SUMMARY OF SALMON TAGGING IN DIXON ENTRANCE AND HECATE STRAIT IN 1968

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INTRODUCTION

Analysis of salmon tagging and research fishing results from studies conducted in Dixon Entrance in 1966 and 1967 revealed radical differences between stock compositions and migration patterns of pink salmon entering the region in these two years.* The 1967 migration entered from the west only and were primarily destined for British Columbia streams while in 1966, Alaska-bound fish were a major component and pink salmon entered Dixon Entrance both from the west and from the south via Hecate Strait. Examination of tagging data from earlier years and analysis of catch statistics for fisheries adjacent to the British Columbia - Alaska boundary indicated that the difference between pink migrations in 1966 and 1967 characterize the even- and odd-year pink cycles. Thus it was hypothesized that a northern migration of pink salmon from Hecate Strait was a regular, but exclusively even-year occurrence.

This report summarizes the results of salmon tagging conducted in Dixon Entrance and Hecate Strait in 1968. The objective of the tagging program was to further define the characteristics of even-year pink salmon migrations in Dixon Entrance and Hecate Strait, particularly in the latter area where 1966 tagging had shown that pink salmon migrating northward

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* Anon. MS 1968. A summary of the 1966 and 1967 results of the Dixon Entrance salmon investigations. Canada Dept. of Fish., Vancouver. Typescript 14 p.

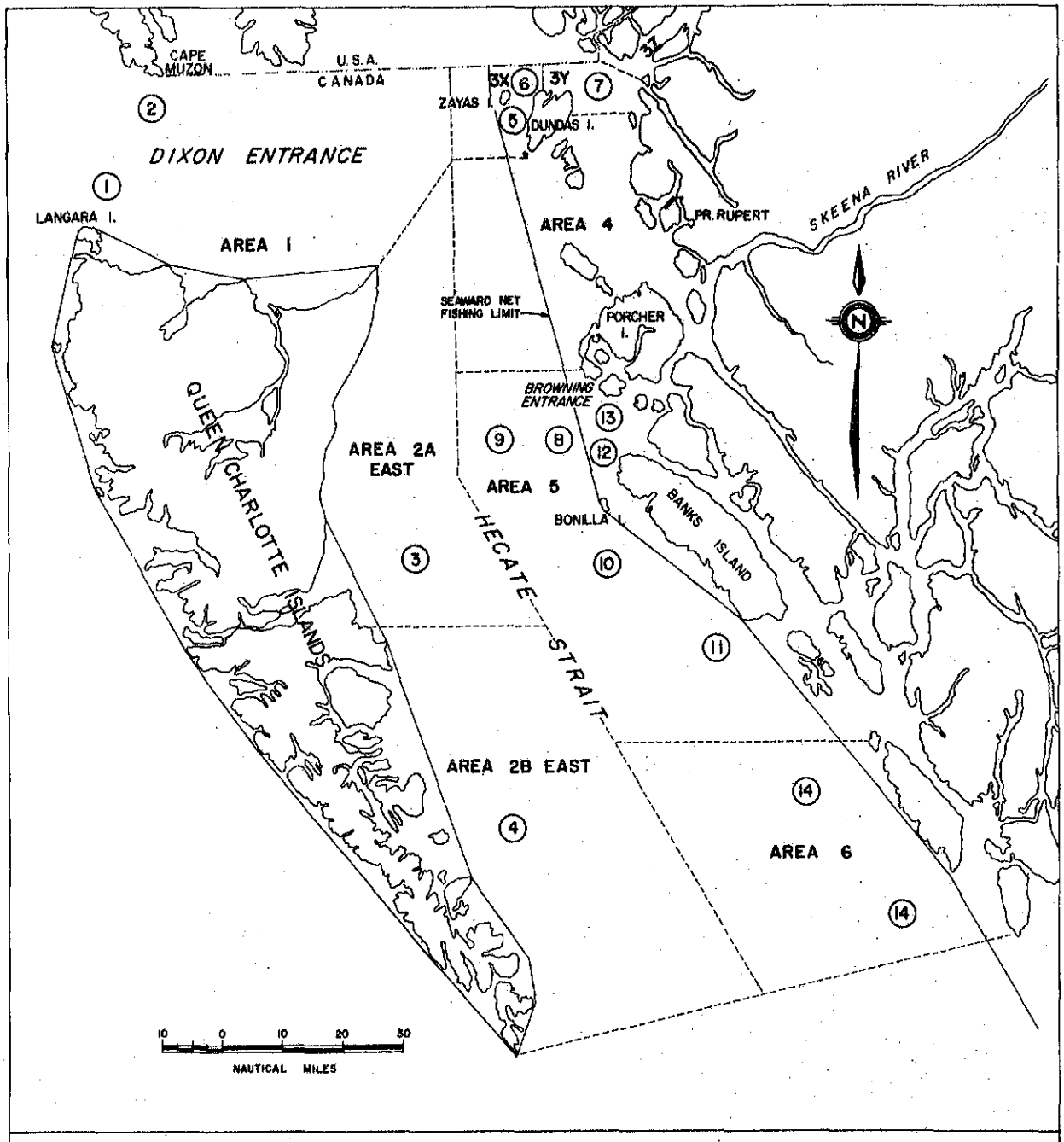
in Hecate Strait were subject to exploitation by net fisheries operating in Browning Entrance and near Dundas Island. An additional objective was to provide information on migration routes, timing and stock composition of other species of salmon entering the region.

