

Exxon Valdez Oil Spill
Restoration Project Annual Report

Chenega Chinook Release Program

Restoration Project 95272
Annual Report

This annual report has been prepared for peer review as part of the *Exxon Valdez* Oil Spill Trustee Council restoration program for the purpose of assessing project progress. Peer review comments have not been addressed in this annual report.

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Study History: 50,000 Chinook salmon smolts were released in the summers of 1994 and 1995 at Crab Bay on Evans Island, Prince William Sound (PWS) as part of an ongoing Trustee Council program to replace injured subsistence resources and services (Restoration Projects 94272 and 95272). Chinook salmon return varying between adult ages of 4 and 7 years. A few adults are anticipated to begin returning in 1996, with nearly 1,000 returning in 1998 as the age classes build and releases continue.

Chinook salmon returning to Prince William Sound Aquaculture Corporation's Wally Noerenberg Hatchery (WNH) at Esther Island were harvested as brood stock. Eggs were taken and incubated at the hatchery and the resultant fry reared for an additional year to smolt size. 50,000 smolt were released at Crab Bay. This annual cycle will continue through 1998.

Abstract: Chinook salmon incubated and reared at Wally Noerenberg Hatchery were released in Crab Bay, adjacent to the native community of Chenega. Adult salmon returning to the site of release will provide replacement resources and associated services injured by the *Exxon Valdez* oil spill. Two releases have taken place (1994, 1995) as part of this multi year project. Adult salmon will begin returning in 1996 and 1997, with larger numbers projected at nearly 1,000 adult fish, returning in 1998 and thereafter.

Key Words: Chenega, chinook salmon, *Exxon Valdez*, hatchery, *Oncorhynchus tshawyscha*, Prince William Sound, Prince William Sound Aquaculture Corporation, subsistence.

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TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	4
INTRODUCTION	4
OBJECTIVES	5
METHODS	5
RESULTS	5
DISCUSSION	6
CONCLUSIONS	6
LITERATURE CITED	6

EXECUTIVE SUMMARY

The release of chinook salmon *Oncorhynchus tshawytscha* smolts at Crab Bay adjacent to the community of Chenega on Evans Island, Prince William Sound (PWS) was proposed to replace lost and injured resources resulting from the *Exxon Valdez* oil spill with adult chinook salmon for local harvesting.

Prince William Sound Aquaculture Corporation (PWSAC) operates four salmon hatcheries in Prince William Sound and produces chinook salmon smolts at its Wally Noerenberg facility. PWSAC provided contracted services to collect brood stock, incubate eggs, rear fry to smolt stage and transport 50,000 smolts to Crab Bay for net pen rearing, imprinting, and release. The release group was marked and coded wire tagged (CWT) for later survival evaluation. Residents of Chenega were contracted to care for the fish. After training, they cared for and monitored the fish during imprinting and rearing phases. Adult chinook salmon will begin to return to the location in 1996.

INTRODUCTION

Oil spilled from the ruptured tanks of the *Exxon Valdez* spread throughout much of the waters of Prince William Sound in 1989. In the wake of this disaster, numerous species and populations of marine resources were impacted. Direct oiling of salmon spawning streams, intertidal beaches, marine mammals, and birds, resulted in injury and in some instances death of affected organisms. In particular, pink salmon were injured and are still classified as not recovering. As a consequence of the injury to the marine resources, associated human activities based on the harvest and utilization of injured resources were curtailed and consequently described as injured services.

Heavy oiling and injury occurred in Southwest PWS in the immediate vicinity of the village of Chenega Bay. Local subsistence harvesting of marine resources was impacted. In 1992, the Alaska Department of Fish and Game (ADF&G), in cooperation with the residents of the village of Chenega Bay, proposed to the *Exxon Valdez* Oil Spill (EVOS) Trustee Council that local salmon runs be established at Crab Bay (Evans Island, PWS), near the Chenega village to replace damaged subsistence resources resulting from the *Exxon Valdez* oil spill. The recovery objective for subsistence is 'healthy and productive resources at pre-spill levels, and people are confident that those resources are safe to eat'. Although chinook salmon were not historically an important subsistence resource in the vicinity of Chenega, these fish will provide a replacement resource during local resource recovery.

