Technical (Working) Document

Recreational Fishing Activities Related to the Pacific Salmon and Steelhead Resources of the United States and Canada

By

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This document brings together most of the available information on recreational fishing catches and estimated values related to the Pacific salmon and steelhead resources of the United States and Canada.[1/] The primary purpose is to provide the National Marine Fisheries Service with a comprehensive overview and perspective as to the trend, magnitude, and value of recreational activities supported by these resources.

Sport Fishing

As in most other outdoor recreation, the basic factors believed to be underlying the increased demand for sport fishing are population changes, growth in real income per capita, improved travel facilities, and increased leisure. Variability in demand for sport fishing in general may be a function of the type of resource, its availability, accessibility, and catchability. In context of current jargon, the Pacific salmon and steelhead resources would satisfy both social criteria of "maximum happiness yield" and "maximum trophy yield."

1/ Data sources are presented in Appendix A.

Sport Salmon Catch.--The trend in sport catch of Pacific salmon in the United States and British Columbia, Canada, is presented in Table 1 and Figures 1 and 2. The totals up to 1964 are underestimates as data were not available for many years and areas. In addition, the data are also minimal in that sport catch of salmon in freshwater areas along the Pacific coast (exception is Idaho) were not available for most areas and years. Sport fishing for salmon in the Great Lakes started essentially in 1967 following the successful introduction of chinook and coho salmon into the lakes by the State of Michigan in the mid-sixties. The data presented in Table 1 are for sport salmon landings in Michigan only.

The species composition of the sport catch by area is presented in Tables 2-5. A summary of the catch by species and area for the more complete and recent years of 1965-69 is presented in Table 6. The average annual catch of 2.1 million salmon during that period was composed of 64.0 percent coho salmon, 31.8 percent chinook, 3.1 percent pink, and 1.1 percent sockeye and chum salmon. The State of Washington led in landings of chinook, coho, and pink salmon.

Sport Salmon Participation.--The trend in number of individual anglers in Washington, Oregon, and Idaho is presented in Table 7 and Figure 3. Salmon and steelhead anglers are combined for the State of Oregon. The trend in number of angler days (or trips) is presented in Table 8 and Figure 4. Estimates of the average annual increase in participation (number of anglers and number of angler trips) is presented in Table 9. In number of anlgers, the Washington fishery showed an average increase of 9.6 percent during 1964-70, the Oregon salmon and steelhead fishery a 9.9 percent increase during 1953-69, and the Idaho fishery an

average annual increase of 19 percent during 1966-69. In terms of angler days, the average annual increase was estimated at 10.8 percent for Alaska during 1965-70, 5.5 percent for Washington during 1949-70, 3.5 percent for California during 1962-69, 5.7 percent for British Columbia during 1960-70, and 123.3 percent for Michigan during 1967-70. Steelhead angler days are included in the estimates for Alaska and Michigan.

Sport Kokanee Catch and Participation.--The land-locked variety of sockeye salmon is kokanee. Sport fishing activities on kokanee are probably more extensive than available information indicates. The magnitude of this sport fishery is indicated in part from available statistics on these few selected areas: Pend Oreille Lake, Idaho; Lake Arrowhead, California; and British Columbia (Table 10).

Sport Steelhead Catch.--A partial estimate of the sport catch of steelhead in the United States and British Columbia is presented in Table 11 and Figure 5. Similar to salmon data, with some statistics not being available, steelhead estimates should be considered as minimal and the totals as underestimates. At least one-half million steelhead were landed in the Pacific area, led by Washington landings. A sizeable steelhead catch also occurs in the Great Lakes.

Sport Steelhead Participation.--Estimates of public participation in sport steelhead fishing is presented in Table 12. Separate estimates for steelhead anglers were available only for Washington, Idaho, and British Columbia. As shown for Washington and British Columbia, those estimated as actually fishing were much less than the fishing cards or licenses issued. Apparently some sports fishermen obtain cards or licenses but do not participate for reasons undetermined at this time.

Economic Value[2/]

As in most other outdoor recreation activities, the value of salmon and steelhead sport fishing is in the total experience. From an economic standpoint, the value for this experience that is generally considered most relevant is the "net economic value"; a value which is exclusive of other expenditures associated with the fishing trip or outing. This net value would be similar, say, to a theatre ticket; vis-a-vis, the market value of the experience measured by the price of the ticket which is aside from all of the other expenditures expended in preparing for, and getting to and from the theatre.

Net values for salmon and steelhead sport fishing are currently based on estimated market prices or demand conditions. Pacific salmon and steelhead resources are "common property" resources with entry and fishing primarily unlimited and free. Where a cost (price) is required for this privilege (license), it is minimal and set administratively rather than on any willingness-to-pay basis of those seeking this experience. Present license fees at most probably cover only administration and enforcement costs.

Economic values that have been estimated for salmon and steelhead sport fishing in the United States and British Columbia are presented in Table 13. The per-day estimates are of primary concern and interest but, for convenience, related estimates on a per-fish basis are also given in this table. Caution is advised on the use of alternative estimates. Gross expenditure estimates are more applicable to indicating changes in demand for fishing or measures of impact on the economy of an area or industries that supply goods and services to salmon and steelhead sport fishing activities. The net value estimates of Table 13 in turn simulates values (prices) that are comparable with those found in currently marketed indoor or outdoor recreation activities such as athletic events, concerts, movies, stage plays, etc.

2/ Data sources are presented in Appendix B.

Net Economic or Market Value .--The per-day estimated value of the fishing experience, or net economic value, is presented in Table 13. A preliminary, conservative approximation of the market value of the Pacific salmon resource (excluding the kokanee salmon) in relation to sport fishing activities in the United States for 1965-70 was $28.6 million annually (Table 14). The capitalized value of the sport salmon resource is $572 million at a 5 percent interest rate. Expressed in another way, it would require an annual return from an investment of $572 million at 5 percent interest to equal the annual net recreational value of $28.6 million of the United State Pacific salmon resource.

The sport steelhead resource of the United States is conservatively estimated (i.e., based on incomplete data) at an average annual market value of $10.8 million (Table 15). The capitalized value of the steelhead resource is $216 million at a 5 percent interest rate.

Gross Value (Expenditure). The gross value of an outdoor recreation activity such as sport salmon or steelhead fishing is a measure of the expenditures incurred in pursuit of those activities. These are generally classified into expenditures on fixed or durable goods and into variable or current expenses. Expenditures for durable goods would cover such items as fishing tackle, boating equipment, special clothing, and other equipment which could be used for many fishing trips and over a period of years. Current expenses are generally associated with a fishing trip(s) during a defined time period as, say, a month or a year and would include such items as transportation costs, food, lodging, charter boat and guide service, bait and lures, and rental of boats, motor, tackle and other gear,

Although seemingly straight forward, there are some difficulties associated with the estimation of these expenditures. For example, the purchase of a multiple purpose boat--boating, water skiing, salmon fishing, prestige, etc.--and the proper proration of the cost to each activity, thereof. Proper assignment of current expenses to salmon fishing, when it is but part of a general vacation trip which includes other activities such as sightseeing, camping, etc., is another example of this problem.

The total expenditures provide an estimate of the gross value of salmon and steelhead sport fishing in the United States. However, economists caution against the misuse of this gross expenditure estimate in valuing salmon and steelhead sport fishing. One rationale is that most of these expenditures (especially current expenses) would be redirected to other goods and services if the salmon and steelhead resources were to somehow become unavailable to sport fishermen, be eliminated, or drastically reduced. Gross values do, however, provide an estimate of the money currently spent in the pursuit of salmon and steelhead sport fishing.

Information was not readily available for determining the total or gross value (expenditure) of salmon and steelhead sport fishing. Based on the more available current expense estimates in Table 13, an extremely conservative estimate is that current-type expenses average about $39.4 million annually for salmon sport fishing (Table 16) and $16.2 million for steelhead sport fishing (Table 17) in the United States. As a rough approximation, gross expenditure would probably be more than double the respective current expenses estimated for each fishery.

As indicated earlier, gross expenditure estimates are more properly used in determining the impact of salmon or steelhead fishing on the economy of an area or on industries that provide goods and services to those activities. The impact on the economy of port cities such as Westport and Ilwaco, Washington, from the expenditures of the thousands of sport salmon enthusiasts that fish out of those ports is an example.