METHODS

Salmon were tagged at 14 locations within Dixon Entrance and Hecate Strait between June 15 and August 21, 1968 (Fig. 1). Tagging effort was most concentrated in the vicinity of Browning Entrance where there were five tagging locations and near Dundas Island where there were three locations. Salmon for tagging were captured by a chartered purse seiner at the three Dundas Island tagging sites and by chartered troller elsewhere. Each of five trollers chartered for salmon tagging was equipped and operated to maximize the capture of pink salmon. All salmon judged to be in good condition were tagged with Petersen tags 7/8 inches in diameter.

A total of 27,781 salmon was tagged, consisting of 22,717 pink, 2,633 coho, 1,087 chum, 1,040 sockeye and 304 chinook salmon. Tagged pinks, cohoes and chinooks were fairly well distributed between the 14 tagging locations. Most of the sockeye and chum, however, were tagged near Dundas Island. The capture method, tagging period and number of salmon tagged by species for each tagging location are listed (Table 1).

In the following analysis, all salmon originating in a statistical area are referred to as "stock" and the relative strength of each stock in a tagging location is represented by the percentage of the total tag recoveries returned from each



TAGGING LOCATIONS

NO.	STAT. AREA	GEOGRAPHICAL LOCATION	NO.	STAT. AREA	GEOGRAPHICAL LOCATION
①	1	DIXON ENTRANCE - LANGARA	⑧	5	HECATE STRAIT
②	1	DIXON ENTRANCE - MUZON	⑨	5	HECATE STRAIT
③	2A EAST	HECATE STRAIT	⑩	5	HECATE STRAIT
④	2B EAST	HECATE STRAIT	⑪	5	HECATE STRAIT
⑤	3X	ZAYAS ISLAND	⑫	5	BROWNING ENTRANCE - WEST
⑥	3X	DUNDAS ISLAND	⑬	5	BROWNING ENTRANCE - EAST
⑦	3Y	DUNDAS ISLAND - MAINLAND	⑭	6	HECATE STRAIT

Figure 1. Tagging locations

TABLE I Summary of Tags Applied.

Tagging Location			Capture method	Tagging period	Number Tagged				
No.	Geographical location	Statistical Area			Sockeye	Coho	Pink	Chum	Chinook
1	Dixon Entrance Langara	1	troll	June 30-Aug. 23	1	363	2843	5	4
2	Dixon Entrance Muzon	1	"	July 1-Aug. 14	-	246	895	1	7
3	Hecate Strait	2AE	"	June 17-July 17	-	72	52	-	2
4	Hecate Strait	2BE	"	June 19-July 16	-	146	424	-	7
5	Zayas Island	3X	seine	June 29-Aug. 20	516	460	5338	647	11
6	Dundas Island	3X	"	June 29-Aug. 21	418	158	1900	257	5
7	Dundas Island - Mainland	3Y	"	July 4-Aug. 19	93	174	2093	161	7
8	Hecate Strait	5	troll	June 16-Aug. 11	3	93	789	6	19
9	Hecate Strait	5	"	June 17-Aug. 7	1	180	531	3	70
10	Hecate Strait	5	"	June 22-Aug. 6	3	61	1461	1	9
11	Hecate Strait	5	"	June 16-Aug. 15	1	106	1796	-	10
12	Browning Entrance West	5	"	June 15-Aug. 16	4	216	2380	3	42
13	Browning Entrance East	5	"	June 15-Aug. 16	-	300	1118	3	107
14	Hecate Strait	6	"	June 20-Aug. 13	-	58	1097	-	4
				Totals	1040	2633	22717	1087	304

statistical area. This approach assumes equal rates of tagging, tagging mortality, fishing mortality and tag return for all stocks and assumes that all recoveries were made in the areas of origin. Almost certainly, none of the above assumptions is completely valid but the amount of error they introduce is not considered sufficient to alter the basic interpretations.

