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NPAFC DOCUMENT NUMBER**

NPAFC

Doc. No. 96

Rev. No. _____

**An update on trends in catch of Pacific salmon in Canada, with a
report on 1993 escapement levels**

by

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submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by

CANADA

October 1994

This paper may be cited in the following manner:

Welch, D.W. An update on trends in catch of Pacific salmon in Canada, with a report on 1993 escapement levels. (NPAFC Doc. No. 96). 10 p. Dept. of Fisheries and Oceans, Biological Sciences Branch, Pacific Biological Station, Nanaimo, B.C. Canada. V9R 5K6

ABSTRACT

Total salmon catches in British Columbia waters increased beginning in the late 1970's, and are now at or above catch levels achieved in the 1930s. During the last ten years, catches have averaged 79,280 tonnes with peak catches of 104,000 tonnes recorded in 1985. This growth is due primarily to sharp increases in catches of both pink and sockeye salmon. Catches in these fisheries have nearly doubled in the 1980s when compared to the catches of pink and sockeye recorded during the 1970's. In contrast, catches of chinook salmon in both the commercial and sport fisheries have declined since 1971. 1993 chinook salmon catches were similar to those recorded during the early 1960's, the last period of low abundance, but only half the peak catch of 1.5 million chinook recorded in 1971. 1993 coho salmon catches dropped to less than half that of recent years, and are among the lowest on record. 1994 coho catches appear to have increased, but are still low compared with previous catch levels. Chum salmon catches in recent years have remained relatively stable. 1993 catches (in numbers) were as follows; chinook: 0.81M (million); sockeye: 18.1M; coho: 2.7M; pink: 10.3M; and chum: 4.1M.

INTRODUCTION

Six species of Pacific salmon are harvested in British Columbia coastal waters. Sockeye, pink, and chum salmon are mainly harvested in commercial net fisheries while chinook and coho salmon are targeted by commercial, troll, and (increasingly) by sport fisheries located primarily in the Strait of Georgia. Steelhead constitute a minor component of the catch, and are not discussed in this document.

In general, escapement goals are established in Canada for major sockeye, pink, and chum stocks, and fisheries are managed to meet these escapement objectives. Chinook and coho fisheries are managed to achieve specified harvest rates although escapement goals have also been established for key stocks.

This document reports data on the changes in catch (numbers and total weight) for the five major salmon species caught in British Columbian waters for the period 1952-1993. Escapement data for 1993 are also reported for freshwater habitats adjoining major statistical areas.

Catch Trends

Total salmon catch has increased significantly over the last decade with the 1993 annual catch reaching 81,693 tonnes. This increase in catch is attributable to increased catch levels of both pink and sockeye salmon in recent years. Over half the 1993 catch was composed of sockeye, catches of which increased to 41,436 tonnes; the largest catch in the last 40 yrs. Pink catches have been in decline since 1990. Catches of chum salmon have been relatively stable over the last 20 years, while chinook salmon production has decreased steadily during the same time frame, to the lowest catch level since 1963. Coho salmon catches decreased sharply in 1993.

Total catch by weight and numbers is reported in Tables 1 and 2 for the period 1952-93. Table 3 provides a breakdown of salmon catch by major statistical area in 1993.

Sockeye Salmon

Sockeye are the most productive salmon species in Canada, with sustainable harvest rates on the order of 70-75%. Recent increases in catch can be primarily attributed to increased production of Fraser River stocks. Catches nearly doubled during the 1980's compared to yields in the previous decade. This increase is primarily due to rebuilding efforts aimed at strengthening runs to the Fraser River in dominant return years (cycle years with large returns). Consideration is also being given to rebuilding "off-cycle" years (years of low production) in the Fraser system, which could reduce or eliminate the four year cycle in catches if successful.

Pink Salmon

Catches of pink salmon in Canada are the largest of the five species of salmon, averaging 11.9 million fish per year during the period 1952-93. Catches increased steadily since the early 1980's, with average yields of close to 30,000 tonnes per year in the late 1980s (Table 1). 1992 and 1993 catches have dropped sharply since then, to about 15,000 tonnes. Preliminary indications are that 1994 pink salmon catches were also well below forecasted levels.

