Populations of Pacific Salmon in British Columbia, 1970-1979

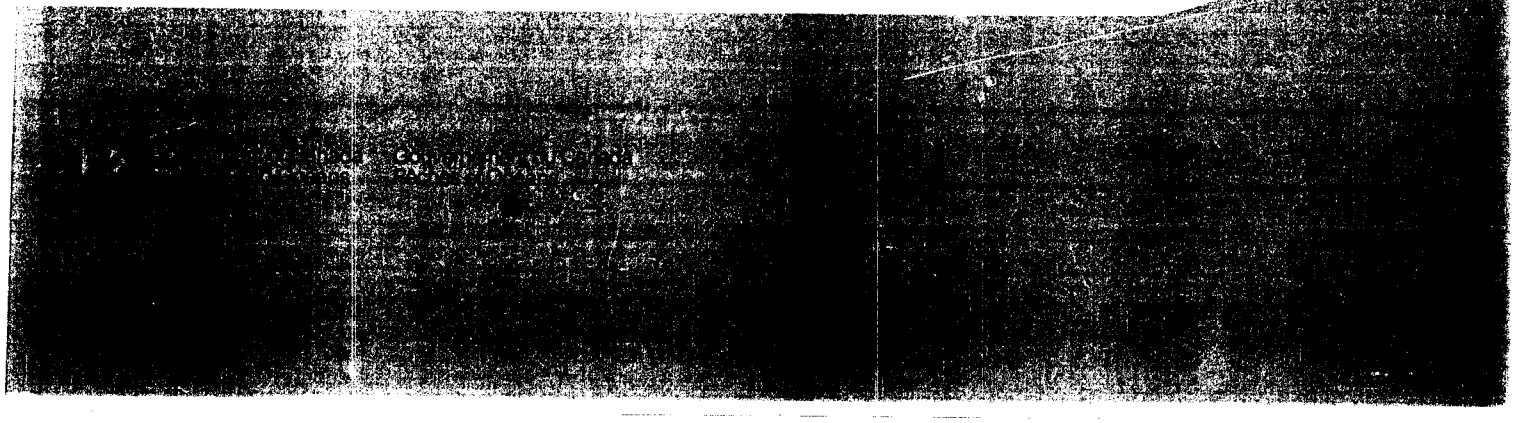
by

D.M. Archibald and C.C. Graham

Salmonid Enhancement Program
Department of Fisheries and Oceans
1090 West Pender Street
Vancouver, B.C. V6E 2P1

July 1981

Canadian Manuscript Report of Fisheries and Aquatic Sciences No. 1616



Canadian Manuscript Report
of Fisheries and Aquatic Sciences

July 1981

POPULATIONS OF PACIFIC SALMON IN BRITISH COLUMBIA, 1970-1979

by

D.M. Archibald and C.C. Graham

Salmonid Enhancement Program
Department of Fisheries and Oceans
1090 West Pender Street
Vancouver, BC V6E 2P1

TABLE OF CONTENTS

ABSTRACT

ARCHIBALD, D.M. and GRAHAM, C.C. 1981. Populations of Pacific Salmon in British Columbia, 1970-1979. Can. MS Rep. Fish. Aquat. Sci. 1616: viii + 64 p.

The escapements and commercial catches of six salmonid species indigenous to British Columbia (sockeye, pink, chum, coho, chinook and steelhead) are examined for the years 1970 - 1979 inclusive.

RÉSUMÉ

ARCHIBALD, D.M. and GRAHAM, C.C. 1981. Populations of Pacific Salmon in British Columbia, 1970-1979. Can. MS Rep. Fish. Aquat. Sci. 1616: viii + 64 p.

On analyse les remontées et les prises commerciales de six especès de salmonidés indigènes de la Colombie-Britannique (le saumon rouge, rose, kéta, coho, quinnat et la truite arc-en-ciel) effectuës au cours des années 1970 à 1979 inclusivement.

LIST OF TABLES

LIST OF FIGURES

LIST OF FIGURES CONT'D

LIST OF FIGURES CONT'D

LIST OF APPENDICES

APPENDIX

Introduction

The annual world harvest of Pacific Salmon (genus Oncorhynchus) has declined from about 1.7 billion pounds, in the 1930's, to about 0.9 billion pounds in the 1970's. Countries currently harvesting salmon are Japan (about 34 percent of the total catch), United States (about 29 percent), U.S.S.R. (about 21 percent) and Canada (about 16 percent). The principal species harvested are pink (O. gorbuscha) (about 40 percent of the total catch); chum (O. keta) (about 30 percent); sockeye (O. nerka) (about 14 percent); coho (O. kisutch) (about 9 percent); and chinook (O. tshawytscha) (about 7 percent) (Fredin, 1980). A sixth species, cherry salmon (O. masou) is native to Asia only.

Production of the five species in Canadian waters is distributed in more than 1,500 streams and tributaries along the coast of British Columbia. In addition, there are a few rivers, eg., the Mackenzie, which support small salmon populations and drain into the Arctic Ocean. Also, there are several rivers which have spawning grounds in Canada, but discharge into the Pacific Ocean in the United States. Such systems include the Yukon, Alsek, Taku, Stikine and Unuk Rivers (which flow from northern British Columbia or the Yukon territory to the sea through Alaska), and the Okanagan River (which flows south from British Columbia to join the Columbia River in the State of Washington).

In Canadian coastal waters, almost all sockeye, pinks and chum caught are maturing individuals taken in the net fishery (gillnets and purse seines) operating along inside passages and in inlets and estuaries close to spawning grounds. These net fisheries are very efficient and are capable of removing very large fractions of the runs.

Coho and chinook salmon are exploited by sport fisheries, troll fisheries which operate in coastal waters up to 30 miles

offshore, and net fisheries, as described in the preceding paragraph. Tagging has shown that the troll fisheries exploit a mixture of stocks bound for different areas. Consequently, troll catches indicative of specific statistical areas are difficult to attain and are thus less reliable indices of the abundance of different stocks than similar statistics obtained by the inshore net fisheries.

Some stocks of chinook and coho spend their entire marine lives in the protected waters of Georgia Strait and Puget Sound and do not migrate to the open ocean. As a result, these fish are relatively smaller at maturity compared to their "outside" counterparts. Nonetheless, these smaller sized fish are very important as they form the basis of a year round sport fishery.

In reference to steelhead trout (Salmon gairdneri), little is known about their open ocean migration. There is no specific ocean sport fishery for this species, and those caught commercially are taken incidentally in the salmon fishery, primarily by gillnets or seines.

For this analysis, the B.C. coastal waters were separated into the zones as shown in Figure 1. The corresponding statistical areas are as follows:

	Statistical Area(s)*		
Zone	Net Fishery	Troll Fishery	Total (N & T)
Northern	1 - 5	1 - 5	1 - 5
Central	6 - 11	6 - 11, 30	6 - 11, 30
Johnstone Strait	12, 13	12, 13	12, 13
Georgia Strait	14 - 18, 28	14 - 18, 29	14 - 18,28,29
S.W. Vancouver Is.	22 - 24	23, 24	22 - 24
N.W. Vancouver Is.	25 - 27	25 - 27	25 - 27
Juan de Fuca	20	20	20
Fraser	29: A-D	-	** -

*Please note that Statistical Area 21 is not included in the discussion as it is classified, along with Area C, as part of the Washington-Oregon fishery in Appendix 1.
**Included in Georgia Strait in "Total" calculations.

The maps included in this report (Figures 2-23) represent the 10 year average commercial catches, from 1970 to 1979 inclusive, of the five Pacific Salmon species and steelhead trout. Figure 2 illustrates the cumulative average, in pieces, of all six species, while Figures 3-22 are species specific. Also included in this report is a series of maps (Figures 24-29) which illustrate the proportion of spawning adults in each zone. A map representative of the steelhead catch has not been included due to the lack of knowledge pertaining to this species.

The data presented in Figure 2 is somewhat biased in that the North, Central and Johnstone Strait zone catches are comprised of 66%, 74% and 67% pinks (by pieces) respectively, whereas the other zones range from 7%-51% pinks. In light of the small body size of pinks, Figure 2 would be biased if one was concerned with the total weight of the catch in the respective zones. This bias is eliminated in Table 1 which gives the average annual combined weight of all species in the specific zones from 1970-79 inclusive. Although the relative differences are not as extreme as in Figure 2, there is still a large gap between the average weights in the Northern, Central and Johnstone Strait zones relative to the rest of the province, as indicated in Table 1.

Table 2 yields comparative commercial catches for three 10 year periods from 1951-1980 inclusive, thus indicating the relative degree of change in number of salmon caught, production, and the average size of the 5 salmon species.

From 1951-60 to 1971-80 only chums show a decrease in total number caught, although there is a net increase of 7% when all species are added together. For the same time periods, the

production figures, measured in round weight, show a net decrease of 6%, even though both sockeye and chinook increased. Consequently, this indicates that although more fish were caught in the latter decade, the average size had decreased.

In a comparison of 1961-70 versus 1971-80 the trend is reversed in that the number of salmon caught decreased by 4% while the weight increased by 1%.

SOCKEYE SALMON

Traditionally, sockeye is the most highly prized of the five species of Pacific salmon found in Canada. The first commercial fisheries began in the latter part of the nineteenth century, while the native food fisheries were in existence for hundreds of years before this time. Both of these fisheries were almost entirely dependant on sockeye.

In British Columbia, most sockeye spawn at the outlets of lakes or in streams tributary to lakes in the late summer or autumn. Upon emerging from the gravel the following spring, the young usually spend one year in the lake (although in some areas they remain for two years) before migrating to the sea.

There are six drainage areas which support most of Canada's sockeye. These are the Fraser River (one of the world's largest sockeye producing systems), Owikeno and Long Lakes (tributary to Rivers and Smith Inlets), the Skeena River, the Nass River and the Somass River (see Figure 24).

Figure 3 shows the combined total net and troll catches for British Columbia waters. This figure shows that the sockeye catch is fairly substantial in each of the zones. The actual

data (Appendix 1) reveals that the range is from a low of 209,000 in "N.W. Vancouver Island" to a high of approximately 1.3 million in the Northern zone. A comparison of Figures 3 and 24 would seem to indicate that most of the commercial catch in the Johnstone, Georgia and Juan de Fuca Straits is composed of Fraser River stocks, while the north and south-west Vancouver Island catches are made up primarily of a combination of Fraser River and south-west Vancouver Island stocks.

Figure 4 shows that north and south-west Vancouver Island both have an annual average troll catch in excess of 100,000 sockeye, while Figure 5 reveals that the prime areas for catching sockeye are from Johnstone Strait north, the Fraser River, the south-west coast of Vancouver Island, and the Strait of Juan de Fuca. The majority of the fish is caught in the net fishery. The period of peak catch for sockeye ranges from mid-June to mid-September.

PINK SALMON

Pink salmon is the most abundant of the five species of Pacific salmon in British Columbia waters. In British Columbia, most pinks spawn between late August and late October, while the peak of the commercial catch generally occurs from mid-June to late September. Although pink stocks are considerably more widespread than sockeye, the vast majority of pinks is concentrated in relatively few of the Province's major river systems. For example, approximately 75% of all spawners utilize only 8% of the total number of streams inhabited by pinks.

Pink fry emerge from the gravel mainly in April and May, whereupon they immediately migrate to sea. Virtually all pinks spend about 18 months at sea, followed by a return to their

natal streams to consummate a two-year life cycle. The inevitability of this two year life cycle means that there are two genetically isolated, non-interacting populations in a given stream in even and odd-numbered years. In some British Columbia areas, i.e., the north, the abundance of both even and odd-year pinks is relatively equal, whereas in other areas either the odd or even-year stock vastly outnumbers its counterpart. In the Fraser River system, for example, the odd-year pink run is very large, whereas the even-year run is inconsequential in comparison (see Appendix 3).

In lieu of the biological differences, the odd and even-year stocks are considered separately in the following discussion.

ODD-YEAR STOCKS

Figure 6 shows that the catch of odd-year pinks is fairly substantial in each of the zones. In actual numbers (Appendix 1), the 10 year average catch varies from a low of 410,000 in Georgia Strait to a high of 2.1 million in Johnstone Strait.