Tags recovered in the area of tagging have not been included in the analysis, nor have freshwater recoveries which were mainly recovered by fisheries agencies and merely reflect the location of freshwater research programs. With the exception of chinook salmon, only tags returned in the year of tagging have been included.

Preliminary examination of tagging data has shown that in many cases, the distribution of recoveries varied little between adjacent tagging locations. Where this occurred, tagging locations have been grouped. Where only small numbers of fish were tagged, tagging locations have been grouped into general areas.

RESULTS

PINK SALMON

Western Dixon Entrance (Tagging locations 1 & 2)

British Columbia and Alaska pinks were about equally abundant in total but the proportion of British Columbia fish increased with time, approximating a third in early July, a half in late July and early August and two thirds in late August (Table II). Almost all the British Columbia recoveries

TABLE II Distribution of commercial recoveries of pink salmon tagged in western Dixon Entrance (tagging locations 1 & 2).

Tagging week ending	July 6	July 13	July 20	July 27	Aug. 3	Aug. 10	Aug. 17	Aug. 24
Number tagged	359	211	202	446	344	371	1349	408
Number Recovered	83	53	36	106	51	63	208	59
Recovery location	percent of recoveries by statistical area							
British Columbia								
Area 1	4.8		11.1	3.8	11.8	31.7	35.5	20.3
2						4.8	2.4	3.4
3	12.0	15.1	16.7	20.8	15.7	7.9	12.0	3.4
4	6.0	9.4	2.8	15.1	7.8	6.3	12.0	13.6
5	4.8	3.8	5.6	4.7	9.8	7.9	6.3	8.5
6	3.6	3.8	8.3	5.7	2.0	4.8	9.1	5.1
7						7.9	1.9	5.1
other	1.2		2.8	.9	5.9	3.2	1.9	3.4
unknown				.9	2.0		.5	
totals	32.5	32.1	47.2	51.9	54.9	74.6	71.6	62.7
Southeast Alaska								
Area 101	53.0	58.5	36.1	34.9	19.6	15.9	11.5	18.6
102	2.4	3.8	8.3	6.6	13.7	4.8	8.7	8.5
103					2.0	1.6	2.4	6.8
106	1.2		5.6	1.9	2.0	3.2	2.9	
107	2.4		2.8	2.8	3.9			
other	1.2						1.0	
unknown	7.2	5.7		1.9	3.9		1.9	3.4
totals	67.5	67.9	52.8	48.1	45.1	25.4	28.4	37.3

were taken in statistical areas 1 to 7 (Figure 2). Pinks from Areas 3 and 4 were present in moderate strength (generally 6 to 20% per area) throughout July and August with the Area 3 stock exhibiting greater strength and earlier timing. Area 5 and 6 stocks were also present throughout July and August, but in less strength. In August, Area 1 was the major stock, providing a peak weekly contribution of 32 percent of the recoveries. Area 2 and 7 pinks were present in the tagging location only after August 3 and in relatively low abundance.

Virtually all Alaskan recoveries were made in statistical areas 101, 102, 103, 106 and 107 with Area 101 being by far the most important, particularly for early July tagging when it contributed over 50 percent of the total recoveries. Area 106 and 107 fish were most abundant in the tagging location during July while Area 102 and 103 stocks peaked during August.

Dundas Island (Tagging locations 5, 6 & 7)

Stock compositions varied between the three tagging locations and to a lesser extent, between July and August (Table III). Alaskan stocks predominated (65%) in the western portion of Area 3X but were in the minority in the eastern portion of Area 3X (38%) and in Area 3Y (24%). Most of the Alaskan recoveries from all three tagging locations were made in Area 101; a few were recovered in Areas 102, 103, 106 and 107.

Of British Columbia pink stocks, Area 3 predominated in all three tagging locations and was the most abundant single