Chum Salmon

Annual catches of British Columbia chum salmon have averaged 2.7 million fish over the period 1952 to 1993. The relatively stable catch history is punctuated by years of good recruitment, suggesting occasional periods of strong environmental influence on survival. Beginning in the 1980's increasing portions of chum production from southern British Columbia have been from enhancement. The contribution of enhancement to southern British Columbia catches reached 30 to 40% in the late 1980's.

Coho Salmon

Coho catches in British Columbia have remained fairly stable over the last 30 to 40 years, with average catches generally ranging between 3 and 4 million fish for the combined commercial and sport fisheries. 1993 coho catches were considerably below recent catch levels, and preliminary data suggests that 1994 catches have declined further.

Chinook Salmon

Compared to the other salmon species, the combined commercial and sport catches of chinook salmon are small, averaging about a million fish per year. Chinook salmon, like coho, support an extremely important and valuable sport fishery.

Chinook catches have declined steadily since the early 1970's. The 1993 catch of 808,843 fish is roughly half the peak catch of 1.5 million recorded in 1971, and the lowest catch on record since the early 1960s. Some hatcheries, such as the one located at Robertson Creek on the west side of Vancouver Island, have been very successful, adding an additional 200,000 fish to the catch.

Summary: Catch Trends

Total catch levels in Canada in recent years have been as high or higher than yields recorded over the last 80 to 100 years. Recent increases are due primarily to increases in the production of sockeye salmon. Catches of chum have remained fairly stable, and chinook catches have continued a downward trend that started in the 1970s. Coho and pink salmon catches were down sharply in 1993.

1993 Escapements

Table 4 provides salmon escapement estimates (numbers, both sexes combined) for land regions adjacent to major statistical areas of British Columbia, 1993.

ACKNOWLEDGEMENTS

I thank Mr Greg Serbic for extracting the data reported here.

FIGURES

Fig. 1 a,b. Major statistical reporting areas for Pacific salmon catches in British Columbia.

Table 1. Total salmon catch (tonnes) by species in British Columbia, 1952-1993.

<u>Year</u>	<u>Chinook</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	<u>Total</u>
1952	5812	13965	8767	23200	14452	66196
1953	6344	16028	9422	27883	24686	84363
1954	5525	21319	8567	11673	33747	80831
1955	5127	7549	9759	28624	8245	59304
1956	5540	9751	10510	13125	12441	51367
1957	5078	7130	9337	25839	12355	59739
1958	5824	33571	10100	15308	17283	82086
1959	5533	8172	8046	15592	10481	47824
1960	4241	7017	5818	7672	9214	33962
1961	3707	12063	10193	22463	6623	55049
1962	3700	9107	10934	42280	8186	74207
1963	4102	5376	10443	27073	6991	53985
1964	5413	10397	12959	16530	10847	56146
1965	5110	7347	15016	10306	3014	40793
1966	6135	11636	15840	33059	6964	73634
1967	6071	16724	8791	22425	5513	59524
1968	6022	18920	13452	25576	16645	80615
1969	5604	10875	6957	5978	6073	35487
1970	5548	11217	10692	23660	16760	67877
1971	7277	17030	12106	17169	5410	58992
1972	7176	9464	8991	17647	29925	73203
1973	6429	21404	9654	12875	32643	83005
1974	6501	21259	8843	11057	12464	60124
1975	6260	5632	6808	9929	5379	34008
1976	6634	12294	7855	16859	10912	54554
1977	6555	17327	8657	23659	6012	62210
1978	6897	21811	8131	15220	15802	67861
1979	6057	14271	9058	23374	4650	57410
1980	5852	7816	8093	13677	17173	52611
1981	5229	20852	6651	36810	6099	75641
1982	6265	28914	8136	3930	15023	62268
1983	4710	14122	9078	38706	4861	71477
1984	5489	12737	8742	11694	8935	47597
1985	4833	30976	7957	36541	23393	103700
1986	4419	29789	11663	29263	24919	100053
1987	4536	14661	7308	25839	10936	63280
1988	5123	11770	6129	31458	30119	84599
1989	4617	33547	7662	29574	9238	84638
1990	4562	35761	9190	25610	17128	92251
1991	4474	24447	8719	34109	10160	81909
1992	4612	20653	6342	14563	17882	64052
1993	4188	41536	3735	15301	16933	81693

Table 2. Total Salmon Catch (Numbers) by species in British Columbia, (1952-1993).