Upon further breakdown of the catch, one finds that pinks, which have traditionally been caught primarily in the net fishery, are caught in relatively large quantities in the troll fishery in the N.W. and S.W. Vancouver Island zones (see Figure 7). This troll catch is a recent development, as it is in contrast with the data reported in the Aro and Shepard report of 1967. In their study they found an insignificant troll, as well as net, catch of odd-year pinks on western Vancouver Island (excluding Juan de Fuca) from 1951 to 1963. A review of the catch statistics reveals that from 1967 onwards, the troll

fishermen began to target on odd-year pinks on the west coast, thus supplementing their catch which formerly consisted primarily of coho, chinook and sockeye.

In the rest of the zones, the 1970 to 1979 troll catch of odd-year pinks is substantially less.

From Figure 8, it is evident that the largest net catches of odd-year pinks come from the Northern, Central, Johnstone Strait and Juan de Fuca zones. One can also see that the Fraser River net fishery constitutes the majority of the Georgia Strait catch, as shown in Figure 6.

Figure 25 illustrates the escapement for each of the zones. The large catches in Johnstone Strait, Juan de Fuca and the west coast of Vancouver Island are made up primarily of fish bound for the Fraser River (the most important producer) and other Canadian streams immediately north of the Fraser, i.e., the Indian, Squamish-Cheakamus, and Glendale Rivers. These fish follow migration routes which will lead them either through Johnstone Strait or through the Strait of Juan de Fuca.

The main spawning area in the Central coast is the Atnarko River, a tributary to the Bella Coola.

In reference to the northern stocks of odd-year pinks, the Skeena River and its tributaries (Lakelse, Kispiox, Kitwanga and Babine Rivers) constitute the most important system, while the Nass River also supports a large population of pink salmon.

EVEN-YEAR STOCKS

Figure 9 shows that even-year pinks are caught in

substantial quantities only in the Northern, Central and Johnstone Strait zones. The actual catch (Appendix 1) varies from a 10 year average of 1.8 million in Johnstone Strait to 5.3 million in the Central zone. The net fishery (especially seiners) accounts for the vast majority of these catches, as can be seen in comparing Figures 10 and 11.

The peak of the commercial catch is similar to the odd-year catch, except that it starts a week or two earlier in June and ends in early September as opposed to late September.

The escapements for each zone are depicted in Figure 26. Unlike the odd-year line, the even-year pinks are quite abundant in the Queen Charlotte Islands. Spawning occurs mainly in September in a number of medium-sized streams, i.e., Yakoun River, Copper Creek, Naden River, Deena River and Kaisun Creek.

Also in the Northern zone, the Skeena is again of great importance, although the emphasis may shift to different tributaries.

In the Central zone, the Bella Coola and Atnarko Rivers are again the most important spawning grounds, as in the odd years.

A large proportion of the Johnstone Strait catch is composed of runs to nearby streams such as the Keogh, Amor de Cosmos, Glendale and Quatse Rivers. The remaining runs on the mainland shore, south of Knight Inlet; on the east coast of Vancouver Island, south of the above-mentioned rivers; and throughout the west coast of the Island are insignificant at best.

CHUM SALMON

In British Columbia, chums spawn mainly in areas which are relatively close to the sea. Unlike sockeye and pinks, chum tend to spread more evenly over a larger number of moderate-sized streams. In northern B.C., they may arrive on the spawning grounds as early as July, whereas in the south the arrival time varies from September to January. There may be a distinct summer and fall run and, in general, chum are the last salmon to spawn in British Columbia.

Similar to pinks, chum fry head to the ocean shortly after emerging from the gravel. They tend to stay in the estuary for 2 - 4 weeks, form into schools, and then head out into the sea. The majority matures and returns as 3 or 4 year olds.

While there are some summer runs of chum in the Province, most of the runs are in the fall. The peak commercial catch extends from July to November.

Figure 12 indicates that the best chum catches are taken in the Northern, Central and Johnstone Strait zones. Unlike pinks and sockeye, very few chum are taken in Juan de Fuca Strait, as the majority of south-bound chum passes through Johnstone Strait on the way to their spawning grounds. The chums caught in Johnstone Strait represent mixed stocks, as the early catch is comprised of fish bound for streams and inlets in the general area of Johnstone and Georgia Straits (see Figure 27). Some of the rivers include the Klinaklini, Viner, Puntledge, Big Qualicum and Squamish. Following these stocks, the Fraser River chum are usually the last through the Johnstone Strait.

In the Northern zone, Portland Inlet and the Nass are two of the larger producing systems, while the Fishing Branch in the Porcupine River drainage is the largest chum producer in the North. The Bella Bella and Bella Coola regions are the most productive in the Central zone, while the main chum spawning grounds on the south and west coasts of Vancouver Island include the Nitinat, Nahmint, Sarita and Toquart Rivers.

Figure 13 shows that very few chum are caught in the troll fishery, whereas Figure 14 illustrates that most of the chum catch is made by the net fishery.

COHO SALMON

Coho salmon generally spawn late in the year (October, November), and the main production appears to be spread over a large number of moderate-sized systems, rather than a few large ones. Coho are concentrated primarily in the near coastal streams, although there are runs as far inland as the Shuswap system, in the Fraser, and Babine Lake on the Skeena.

Spawning proceeds from October to January and, due to this time spread, fry emerge from early March to late July. Following emergence, the fry usually remain in fresh water for 1 year before migrating to the sea as smolts. The adult coho usually return to spawn as 3 or 4 year olds.

While the majority of coho are taken by trollers (Figure 16), 29% of the total catch from 1970 to 1979 was taken by net fishermen (Figure 17). The majority of the commercial catch is taken from mid-June to October. Figure 15 shows moderate catches in all zones with S.W. Vancouver Island, Central and Northern zones leading in terms of average annual catches. The

majority of the net coho catch is in the Johnstone Strait, Bella Coola, Butedale, Fraser River estuary, Skeena River and Juan de Fuca areas. In contrast, the troll catches are very low in Juan de Fuca and Johnstone Strait, but are highest in S.W. and N.W. Vancouver Island, followed by the Northern and Central zones.

Some of the major spawning grounds include the Tlell River and Copper Creek on the Queen Charlotte Islands, Lakelse River, the Bella Coola-Atnarko River system, the Kingcome, Kakweiken, Nimpkish, Big Qualicum, Cowichan, Squamish, Capilano and Chilliwack Rivers. Figure 28 reveals that although escapements are relatively consistent throughout B.C. waters, they are at extremely low levels in comparison to sockeye, pink and chum stocks.

In addition to the commercial catch, the recreational catch also accounts for a sizeable amount of the coho catch, especially in Georgia Strait. One current estimate of the average annual sport catch of coho in Georgia Strait is 800,000 fish (pers. comm. with B. Masse) which outnumbers the commercial catch by more than 3 to 1.

CHINOOK SALMON

Chinook are the largest of the five salmon species in Canada, as some individuals have been recorded as weighing in excess of 100 pounds. Chinook spawning areas are scattered throughout British Columbia although, as with sockeye and pink escapement, the bulk of chinook escapement is associated with only a few streams. The majority of chinook spawn in August and September in the mainland streams, and in October in the Vancouver Island streams.

Upon emergence from the gravel in the spring, chinook juveniles may migrate to sea after spending anywhere from a few days up to a year in their natal streams. Most Canadian chinook return to spawn after spending two or three winters at sea, although some may return after four or five winters. As with coho, young male fish or jacks may return to the spawning grounds a year before they are fully mature. Chinook spawning sites range from areas immediately above the tidal limit, to over 2000 miles upstream from the sea, as occurs in the Yukon River system.

Chinook are taken primarily in the troll fishery (Figures 19 and 20). The trollers account for 77% of the catch, while the gillnetters and seiners take the remaining 23% of the commercial catch, based on the total catch from 1970 to 1979 (Appendix 2). Similar to coho, a substantial number of chinook is taken each year by sport fishermen.

The largest commercial catches of chinook are made in southern British Columbia, with the bulk caught in the S.W. Vancouver Island zone. The timing of the catch is very broad, as the peak period extends from April to October. This is a result of maturing chinook moving inshore into spawning rivers over much of the year. Many rivers have more than one run, eg., a summer and winter run, consisting of fish headed for different spawning sites.

In northern British Columbia, the larger chinook runs occur in the Bella Coola, Nass, Kitimat, Taku and Skeena River systems. The largest run, however, occurs in the Canadian section of the Yukon River Drainage.

In southern British Columbia, the most productive systems include Robertson Creek, Nimpkish, Klinaklini, Big Qualicum, Cowichan, Somass, Squamish and Fraser River systems.

From Figure 29, it is obvious that the present status of chinook stocks in B.C. is dangerously low.

STEELHEAD TROUT

As previously indicated, steelhead are taken incidentally in the commercial fishery. The total catch of steelhead is relatively insignificant (Figure 21), and they are taken primarily in the net fishery (Figures 22 & 23).

Very little is known about the ocean migration routes of this species, and steelhead life histories are extremely variable. Studies by Oguss and Andrews (1977) suggest that the commercial catch pattern is entirely random. Consequently, steelhead protection via selective commercial fishing methods is deemed unfeasible.

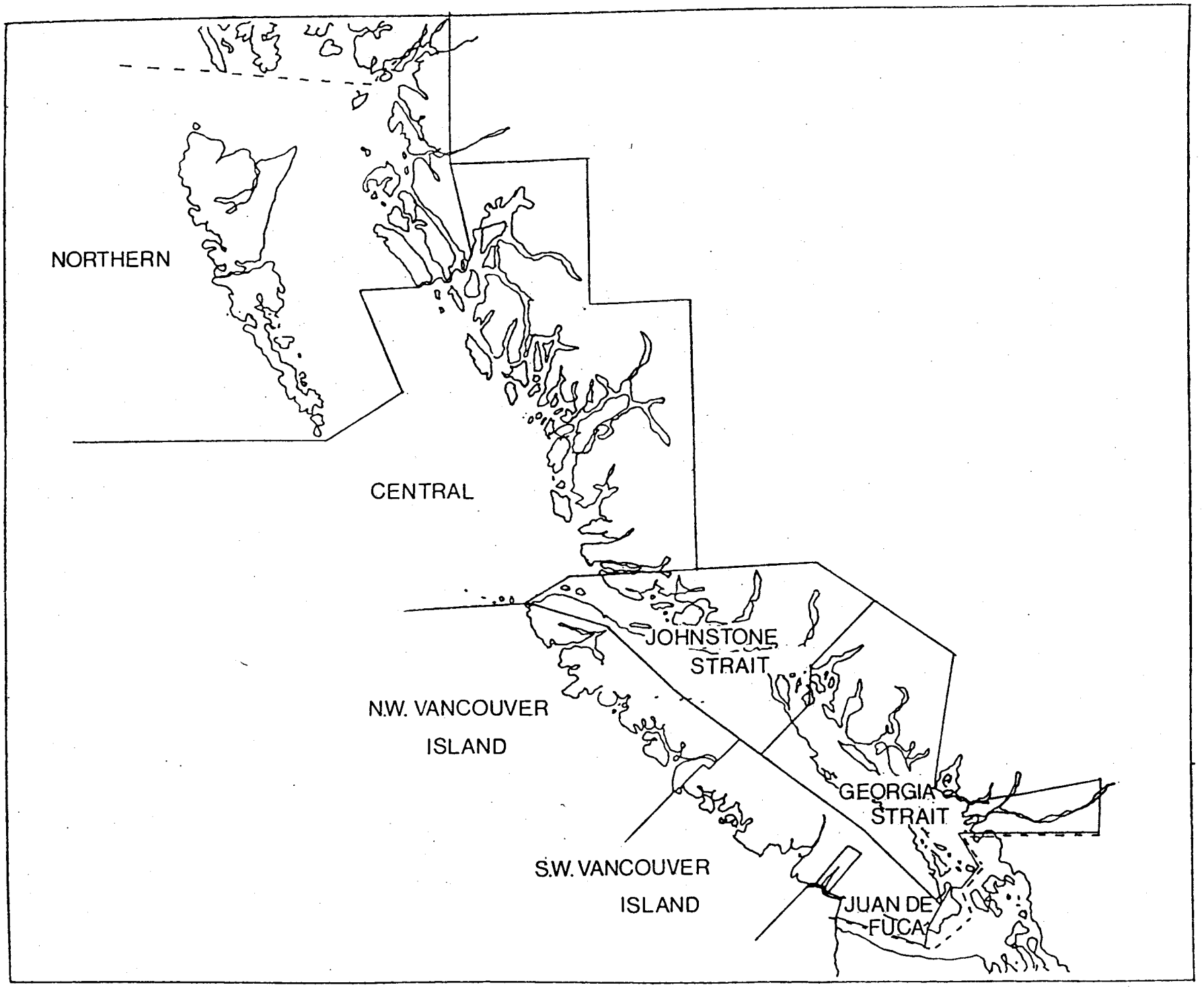


Figure 1. The British Columbia coastal zones used in this survey. (Note: for the "net catch" statistics, Fraser River is considered as a separate zone.)