Summary.--It is conservatively estimated that the United States sport salmon resource has an average net worth of $28.6 million annually and the sport steelhead resource $10.8 million annually. Stated in another way, the United States would be poorer or worse off by those amounts ($28.6 and $10.8 million) annually if those resources were to be eliminated.

It is also conservatively estimated that current-type expenditures are in the magnitude of $39.4 million annually on sport salmon fishing and $16.2 million annually on sport steelhead fishing in the United States.

Note

A committee composed of Dr. Jack Richards, Regional Economist, Northwest Region, NMFS, and economists from other United States and Canadian agencies and academic institutions along the Pacific coast is currently in the process of refining research methods and past estimates on economic values of salmon and steelhead sport fisheries. One of their immediate objectives is to arrive at interim, unit values on salmon and steelhead sport fishing for use by resource agencies.

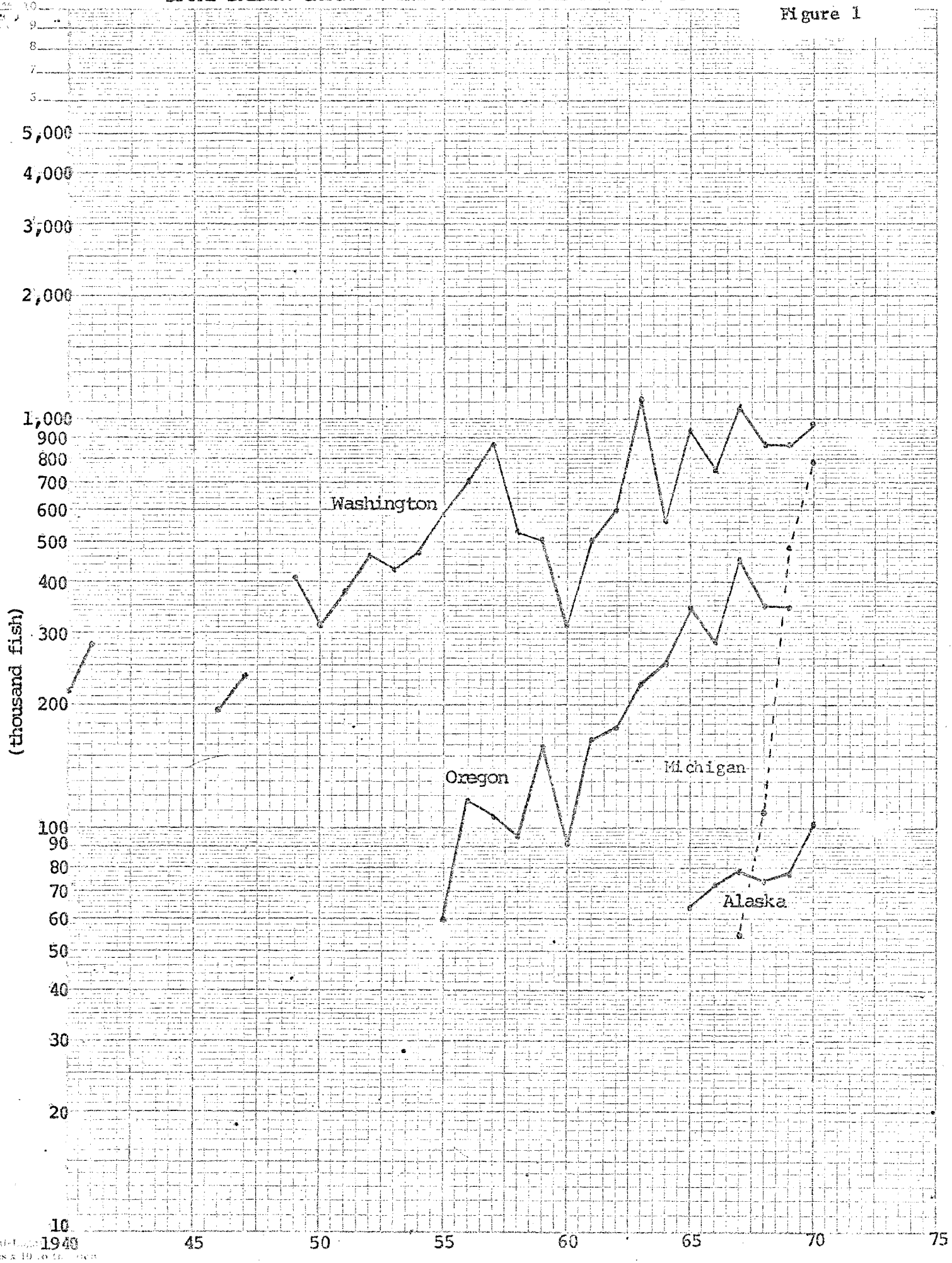
Table 1

Sport salmon (Oncorhynchus sp.) catch in the United States and Canada

Year	United States--Pacific Area						British Columbia	Pacific Total	Great Lakes Total	Grand Total
	Alaska	Washington	Oregon	Idaho	California	Total				
	(thousands of fish)									
1938	-	177.4	-	-	-	177.4	-	177.4	-	177.4
39	-	252.0	-	-	-	252.0	-	252.0	-	252.0
1940	-	217.4	-	-	-	217.4	-	217.4	-	217.4
41	-	281.9	-	-	-	281.9	-	281.9	-	281.9
42	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-
46	-	194.1	-	-	-	194.1	-	194.1	-	194.1
47	-	237.7	-	-	5.4	243.1	-	243.1	-	243.1
48	-	-	-	-	12.0	12.0	-	12.0	-	12.0
49	-	409.4	-	3.0	25.0	437.4	-	437.4	-	437.4
1950	-	315.5	-	4.4	62.0	381.9	-	381.9	-	381.9
51	-	378.0	-	6.8	111.0	495.8	-	495.8	-	495.8
52	-	463.3	-	7.1	133.0	603.4	-	603.4	-	603.4
53	-	434.3	-	8.7	152.0	595.0	204.6	799.6	-	799.6
54	-	472.2	-	15.0	185.0	672.2	210.3	882.5	-	882.5
55	-	585.3	59.6	19.0	199.0	862.9	273.8	1136.7	-	1136.7
56	-	703.9	118.2	21.0	176.0	1019.1	304.0	1323.1	-	1323.1
57	-	868.9	107.0	39.0	69.0	1083.9	396.3	1480.2	-	1480.2
58	-	531.3	95.9	24.0	81.0	732.2	408.9	1141.1	-	1141.1
59	-	508.5	159.0	20.0	86.0	773.5	396.4	1169.9	-	1169.9
1960	-	312.0	92.0	21.0	56.0	481.0	331.4	812.4	-	812.4
61	-	508.3	164.4	13.0	59.0	744.7	250.4	995.1	-	995.1
62	-	599.1	175.9	12.0	132.5	919.5	276.0	1195.5	-	1195.5
63	-	1115.9	225.9	12.0	116.4	1470.2	393.2	1863.4	-	1863.4
64	-	564.8	251.8	8.0	140.9	965.5	253.2	1218.7	-	1218.7
65	64.1	940.2	348.3	Closed	80.7	1433.3	254.2	1687.5	-	1687.5
66	73.2	756.9	287.2	8.5	106.0	1231.8	353.0	1584.8	-	1584.8
67	78.4	1066.1	456.9	7.5	122.9	1731.8	283.0	2014.8	55.0	2069.8
68	74.5	877.3	350.1	11.5	194.6	1508.0	320.4	1828.4	110.3	1938.7
69	76.8	876.6	348.8	13.0	184.0	1499.2	281.0	1780.2	488.4	2268.6
1970	101.8	978.0					387.3		789.0	
71										
72										
73										
74										
75										

SPORT SALMON CATCH IN THE UNITED STATES AND CANADA

Figure 1



SPORT SALMON CATCH IN THE UNITED STATES AND CANADA (cont'd)