<u>Year</u>	<u>Chinook</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>
52	804397	4887820	2919457	11416034	2645107
53	883843	5920654	2917301	11204661	4885675
54	778360	6964673	2551479	5617296	6535430
55	717670	2835625	3036190	11427686	1632818
56	748361	3257452	3041362	7351860	2458288
57	720495	3033987	3132212	11309805	2412104
58	812687	12047521	2976943	6907980	3191759
59	769715	3254291	2882228	6772005	2015338
60	592593	2857635	2026273	4097345	1836758
61	510958	4564714	3292332	8304640	1217509
62	516343	3499192	3619051	23427869	1495989
63	794905	2085955	3413581	12198542	1463181
64	956078	3619050	4145386	9627530	2252753
65	975640	3018760	4435533	5107830	633123
66	1158840	4020268	5394898	17258701	1310661
67	1098236	6746632	3145848	9706849	1129777
68	1053564	6345464	5137673	20244483	3094917
69	1074447	4266675	2336895	2562895	1310424
70	1141815	4068051	3335395	13576249	3682081
71	1514147	6302550	4553359	8437677	1262822
72	1504034	3561062	3194271	13992349	6031403
73	1369596	7582516	3321087	6489094	6224725
74	1419942	7219311	3500492	7371608	2201691
75	1375285	2270099	2222927	4616545	1147083
76	1495118	4813187	3477942	10343221	1901013
77	1465048	6345808	3261672	10305912	1088072
78	1351080	7221015	3347178	10747396	2978281
79	1325586	5668818	3626085	11804181	850708
80	1470877	3185825	3801348	8362078	3414260
81	1329368	8412895	3127082	18056379	1116074
82	1356743	10050913	3566126	2677509	2966616
83	1144253	5498366	4502973	23991816	998817
84	1422210	5063513	4034142	7500343	1842061
85	1126186	12219368	3676842	20315665	5470540
86	1008229	10548934	5478453	17980763	5580626
87	925215	5398109	4012884	13428904	2270411
88	877571	4464278	3828020	23123829	6172067
89	835373	13755682	3964394	17163377	1816809
90	846205	14206509	4513624	17264620	3206951
91	846638	10439390	3738712	24261157	2354759
92	863798	8290072	3635722	10321558	4012717
93	808843	18110008	2738623	10262985	4132995

Table 3. 1993 Salmon Catch (Numbers) by Statistical Area

<u>Area</u>	<u>Chinook</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>
1	118309	258429	212839	1010271	191146
2E	9746	2533	33469	9962	84118
2W	27677	1068748	35568	538897	59882
3	25346	1364994	105736	2263711	473400
4	21887	1660153	64534	584470	197925
5	3531	42489	18523	38189	16873
6	4493	4345	8337	9571	10624
7	7469	6107	11493	19514	99233
8	9241	62965	15600	267735	188014
9	1226	84969	5520	2494	3498
10	1543	283991	15376	12951	12722
11	9680	697907	27044	115851	5059
12	16933	5809846	76302	3278079	636581
13	33820	1341833	214933	915949	632443
14	52736	2071	487005	12334	371900
15	4136	322	19252	770	1
16	27188	788926	105554	285511	116926
17	18443	2683	175649	11227	16759
18	2653	7272	3855	4280	79353
19	0	0	0	0	0
19A	565	0	189	0	0
19B	13967	15675	108918	112630	91
20	2644	515960	6194	54157	136
21	6273	13834	64444	32691	742395
22	43	1	74	48	0
23	86510	642103	315558	66217	520
23A	10187	99985	587	0	4
23B	56758	7422	9207	614	95
24	43487	149306	155412	79716	309
25	33962	98068	91375	55830	106567
26	39236	37136	107779	31405	727
27	99829	269127	222690	184357	5923
28	1694	8	5368	12	0
29	17631	2770800	14239	263542	79771
TOTAL	808843	18110008	2738623	10262985	4132995

Table 4. Salmon escapement numbers for 1992 (both sexes combined) by statistical area, British Columbia.