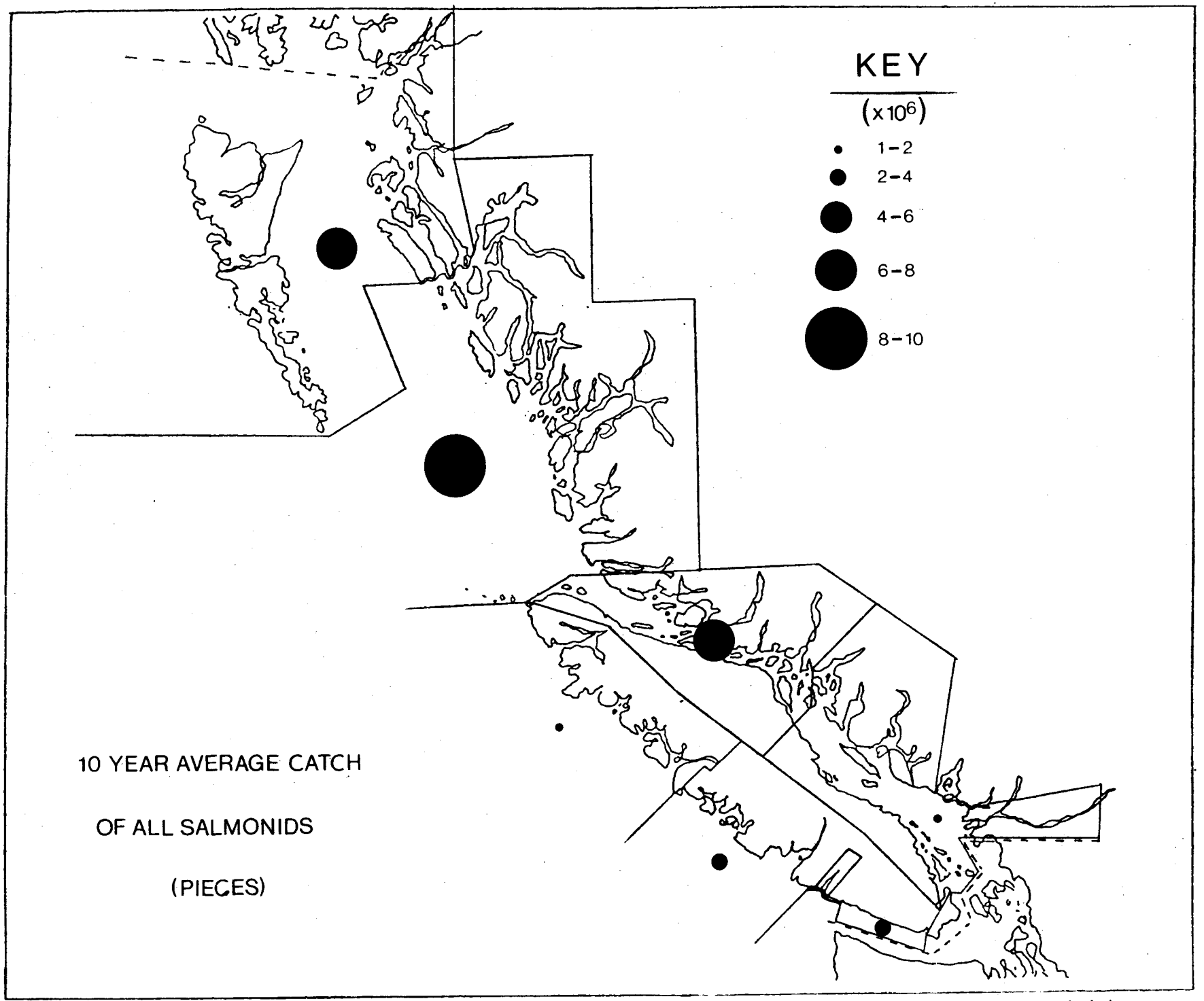


Figure 2. Average annual catch of all six salmonid species caught commercially in the various British Columbia zones from 1970 to 1979 inclusive.

TABLE 1

AVERAGE ANNUAL COMBINED WEIGHT OF ALL 5 SALMON SPECIES CAUGHT COMMERCIALLY IN THE VARIOUS BRITISH COLUMBIA ZONES FROM 1970 TO 1979 INCLUSIVE

ZONE	AVERAGE ANNUAL COMBINED WEIGHT (IN POUNDS)
NORTHERN	40,192,802
CENTRAL	47,972,430
JOHSTONE STRAIT	32,925,019
GEORGIA STRAIT	13,724,265
S.W. VANCOUVER ISLAND	20,497,964
N.W. VANCOUVER ISLAND	9,082,925
JUAN DE FUCA	13,777,764
TOTAL	178,173,169

TABLE 2

COMPARISON OF COMMERCIAL SALMON CATCHES IN BRITISH COLUMBIA BY 10 YEAR PERIOS 1950-80*

NUMBER OF SALMON	1951-60	1961-70	1971-80
SOCKEYE	4,896	4,216	5,411
COHO	2,912	3,927	3,488
PINK	8,690	12,155	9,209
CHUM	3,229	1,757	2,690
CHINOOK[1]	908	984	1,321
TOTAL	20,635	23,040	22,119
[1]NOT INCLUDING JACKS			
PRODUCTION OF SALMON (ROUND WEIGHT) (IN MILLIONS OF POUNDS)			
SOCKEYE	30.46	25.13	33.04
COHO	23.11	28.74	22.36
PINK	43.45	51.15	36.51
CHUM	37.86	19.31	30.76
CHINOOK	13.41	12.90	16.37
TOTAL	148.29	137.22	139.04
AVERAGE SIZE OF SALMON (POUNDS)			
SOCKEYE	6.2	6.0	6.1
COHO	7.9	7.3	6.4
PINK	5.0	4.2	3.9
CHUM	11.7	11.0	11.4
CHINOOK	14.8	13.1	12.6

*TAKEN FROM "A SUMMARY OF SALMON LANDINGS IN B.C. BY SPECIES AND GEAR FOR 3-10 YEAR PERIODS" BY BLAKE A. CAMPBELL (1981)

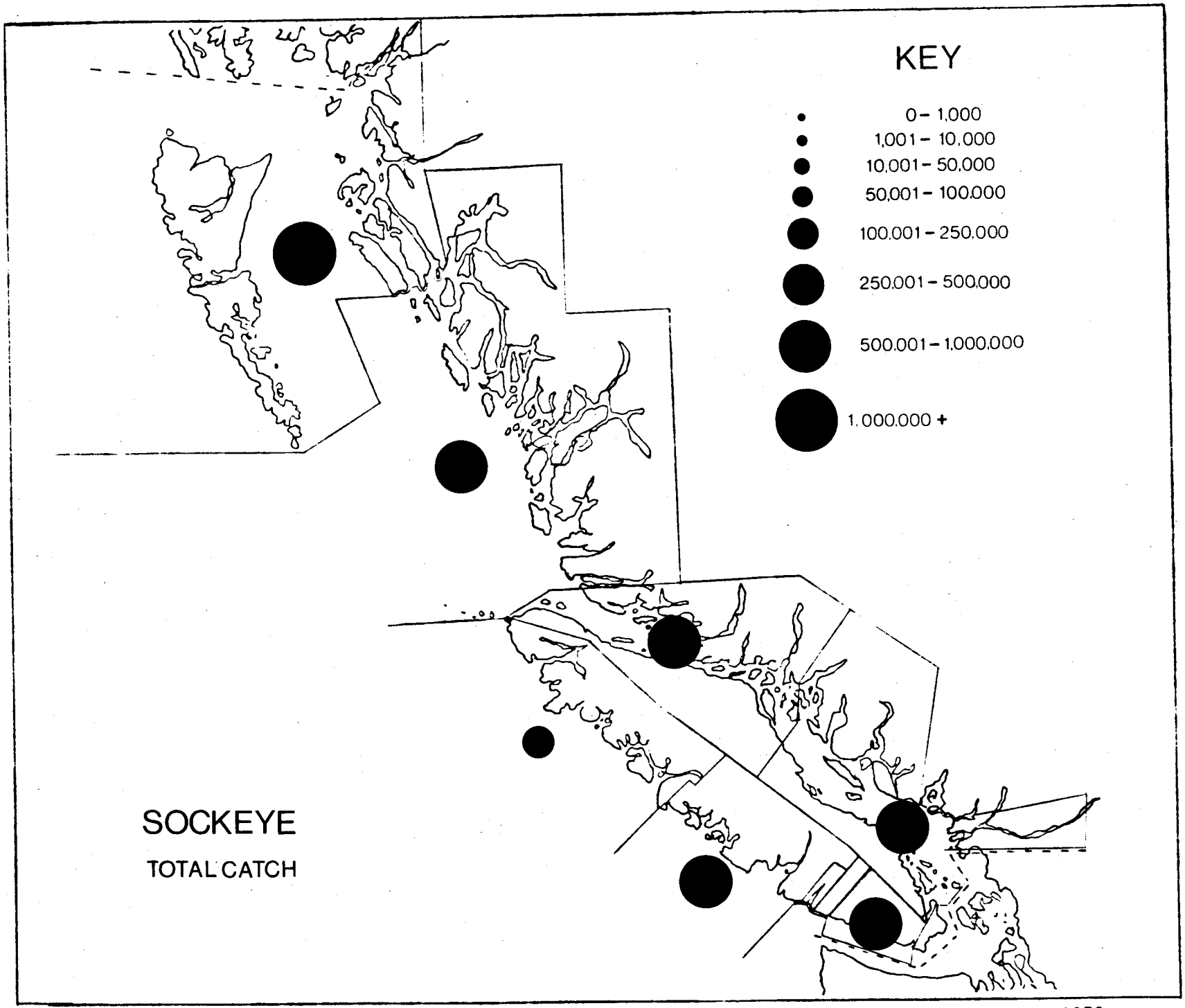


Figure 3. Average annual catches of sockeye salmon in the various British Columbia zones from 1970 to 1979 inclusive.

