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Utilization of Recaptured Canadian Tagged  
Salmon, 1964-1967

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Recent development of a fishery for salmon in the West Greenland area has brought into the foreground the problem of how and where Canadian Atlantic salmon are used. Following the initial period of growth, annual salmon catches in the Greenland fishery have, beginning in 1964, been of the same order of magnitude as Canadian commercial catches.

Tagged as smolts

As shown by recaptures of fish tagged in home waters, most Canadian fish which contribute to the Greenland fishery do so during their second year at sea. There is some indication of the comparative amounts of use being made of Canadian salmon in Greenland and home waters in recoveries of tags applied to smolts from 1963 to 1966, inclusive. Smolts tagged in this period have had opportunity to enter the Greenland fishery since it reached comparative stability in 1964.

Table 1. Recaptures from 149,398 Atlantic salmon tagged as smolts and liberated in Canada, 1963-1966. (Escapement = fish recorded in counting weirs or brood stock collections and not subsequently in fisheries)

Taken as	Recaptured in				Total recaptures
	Green- land	commercial	angling	escapement	
Grilse	0	454	381	393	1228
Older	<u>238</u>	<u>398</u>	<u>40</u>	<u>25</u>	<u>701</u>
Totals	238	852	421	418	1929

The smolt liberations included more hatchery-reared than native fish and many of the former were of selected, including for grilse, parentage. Recaptures (Table 1) do not indicate normal proportionate utilization of natural stocks.

They do, however, show that most use of recaptured salmon larger than grilse occurs in commercial fisheries. Of these recaptured large fish, 34% were taken in Greenland, 57% in Canadian commercial fisheries, 6% by anglers in home waters, and the remainder, under 4%, were passed through counting fences or brood-stock collection traps. Discounting those taken in Greenland, of the 463 large salmon recorded as having returned to Canadian waters, 86% were exploited in commercial fisheries, 9% were used by anglers and 5% were recorded passing through spawning escapement traps.

Tagged as grilse or as older salmon

Both grilse (Table 2) and older salmon (Table 3) have been tagged in the Miramichi area in addition to smolts. In these cases tagging

was done well inside the estuary or in lower freshwater reaches. So these fish had already passed much of the fishery hazard for the year of tagging.

Table 2. Recaptures from 3,594 Atlantic salmon tagged as grilse in Miramichi estuarial (57%) and fresh (43%) waters, 1963-1966. (Escapement = fish recorded in counting weirs or brood stock collections and not subsequently in fisheries)

Taken in year of	Recaptured in			Total recaptures
	Green- land	Canada commercial	Canada angling escapement	
Tagging	0	147	621	1316
Later	0	113	36	161
Totals	0	260	657	1477

Recaptures of these tagged grilse (Table 2) amounted to 41% in the first year and 4% in later years. Among those recaptured as grilse, 47% were taken by anglers and 42% were recorded as spawning escapement. Apparatus for counting spawning escapement is limited to one freshwater tributary and a few estuarial nets, so fish entering other tributaries and escaping from anglers are not recorded. Recaptures in the second year amounted only to about 10% of total recaptures from the tagged grilse. Among these, utilization in commercial fisheries was

70%, in angling 22% and 7% were recorded as spawning escapement. This order of utilization resembles that for the 463 large salmon of Table 1 which were recorded in home waters (86%; 9%; and 5%).

Table 3. Recaptures from 745 Atlantic salmon tagged as 2-sea-year and older fish in Miramichi estuarial (78%) and fresh (22%) waters, 1963-1966. (Escapement = fish recorded in counting weirs or brood stock collections and not subsequently in fisheries)

Taken in year of	Green- land	Recaptured in			Total recaptures
		commercial	angling	escapement	
Tagging	0	72	112	87	271
Later	<u>1</u>	<u>35</u>	<u>8</u>	<u>4</u>	<u>48</u>
Totals	1	107	120	91	319

Similarly as for tagged grilse, 36% of the large salmon were reported again in the year of tagging (Table 3). Distribution of these among commercial and angling fisheries, and escapement was 27%, 41%, and 32%. It is to be noted that the total exploitation (68%) applies to fish which have already passed through much of the commercial fishery. To balance this in part, there may also have been additional spawning escapement in tributaries not screened with counting weirs. Another 6% of the tagged salmon (15% of the total returns from this group) was taken in the years after tagging, mostly (75%) from commercial fisheries; recorded escapement amounted to about 8%.

On the whole, the data available from recent tagging of grilse and salmon in home waters tend to confirm the high recapture, especially of fish older than grilse, in home fisheries. Returns, from fisheries only, of fish tagged as salmon amount to 30% and from fish tagged as grilse to 24%. These values are not substantially different from the mean value ( $27 \pm 4.5\%$ ) for a series of taggings in commercial fisheries between 1935 and 1953 summarized by Wilson (1957; Canadian Fish Culturist, No. 21, pp. 25-31). Proportionate

use in commercial versus angling fisheries for several of these earlier studies was roughly 10:1, or about like that for the result given in Table 1 for salmon older than grilse which have returned to Canadian waters.