<u>Area</u>	<u>Sockeye</u>	<u>Coho</u>	<u>Pink</u>	<u>Chum</u>	<u>Chinook</u>
01	12100	8200	994800	6300	2000
2E	5726	26599	654261	137123	1820
2W	260	1682	100766	30335	0
3A	0	9400	192448	15684	592
3B	594518	5157	4360	0	7220
4A	6500	1210	37973	2503	1002
4B	22090	22451	141755	5676	16651
4C	12262	4635	239255	2611	17731
4D	1509107	4049	402625	0	31157
05	22895	3982	41161	731	10
06	27453	15340	700798	152379	20073
07	1617	2820	267265	57449	0
08	55485	17426	4614800	112468	31347
09	343005	0	158585	16450	10600
10	220000	0	2100	15500	500
11	242920	1528	142105	118947	3400
12	782	4553	1497723	26946	2055
13	3700	20657	698063	258494	5800
14N	200	7012	42550	79045	110
14S	107	8651	2427	274006	2424
15	0	2563	1512	17583	329
16	1000	355	10100	129525	0
17	0	3529	191	124112	1805
18	0	6300	0	115000	7600
19	0	375	0	17000	9
20	150	3404	6	67024	707
21	1500	0	0	0	0
22	7300	500	0	223800	30020
23	405190	53310	0	145472	126194
24	19010	940	0	16590	170
25	17925	5754	20	274893	30152
26	1272	4200	12	139400	672
27	400	5875	4627	65100	1025
28A	0	4155	0	38449	190
28B	229301	2415	0	32480	3150
29B	40	1995	0	399	44
29C	9221	3511	50	24061	300
29D	62235	4418	0	33191	0
29E	2733	621	0	582	0
29F	7188	5809	0	0	8502
29G	518099	100	0	0	19169
29H	150	75	0	0	5550
29I	193405	0	0	0	34411
29J	23281	5422	0	0	12329
29K	36632	8802	0	0	33901
TOTALS	4616759	289780	10952338	2777308	470721

READ CAREFULLY

1. Reporting of all catches to the Dept of Fisheries and Oceans is the responsibility of the fisherman and a condition of licence renewal.
2. Accurate catch reports must include the map number or numbers showing the area in which your fish were caught.
3. The statistical areas shown on this map are to be used as a guide only. For more exact information refer to the Pacific Fishery Management Area Regulations.

- Dept of Fisheries and Oceans Office
 - Statistical areas are divided by red lines
 - Surfline
- Note - All areas revised February 1985



Fisheries and Oceans
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STATISTICAL AREA MAP

