"Feasibility of Implanting Blank-wire Tags in the Body of Juvenile Fall Chinook Salmon."

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ABSTRACT

Fall chinook salmon are released annually into the Umatilla River to partially mitigate for fish losses attributable to mainstem Columbia River Dams. Upper River Bright stock fall chinook salmon from early releases (1983-1990) were reared at Bonneville Hatchery only. Fall chinook salmon from recent years were reared at Irrigon Hatchery (1991), Umatilla Hatchery (1992-present) and Bonneville Hatchery (present). Each year varying numbers of Umatilla fall chinook salmon strayed into the Snake River. Concomitant with the endangered species listing of Snake River stock fall chinook salmon there was a need to separate lower river strays from Snake River stock at mainstem dams. Thus, we initiated a study to examine the utility of potential mass marking techniques. This presentation overviews the evaluation of body tagging as a mass marking tool and compares body tagging to other mass marking options.

Body tags are blank-wire tags injected into the body of a fish. For this evaluation, we implanted body tags into the right shoulder of juvenile fall chinook salmon. To separate the effects of individual marks, we compared body tagging with numerous marking combinations utilizing fin clips, body tags, and coded-wire tags (Table 1). The body tagging study was initiated in 1991 on fall chinook salmon reared at Irrigon Hatchery and continued in 1992 and 1993 at Umatilla Hatchery.

After the first three years of body tagging juvenile fall chinook salmon it was evident that implanting body tags was too costly and time consuming to make them effective as a mass marking tool. Estimated costs per 1,000 fish for body tags + left ventral fin clip, body tags only, and left ventral fin clip only were $87, $70, and $17 respectively. Time required for marking 1,000 fish was estimated at 1.2 h

Table 1. Numbers of fall chinook salmon fin clipped and recognizably adipose and coded-wire tagged at Irrigon and Umatilla Hatcheries to study the effects of tagging.

Mark	Irrigon Hatchery 1991	Umatilla Hatchery 1992	Umatilla Hatchery 1993
Left ventral	-	69,816 74,408	61,801[a] 66,204[a]
Body tag & left ventral	-	65,749 67,144	68,644 70,442
Body tag	147,586	70,435 65,184	69,225 69,518
Adipose & coded-wire tag	104,258	-	-
Adipose & coded-wire tag & right ventral	103,980	31,982 32,287	29,594 29,360
Adipose & coded-wire tag & body tag	145,048	-	-

[a] *Adjusted for fin clip quality.*

for fish marked body tag + left ventral fin clip, 0.85 h for fish marked body tag only, and 0.13 h for fish marked left ventral only. For Umatilla Hatchery production, mass marking 2.3 million fall chinook salmon would require 115 days for fish marked body tag + left ventral clip, 81.4 days for fish marked body tag only and 12.4 days for fish marked left ventral clip only. Tag retention for body tagged fish was similar to that found in coded-wire tagged fish.

In 1993 we began examining adults returning to the Umatilla River for wire tags and fin clips. We have encountered some problems detecting body tags in live adults because of variability in the accuracy of the hand-held tag detector. In 1994 National Marine Fisheries Service requested that all fall chinook salmon from Umatilla Hatchery be given a blank or coded-wire nose tag and a right ventral fin clip. Consequently, the tagging study has been discontinued. In 1995 we tested a tube-type tag detector for adult fish which has improved the detection of body tags. Because we are in the early stages of this study, few adults have been recovered and the effects of marking on smolt to adult survival is inconclusive. We will continue to monitor adult returns in future years to study the effects of fin clips, body tags, and coded-wire tags on smolt to adult survival.