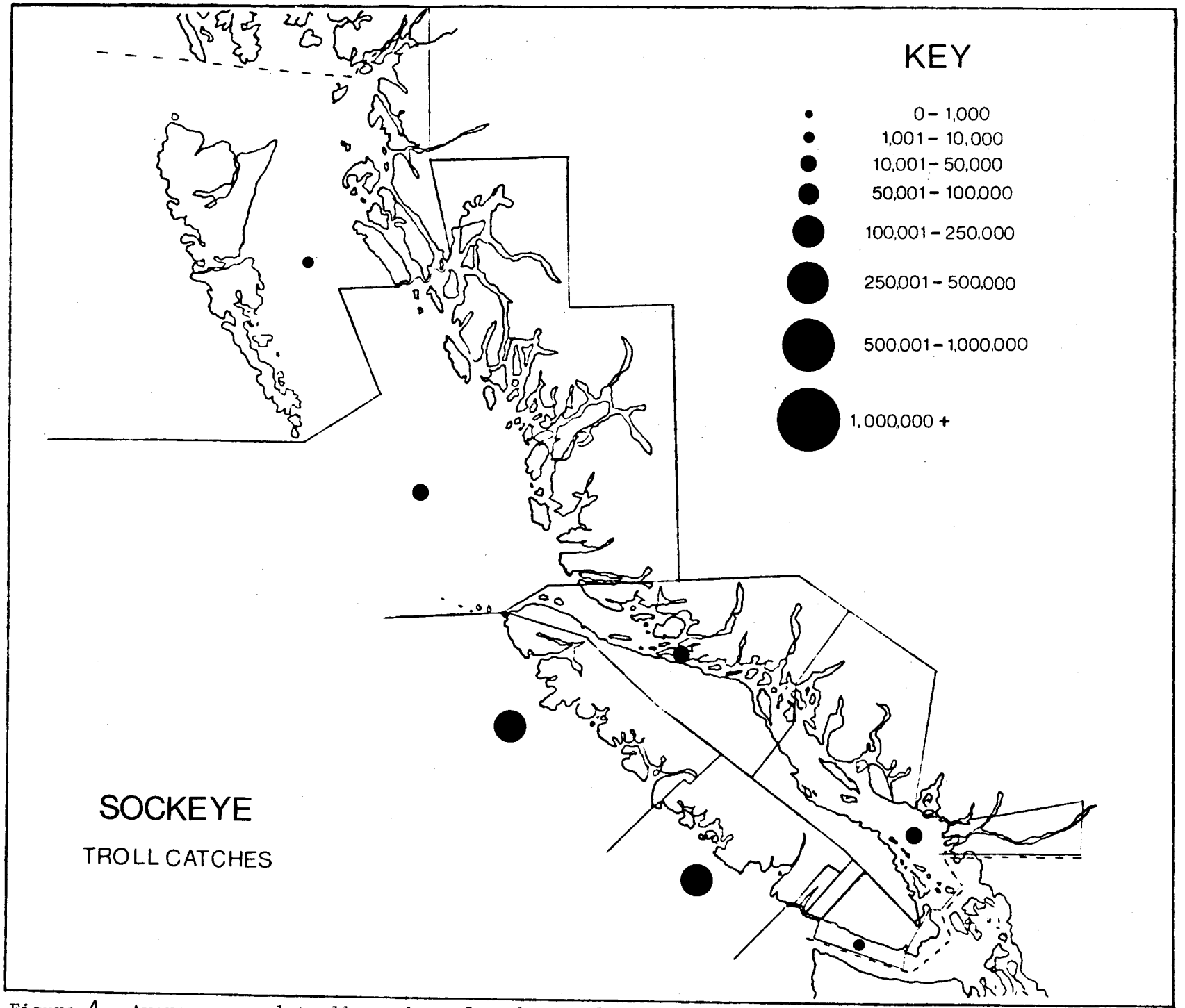


Figure 4. Average annual troll catches of sockeye salmon in the various British Columbia zones from 1970 to 1979 inclusive.

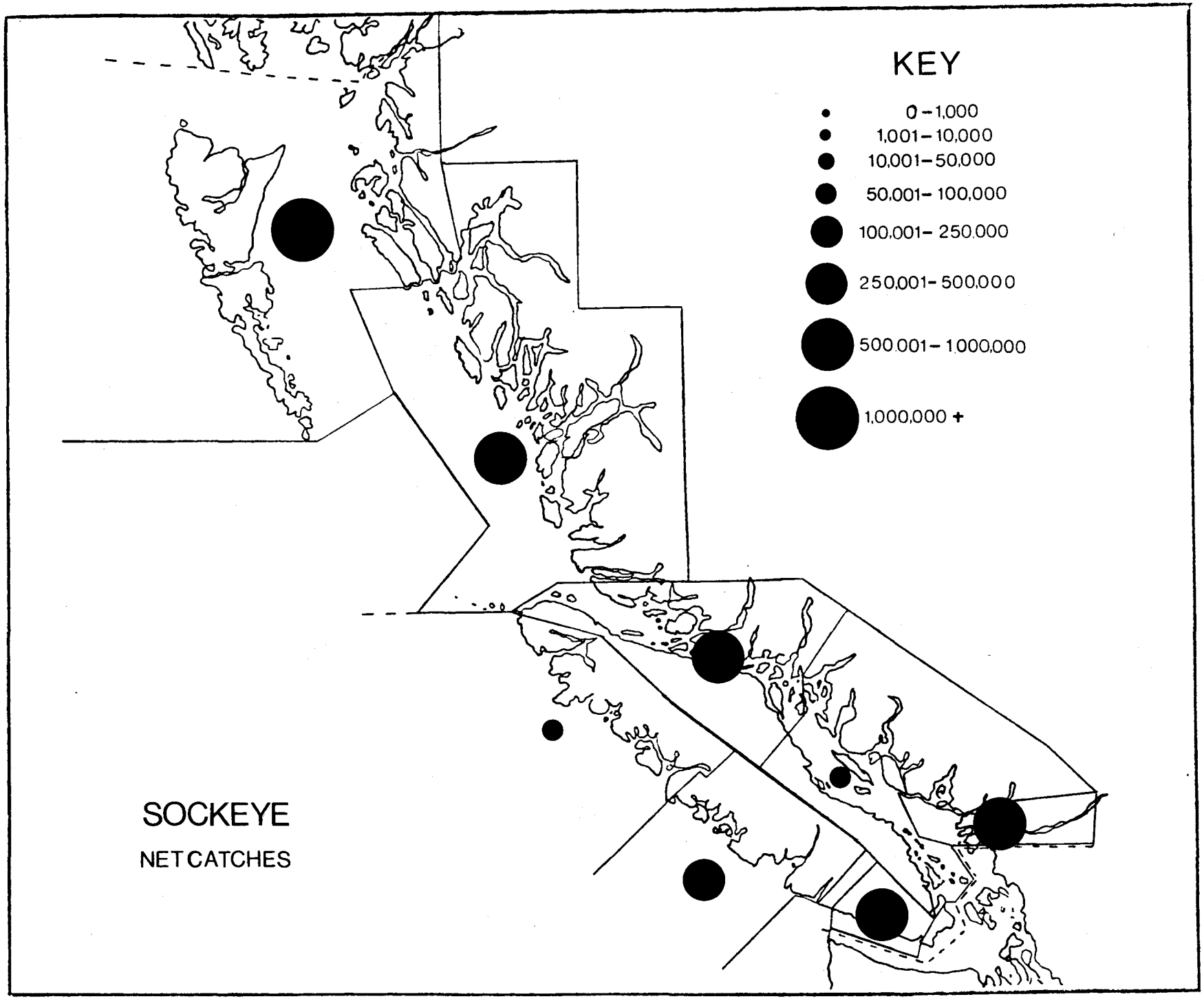


Figure 5. Average annual net catches of sockeye salmon in the various British Columbia zones from 1970 to 1979 inclusive.

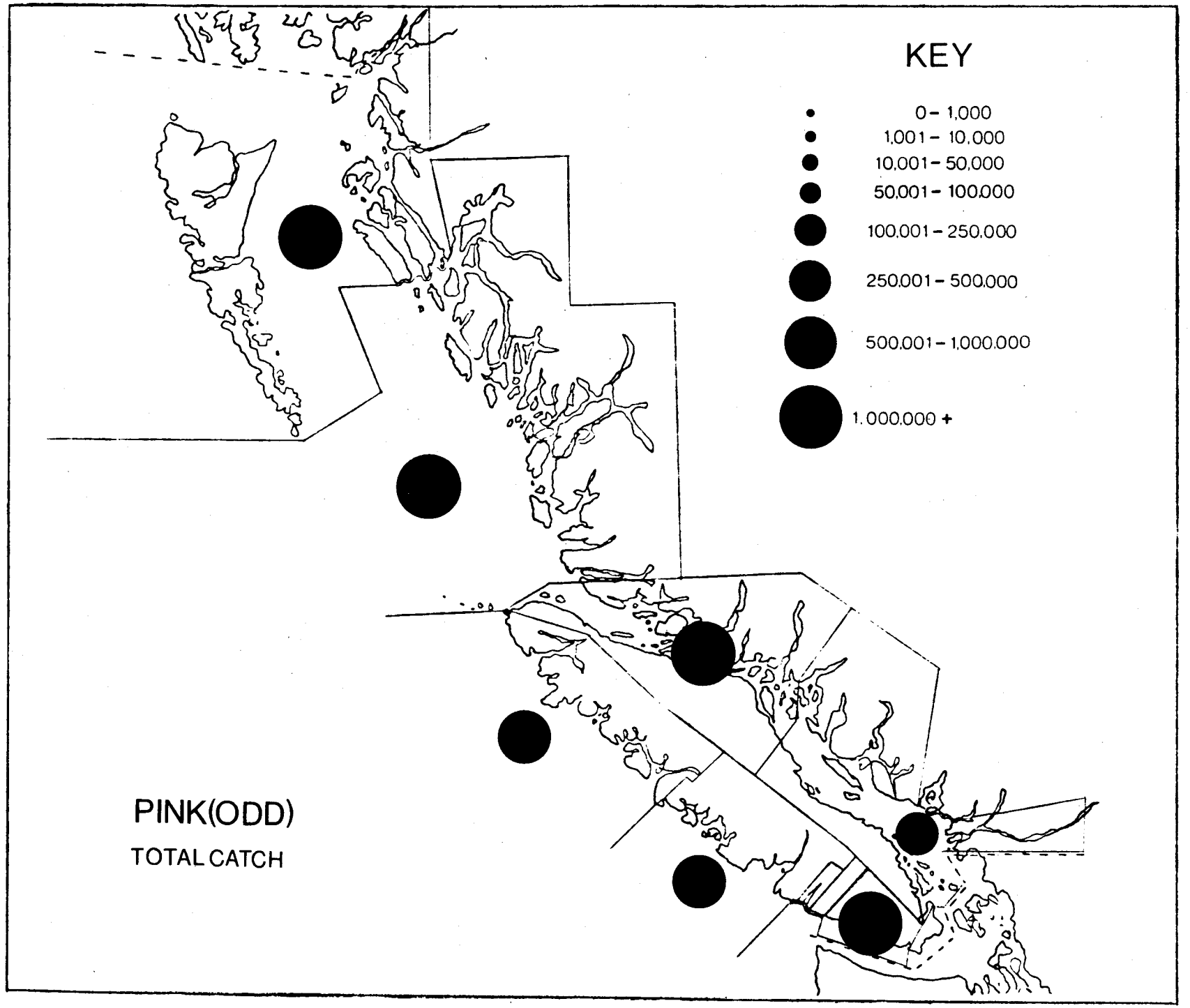


Figure 6. Average annual catches of pink (odd) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (odd years only)