SHOWING AREAS OF CATCH FOR
BRITISH COLUMBIA WATERS
SOUTHERN HALF

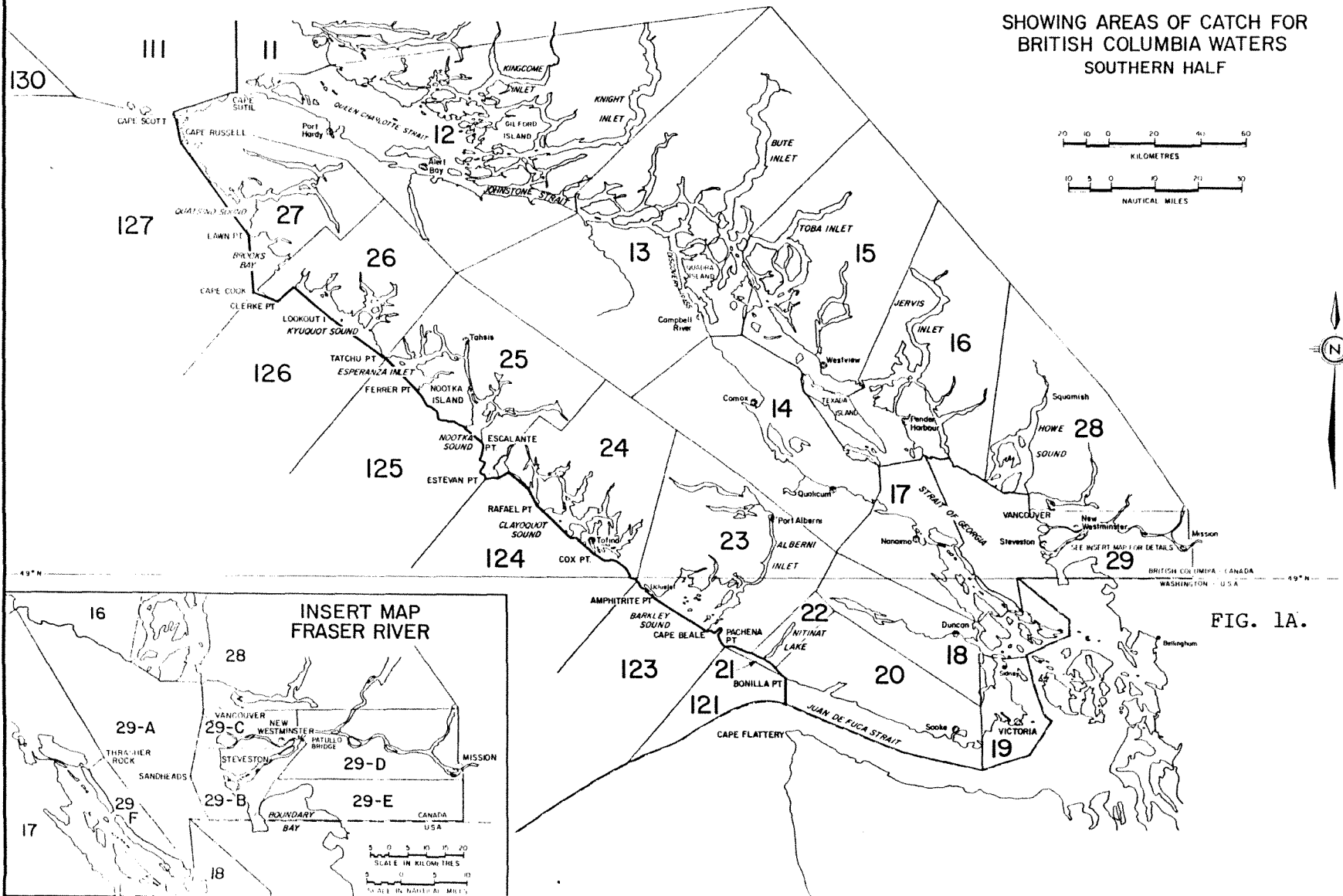
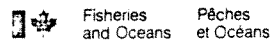


FIG. 1A.

READ CAREFULLY

1. Reporting of all catches to the Dept. of Fisheries and Oceans is the responsibility of the fisherman and a condition of licence renewal.
2. Accurate catch reports must include the map number or numbers showing the area in which your fish were caught
3. The statistical areas shown on this map are to be used as a guide only. For more exact information refer to the Pacific Fishery Management Area Regulations.



- ▷ Dept. of Fisheries and Oceans Office
- Statistical areas are divided by red lines
- Surfline

Note: All areas revised February 1985

STATISTICAL AREA MAP

SHOWING AREAS OF CATCH FOR
BRITISH COLUMBIA WATERS
NORTHERN HALF

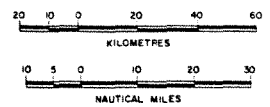


FIG. 1B.

