FILE REPORT

358441

The Migration Times of the Skeena River Sockeye Runs through the Estuary as indicated by ocean taggings.

Introduction

During the years from 1944 to 1948, inclusive, and during 1955 sockeye salmon were tagged in the estuary of the Skeena River partly to determine whether there is any segregation of populations destined to the various tributary lakes in point of time of movement through the commercial fishery. Knowledge of the times of migration of the component runs is an important factor in the management of the Skeena River gill-net fishery.

Method

Sockeye salmon were captured for tagging in the years 1944 to 1948 by salmon purse-seiners chartered for the purpose. The majority of the fish were tagged well within the Skeena gill-net area close to Smith, Kitson, Lelu, and Ridley Islands and off Moore Cove. A few sockeye were also tagged further offshore close to Percher, Stephens, and Dundas Islands. Some tagging was carried out in the Nass River gill-net area and in the Principe channel area but are not considered in this report. In 1955 sockeye were obtained for tagging from the test fishing gillnets which were operated several miles upstream from the Skeena sockeye fishing boundary. Conventional Peterson type tags--two one-half inch celluloid discs fastened on either side of the back of the fish under the dorsal fin by means of a nickel pin inserted through the tags and flesh--were used in each year.

Tags were recovered from upriver areas by personnel of the Fisheries Research Board and Department of Fisheries from the Indian fishery, counting weirs and spawning stream surveys. Only those tags which can be assigned to definite spawning areas are dealt with in this report. Tags recovered at points along the main stem of the Skeena River are not considered since their ultimate destination is uncertain.

Results and Discussion

The number of tags affixed and the commencing and ending dates of the tagging operations are shown in Table I.

Year	Number of Sockeye tagged	Commencing Date	Ending Date
1944	901	July 8	July 21
1945	2212	June 19	July 30
1946	2135	June 18	July 28
1947	2329	June 15	July 27
1948	2342	June 15	July 18
1955	822	May 26	Sept.28
	10,741		

Table I. The number of sockeye tagged and the commencing and ending dates of the tagging operations.

A total of 1486 tags which could be assigned to specific spawning areas were recovered. The distribution of these tags by years and spawning areas, as indicated in Table II, shows very variable recoveries from different areas.

Table II.	The	number	of	sockeye	tags	recovered	by	years	and	spawning
	area	.								

	1944	1945	1946	1947	1948	1955	Total
Lakelse Lake		5	3	14	8	2	32
Alastair Lake				7			7
Bulkley River	10	59	71	44	46	8	238
Babine Lake	20	84	331	575	127	47	1184
Bear Lake		l	1	9		1	12
Kitsumgalum Lake				3			3

Table II. (continued)

	1944	1945	1946	1947	1948	1955	Total
Kitwanga Lake	1	l		7			9
Johanson Lake		1	98 				1
Total	31	151	406	659	181	58	1486

This may due to several reasons, firstly, to the relative sizes of the different stocks, secondly, to the unavoidably disproportionate tagging ratios, and thirdly, to the success of recovery of tags. In the years 1944 to 1948 tagging was commenced after some of the runs may have passed the estuary and was discontinued before all runs had entered the river proper. Also tagging was not continuous throughout the actual tagging season. Because of these factors and because of variable fishing success some runs or segments of runs may have been tagged in a different ratio than others. The recoveries at Babine and Lakelse Lakes are proportionately higher than elsewhere since the fish counting weirs located at those lakes permitted almost complete recovery of tags passing the fence. The Bulkley River recoveries are also high since the Indians at Moricetown tended to fish selectively for tagged fish in order to collect the reward offered for tags. Recoveries from remoter areas are from occasional surveys made into those areas by personnel of the Fisheries Research Board and Department of Fisheries.

The best method of determining whether there was any segregation of populations for different lakes as the runs pass the estuary of the Skeena River is to refer the tag taken in each locality to the time that particular sockeye was tagged. From figure 1, a frequency diagram, are given the numbers recovered in each locality which were tagged on a given day, it is evident that there is not a complete segregation of runs. The Lakelse and Alastair Lake runs are early having fairly well passed by June 25 around which time the fishery opened in the years prior to 1949. The recoveries from Alastair Lake, however, were collected on a three day spawning survey made to the lake in August 1947. Tags recovered along the Bulkley River showed those fish were present in the estuary from June 15 to July 29 with heaviest concentrations from June 23 to July 19. Recoveries from Babine Lake indicate the fish were in the fishing throughout the period of the tagging. Babine Lake sockeye seemed most heavily concentrated in late June and early July. Bear and Kitsumgalum Lake sockeye are present between July 1 and July 29. Sockeye

recovered at Kitwanga Lake were tagged between July 19 and July 27. The single tagged sockeye recovered at Johanson Lake was tagged on July 21.