Figure 2

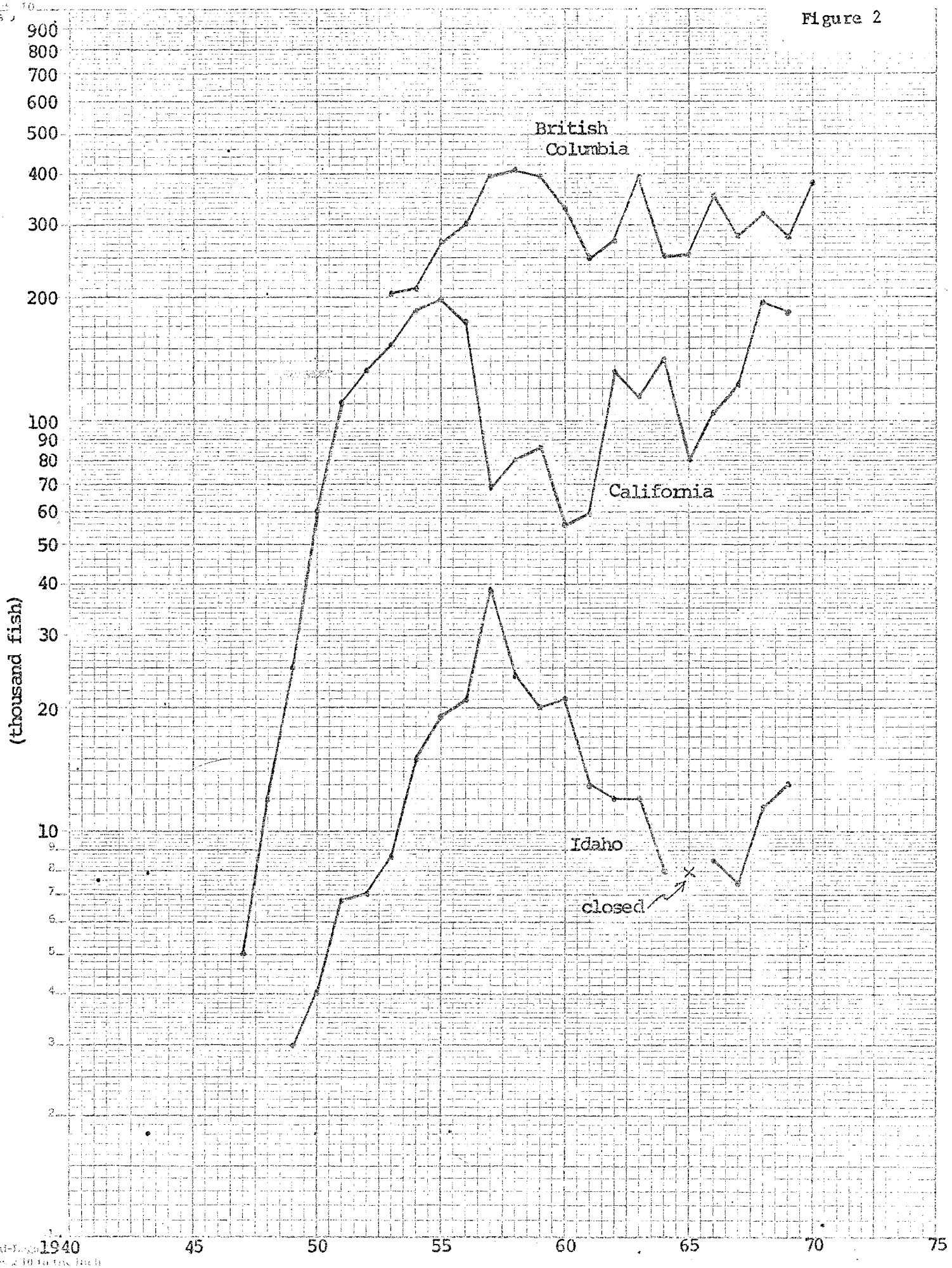


Table 2

Sport salmon catch by species

Year	Chinook Salmon									
							British Columbia 1/			
	Alaska	Wash. 1/	Oregon 1/	Idaho 2/	Calif. 1/	Mich. 2/	Chinook	Grilse 3/	Total	Total
	(thousands of fish)									
1938	-	67.7	-	-	-	-	-	-	-	67.7
39	-	86.5	-	-	-	-	-	-	-	86.5
1940	-	88.8	-	-	-	-	-	-	-	88.8
41	-	81.3	-	-	-	-	-	-	-	81.3
42	-	-	-	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-	-	-	-
46	-	84.4	-	-	-	-	-	-	-	84.4
47	-	95.2	-	-	5.0	-	-	-	-	100.2
48	-	-	-	-	11.0	-	-	-	-	11.0
49	-	103.7	-	3.0	23.0	-	-	-	-	129.7
1950	-	114.7	-	4.4	57.0	-	-	-	-	176.1
51	-	138.9	-	6.8	103.0	-	-	-	-	248.7
52	-	212.8	-	7.1	123.0	-	-	-	-	342.9
53	-	148.6	-	8.7	141.0	-	75.0	-	75.0	373.3
54	-	218.5	-	15.0	171.0	-	75.0	-	75.0	479.5
55	-	228.3	-	19.0	184.0	-	90.0	-	90.0	521.3
56	-	318.1	-	21.0	163.0	-	105.0	-	105.0	607.1
57	-	330.9	-	39.0	64.0	-	135.0	-	135.0	568.9
58	-	230.1	-	24.0	73.0	-	145.0	-	145.0	472.1
59	-	188.8	-	20.0	77.0	-	117.0	-	117.0	402.8
1960	-	189.3	-	21.0	50.0	-	93.0	-	93.0	353.3
61	-	198.7	-	13.0	53.0	-	40.6	23.9	64.5	329.2
62	-	211.6	-	12.0	119.6	-	56.0	30.8	86.8	430.0
63	-	263.4	-	12.0	83.8	-	52.3	30.0	82.3	441.5
64	-	206.9	41.2	8.0	101.3	-	42.2	25.4	67.6	425.0
65	7.7	240.7	61.3	Closed	60.2	-	43.4	21.9	65.3	435.2
66	10.3	267.6	71.4	8.5	73.6	-	68.9	24.1	93.0	524.0
67	11.3	274.0	42.8	7.5	72.6	-	62.6	20.0	82.6	490.8
68	10.1	262.6	24.8	11.5	154.2	-	71.1	23.8	94.9	558.1
69	12.9	267.1	31.2	13.0	155.8	117.0	79.7	17.7	97.4	681.5
1970	10.6	300.1				190.0	91.0	30.1	121.1	
71								22.4	123.2	
72										
73										
74										
75										

1/ Offshore or marine catch only
2/ River or fresh water catch only
3/ Small (immature) chinook. Category used in British Columbia statistics only

Table 3

Sport salmon catch by species (Continued)

Year	Coho Salmon						Total
	Alaska	Wash.1/	Oregon1/	Calif.1/	Mich.2/	British1/ Columbia	
	(thousands of fish)						
1938	-	109.7	-	-	-	-	109.7
39	-	155.4	-	-	-	-	155.4
1940	-	128.6	-	-	-	-	128.6
41	-	187.8	-	-	-	-	187.8
42	-	-	-	-	-	-	-
43	-	-	-	-	-	-	-
44	-	-	-	-	-	-	-
45	-	-	-	-	-	-	-
46	-	109.7	-	-	-	-	109.7
47	-	123.3	-	.4	-	-	123.7
48	-	-	-	1.0	-	-	1.0
49	-	217.6	-	2.0	-	-	219.6
1950	-	200.8	-	5.0	-	-	205.8
51	-	210.8	-	8.0	-	-	218.8
52	-	250.5	-	10.0	-	-	260.5
53	-	211.8	-	11.0	-	130.0	352.8
54	-	253.7	-	14.0	-	135.0	402.7
55	-	265.9	-	15.0	-	184.0	464.9
56	-	385.8	-	13.0	-	198.0	596.8
57	-	454.1	-	5.0	-	251.0	710.1
58	-	301.2	-	8.0	-	262.0	571.2
59	-	279.9	-	9.0	-	235.0	523.9
1960	-	122.7	-	6.0	-	243.0	371.7
61	-	271.4	-	6.0	-	159.4	436.8
62	-	385.7	-	13.0	-	185.9	584.6
63	-	424.5	-	32.6	-	199.8	656.9
64	-	328.9	282.4	39.6	-	183.3	834.2
65	31.4	600.8	431.3	20.5	-	179.3	1263.3
66	31.4	434.3	187.8	32.4	-	255.0	940.9
67	34.7	556.3	333.6	50.3	54.8	170.4	1200.1
68	30.1	552.4	257.6	40.4	108.0	219.9	1208.4
69	30.4	497.6	220.0	28.2	363.0	145.9	1285.1
1970	32.1	540.2			599.0	248.9	
71						370.5	
72							
73							
74							
75							

1/ Offshore or marine catch only

2/ Freshwater

Table 4

Sport salmon catch by species (Continued)