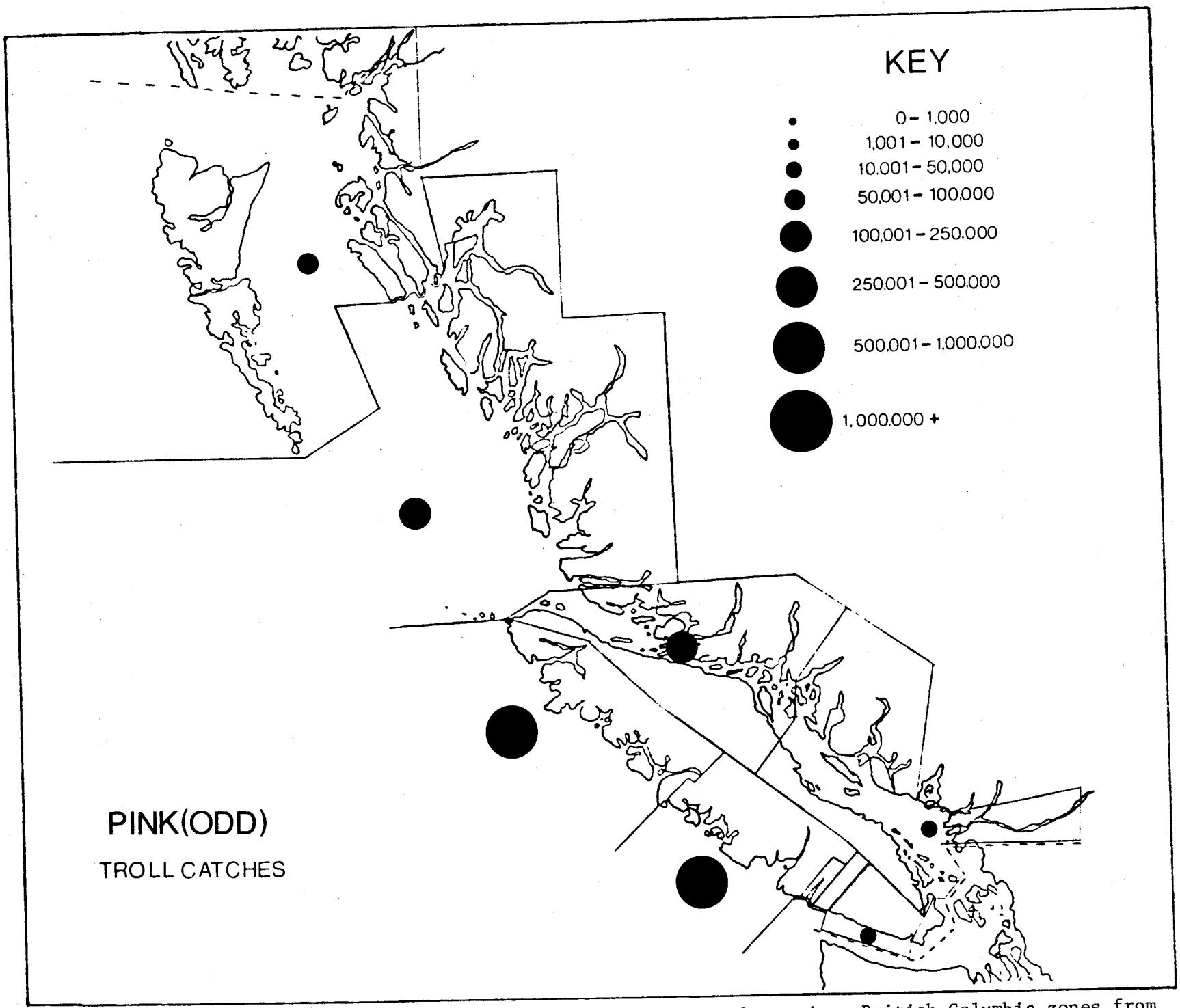


Figure 7. Average annual troll catches of pink (odd) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (odd years only)

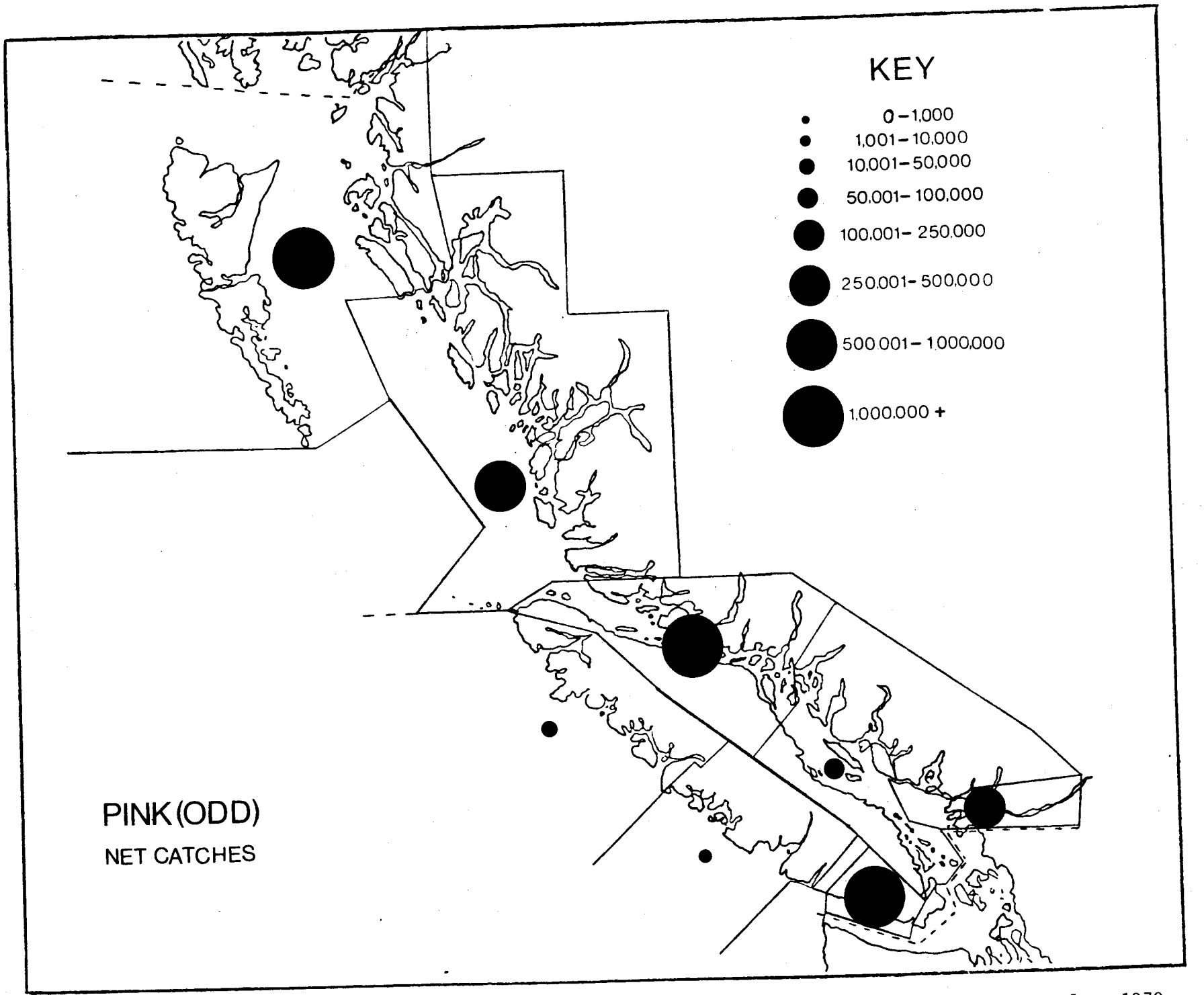


Figure 8. Average annual net catches of pink (odd) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (odd years only)

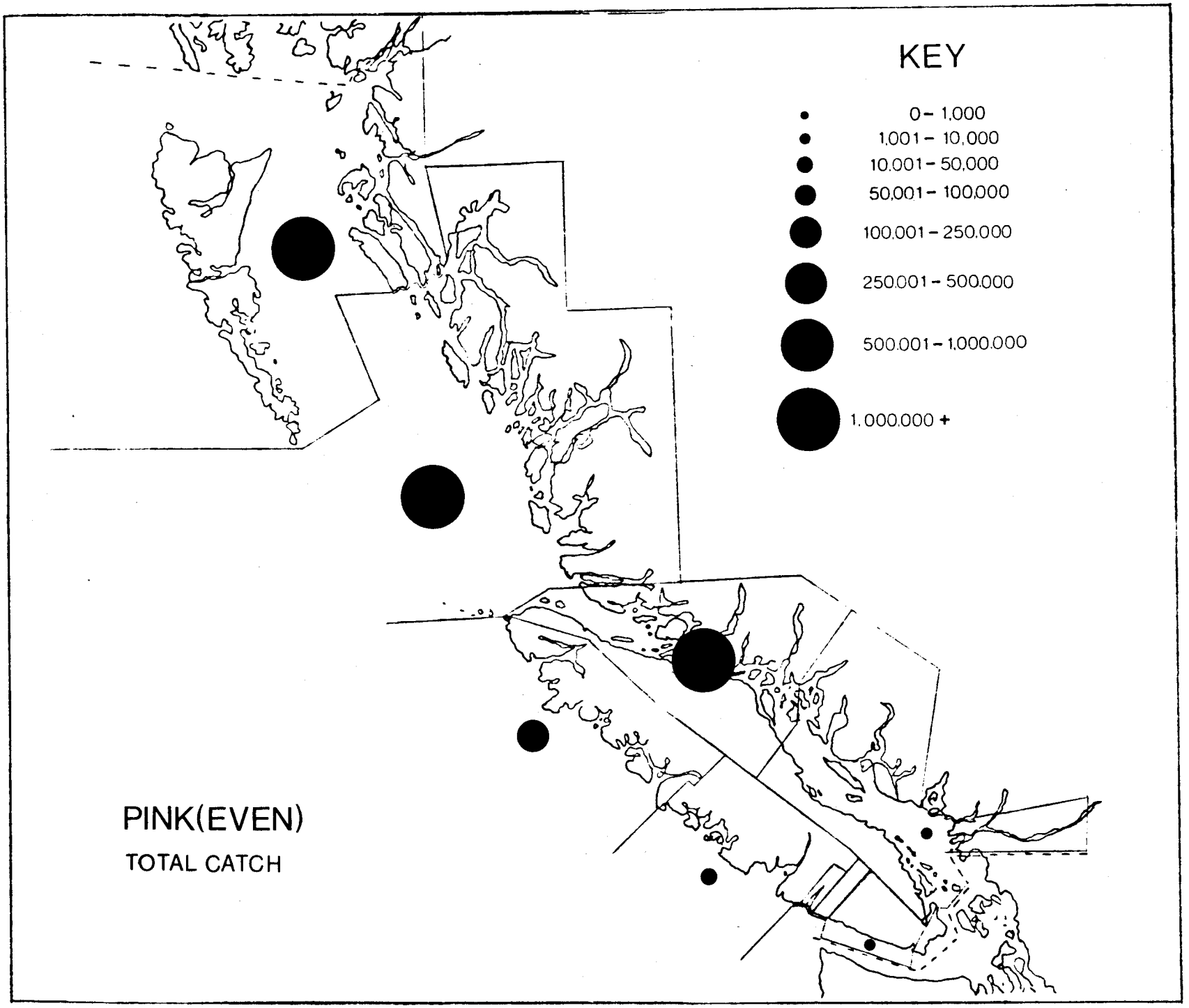


Figure 9. Average annual catches of pink (even) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (even years only)

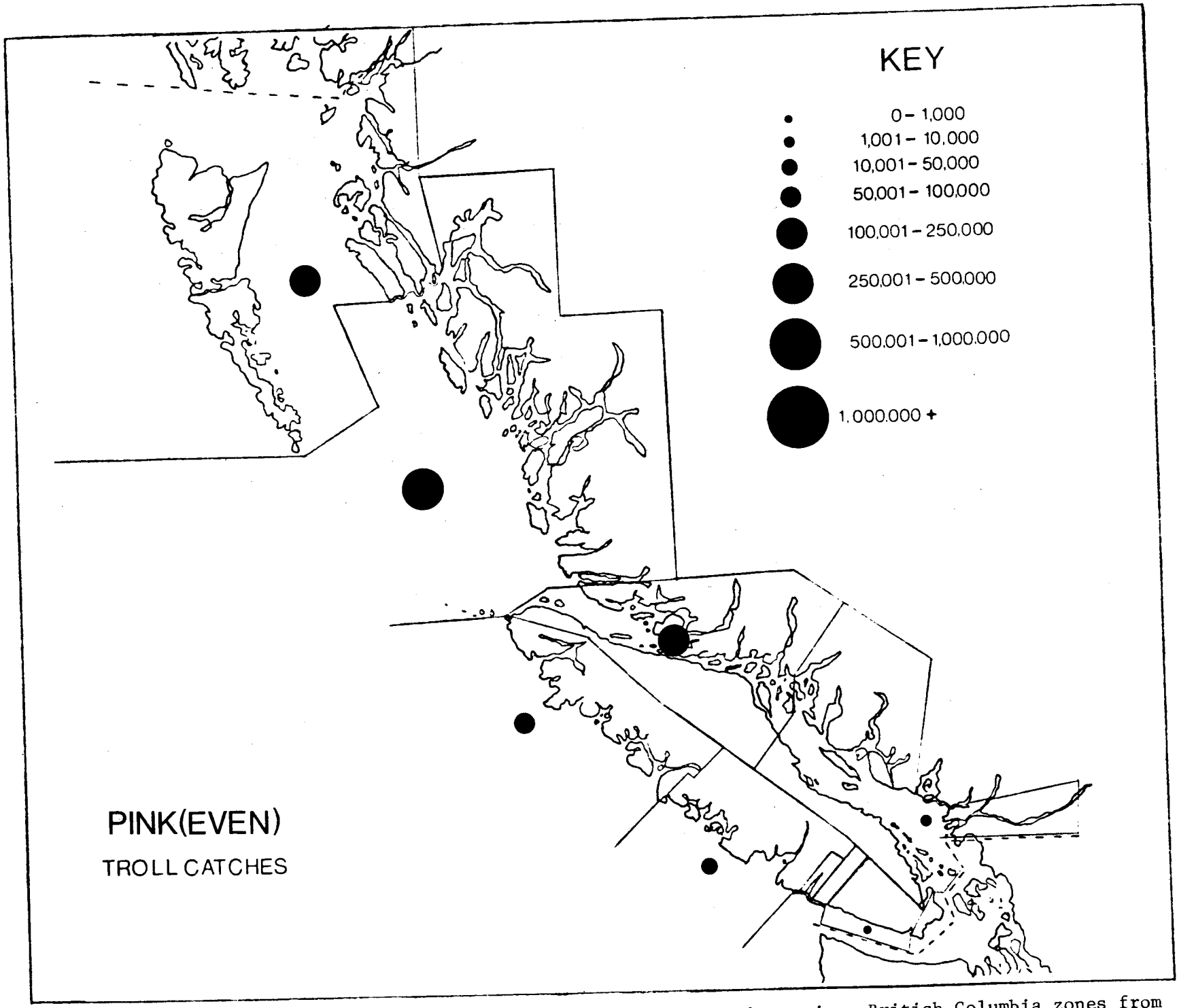


Figure 10. Average annual troll catches of pink (even) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (even years only)

