COHO TAGGING AND OUTPLANTING

IN THE ELWHA WATERSHED

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Introduction

In February 1987, the U.S. Fish and Wildlife Service, Fisheries Assistance Office (FAO), Olympia developed a study proposal entitled, "Evaluation of Elwha Coho and Steelhead Freshwater Productivity, Downstream Passage Mortality, and Marine Survival". The objectives of this study were to develop information on survival-to-smolt, outmigrant timing, dam passage mortality, and marine survival of naturally reared Elwha coho and steelhead. This information was intended for use in federal licensing of the Elwha dams, including evaluation of interim fish passage measures.

The approach proposed in the study was to outplant coded-wire tagged coho and steelhead in the upper Elwha River basin and subsequently monitor passage and survival via hydroacoustics, downstream trapping, and coded-wire tag mark sampling. Due to inherent variability in annual stream flow and salmonid productivity, these activities were to be conducted for a full cycle of each species (steelhead -4 years; coho - 3 years) and be timed so that outmigration occurred with inception of interim operating conditions for downstream fish passage at the Elwha dams. When the study was proposed (February 1987), interim operating conditions were believed possible by spring of 1988.

Accordingly, FAO proposed tagging and outplanting coho salmon fry in the upper Elwha watershed for a full cycle beginning in 1987 (steelhead fry were not available for tagging and outplanting in 1987). The 1987 work was funded by Crown Zellerbach Corporation, and the following report discusses activities conducted by FAO Olympia, with assistance from the Lower Elwha Tribe and Olympic National Park.

Tagging and Outplanting Activities

To meet study objectives, approximately 150,000 subyearling coho salmon were coded-wire tagged and outplanted. Although a larger

group (approximately 450,000 fish) was considered optimal to estimate marine survival, limitations in tagging time and fish availability precluded an outplant of this magnitude in 1987. Nonetheless, the 1987 group size was considered adequate to meet all study objectives. If greater resolution of marine survival should be necessary, however, recovery data from Lower Elwha Tribal Hatchery releases of coded-wire tagged coho could be used as a basis to expand outplant recovery data, providing their recovery distributions are comparable.

Coho stock from the Lower Elwha Tribal Hatchery was used for tagging. Tagging occurred June 22-26, 1987, at the tribal hatchery using an FAO tagging trailer and a five-person tagging crew. The entire planting group received a full length coded-wire tag, serially replicated three times. In all, 152,525 coho were tagged, of which an estimated 86.9%, or 131,740, retained the tag. Post-tagging, pre-release mortality was 725 fish.

Three sites in the upper Elwha watershed were selected for outplanting. These sites, located at mainstem river miles 19.4, 30.8, and 35.4, were used for steelhead fry planting in 1986. Each site offered suitable side-channel rearing habitat for young-of-the-year coho salmon and was believed representative of the excellent rearing conditions in the upper watershed within Olympic National Park. The sites were also sufficiently distant from one another to allow maximum fry dispersal. Their location in the upper watershed above Lake Mills will also permit smolt monitoring at Glines Canyon Dam and calculation of freshwater survival rates in 1988, as described in the FAO proposal. Other potential outplant sites between the Elwha dams were considered, but were rejected for habitat and smolt monitoring considerations.

Outplanting was accomplished on July 14, 1987, by personnel from FAO Olympia, Olympic National Park, and the Lower Elwha Tribe using a truck/helicopter transport system. Initially, fish were weight- and length-sampled, then loaded at a density of one lb./gallon into 80-gallon polyethylene plastic fish totes situated on flat bed trucks. Each tote was equipped with an individual oxygen system consisting of a weighted, 10-foot length of micropore tubing within the tank serviced by a 4-cu.ft. oxygen bottle on the lid. Loaded totes were transported via truck to Sweets Field within Olympic National Park to avoid over-road helicopter transport. At Sweets Field, individual totes were slung by cargo straps from a Hughes 500D helicopter and flown to upriver planting sites. At each planting site, a four-person crew scatter-planted the fish throughout suitable habitat. Radio communication ensured minimal handling and delay during all phases of transport. In all, 13 loads were flown to the three upriver sites. This 10-person effort was completed in 12 hours. Table 1 shows the final distribution of the release group and related information.

Throughout the planting operation, fish appeared to be in excellent condition and showed no signs of stress or other ill-

effects, although an estimated 200 fish were killed from mechanical injuries during handling. A pre-release health inspection of this production lot on June 4, 1987, revealed no background disease other than minor incidence of the parasite Costia (Ray Brunson, Olympia Fish Health Center, personal communication).

Length and weight sampling on the day of release indicated the group averaged approximately 160/lb., and fork length ranged from 44 to 87 mm and averaged 61 mm (n=500). For reference, Figure 1 shows length distribution of a random sample of outplanted fish.

Discussion and Recommendations

The mechanics involved in the coded-wire tagging and outplanting conducted by FAO in 1987 worked well. We recommend that similar equipment and procedures be used for future fry outplants in the Elwha for this purpose.

