinook Propagation Technical Oversight Committee
California Department of Fish and Game
Idaho Department of Fish and Game
Oregon Department of Fish and Wildlife
Pacific Northwest Fish Health Protection Committee
Washington Department of Fish and Wildlife
Shoshone-Bannock Tribes of Idaho
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