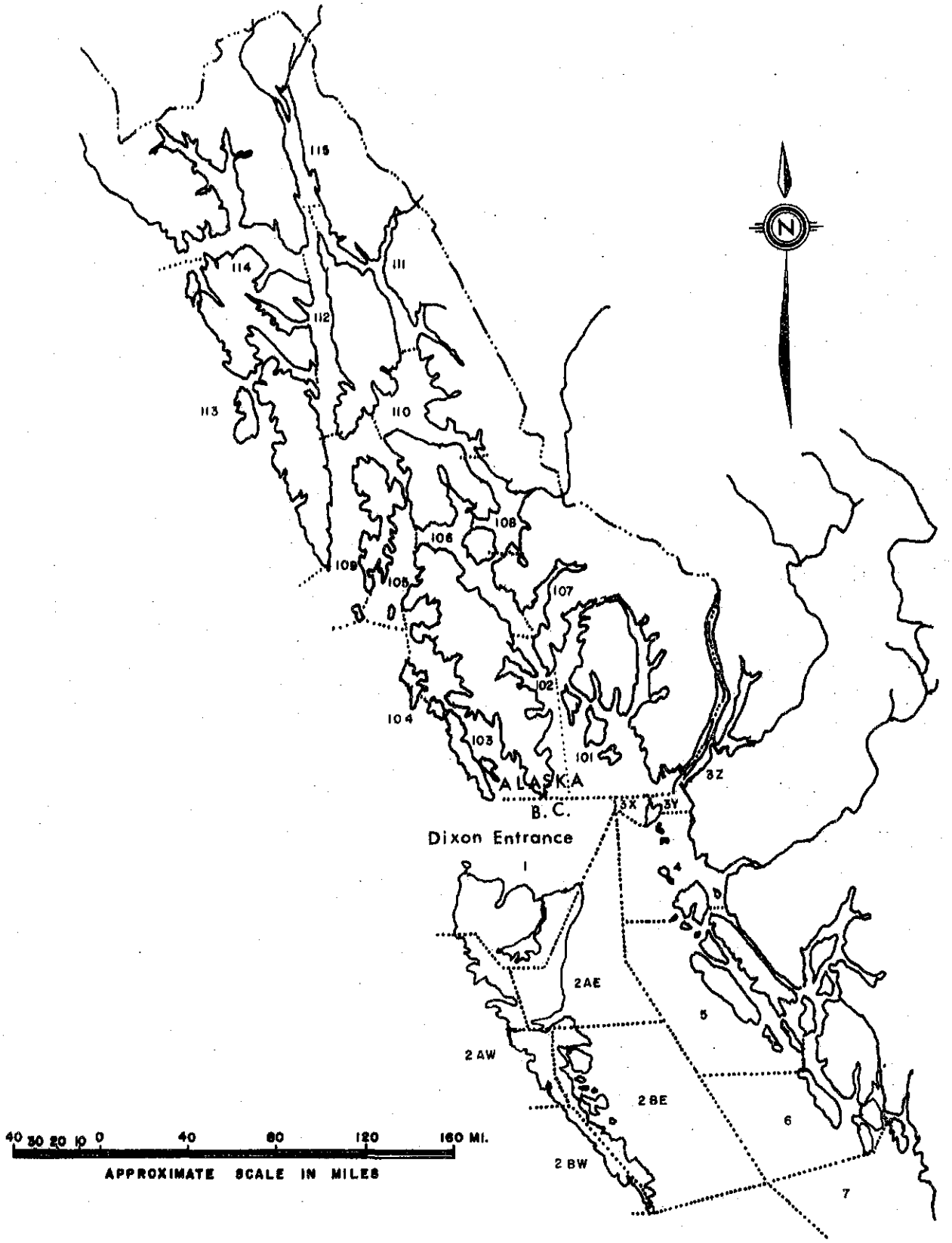


Figure 2. Statistical areas in northern British Columbia and southeast Alaska

TABLE III Distribution of commercial recoveries of pink salmon tagged near Dundas Island (tagging locations 5, 6 & 7).

Tagging location	5(Area 3X West)		6(Area 3X East)		7(Area 3Y)	
Tagging month	July	August	July	August	July	August
Number tagged	1999	3339	705	1195	650	1443
Number recovered	626	1028	226	392	177	163
Recovery location	percent of recoveries by statistical area					
British Columbia						
Area 1	.5	2.8	.9	2.0		.6
2		.7	.9	.5		.6
3	22.8	17.6	49.1	34.7	69.5	48.5
4	4.6	9.1	8.0	16.1	5.1	19.0
5	1.3	2.1	2.7	2.3	2.8	
6	1.3	3.6	2.2	4.1	.6	1.2
other	.2	.9		.8	.6	.6
unknown	.3	.8	.4	.8	1.1	1.8
totals	31.0	37.6	64.2	61.2	79.7	71.8
Southeast Alaska						
Area 101	61.8	45.3	33.2	29.3	19.2	25.8
102	1.8	7.7		3.3		
103		1.3		.3		
106	.5	1.5		1.5		
107	.8	1.3		1.0		
other	.6	.7	.4	.5		
unknown	3.5	4.7	2.2	2.8	1.1	2.5
totals	69.0	62.4	35.8	38.8	20.3	28.2

stock (British Columbia or Alaska) in the eastern portion of Area 3X and in Area 3Y. Area 4 was the only other British Columbia stock present in any strength and contributed from 5 to 19 percent of the recoveries with its contribution increasing from west to east and from July to August.