Year	Pink Salmon					
	Alaska	Wash.	Oregon	U.S. Total	British Columbia	Pacific Total
	(thousands of fish)					
1938	-	0	-	-	-	-
39	-	10.1	-	10.1	-	10.1
1940	-	0	-	-	-	-
41	-	12.8	-	12.8	-	12.8
42	-	-	-	-	-	-
43	-	-	-	-	-	-
44	-	-	-	-	-	-
45	-	-	-	-	-	-
46	-	0	-	-	-	-
47	-	19.2	-	19.2	-	19.2
48	-	-	-	-	-	-
49	-	88.1	-	88.1	-	88.1
1950	-	0	-	-	-	-
51	-	28.6	-	28.6	-	28.6
52	-	0	-	-	-	-
53	-	73.9	-	73.9	-	73.9
54	-	0	-	-	-	-
55	-	91.1	-	91.1	-	91.1
56	-	0	-	-	-	-
57	-	83.9	-	83.9	-	83.9
58	-	0	-	-	-	-
59	-	39.8	-	39.8	-	39.8
1960	-	0	-	-	-	-
61	-	38.2	-	38.2	26.4	64.6
62	-	1.8	-	1.8	3.4	5.2
63	-	428.0	-	428.0	111.0	539.0
64	-	*	0	-	2.3	2.3
65	25.0	43.9	0	68.9	9.6	78.5
66	9.7	*	0	9.7	4.8	14.5
67	10.7	96.0	0	106.7	28.9	135.6
68	11.8	*	.3	12.1	3.5	15.6
69	10.9	32.1	3.8	46.8	36.4	83.2
1970	33.2	1.7			10.6	
71						
72						
73						
74						
75						

Table 5

Sport salmon catch by species (Continued)

Year	Sockeye and Chum Salmon		
	Washington	Alaska	British Columbia
1938	-	-	-
39	-	-	-
1940	-	-	-
41	-	-	-
42	-	-	-
43	-	-	-
44	-	-	-
45	-	-	-
46	-	-	-
47	-	-	-
48	-	-	-
49	-	-	-
1950	-	-	-
51	-	-	-
52	-	-	-
53	-	-	-
54	-	-	-
55	-	-	-
56	-	-	-
57	-	-	-
58	-	-	-
59	-	-	-
1960	-	-	-
61	-	-	.1
62	-	-	.1
63	-	-	.1
64	-	-	.1
65	-	-	.1
66	-	21.8	.2
67	-	21.6	1.1
68	-	22.5	2.1
69	-	22.6	1.4
1970	.4	26.0	.5
71			
72			
73			
74			
75			

Table 6

Average Annual Sport Salmon Catch, 1965-69.

	Average annual catch				
	Chinook	Coho	Pink	Other 1/	Total
	(thousands of fish)				
Alaska	10.5	31.6	13.6	22.1	77.8
Washington	262.4	528.3	34.4	-	825.1
Oregon	46.3	286.1	0.8	-	333.2
Idaho	10.1	-	-	-	10.1
California	103.3	34.4	-	-	137.7
Michigan 2/	153.5	281.2	-	-	434.7
British Columbia	86.6	194.1	16.6	1.0	298.3
Total =	672.7	1,355.7	65.4	23.1	2,116.3
Percent by species =	31.8%	64.0%	3.1%	1.1%	100.0%
	Percent composition by area and species				
Alaska	1.6%	2.3%	20.8%	95.7%	3.7%
Washington	39.0	39.0	52.6	-	39.0
Oregon	6.9	21.1	1.2	-	15.7
Idaho	1.5	-	-	-	0.5
California	15.4	2.5	-	-	6.5
Michigan	22.8	20.7	-	-	20.5
British Columbia	12.9	14.3	25.4	4.3	14.1
Total =	100.0	100.0	100.0	100.0	100.0

1/ Sockeye and chum salmon.

2/ Average for chinook is based on 1969-70 catch, while coho is based on 1967-70 catch.

Table 7

Public participation in sport salmon fishing--United States and Canada

Year	Number of anglers						
	Alaska	Washington 1/	Oregon 2/	Idaho 1/	California	Michigan 2/	British Columbia
	(thousands)						
1938	-	-	-	-	-	0	-
39	-	-	-	-	-	0	-
1940	-	-	-	-	-	0	-
41	-	-	-	-	-	0	-
42	-	-	-	-	-	0	-
43	-	-	-	-	-	0	-
44	-	-	-	-	-	0	-
45	-	-	-	-	-	0	-
46	-	-	-	-	-	0	-
47	-	-	-	-	-	0	-
48	-	-	-	-	-	0	-
49	-	-	-	-	-	0	-
1950	-	-	-	-	-	0	-
51	-	-	-	-	-	0	-
52	-	-	-	-	-	0	-
53	-	-	95.3	-	-	0	-
54	-	-	92.3	-	-	0	-
55	-	-	82.7	-	-	0	-
56	-	-	96.5	-	-	0	-
57	-	-	74.4	-	-	0	-
58	-	-	112.0	-	-	0	-
59	-	-	165.7	-	-	0	-
1960	-	-	*113.7	-	-	0	-
61	-	-	142.1	-	-	0	-
62	-	-	159.4	-	-	0	-
63	-	-	160.7	-	-	0	-
64	-	302.7	190.1	-	-	0	-
65	-	266.8	218.0	-	-	0	-
66	-	372.9	213.3	13.5	-	0	-
67	-	450.9	303.6	14.2	-	-	-
68	-	428.9	230.9	20.0	-	-	-
69	-	444.7	284.9	22.2	-	-	-
1970		488.9				180.0	
71							
72							
73							
74							
75							

1/ Salmon anglers only
2/ Combined number of salmon and steelhead anglers that actually fished
* First year for a $1.00 punch card charge