PWSAC was asked to participate in projects 94272 and 95272 to produce chinook salmon smolts at the Wally Noerenberg hatchery (WNH) on Esther Island, PWS, and release 50,000 of these smolts at Crab Bay. The first project and continued annual releases are estimated to produce an annual return of 1,000 adult chinook salmon of different age classes beginning in 1998, with smaller numbers of adults returning in 1996, and 1997. At an average weight of 20 pounds per fish, 40,000 pounds of salmon are expected to be harvested annually. Fish released to the marine

waters are common property and therefore may also be harvested by recreational fishers and other users.

Due to the complex and lengthy permitting process to undertake such a restoration program, *EVOS* funding was withheld in 1993; project funding and releases of chinook first occurred in Spring, 1994.

OBJECTIVES

The key objective of this project is to provide a return of adult chinook salmon to subsistence users at Crab Bay. The release objective is 50,000 smolts. The adult return objective, based on a marine survival estimate of 2% from smolts to adults, is 1,000 fish. Chinook salmon are a multi age species, therefore, returns will not meet the expected potential until fish of ages 4, 5, 6 and 7 return following 4 years of releases. Preceding the 1998 return, fewer numbers of adults of ages 4 and 5 year fish will return in 1996 and 1997.

METHODS

Annually, 820,000 chinook salmon eggs are taken at PWSAC's Wally Noerenberg hatchery (WNH) on Esther Island. Brood stock are harvested from among adult chinook salmon returning to the hatchery. Following incubation, hatch and outmigration from incubator trays, chinook fry are reared in raceways at WNH for one year. Prior to release, chinook smolts are transferred to saltwater net pens at the hatchery or to remote release sites for a short period of saltwater rearing.

In May of 1995, 50,000 chinook smolt were taken from WNH and transported via barge and fry/smolt transport tanker to Crab Bay. The smolt were released into a 350 m³ (40 ft X 40 ft X 5 ft) net pen anchored in Crab Bay and reared for two weeks at the site for imprinting and additional growth prior to release. Technical support for the incubation, hatching and feeding of the smolts were provided by PWSAC. Residents of Chenega village were trained in basic fish culture techniques, contracted to feed and rear the smolt, and paid for their services.

RESULTS

A total of 50,000 chinook salmon smolts were transported to Crab Bay and transferred to the anchored net pen for short term rearing and imprinting. Due to the lack of a tag recovery and evaluation program, none of the smolt released in 1995 were coded wire tagged prior to release. After two weeks of salt water rearing, the smolt were released into Crab Bay. During the net pen rearing and imprinting phase smolt mortalities were insignificant.

DISCUSSION

The incubation and transportation phases of the project remained on schedule with smolt arriving at the net pens at Crab Bay in May 1995. Mortality at early life stages was low and within PWSAC fish culture specifications (Little, 1990). Unlike the 1994 release when a clinical expression of bacterial kidney disease (BKD) forced abbreviated rearing and early release of the chinook smolt, in 1995 the smolt were salt water reared for the planned two week period prior to release.

From July 1 to August 1, 1995, brood year 95 chinook eggs were taken at WNH for incubation with outmigration to occur from March to April 1996. A projected release of brood year 94 chinook smolt into Crab Bay will occur in June 1996.

CONCLUSIONS

While evaluation of the final conclusions await the return of adult fish and the local residents' capture efforts, the necessary milestones were accomplished on schedule. The logistics of smolt transport, rearing, and release are common aquaculture practices which should present few difficulties over the duration of the project. Disease prevention in smolt is an issue that PWSAC continues to address in the course of normal hatchery operations.

The first adult salmon resulting from the releases should return to Crab Bay in 1996 and begin to fulfill the objective of replacing lost and injured resources for people of the region. A final report will be submitted in 1999 which will give better perspective of project success at the adult return phase even though smolt releases will discontinue under Trustee funding in FY 98.

LITERATURE CITED

Little, R. 1990. Wally Noerenberg Hatchery: Fish Culture and Harvest Procedures, Volume 1. Prince William Sound Aquaculture Corporation, Cordova, Alaska.