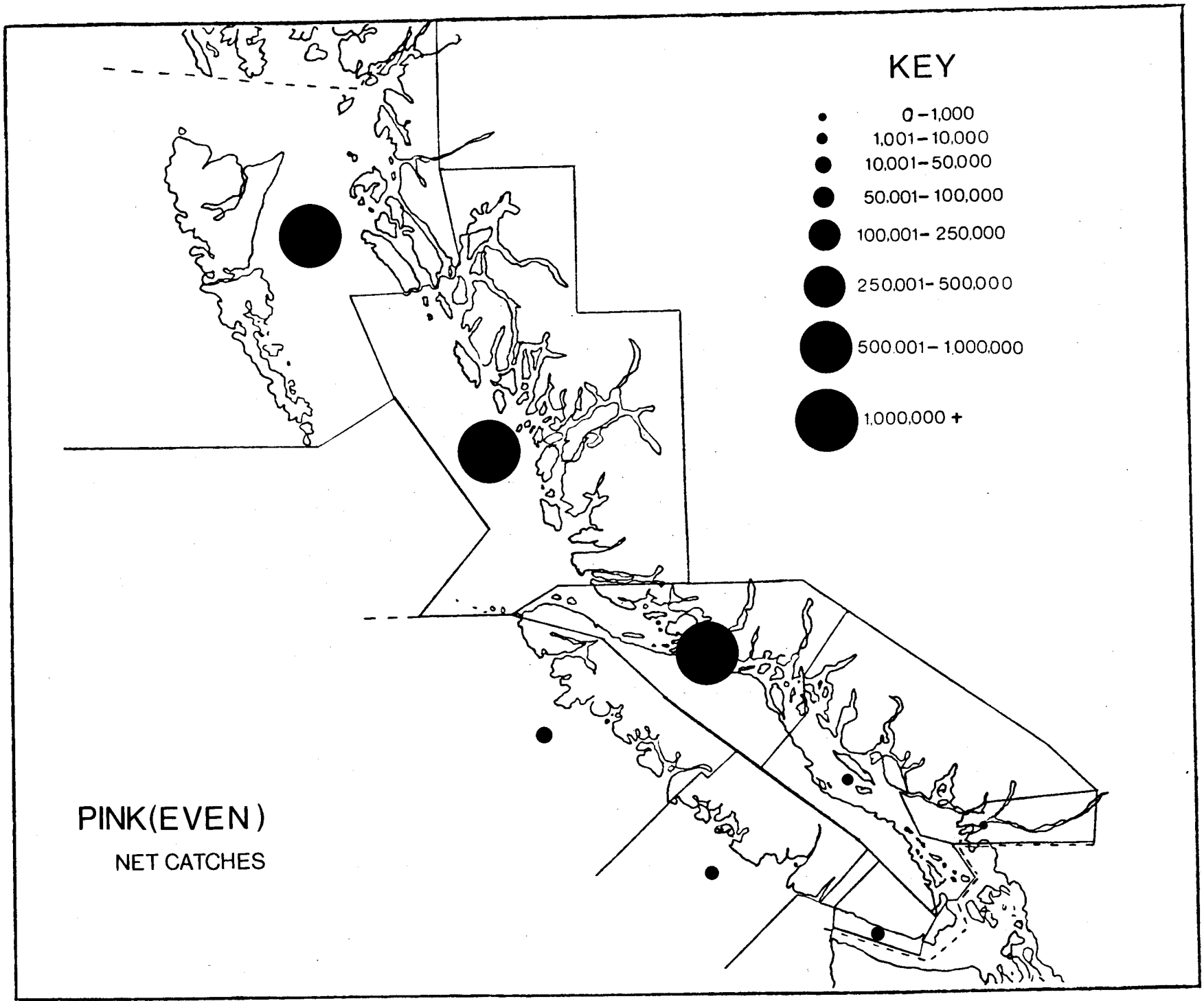


Figure 11. Average annual net catches of pink (even) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (even years only)

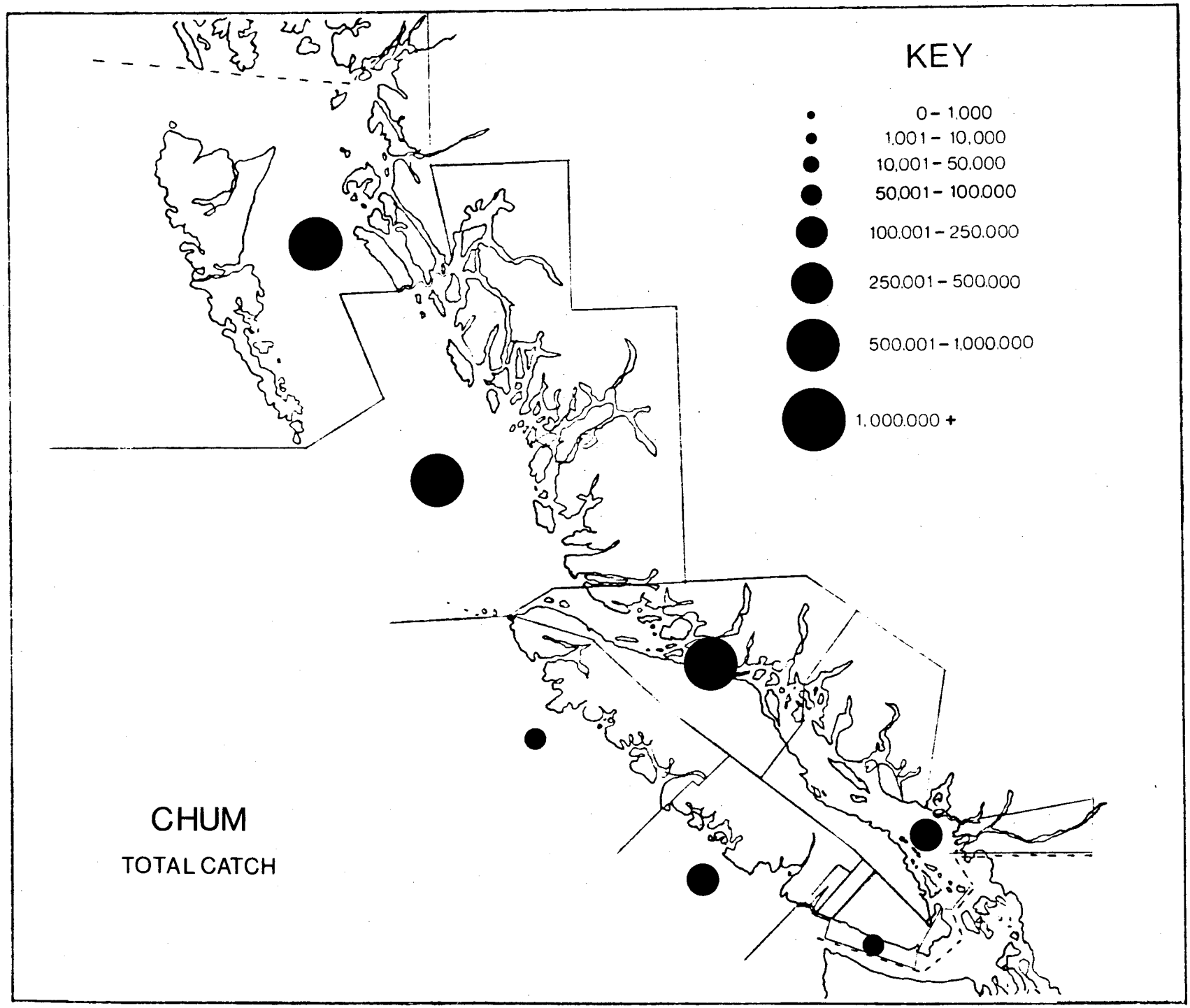


Figure 12. Average annual catches of chum salmon in the various British Columbia zones from 1970 to 1979 inclusive.

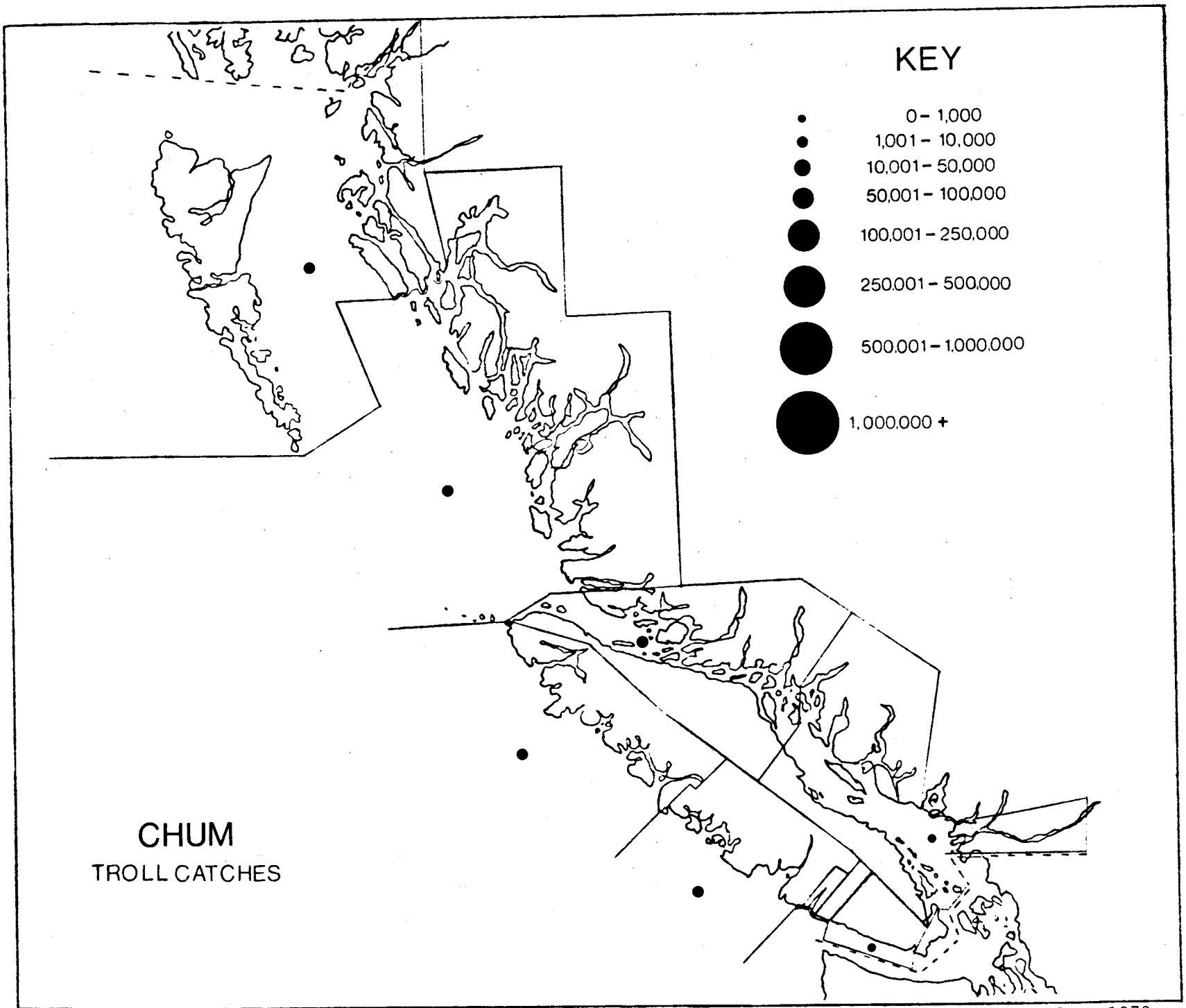


Figure 13. Average annual troll catches of chum salmon in the various British Columbia zones from 1970 to 1979 inclusive.