PUBLIC PARTICIPATION IN SPORT SALMON FISHING --- UNITED STATES & CANADA

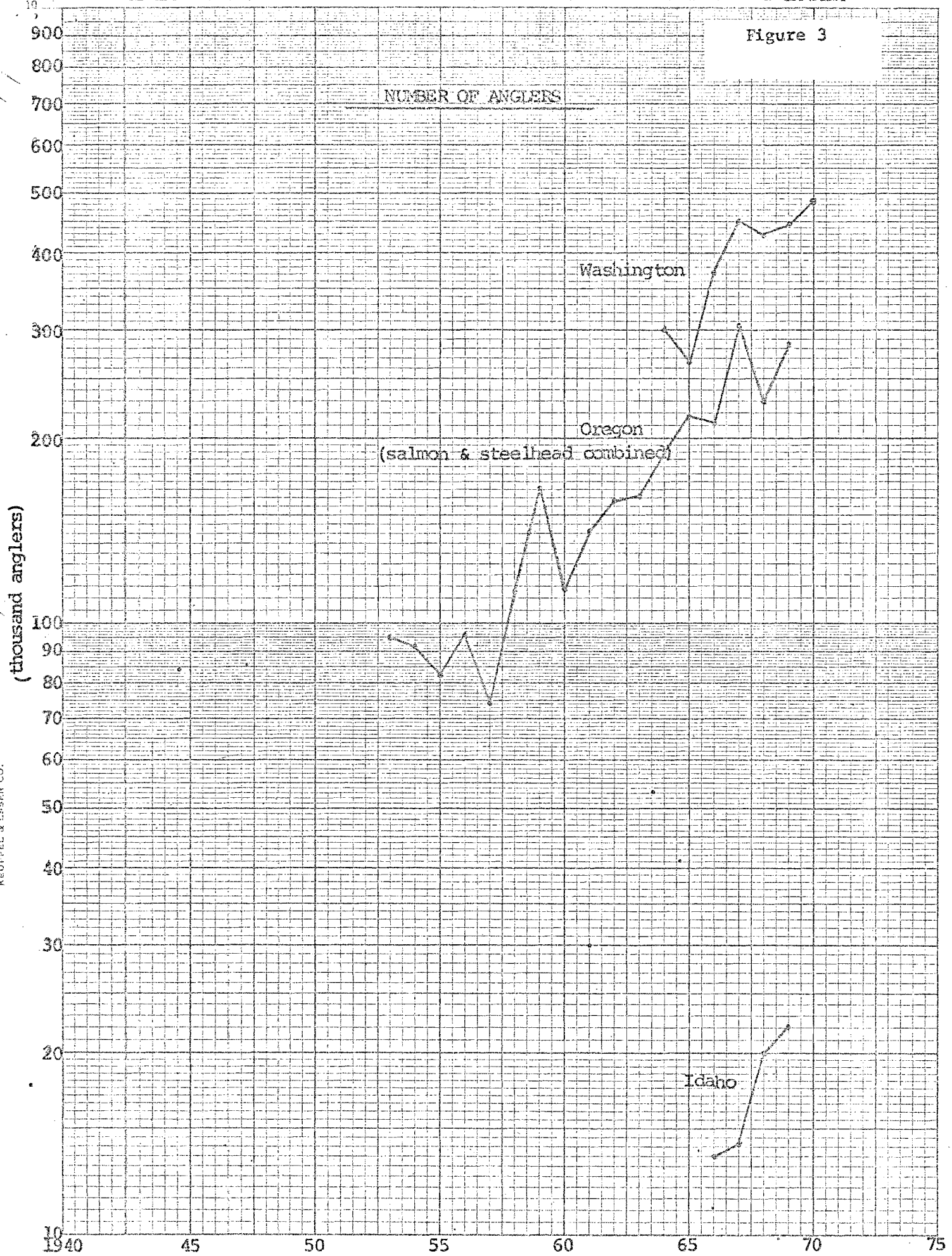


Table 8

Public participation in sport salmon fishing--United States and Canada

Year	Number of angler trips or days						
	Alaska 1/	Washington 2/	Oregon	Idaho	California 2/	Michigan 1/	British Columbia 2/
	(thousands)						
1938	-	303.0	-	-	-	0	-
39	-	231.0	-	-	-	0	-
1940	-	260.0	-	-	-	0	-
41	-	271.0	-	-	-	0	-
42	-	-	-	-	-	0	-
43	-	-	-	-	-	0	-
44	-	-	-	-	-	0	-
45	-	-	-	-	-	0	-
46	-	356.4	-	-	-	0	-
47	-	382.0	-	-	-	0	-
48	-	-	-	-	-	0	-
49	-	571.8	-	-	-	0	-
1950	-	576.8	-	-	-	0	-
51	-	658.0	-	-	-	0	-
52	-	716.6	-	-	-	0	-
53	-	707.0	-	-	-	0	-
54	-	807.8	-	-	-	0	-
55	-	837.1	-	-	-	0	-
56	-	956.0	-	-	-	0	-
57	-	964.1	-	-	-	0	-
58	-	814.4	-	-	-	0	-
59	-	750.1	-	-	-	0	-
1960	-	778.3	-	-	-	0	511.8
61	-	971.2	-	-	-	0	533.0
62	-	1107.0	-	-	172.2	0	558.7
63	-	1432.2	-	-	115.3	0	671.3
64	-	1252.7	-	-	144.7	0	540.2
65	67.9	1278.8	-	-	122.7	0	668.0
66	77.0	1147.6	-	-	114.9	0	690.4
67	84.8	1295.0	-	-	160.3	167.0	693.6
68	90.6	1091.2	-	-	185.0	500.0	713.8
69	99.3	1215.5	-	-	183.2	1000.0	763.8
1970	113.4	1509.8				1755.0	839.2
71							
72							
73							
74							
75							

1/ Combined salmon and steelhead trips or days
2/ Angler trips or days in marine waters only

PUBLIC PARTICIPATION IN SPORT SALMON FISHING— UNITED STATES & CANADA

Figure 4

NUMBER OF ANGLER TRIPS OR DAYS

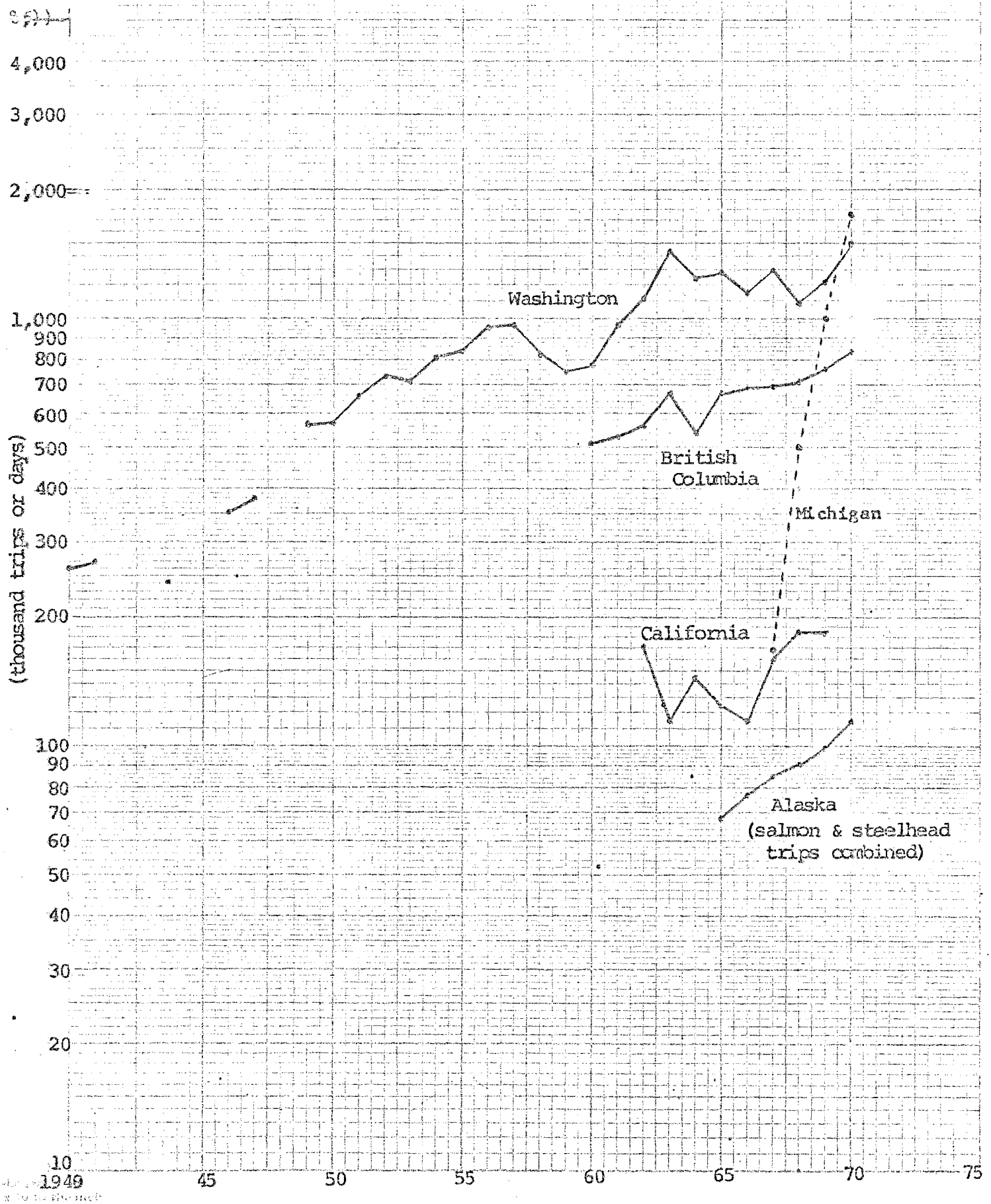


Table 9

Average annual increase in public participation--salmon and steelhead recreational fisheries.

	Number of anglers			Number of angler days or trips				
	Washington 1/	Oregon 2/	Idaho 1/	Alaska 3/	Washington 4/	California 4/	British Columbia 4/	Michigan 3/
Years:	1964-70	1953-69	1966-69	1965-70	1949-70	1962-69	1960-70	1967-70
Number of years:	6	16	3	5	21	7	10	3
Average annual increase:	9.6%	9.9%	19.0%	10.8%	5.5%	3.5%	5.7%	123.3%

1/ Salmon anglers only.

2/ Salmon and steelhead anglers.

3/ Salmon and steelhead fishing days or trips.

4/ Salmon fishing days or trips.