Browning Entrance (Tagging locations 8, 9, 10, 12 & 13)

The tag recovery pattern for each of the five tagging locations was generally similar. For example, British Columbia fisheries yielded the following percentages of the total commercial recoveries: tagging location 8 (64%), 9 (64%), 10 (74%), 12 (66%) and 13 (65%). On a grouped tagging location basis, Area 101 was the most abundant stock yielding 25% of the total recoveries (Table IV). Area 4 (24%) was a close second, followed by Area 3 (17%), Area 6 (12%) and Area 5 (10%). Small numbers of tags were recovered in British Columbia Areas 1 and 2 and Alaska Areas 102, 106, and 107. Considering stock timing, Areas 101 and 3 peaked before mid-July, Area 4 peaked near the end of July while the strength of the Area 5 and 6 stocks exhibited no definite timing pattern.

Southwest Hecate Strait (Tagging locations 3 & 4)

Tagging in this area was somewhat limited since all of the tagging was conducted prior to July 18 and 424 of the 476 tags were applied in one location (tagging location 3). The tag recoveries indicate that Area 101, 4, 5 and 6 pink stocks were present in almost equal abundance and together comprised over 70 percent of the total (Table V). Present in less

TABLE IV Distribution of commercial recoveries of pink salmon tagged in Browning Entrance (tagging locations 8, 9, 10, 12 & 13).

Tagging week ending	June 22	June 29	July 6	July 13	July 20	July 27	Aug. 3	Aug. 10	Aug. 17
Number tagged	186	620	835	257	984	1011	904	401	283
Number recovered	35	185	470	83	296	342	227	79	66
Recovery location	percent of recoveries by statistical area								
British Columbia									
Area 1	2.9		.4		.3	.6	1.8		7.6
2			.6			.3	.4	2.5	1.5
3	8.6	17.3	18.9	28.9	16.2	16.4	14.9	8.9	9.1
4	11.4	13.5	14.5	15.7	25.3	42.4	28.9	20.3	21.2
5	17.1	7.0	8.5	6.0	13.5	7.6	5.5	3.8	28.8
6	22.9	9.7	12.8	3.6	18.9	9.9	9.6	12.7	4.5
other	2.9	1.6	2.3		3.7	2.0	.9	7.6	1.5
unknown		2.7	1.3	2.4	2.0	1.5		1.3	3.0
totals	65.7	51.9	59.4	56.6	80.1	80.7	63.9	57.0	77.3
Southeast Alaska									
Area 101	25.7	35.7	34.5	37.3	13.9	15.5	25.9	24.1	13.6
102	2.9	.5	.9	2.4	2.0	1.2	2.6	11.4	6.1
103			.2					1.3	
106		2.2	.6	1.2		1.3	2.6	3.8	1.5
107	2.9	3.2	1.5		1.0	.3	1.8		
other		1.6	.4	1.2			.9	1.3	
unknown	2.9	4.9	2.8	1.2	1.0	1.8	1.8	2.5	1.5
totals	34.3	48.1	40.6	43.4	19.9	19.3	36.1	43.0	22.7

TABLE V Distribution of commercial recoveries of pink salmon tagged in southwest Hecate Strait (tagging locations 3 & 4).

Tagging week ending	June 22	June 29	July 20
Number tagged	73	150	353
Number recovered	17	32	58
Recovery location	percent of recoveries by statistical area		
British Columbia			
Area 3	5.9	9.4	8.6
4	5.9	15.6	25.9
5	23.5	25.0	12.1
6	11.8	12.5	20.7
8	5.9	3.1	6.9
12	5.9	3.1	1.7
other		3.2	5.2
unknown		3.1	3.4
totals	58.8	75.0	84.5
Southeast Alaska			
Area 101	41.2	18.8	12.1
102			3.4
106		3.1	
107		3.1	
totals	41.2	25.0	15.5

strength were pinks from Alaskan Areas 102, 106 and 107 and British Columbia Areas 3, 8 and 12. The latter two stocks were not present in the more northern tagging locations discussed previously.

Southeast Hecate Strait (Tagging location 11 & 14)

In contrast to the other tagging locations, pinks in southeast Hecate Strait were almost all bound for British Columbia streams; 92% of the commercial recoveries from each of the two tagging locations were recovered in British Columbia fisheries. Areas 6 (34%) and 5 (21%) were the major stocks, followed by Areas 8 (10%), 4 (8%), 3 (8%) and 101 (6%) (Table VI). As in the adjacent tagging location on the western side of the Strait, southern stocks were present (in this case Area 8, 9 and 12 fish) that were absent in the more northern tagging locations. No seasonal differences in the abundance of individual stocks were apparent.

