C.M. 1971/M: 9

INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

ANADROMOUS AND CATADROMOUS FISH COMMITTEE

AN EVALUATION OF THE UTILITY OF A PLASTIC STRAP TAG APPLIED TO ASCENDING SALMON MIGRANTS

by

A S CHAMPION

Salmon and Freshwater Fisheries Laboratory

Ministry of Agriculture, Fisheries and Food, London.

INTRODUCTION

In 1967 and 1968 plastic strap tags, identical in all but colouring and lettering to those used on salmon in West Greenland in 1965-1970, were used to mark upstream migrants at the Ministry's trapping installation on the R. Axe. The object of the investigation was to examine the possibility of different mortality rates occurring between upstream and kelt migration for early and late running salmon and for different age classes. The experiment was of only limited value due to excessive tag loss.

DESCRIPTION OF TAG AND TAGGING PROCEDURE

The tags which were manufactured from plastic sheet 1/24 inch thick, were rectangular ($1\frac{1}{4}$ inch x $\frac{1}{4}$ inch) with rounded ends and holes punched approximately 1/32 inch from each end. They were serially numbered with the Ministry's address on the reverse side. The fish were anaesthetized and the tags were affixed at the base of the dorsal fin using two strands of annealed silver wire (.02 inches diameter) passed through the dorsal musculature and twisted tight against a blank backing plate of the same size and material as the tag.

TAGGING REGIME

In 1967 a different coloured tag in conjunction with a partial dorsal fin clip was used for each month. In 1968 the regime was repeated but with three partial fin clips (right pelvic, left pelvic and dorsal fins respectively) corresponding approximately to the "spring" (January to June), "grilse" (July to September) and "autumn" (October to December) runs of salmon.

Surviving kelts were recaptured at the trap during their downstream migration and examined for clips and tags.

RESULTS

Table I. Survival and tag loss observed in the 1967 upstream salmon run.

	Number tagged	Exploitation by anglers	Number of tagged kelts recaptured	Number of clipped kelts recaptured	% tag loss
Male	117	2	2	2	50
Female	255	3	64	77	54.6

Clearly with such a high rate of tag loss, which was not identifiable with any one month, calculation of differential mortality rates on the basis of monthly tag returns could be misleading and was therefore not attempted.

Table II. Survival and tag loss observed in the 1968 upstream salmon run.

Sex	Time of upstream migration	Number tagged	Number of tagged kelts recaptured	Number of clipped kelts recaptured	% tag loss	% mortality
Male	January-June	16	0	1)	Insufficient information	94
	July-September	23	2	1)		87
	October-December	7	0	1)		86
Female	January-June	90*	15	11	42	71
	July-September	46	13	10	43	50
	October-December	12	4	5	56	25

*One fish from this class was caught by an angler during the year.

As for the 1967 upstream run, mortality of cock fish was very heavy and no information regarding tag loss was forthcoming. The mortality of hen fish was significantly(chi squared = 9.72) higher for the 1968 run and a clear differential was apparent over the three periods investigated. In view of the difference (chi squared = 5.88) between the two periods when the pelvic fins were clipped, it seems unlikely that this was due to the clip used. Also the difference in overall mortality between the 1967 and 1968 migrations can, with similar fluctuations in earlier years, be explained by the effect of climatic factors. However the partial clip of a pelvic fin cannot be altogether ruled out as a possible cause of the higher mortality in the earlier part of the year, as against the October to December period when the dorsal fin clip was used.

No significant differences in tag loss were apparent for the three periods.

DISCUSSION

Although no significant differences in tag loss were observed between the three periods investigated the numbers involved were insufficient to give a satisfactory test for all but large differences; it would therefore be unwise

to proceed on the assumption that no differences exist and calculate the mortality rates for the different periods in 1967 accordingly.

The 1968 tagging results indicate that for that year a differential in mortality rates occurred between the three periods despite the negligible exploitation by anglers and that therefore a crude mark/recapture method for estimating escapement of upstream migrants could lead to serious inaccuracies.

The degree of tag loss for both years was unacceptable but can probably be partially accounted for by the loss of condition of the salmon through spawning. The tags on recaptured kelts were frequently loose and normally where a fish had shed the tag it was apparent that it had been torn out vertically through the dorsal musculature and then the dorsal fin; in fact some kelts were observed with the tag hanging in the dorsal fin.

The experiment was repeated in 1970 using the Carlin type smolt tag attached by polythylene thread; but due to an exceptionally high mortality rate associated with an outbreak of U.D.N. in the river insufficient recaptures were made to evaluate the effectiveness of the tag.

CONCLUSIONS

1) In 1967 and 1968 respectively 45% and 55% of plastic strap tags affixed through the dorsal musculature of upstream migrating female salmon were shed before recapture of the downstream migrating kelts.

2) A differential mortality can occur between spring, summer and autumn migrants without exploitation by anglers.

3) The plastic strap tag is unsuitable for the investigation of this mortality due to the high rate of tag loss.