Some of the tagged sockeye which reached the Babine River counting weir were allowed to continue and the tags were recovered subsequently on the actual spawning grounds. As indicated by Table III the recoveries of tags is very variable in relation to the sizes of the runs to the different streams.

-	1945	1946	1947	1948	1955	Total
9 Mile Creek		1		7	9	8
Twin Creek	1	3	20	20		44
6 Mile Creek		3	1	7		8
Pendleton Creek		1		1		2
Pierre Creek	2	6	16	8		32
Sockeye Creek			3	3	1	7
Tachek Creek		2	7	7		16
4 Mile Creek				3		3
Fulton River			35	6		41
15 Mile Creek			5	1		6
Morrison River	1	l	2			4
Grizzly Creek			2	2		4
5 Mile Creek		*	1	1		2
Babine River	- 1			10. De	1	1
Total	4	14	92	66	2	178

Table III. The numbers of sockeye tags recovered from Babine Lake spawning streams.

Examination of figure 2, a frequency diagram showing numbers recorded in each locality tagged on a given date in the estuary, indicates that some separation occured in the fishing area among sockeye bound for different streams at Babine Lake: namely,

(1) Babine sockeye bound for Nine Mile, Six Mile, Pendleton, and Sockeye Creeks are present in the fishery in June.

(2) Sockeye migrating to Twin, Pierre, Tachek, and Four Mile Creeks are present from June 15 to July 10.

(3) Sockeye migrating to Fifteen Mile, Morrison, Grizzly, and Five Mile Creeks are present from about July 7 to July 21.

(4) Those bound for the Fulton, and the Upper and Lower Babine Rivers are present from about July 15 to August 10.

The timing of the runs in the first category is similiar to that of the runs to Lakelse and Alastair Lakes. The timing distribution of the Bulkley River run is similiar to that of categories 2 and 3 above. The runs to the Fulton and the Babine Rivers are present in the fishing at the same time as the Bear, Kitsumgalum, Kitwanga, and Johanson Lake sockeye.

Recent collections of underyearling sockeye in different parts of Babine Lake have showed that the distribution of young sockeye parallelled the distribution of the parent spawning population. To obtain maximum utilization of the nursery areas it may be necessary to change the distribution of Babine spawners by regulation of the fishery. The lake may be divided roughly into three nursery areas, the northern area including Nilkitkwa Lake and that portion of Babine Lake lying west and north of Halifax Narrows, the central area or that portion between Halifax Narrows and Sandspit, and the southern area, the area to the south and east of Sandspit. Figure 3, which shows the timing of the runs to the Babine nursery area, indicates that all areas receive both early and late running spawners. The s uthern area, where the dominant runs are those to Twin, Pierre, and Fifteen Mile Creeks, receives spawners most of which pass the fishery in June and the first half of July. The central area is dominated by the Fulton River spawners and hence receives the bulk of its sockeye from amongst those fish present in the estuary in the latter portion of July and in early August. The run to the Fulton River probably precedes the runs to the Babine Rivers by a few days. The central area also receives some earlier running sockeye through the medium of runs to Sockeye and Tachek Creeks. Except for the relatively insignificant run to Nine Mile Creek, the spawners in the northern area are fish which pass

through the Skeena commercial gill-net area in late July and in August.

Summary

Some segregation of sockeye populations is evident among sockeye destined for the various tributary lakes of the Skeena River in point of time of movement through the commercial fishery. Similiar segregation exists among sockeye destined for tributary streams of Babine Lake, the largest single spawning area of the Skeena River system. Therefore it should be possible by means of fishing regulations to control to a certain extent the catch and escapement of certain components of the Skeena River sockeye salmon run. Since Babine Lake sockeye are present in the fishing area throughout the fishing season any regulations designed to capture or allow escapement of runs to other areas will affect the Babine sockeye run. As the run to Babine Lake is the most important of the Skeena runs forming up to 70 per cent of the total the affect of any regulation on the Babine run should be considered.

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Upstream recoveries of Pinks tagged in the Skeena Estuary 1945 - 55

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FIGURE 1. Lakelse glastain Bulkley Babine N.US. Ben Kalum Kitwanga Johanson afastain Lake (7) Lakelse Lake (32) Kalum Lake (3) Kitwanga River (9) Johanson Lake (1) Bear Lake (12) 20 Bulkley Rivers (2392) 10 90 80 Babine Lake (1184) 20 60



FIGURE 2	9 Mile (8)
	Twin (44)
	6 Mile (8)
	Rendleton (2)
	Sockeye (2)
	Pierre (32)
	Tachek (16)
	4-Mile (3)
	Fulton (41)
	15 Mile (6)
	Morrison (4)
	Givizzly (4)
	5 Mile (2)
	Lower Babine (2)
	9 Mile Twin GMile Fondleton Sockege Pierre Tachek 4 Mile Fulton Is Mile Morrison Grizzly 5 Mile Babine River
FIGURE 3.	North
	Bentral
<u>Merule Luci en hleutti</u>	South