COHO SALMON

Preliminary analysis of the tagging results revealed no meaningful seasonal variation in stock composition for any of the tagging locations and little stock composition variability between adjacent tagging locations. Consequently, tagging data have been presented as season totals and grouped into four general tagging areas (Table VI).

The same stocks were present in each of the four tagging areas but the strength of individual stocks varied between these areas. For Dixon Entrance tagging, major recovery locations, in order of magnitude, were Areas 4, 3 and 101.

TABLE VI Distribution of commercial recoveries of pink salmon tagged in southeast Hecate Strait (tagging locations 11 & 14).

Tagging week ending	June 22	June 24	July 6	July 13	July 20	July 27	Aug. 3	Aug. 10	Aug. 17
Number tagged	176	310	376	211	403	382	327	370	338
Number recovered	40	82	137	65	130	96	82	87	68
Recovery location	percent of recoveries by statistical area								
British Columbia									
Area 1			.7	1.5	.8	1.0			4.4
2		1.2	.7				1.2	2.3	2.9
3	12.5	6.1	8.0	3.1	3.1	17.7	6.1	11.5	4.4
4	5.0	9.8	5.8	4.6	6.2	12.5	9.8	8.0	13.2
5	32.5	15.9	26.3	27.7	23.8	7.3	14.6	19.5	23.5
6	17.5	26.8	24.8	40.0	44.6	40.6	35.4	33.3	32.4
7	2.5	2.4	2.2		3.1	3.1	3.7	4.6	1.5
8	5.0	15.9	19.7	12.3	7.7	3.1	9.8	3.4	5.9
9		7.3	2.2	3.1	1.6	2.0	1.2	1.1	2.9
12	2.5	1.2	.7	1.5	2.3	2.0	3.6	3.4	5.9
unknown		2.4	2.2	1.5	3.1	1.0	1.2	1.1	1.5
totals	77.5	89.0	93.4	95.4	96.2	90.6	86.6	88.5	98.5
Southeast Alaska									
Area 101	17.5	9.8	4.4	4.6	2.3	6.3	9.8	10.3	1.5
102			1.5		.8	3.1	2.4	1.1	
103							1.2		
107					.8				
unknown		1.2	.7						
totals	17.5	11.0	6.6	4.6	3.8	9.4	13.4	11.5	1.5

TABLE VII Distribution of commercial recoveries of tagged coho salmon.

Tagging location	Dixon Entrance (1 & 2)	Dundas Island (5, 6 & 7)	Browning Entrance (8,9,10, 12 & 13)	Hecate Strait (3,4,11 & 14)
Number tagged	609	791	850	382
Number recovered	93	177	165	75
Recovery locations	percent of recoveries by statistical area			
British Columbia				
Area 1	3.2	4.0	3.0	
2		1.1		2.7
3	21.5	32.8	10.3	6.7
4	24.7	22.6	8.5	6.7
5	5.4	6.8	23.0	16.0
6	3.2	6.8	24.8	22.7
7	1.1	1.7	7.9	12.0
8	2.2	2.8	10.9	6.7
other	3.2	1.1	3.6	13.3
unknown	3.2	1.1	1.8	4.0
totals	67.7	80.8	93.9	90.7
Southeast Alaska				
Area 101	16.1	16.4	3.6	2.7
102	5.4	1.1	.6	2.7
103	2.2			
106	1.1	.6	1.2	
107				1.3
109		.6		1.3
114	1.1	.6		
unknown	1.1			
108			.6	1.3
totals	32.3	19.2	6.1	9.3

Together these three areas contributed 62% of the recoveries. The remainder of the recoveries were scattered between 11 other statistical areas, mainly adjacent to the B.C. - Alaska boundary. For Dundas Island tagging, Areas 3, 4 and 101 again provided the majority (72%) of the recoveries. Area 5 and 6 fish were present in moderate strength, each providing 7% of the recoveries. For Browning Entrance tagging, Areas 6 and 5 were the major stocks, together contributing about half the recoveries. Other stocks present in moderate strength were Areas 8 (11%), 3 (10%) and 7 (8%). In the tagging conducted in Hecate Strait, the stock composition was similar to that for Browning Entrance. One difference was a minor recovery (7%) of Hecate Strait tags in the Johnstone Strait fishery.