Table 10

Sport Catch of Kokanee Salmon in Pend Oreille Lake, Idaho

Lake Arrowhead, California, and British Columbia

Year	Idaho Pend Oreille Lake Angler trips	Idaho Pend Oreille Lake Catch	California Lake Arrowhead Angler trips (thousands)	California Lake Arrowhead Catch (thousands)	British Columbia No. of Anglers	British Columbia Angler trips	British Columbia Catch
1950	--	--	0	0	--	--	--
51	--	650.0	0	0	--	--	--
52	--	451.8	0	0	--	--	--
53	--	794.9	0	0	--	--	--
54	72.6	689.4	0	0	--	--	--
55	49.4	410.1	0	0	--	--	--
56	65.0	663.4	0	0	--	--	--
57	52.8	534.0	0	0	--	--	--
58	67.4	723.9	--	58.5	--	--	--
59	54.3	809.1	--	--	--	--	--
1960	52.7	597.6	--	--	--	--	--
61	59.9	562.4	--	--	--	--	--
62	39.6	358.9	--	--	--	--	--
63	51.4	674.0	--	--	--	--	--
64	--	--	--	--	--	--	--
65	--	--	--	--	--	--	--
66	--	--	--	--	--	--	--
67	--	--	--	--	--	--	--
68	--	--	--	--	--	--	--
69	42.9	494.4	--	--	37.8	352.9	977.0
1970							
71							
72							
73							
74							
75							

SPORT STEELHEAD CATCH IN THE UNITED STATES AND CANADA

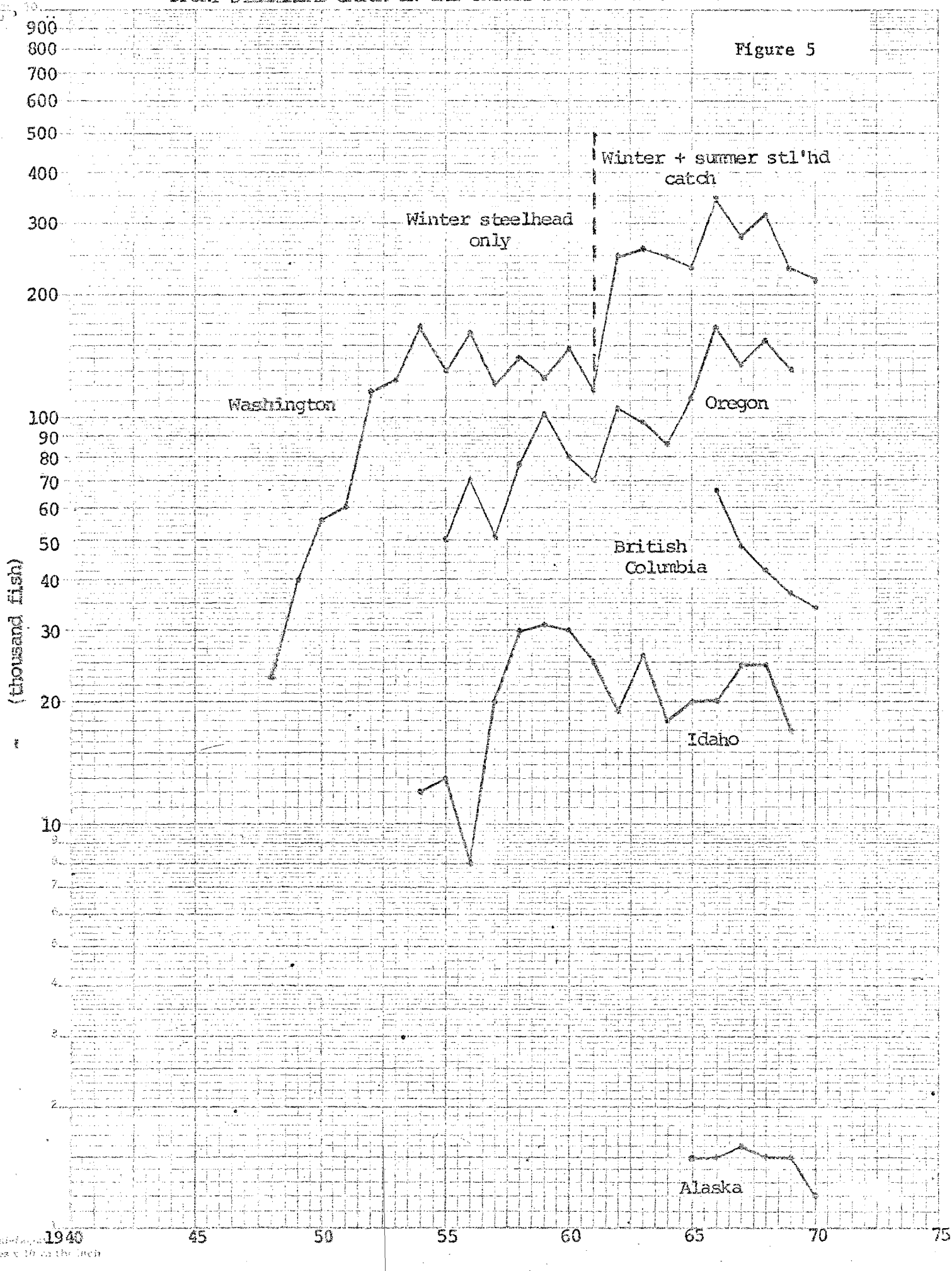


Table 11

Sport steelhead catch in the United States and Canada

Year	United States--Pacific Area						British Columbia	Pacific Total	Great Lakes Total	Grand Total
	Alaska	Washington 1/	Oregon	Idaho	California	Total				
	(thousands of fish)									
1948	-	23.0	-	-	-	23.0	-	23.0	-	23.0
49	-	39.9	-	-	-	39.9	-	39.9	-	39.9
1950	-	56.4	-	-	-	56.4	-	56.4	-	56.4
51	-	60.3	-	-	-	60.3	-	60.3	-	60.3
52	-	118.3	-	-	-	118.3	-	118.3	-	118.3
53	-	122.7	-	-	-	122.7	-	122.7	-	122.7
54	-	168.8	-	12.0	-	180.8	-	180.8	-	180.8
55	-	130.8	49.7	13.0	-	193.5	-	193.5	-	193.5
56	-	161.3	71.4	8.0	-	240.7	-	240.7	-	240.7
57	-	120.5	51.4	20.0	-	191.9	-	191.9	-	191.9
58	-	140.8	76.7	30.0	-	247.5	-	247.5	-	247.5
59	-	126.5	100.2	31.0	-	257.7	-	257.7	-	257.7
1960	-	148.3	80.2	30.0	-	258.5	-	258.5	-	258.5
61	-	117.5	69.6	25.0	-	212.1	-	212.1	-	212.1
62	-	252.6	106.1	19.0	-	377.7	-	377.7	-	377.7
63	-	262.2	97.5	26.0	-	385.7	-	385.7	-	385.7
64	-	249.5	86.0	18.0	-	353.5	-	353.5	-	353.5
65	1.5	236.3	111.4	20.0	-	369.2	-	369.2	-	369.2
66	1.5	347.1	168.1	20.0	120.0	656.7	66.4	723.1	-	723.1
67	1.6	280.0	134.0	24.5	23.0	463.1	48.5	511.6	-	511.6
68	1.5	316.9	153.9	24.5	-	496.8	41.7	538.5	167.0	705.5
69	1.5	232.4	130.4	17.0	-	381.3	37.3	418.6	224.0	642.6
1970	1.2	218.2					34.0		383.0	
71										
72										
73										
74										
75										

1/ 1948-61 catches are for winter steelhead only. 1962 on includes summer steelhead catches

Table 12

Public participation in sport steelhead fishing--United States and Canada

Year	Number of anglers								
		Washington					British Columbia		
	Alaska 1/	Cards issued	Actually fishing	Oregon 1/	Idaho	California	License issued	Actually fishing	Michigan 1/
	(thousands)								
1948	-	-	-	-	-	-	-	-	-
49	-	39.0	-	-	-	-	-	-	-
1950	-	50.0	-	-	-	-	-	-	-
51	-	50.0	-	-	-	-	-	-	-
52	-	62.0	-	-	-	-	-	-	-
53	-	76.0	-	95.3	-	-	-	-	-
54	-	89.0	-	92.3	-	-	-	-	-
55	-	90.0	-	82.7	-	-	-	-	-
56	-	88.0	-	96.5	-	-	-	-	-
57	-	84.0	-	74.4	-	-	-	-	-
58	-	83.0	-	112.0	-	-	-	-	-
59	-	82.0	-	165.7	-	-	-	-	-
1960	-	87.0	-	*113.7	-	-	-	-	-
61	-	93.0	-	142.1	-	-	-	-	-
62	-	145.0	-	159.4	-	-	-	-	-
63	-	151.7	-	160.7	-	-	-	-	-
64	-	160.4	-	190.1	21.1	-	-	-	-
65	67.9	171.4	-	218.0	21.2	-	-	-	-
66	77.0	187.5	134.7	213.3	22.4	-	37.5	27.1	-
67	84.8	202.7	137.6	303.6	25.2	-	39.4	22.3	-
68	90.6	202.8	-	230.9	26.4	-	39.8	19.8	-
69	99.3	200.0	128.8	284.9	25.2	-	45.8	24.5	-
1970	113.4	**142.6	113.9				43.8	23.8	180.0
71									
72									
73									
74									
75									