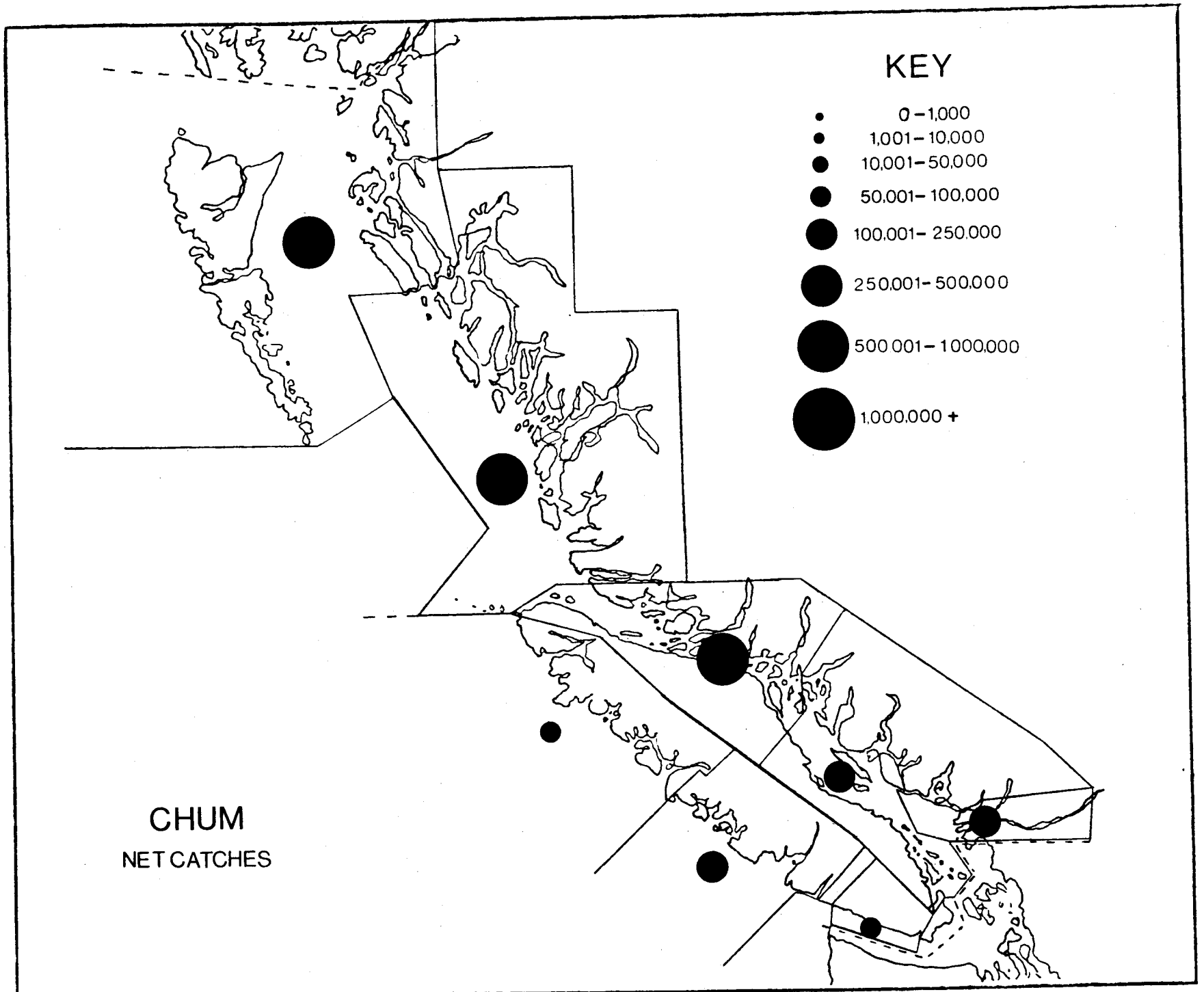


Figure 14. Average annual net catches of chum salmon in the various British Columbia zones from 1970 to 1979 inclusive.

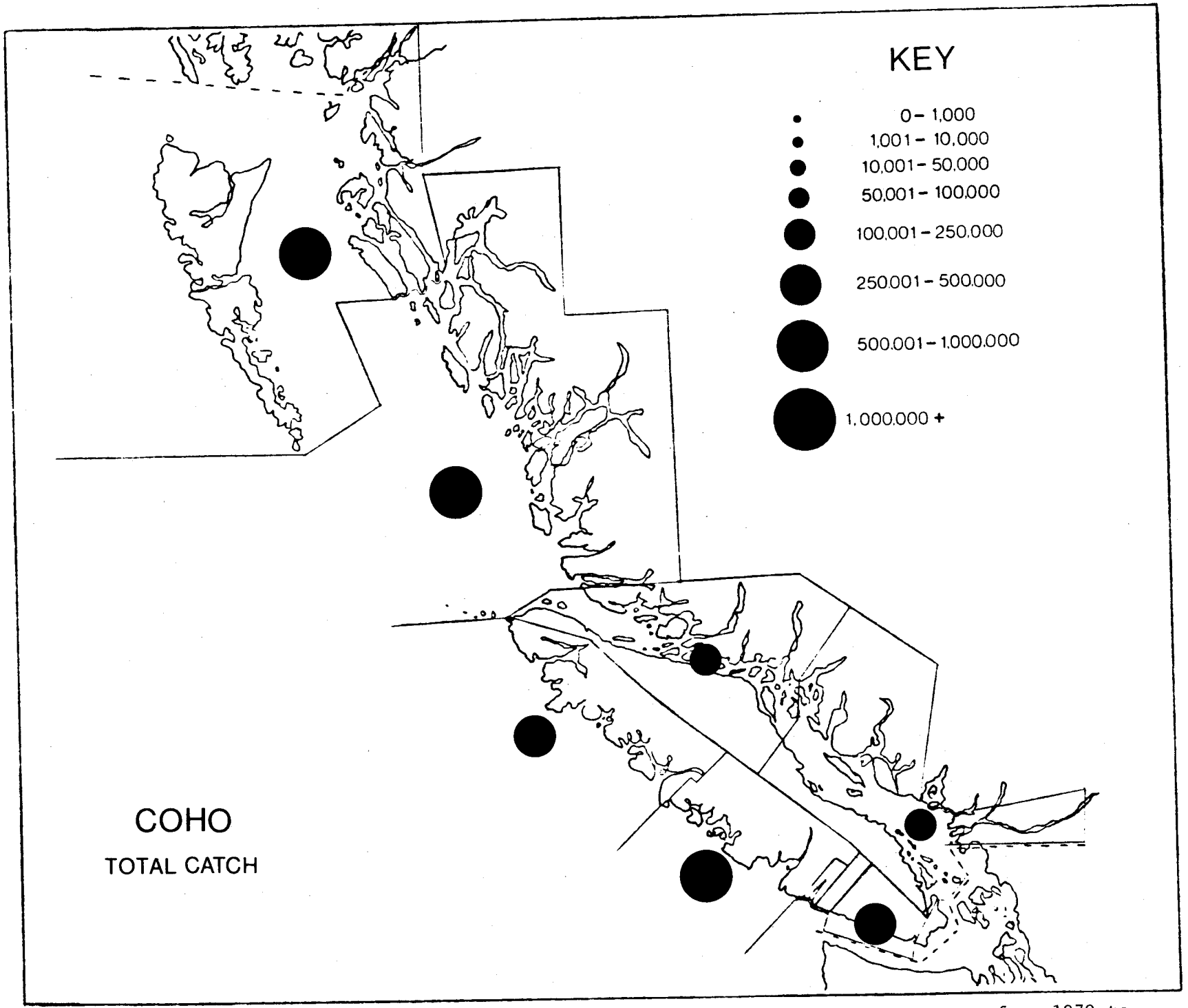


Figure 15. Average annual catches of coho salmon in the various British Columbia zones from 1970 to 1979 inclusive.

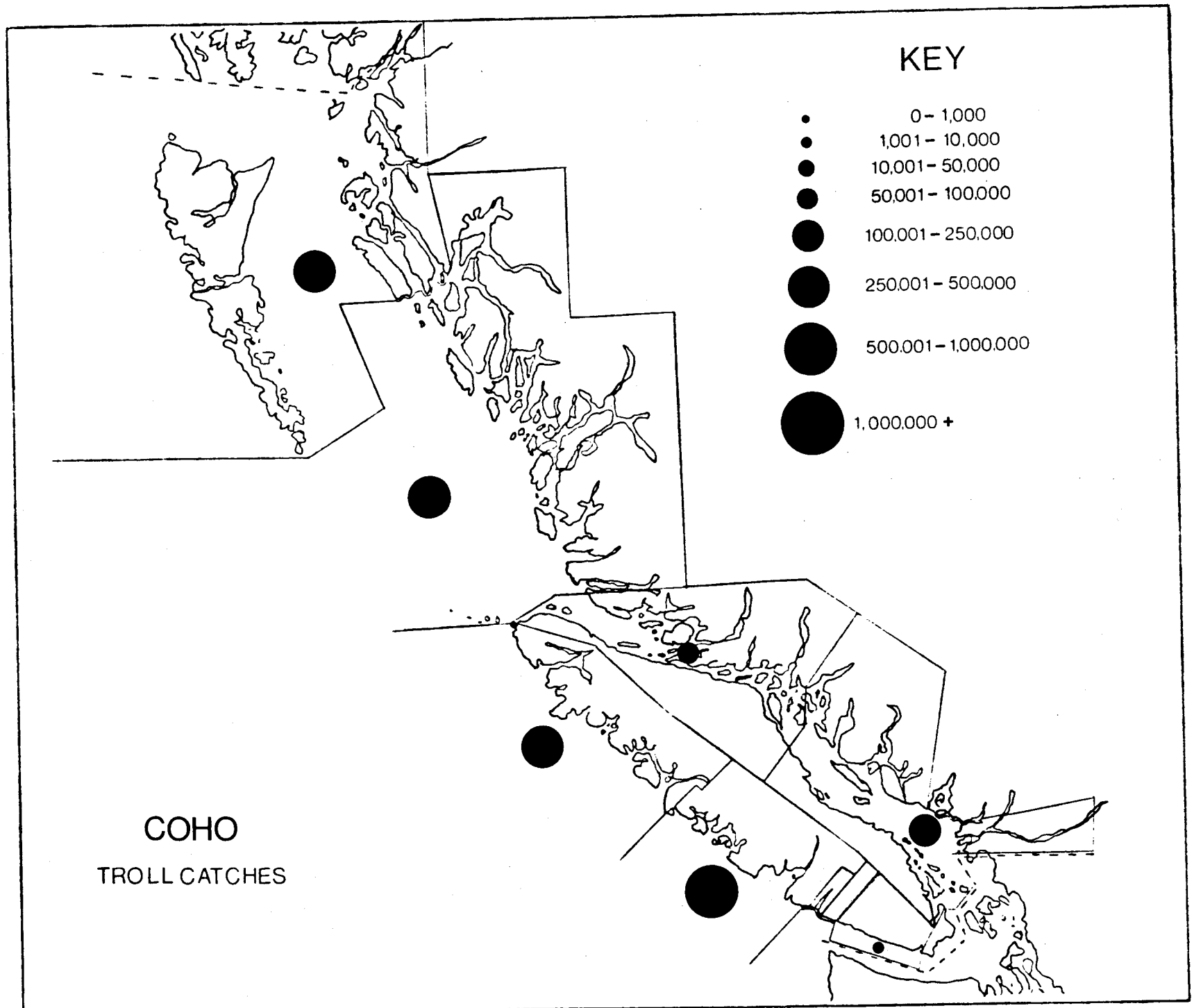


Figure 16. Average annual troll catches of coho salmon in the various British Columbia zones from 1970 to 1979 inclusive.