To meet overall study objectives, follow-up work is still needed to develop information on outmigrant timing, choice-of-exit, and survival of these outplanted fish. As proposed, this follow-up work would commence in 1988 and involve hydroacoustic measurements at Glines Canyon Dam and trap operation below Glines Canyon Dam. (Steelhead smolts will also outmigrate in 1988 from a 1986 fry plant in the upper Elwha River; timing, exit, and survival data for these fish is of equal interest also.) Thus, plans for 1988 follow-up studies, and associated interim passage measures, should be finalized as soon as possible.

The original study plan called for continuing coded-wire tagged steelhead and coho outplants for the next several years (one cycle of each). In view of the questions about chinook outmigrant timing raised in the course of 1987 FAO studies at Glines Canyon Dam, upriver plants of juvenile chinook should instead be made in 1989 and upriver plants of juvenile coho and steelhead should be suspended. This change of plan will improve hydroacoustic smolt detection capability at Glines Canyon Dam and yield better estimates of freshwater survival, choice-of-exit, and outmigrant timing for all three species.

Table 1. Outplant data for Elwha Tribal Hatchery coho.

Release site	River mile	Tag code	Estimated release no.*	Hatchery raceway nos. (source)	No. of tote loads
Camp Wilder	35.4	05-19-08R3	48,982	7,8	4
Tipperary Camp	30.8	05-19-08R3	51,286	8,9,10	4
Humes Ranch	19.3	05-19-08R3	51,332	6,10	5

*Weight-based distribution estimate, less observed mortalities during holding and transport.

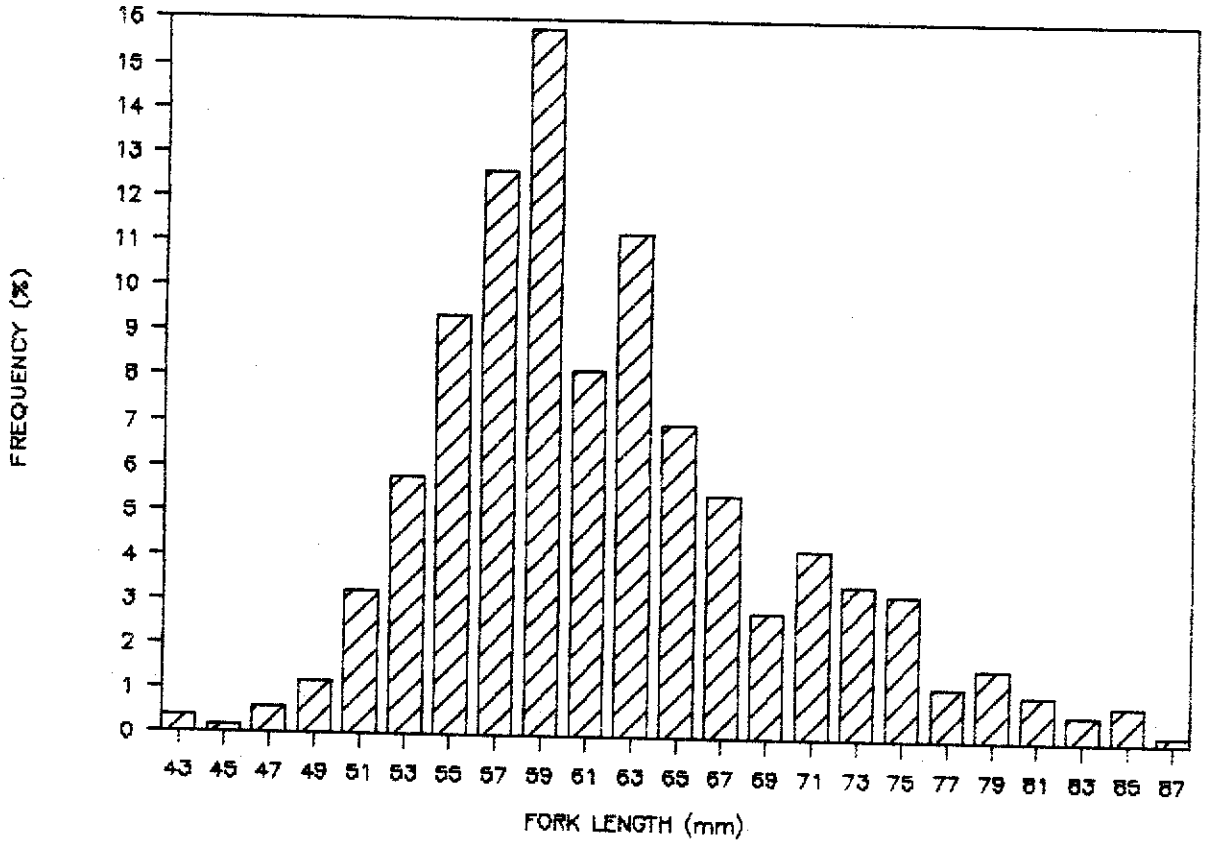

Figure 1. Length distribution of the 1987 Elwha coho outplant in 2-mm increments (n=500).