1/ Includes salmon anglers
* = First year for a $1.00 punch card charge
** = First year in which a charge ($2.00) was made for a steelhead punch card

Table 13

Economic values reported for Salmon and Steelhead sport fisheries[1/]

Area	Species	Year	Gross expenditure or value: Total ($ million)	Gross: Per day (dollar)	Gross: Per fish (dollar)	Net economic value: Total ($ million)	Net: Per day (dollar)	Net: Per fish (dollar)	Source
Oregon	Salmon-Steelhead	1962	15.0-21.0	(16.60)	51.14 (23.17)*	2.5-3.1	8.00	24.64[2/]	Brown et al. (1964)
Columbia River	Salmon-Steelhead	1965	(33.4)	(16.60)	(36.00)	5.8	8.00	17.35	Richards (1969)
Washington	Salmon	1966	50.0	(43.57)	(71.03)	5.0-8.0	(6.97)	11.09	Crutchfield and McFarlane (1968)
Washington	Salmon	1967	24.5*	(14.44)*	(22.96)*	65.7	28.00	(51.24)	Mathews and Brown (1970)
Idaho	Salmon	1968	.376*	(5.78)*	(32.70)*	.217	8.00	(18.86)	Gordon (nd)
	Steelhead	"	1.752*	(9.12)*	(71.51)*	.649	15.00	(26.49)	
British Columbia[3/]	Steelhead	1968	.787	(73.57)	(255.93)	.130	11.50	(41.94)	Pearse-Bowden (1970)
British Columbia	Steelhead	1969							
	B.C. resident:		(3.168)	10.80	(94.70)	-	-	-	Pearse-Bowden (1971)
	Non-Canadian:		(.570)	42.50	(167.50)	-	-	-	
Washington	Steelhead	1968	(16.8)	(13.56)	(53.13)	-	-	-	St. Game Dept. (Dec. 1969)
	Steelhead	1969	-	-	60.00	-	-	-	Anon (Feb. 1, 1971)
Michigan (Great Lakes)	Salmon-Steelhead	1970	15.5*	8.77*	(13.22)*	8.3	(4.75)	(7.12)	Ellefson and Jamsen (Apr. 23, 1971)
United States	Salmon	-	-	-	-	-	6.00	-	Senate Document 97

* = Current (or variable, or direct) expenditures only

1/ Values in parentheses were estimated from data in the source article or in combination with other catch and effort statistics

2/ Estimate by Richards (1969)

3/ Values to British Columbia from expenditures by non-Canadian sport fishermen

Average annual net economic value of the United States salmon sport fisheries[1/]
(thousands of dollars)

Year	Alaska[2/]	Washington[2/]	Oregon[2/]	Idaho[3/]	California[2/]	Michigan[4/]
1965	$1,112.1	$16,312.5	$6,043.0	Closed	$1,400.1	-
1966	1,270.0	13,132.2	4,982.9	$160.3	1,839.1	-
1967	1,360.2	18,496.8	7,927.2	141.4	2,132.3	$ 391.6
1968	1,292.6	15,221.2	6,074.2	216.9	3,376.3	785.3
1969	1,332.5	15,209.0	6,051.7	245.2	3,192.4	3,477.4
1970	1,766.2	16,968.3	-	-	-	-
Annual average	$1,355.6	$15,890.0	$6,215.8	$191.0	$2,388.0	$2,568.0

U.S. Annual average = $28,608.4

1/ Based on the net economic value-per fish estimates of Table 13. The kokanee salmon sport fishery is exluded.

2/ Based on the $17.35 per fish estimate of Richards (1969).

3/ Based on the $18.86 per fish estimate of Gordon (nd).

4/ Based on the $7.12 per fish estimate of Ellefson and Jamsen (April 23, 1971).

Table 14

Table 15

Average annual net economic value of the United States steelhead sport fishery 1/ (thousands of dollars).

Year	Alaska 2/	Washington 3/	Oregon 2/	Idaho 3/	California 2/	Michigan 4/
1965	$26.0	$4,099.8	$1,932.8	$529.8	--	--
1966	26.0	6,022.2	2,916.5	529.8	$2,082.0	--
1967	27.8	4,858.0	2,324.9	649.0	399.0	--
1968	26.0	5,498.0	2,670.2	649.0	--	$1,189.0
1969	26.0	4,032.1	2,262.4	450.3	--	1,594.9
1970	20.8	3,785.8	--	--	--	2,727.0
Annual Average =	$25.4	$4,716.0	$2,421.4	$561.6	$1,240.5	$1,837.0

U.S. annual average = $10,801.9

1/ Based on the net economic value--per fish estimates of Table 13.

2/ Based on the $17.35 per fish estimate of Richards (1969).

3/ Based on the $26.49 per fish estimate of Gordon (nd).

4/ Based on the $7.12 per fish estimate of Ellefson and Jamsen (April 23, 1971).

Table 16

Average annual current expenditures related to the United States salmon sport fishery 1/ (thousands of dollars).

Year	Alaska 2/	Washington 2/	Oregon 3/	Idaho 4/	California 3/	Michigan 5/
1965	$1,471.7	$21,587.0	$8,070.1	--	$1,869.8	--
1966	1,680.7	17,378.0	6,654.4	$278.0	2,456.0	--
1967	1,800.1	24,477.7	10,586.4	245.2	2,847.6	$ 727.1
1968	1,710.5	20,142.8	8,111.8	376.0	4,508.9	1,458.2
1969	1,763.3	20,126.7	8,081.7	425.1	4,263.3	6,456.6
1970	2,337.3	22,454.9	--	--	--	10,430.6
Annual average =	$1,793.9	$21,027.8	$8,300.9	$356.1	$3,189.1	$4,768.1

U.S. annual average = $39,435.9

1/ Based on the current expenditure—per fish estimates of Table 13. Current expenditures cover only those expenses associated with items such as transportation costs, food, lodging, charter boat and guide services, bait and lures, and rental of boats, tackles, or gear.

2/ Based on the $22.96 per fish estimate of Mathews and Brown (1970).

3/ Based on the $23.17 per fish estimate of Brown et al. (1964).

4/ Based on the $32.70 per fish estimate of Gordon (nd).

5/ Based on the $13.22 per fish estimate of Ellefson and Jamsen (April 23, 1971).

Table 17

Average annual current expenditures related to the United States steelhead sport fishery 1/ (thousands of dollars).

Year	Alaska 2/	Washington 2/	Oregon 2/	Idaho 3/	California 2/	Michigan 4/
1965	$34.8	$5,475.1	$2,581.1	$1,430.2	--	--
1966	34.8	8,042.3	3,894.9	1,430.2	$2,780.4	--
1967	37.1	6,487.6	3,104.8	1,752.0	532.9	--
1968	34.8	7,342.6	3,565.9	1,752.0	--	$2,207.7
1969	34.8	5,384.7	3,021.4	1,215.7	--	2,961.3
1970	27.8	5,055.7	--	--	--	5,063.3
Annual average =	$34.0	$6,298.0	$3,233.6	$1,516.0	$1,656.6	$3,410.8

U.S. annual average = $16,149.0

1/ Based on the current expenditure--per fish estimates of Table 13. Current expenditures cover only those expenses associated with items such as transportation costs, food, lodging, charter boat and guide services, bait and lures, and rental of boats, tackles, or gear.

2/ Based on the $23.17 per fish estimate of Brown et al. (1964).

3/ Based on the $71.51 per fish estimate of Gordon (nd).

4/ Based on the $13.22 per fish estimate of Ellefson and Jamsen (April 23, 1971).

DATA SOURCE: Sport salmon and steelhead catch and effort, State of Alaska.

Data	Year	Source
Catch & effort	1965-70	Alaska Department of Fish and Game. Personal communication, July 12, 1971, File: 550.600.

Appendix A

DATA SOURCE: Sport salmon catch and effort, State of Washington.