SOCKEYE SALMON

Tagging results for only the Dundas Island tagging locations are considered here as only 13 sockeye were tagged elsewhere. Tagging results for July and August for each of the three tagging locations are listed (Table VIII). Disregarding tagging periods with only a few recoveries, little variation in stock composition occurred between tagging locations and tagging months. Area 4 was the major stock, providing 55 to 70% of the recoveries, followed by Area 3 (22 to 32%) and Area 101 (8 to 11%). Very few tags were recovered in other areas.

CHUM SALMON

As with sockeye, virtually all chum salmon were tagged near Dundas Island (see Table I) and no other tagging locations

TABLE VIII Distribution of commercial recoveries of sockeye salmon tagged near Dundas Island (tagging locations 5, 6 & 7).

Tagging location	5(Area 3X West)		6(Area 3X East)		7(Area 3Y)	
Tagging month	July	August	July	August	July	August
Number tagged	334	182	375	43	84	9
Number recovered	119	36	145	6	38	1
Recovery location	percent of recoveries by statistical area					
British Columbia						
Area 1	1.7					
3	25.2	22.2	21.4	50.0	31.6	
4	54.6	55.6	69.0	33.3	60.5	
5	2.5		2.1			
6	.8	2.8	2.8			
7			.7			
9			.7			
12		2.8	.7			
unknown			.7			
totals	84.9	83.3	97.9	83.3	92.1	
Southeast Alaska						
Area 101	10.9	11.1	1.4	16.7	7.9	100.0
102	.8		.7			
107	1.7					
111	.8					
115		2.8				
unknown	.8	2.8				
totals	15.1	16.7	2.1	16.7	7.9	100.0

are considered here. The stock composition varied considerably between the three tagging locations (Table IX). In the outside tagging location (Area 3X West) tag recoveries were made in 13 different statistical areas as opposed to six and three recovery areas for tags applied in Area 3X East and 3Y respectively. In spite of the wide distribution of tag recoveries from Area 3X West, the majority were recovered in two areas: Area 101 (36% for both July and August tagging) and Area 3 (July tagging 35%, August tagging 24%). Other recovery sites for Area 3X West tagging were Areas 2, 4, 5, 6 and 102, each contributing 4 to 9% of the recoveries. For Area 3X East tagging, major recovery areas, in order of magnitude, were Areas 3, 101 and 4. The relatively small number of recoveries from Area 3Y tagging indicated a predominance of Area 3, 4 and 101 fish and the presence of a higher proportion of Area 3 fish than in Area 3X.

CHINOOK SALMON

Tagged chinooks measured 37 to 104 cm., fork length, with the majority (74%) in the 40-69 cm. range. It could be shown that some of the tagged fish were not in their ultimate year by the fact that, of the 36 recoveries, 5 were recaptured in the year following tagging and 1 two years after tagging. Tag recoveries were widely distributed: two in southeast Alaska, 25 in British Columbia and 9 in Washington waters (Table X). There were four recoveries in the Fraser and seven in the Columbia River including one sport recovery - the only non-commercial recovery recorded.

TABLE IX Distribution of commercial recoveries of chum salmon tagged near Dundas Island (tagging locations 5, 6 & 7).

Tagging location	5(Area 3X West)		6(Area 3X East)		7(Area 3Y)	
Tagging month	July	August	July	August	July	August
Number tagged	384	263	125	132	48	113
Number recovered	125	70	35	30	12	15
Recovery location	percent of recoveries by statistical area					
British Columbia						
Area 2	.8	4.3				
3	35.2	24.3	31.4	40.0	83.3	60.0
4	8.0	4.3	14.3	23.3		20.0
5	4.0	2.9	5.7			
6	3.2	8.6	2.9			
7	.8	2.9				
8		1.4				
12	.8					
unknown	.8		5.7			20.0
totals	53.6	48.6	60.0	63.3	83.3	100.0
Southeast Alaska						
Area 101	36.0	35.7	31.4	23.3	16.7	
102		8.6				
103	.8					
106	3.2					
107	2.4	1.4		6.7		
unknown	4.0	5.7	8.6	6.7		
totals	46.4	51.4	40.0	36.7	16.7	

TABLE X Chinook salmon tag recoveries by recovery location and year.

