Puget Sound Spring Chinook Salmon Restoration Efforts - An Update

U.S. Fish & Wildlife Service
Fisheries Assistance Office
Olympia, Washington

December, 1981

Background

Spring chinook salmon historically supported valuable sport, commercial, and treaty Indian fisheries throughout the Pacific Northwest; however, their numbers appear to have dwindled in most Puget Sound river systems to a point where their continued existence is threatened. In August 1980, the Olympia Fisheries Assistance Office (FAO) of the U.S. Fish and Wildlife Service (FWS) drafted an action plan for restoring Puget Sound spring chinook populations. The FAO outlined three major goals for spring chinook restoration in the Puget Sound region:

1) Protect existing stocks through habitat protection and enhancement efforts.

2) Perform technical support or applied research by collecting data on critical information voids in spring chinook life history, management, and husbandry.

3) Develop a broodstock program at Quilcene National Fish Hatchery (NFH) to provide eggs or smolts for re-establishing spring chinook into suitable habitat.

FAO has made significant progress in meeting these goals through cooperative efforts with the Washington Department of Fisheries (WDF) and several Indian tribes.

Protection of Existing Stocks

A cooperative program to enhance the population of spring chinook salmon in the Nooksack River system was initiated by FAO, WDF and the Lummi and Nooksack Tribes. The Nooksack stock is one of the few viable spring chinook populations remaining in the Puget Sound region, but there have been no terminal area sport or commercial fisheries for a number of years because of suspected low escapement. We are in the second year of at least a four-year broodstock collection effort to augment natural production in this system. This year, 48 adult spring chinook salmon were captured in the South Fork of the Nooksack for use as broodstock at the Lummi Tribe's Skookum Creek Hatchery. The springs were airlifted to the hatchery by helicopter because the capture site was inacessible and it was important to minimize handling and transportation stress. This method proved highly successful with no transport mortalities reported. Eighty thousand eggs were taken from these fish, were incubated in the Skookum Hatchery, and are being reared for release next spring or summer back into the South Fork Nooksack River. Adult springs returning to Skookum Hatchery will be used to rebuild the Nooksack stock to a level capable of supporting commercial and sport fisheries.

A significant problem associated with the decline of Nooksack spring chinook has been the "incidental catch" by trout anglers and poaching in the upper South Fork of this system. In August of this year, WDF, FWS, and the Lummi and Nooksack tribes requested changes in size and gear restrictions for this reach of river. Subsequently, the Washington Game Commission adopted more restrictive regulations which will improve enforcement and lessen incidental catch of Nooksack springs.

Technical Support and Applied Research

Because little is known about the effects of size and time of hatchery release for Puget Sound spring chinook stocks, we initiated studies to help define optimal size and time of release for Nooksack fish. With the cooperation of the Lummi Tribe, we are currently examining freshwater residence times and migration patterns of 75,000 marked spring chinook smolts released this past June and September from the Skookum Hatchery. Preliminary results indicate that young-of-the-year spring chinook released in June migrated seaward nearly as quickly as a like group of marked fall chinook, whereas spring chinook released in September displayed a considerably slower migration rate. This suggests that, of the two release times, June may be preferrable for early survival of Nooksack spring chinook.

In addition, all spring chinook released from Skookum Hatchery were coded wire tagged to better define marine migration patterns and interceptions. Such tagging may ultimately indicate whether restrictions on specific fisheries would benefit Nooksack spring chinook.

Quilcene NFH Spring Chinook Broodstock

A major thrust of our efforts to restore Puget Sound spring chinook has been to develop a broodstock program at Quilcene NFH. With the cooperation and assistance of WDF, we have completed the first step in this program. Our goal was to use a Puget Sound origin stock. However, after a thorough investigation, it was concluded that no native Puget Sound spring chinook eggs were available and the next best alternative was to use a Cowlitz female, Nooksack male cross. Accordingly, five hundred thousand Cowlitz River Hatchery spring chinook eggs were fertilized with sperm from Nooksack River springs in September of this year. Half the Cowlitz eggs were crossed with the earlier-timed North Fork males and the remainder with later-timed South Fork males to provide a range of spawning timing at Quilcene NFH. The fertilized spring chinook eggs were initially transferred to a quarantine facility at Quilcene, until FWS and WDF pathologists completed an unusually intensive disease survey of Cowlitz River spawners to assure no out-of-system fish diseases were introduced into the Quilcene and Hood Canal systems.

Over 300 female spawners were sampled and found to be healthy. These eggs are now hatching and we expect the first returns of adult spring chinook to Quilcene NFH in 3-4 years. The progency of these fish will, in turn, be used to re-establish wild spring chinook runs in at least parts of their former range in Puget Sound.

Future Efforts

Based upon our initial success, we anticipate continuing our restoration programs at Nooksack and Quilcene. Nooksack activities will include further investigations of optimal hatchery size and release timing coupled with at least a full 4-year cycle of broodstock collection, in cooperation with WDF and the Lummi and Nooksack Tribes. Coded wire tagging of spring chinook will be expanded to include native fish using portable tagging equipment,

if feasible. Additionally, we plan to investigate the chronic siltation problems occuring in the upper South Fork of the Nooksack drainage, which are adversely affecting spring chinook rearing and adult holding habitat. With the continued cooperation and assistance of WDF and the Lummi and Nooksack tribes, we will proceed with Nooksack x Cowlitz spring chinook crosses for a full 4-year cycle, to develop a continuing spring chinook brood run at Quilcene NFH. At the same time, we will continue to investigate other sources of Puget Sound spring chinook eggs, such as the Dungeness stock, which may be available for augmenting the broodstock program at the Quilcene NFH.