Data	Year	Source
Catch & effort	1938-64	Haw, Frank, Henry O. Wendler, and Gene Deschamps, "Development of Washington State Salmon Sport Fishery Through 1964", Research Bulletin No. 7, State of Washington, Department of Fisheries, May 1967, 192 p.
Catch & effort	1965-67	Nye, Gene D., and W. Dale Ward, "Washington Salmon Sport Catch Report from Punch Card Returns in 1967", State of Washington, Department of Fisheries, Statistics Section, October 1968, 75 p.
Catch & effort	1968	Nye, Gene D., and W. Dale Ward, "Washington Salmon Sport Catch Report from Punch Card Returns in 1968", Washington Department of Fisheries, (no date), 71 p.
Catch & effort	1969	Nye, Gene D., and W. Dale Ward, "Washington Salmon Sport Catch Report from Punch Card Returns in 1969", Washington Department of Fisheries, (no date), 60 p.
Effort	1964-69	/Data on number of anglers_7 Id. at p. 14.
Catch & effort	1970	Nye, Gene D., and W. Dale Ward, "Washington Salmon Sport Catch Report from Punch Card Returns in 1970", Washington Department of Fisheries, (no date), 53 p.

DATA SOURCE: Sport steelhead catch and effort, State of Washington.

Data	Year	Source
Catch	1948-61	State of Washington, Department of Game. Personal communication, September 7, 1971. Catch data Tables (processed.).
Effort	1948-61	State of Washington, Department of Game, "Summary of Washington Steelhead Catch During 1969", (no date), 4 p.
Catch & effort	1962-70	State of Washington, Department of Game, "Summary of Washington Steelhead Catch During (----)" respective years, (no date) 4 p. each summary report.

DATA SOURCE: Sport salmon and steelhead catch and effort, State of Oregon.

Data	Year	Source
Catch & effort	1953-69.	Koski, R. O., "Oregon Salmon and Steelhead Sport Fishery", in 1964 and 1969 Annual Reports, Oregon State Game Commission, Fishery Division, (no date).

DATA SOURCE: Sport salmon and steelhead catch and effort, State of Idaho.

Data	Year	Source
Catch	1949-53	/Chinook salmon data_7 National Marine Fisheries Service, Columbia Fisheries Program Office. Personal Communication, July 9, 1971.
Catch	1954-69	Idaho Fish and Game Department, Annual Report 1969, August 1, 1970, p. 58.
Effort	1964	Bjornn, Ted C., "The Harvest of Steelhead Trout as Determined from Steelhead Permits", in "Statewide Fishing Harvest Survey-1964", Idaho Fish and Game Department, February 1966, p. 12-25.
Effort	1965	Bjornn, Ted. C., "The Harvest of Salmon and Steelhead as Determined from Postal Card Questionnaires and Salmon and Steelhead Permits", Idaho Fish and Game Department, January 1967, 14 p.
Effort	1966	Bjornn, Ted. C., "The Harvest of Salmon and Steelhead as Determined from Postal Card Questionnaires and Salmon and Steelhead Permits", Idaho Fish and Game Department, February 1968, 26 p.
Effort	1967	Keating, James F., "The Harvest of Salmon and Steelhead as Determined from Salmon and Steelhead Permits", Idaho Fish and Game Department, February 1969, 15 p.
Effort	1968	Keating, James F., "The Harvest of Salmon and Steelhead as Determined from Salmon and Steelhead Permits", Idaho Fish and Game Department, April 1969, 14 p.
Effort	1969	Keating, James F., "Annual Survey of the Salmon and Steelhead Sport Fishery Harvest in Idaho, 1969", Idaho Fish and Game Department, May 1970, 11 p.

DATA SOURCE: Sport salmon catch and effort, State of California.

Data	Year	Source
Catch	1947-61	Jensen, Paul T., "Landings Estimates of California's Marine Recreational Salmon Fishery", California Department of Fish and Game, California Fish and Game, Vol. 50, No. 1, January 1964, p. 48-52.
Catch & effort	1962-65	Jensen, Paul T., and Phillip G. Swartzell, "California Salmon Landings 1952 through 1965", State of California, Department of Fish and Game, Fish Bulletin 135, (1967) p. 43-57.
Catch & effort	1966	Heimann, Richard F. G., and Herbert W. Frey, "The California Marine Fish Catch for 1966", State of California, Department of Fish and Game, Fish Bulletin 138, (1968) p. 5-46.
Catch & effort	1967	Heimann, Richard F. G., and Herbert W. Frey, "The California Marine Fish and Game, Fish Bulletin 144 (1968), 47 p.
Catch & effort	1968	Heimann, Richard F. G., and John G. Carlisle, Jr., "The California Marine Fish Catch for 1968 and Historical Review 1916-68", State of California, Department of Fish and Game, Fish Bulletin 149, (1970), 70 p.
Catch & effort	1969	Pinkas, Leo, "The California Marine Fish, Catch for 1969", State of California, Department of Fish and Game, Fish Bulletin 153, (1970), 47 p.

DATA SOURCE: Sport steelhead catch and effort, State of California.

Data	Year	Source
Catch	1966	Campbell, H. J., "Status of Salmon and Steelhead Sport Catches in the Pacific States," Pacific Marine Fisheries Commission, 19th and 20th Annual Reports, December 1969, p. 44.
Catch	1967	Gebhards, Stacy V., "Status of the 1967 Salmon and Steelhead Sport Catches in the Pacific Coast States", Pacific Marine Fisheries Commission, 21st Annual Report, August 1969, p. 26-27.

DATA SOURCE: Sport salmon and steelhead catch and effort, State of Michigan.

Data	Year	Source
Catch & effort	1967-68	Michigan Department of Natural Resources, Fish Division, "Coho Salmon Status Report 1967-1968" Fish Management Report No. 3 (David P. Borgeson, Editor), February 1970, 31 p.
	1967-68	Tody, Wayne H., Fish Division, Michigan Department of Natural Resources, Twenty-Fifth Biennial Report, 1969-1970, p. 3-12.
Catch & effort	1969	Jamsen, Gale C., and Paul V. Ellefson, "Economic Evaluation of Michigan's Salmon-Trout Fishery", Michigan Department of Natural Resources. A report presented at the 36th North American Wildlife and Natural Resources Conference. Portland, Oregon, March 7-10, 1971. 15 p.
Catch & effort	1970	Ellefson, Paul V., and Gale C. Jamsen, "Michigan's Salmon-Steelhead Trout Fishery: An Economic Evaluation", Michigan Department of Natural Resources. A report presented at the 75th Annual Meeting of the Michigan Academy of Science, Arts, and Letters, Kalamazoo, Michigan, April 23, 1971. 12 p.

Appendix A

DATA SOURCE: Sport salmon catch and effort, British Columbia, Canada.

Data	Year	Source
Catch	1953-59	Department of Fisheries of Canada, "Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia," Annual Reports, Pacific Area.
Catch & effort	1960-70	Department of Fisheries and Forestry, Annual reports on "Salmon Sport Fishing Catch Statistics for the Tidal Waters of British Columbia," Fisheries Service, Pacific Region.

Appendix A

DATA SOURCE: Sport steelhead catch and effort, British Columbia, Canada

Data	Year	Source
Catch & effort	1966/67-	Thomas, R. C., "The British Columbia Steelhead Sport Fishery, 1969-70," Department of Recreation and Conservation, Fish and Wildlife Branch, Victoria, B. C., May 1971 (processed), 9 p.
Catch & effort	1970/71	Department of Recreation and Conservation, Fish and Wildlife Branch, Victoria, B. C. Personal communication, November 1, 1971, File No. 42-016.

DATA SOURCE: Sport "kokanee" catch and effort, United States and British Columbia.

Area	Data	Year	Source
Idaho	Catch	1951-53	Idaho Fish and Game Department, Annual Reports. Various pagination.
	Catch & effort	1954-63	Mallet, Jerry, "The Pend Oreille Lake Kokanee Fishery," Pacific Marine Fisheries Commission, 16th and 17th Annual Reports, April 1965, p. 47.
	Catch & effort	1969	Idaho Fish and Game Department, Annual Report 1969, August 1, 1970, p. 45.
California	Catch	1957/58	Beland, R. D., "The Lake Arrowhead, San Bernardino County, Kokanee Salmon Fishery, 1957-1960", California Department of Fish and Game, July 1961, Inland Fisheries Administrative Report No. 61-7. 14 p.
British Columbia	Catch & effort	1969/70	Department of Recreation and Conservation, Fish and Wildlife Branch, Victoria, B. C. Personal communication, November 1, 1971. File No. 42-016.

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