Tagging location	Dixon Entrance (locations 1 & 2)	Dundas Island (locations 5, 6 & 7)	Browning Entrance (locations 8, 9, 10, 12 & 13)	Hecate Strait (locations 3, 4, 11 & 14)
Number tagged	11	23	247	23
Number recovered	3	3	26	4
Recovery location	number and year of recoveries			
Southeast Alaska				
Area 113			1(68)	
unknown				1(68)
British Columbia				
Area 4		1(68) 1(69)	2(68)	
5	1(68)	1(69)	2(68) 2(69)	
6			2(68)	
7			1(68)	
9			1(68)	
12			2(68)	
25				1(68)
26			1(69)	
27	1(68)		1(68)	
29	1(68)		1(68)	2(68)
unknown			1(68)	
Washington				
Ocean			2(68)	
Columbia R.			6(68) 1(70)	

DISCUSSION

Tagging results revealed a general similarity in pink salmon migrations in 1966 and 1968 in the Dixon Entrance - Hecate Strait region. In both years pinks entering Dixon Entrance were primarily bound for 10 statistical areas, five in British Columbia and five in southeast Alaska, and pinks migrating to these areas entered Dixon Entrance from the west and from the south via Hecate Strait. On the basis of tagging results, the main differences in stock composition in 1968, relative to 1966, were stronger pink runs to Areas 3 and 101 and weaker runs to Areas 4, 102, 103, 106 and 107. The Area 101 increase and decline in importance of Areas 106 and 107 were particularly evident in Browning Entrance.

Changes in commercial pink catches between 1966 and 1968 for the ten areas involved are in agreement with the tagging data (Table XI).

The total pink catch for these ten areas approximated 19 million fish in 1968 (Table XI). Tagging data and the location of commercial catches within these areas and on other possible approach routes suggested that the majority of the 19 million pinks that were caught plus the escapement, migrated through Dixon Entrance. The question was then raised as to how this migration was divided between the two approach routes. Tagging data is of little use in providing an answer but it did show that pinks moved rapidly through the tagging areas (the majority of recoveries occurred within 12 days of tagging)

TABLE XI

Pink salmon catches in statistical areas adjacent to the British Columbia-Alaska boundary in 1966 and 1968.

Statistical Area	1966	1968
British Columbia		
1	1,366,600	936,800
3	610,500	1,244,500
4	1,076,600	413,300
5	2,743,300	1,400,800
6	3,540,500	3,396,900
sub total	9,307,500	7,392,300
Alaska		
101	3,510,300	5,633,600
102	4,395,600	2,719,900
103	3,111,600	2,175,900
106	1,066,900	561,900
107	1,445,000	547,400
sub total	13,529,500	11,638,600
Total	22,837,000	19,030,900

and thus provided some basis for the assumption that catches by chartered troll vessels which operated at the western end of Dixon Entrance and near Browning Entrance were relative to number of pinks that entered from the west and from Hecate Strait, respectively. A comparison of daily troll catches for the two locations indicated migrations of similar magnitude (Table XII). However, the comparison is not entirely valid since tagging results showed that about 20% of the fish in Browning Entrance were migrating southward.

On the basis of weekly tagging results, weekly net catches of pinks in the Browning Entrance and Dundas Island fisheries have been divided as to area of origin. A summation of weekly stock contribution estimates showed that only 6,000 of the 81,000 pinks caught in Browning Entrance were destined for Area 5 streams (Table XIII). Similarly, of the Dundas Island catch of 809,000 pinks, only 444,000 were destined for Area 3. Area 101 pinks were the largest single contributor to the Browning Entrance and Area 3X fisheries while local pinks (Area 3) predominated in the Area 3Y catch.

TABLE XII Average catch of pink salmon per troll day* by week in the Dixon Entrance and Browning Entrance tagging areas.

Catch Location	Average catch per troll day by week ending									
	June 22	June 29	July 6	July 13	July 20	July 27	Aug.3	Aug.10	Aug.17	Aug.24
Dixon Entrance (tagging locations 1 & 2)	-	-	75	92	67	74	97	50	171	58
Browning Entrance (tagging locations 8, 9, 10, 12 & 13)	24	106	143	46	83	94	125	48	40	-

* Daily troll catches have been adjusted to a catch per 300 hook hour basis. The chartered troll vessels fished an average of 30 lures and operated 10 hours a day when conditions permitted.

TABLE XIII Estimated pink catch by area of origin in the Browning Entrance and Dundas Island net fisheries in 1968.

Fishery Total Catch	Browning Entrance 80,631	Area 3X West 12,327	Area 3X East 112,034	Area 3Y 685,066
Area of origin	Estimated catch by area of origin			
British Columbia				
Area 3	18,070	1,637	32,435	393,982
4	12,734	371	14,594	100,612
5	6,244	140	3,015	1,311
6	7,945	189	3,207	5,260
other and unknown	2,940	47	6,572	11,682
Alaska				
Area 101	27,404	9,049	39,159	158,419
other and unknown	5,294	894	13,052	13,800

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