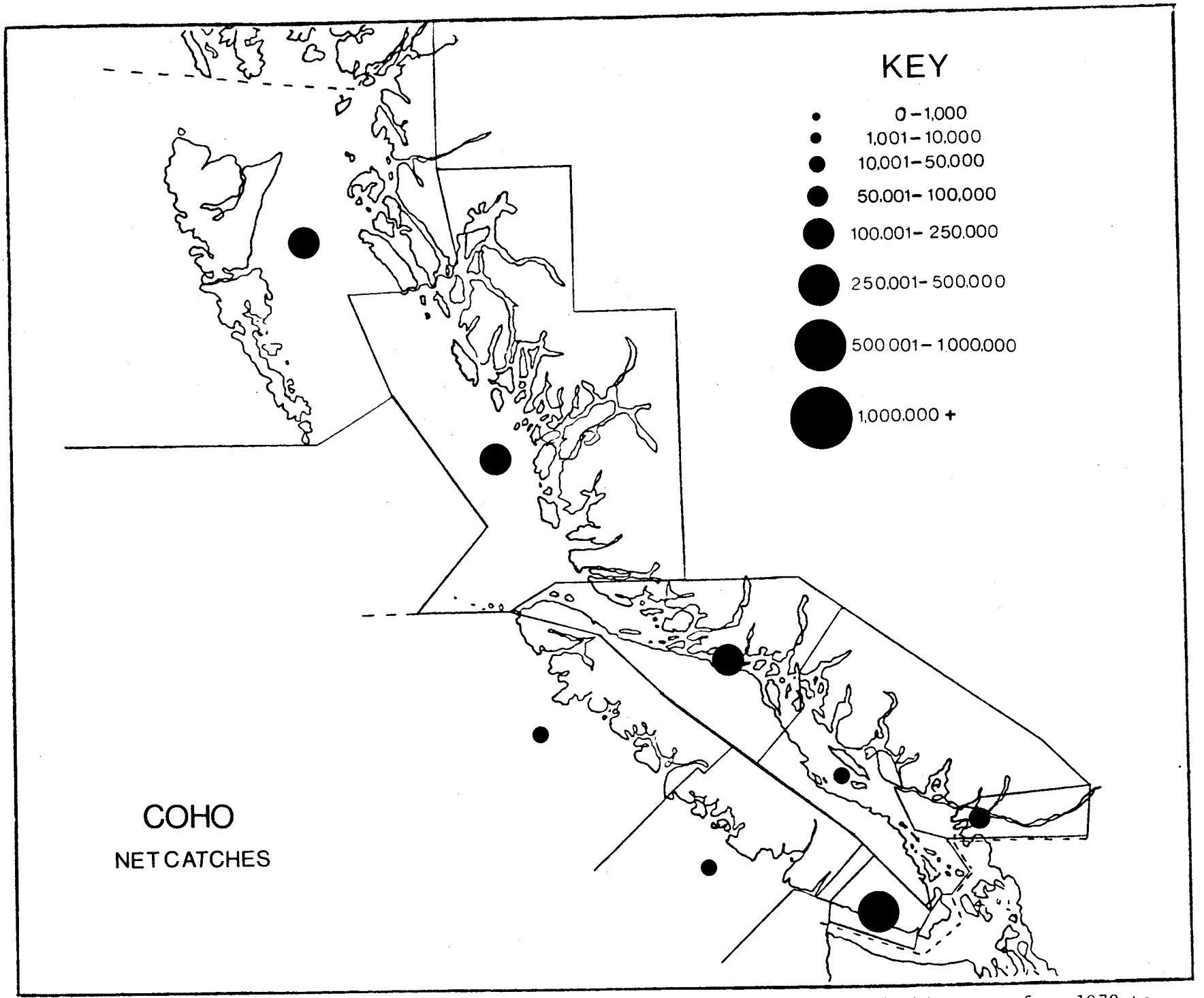


Figure 17. Average annual net catches of coho salmon in the various British Columbia zones from 1970 to 1979 inclusive.

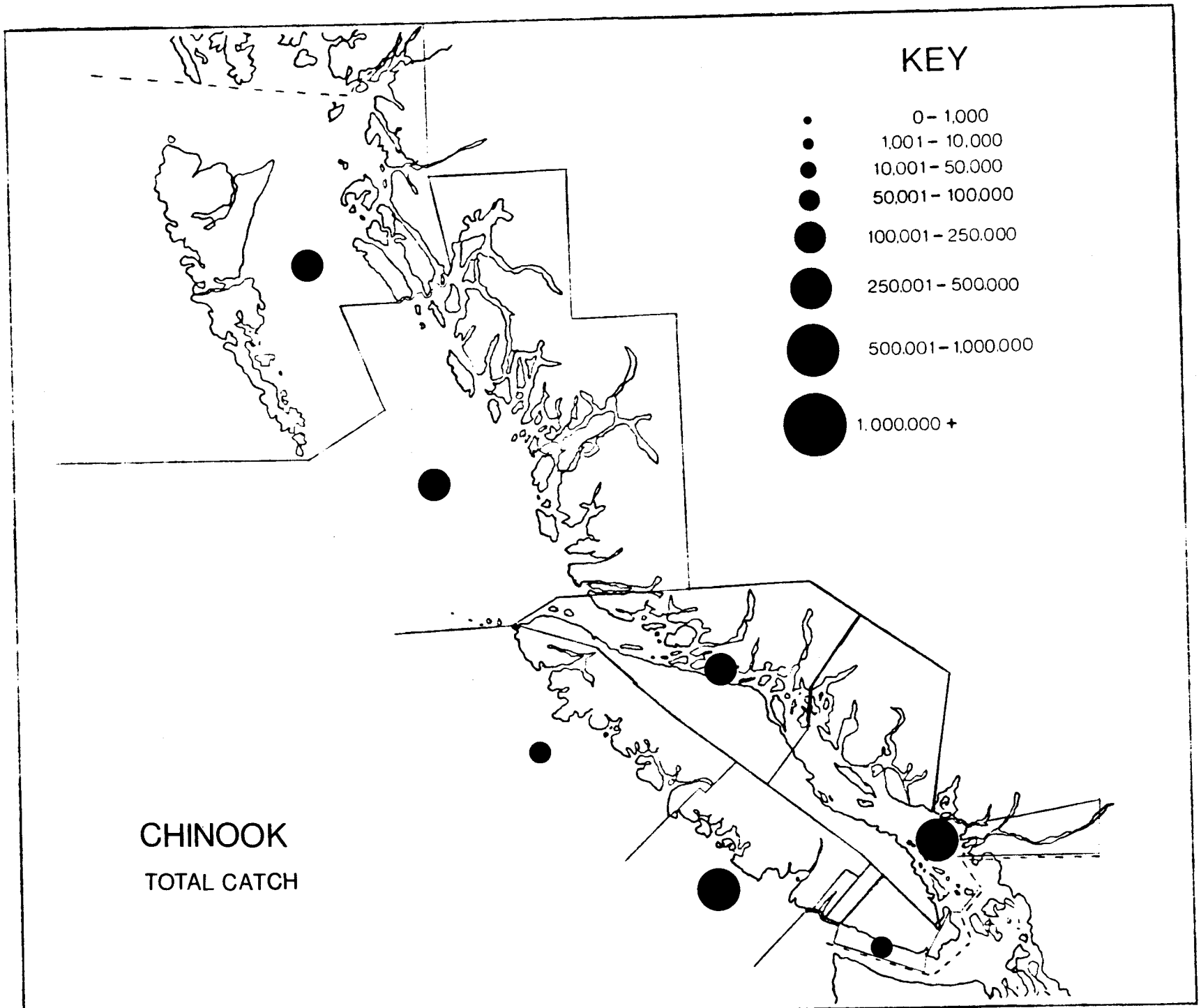


Figure 18. Average annual catches of chinook salmon in the various British Columbia zones from 1970 to 1979 inclusive.

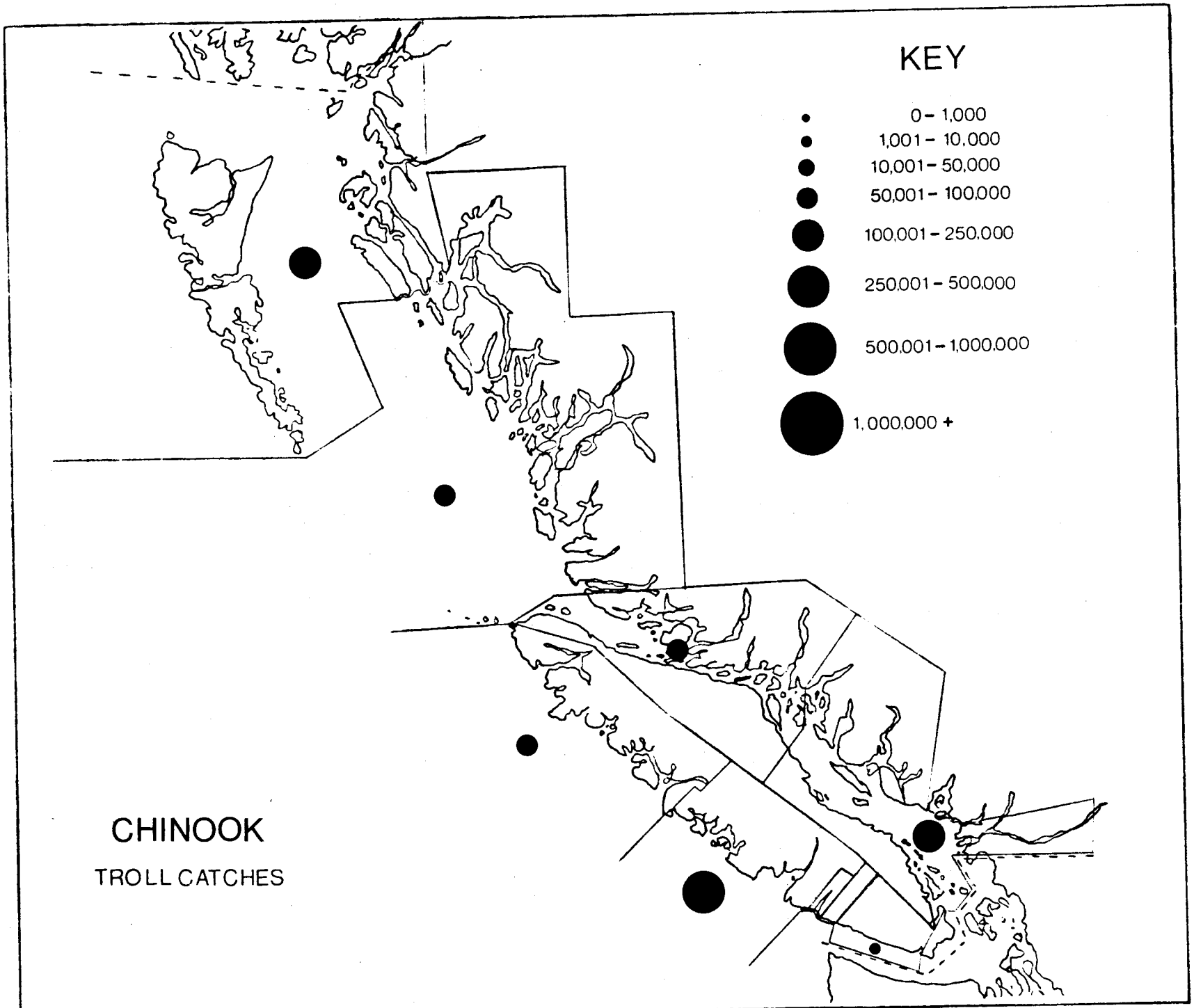


Figure 19. Average annual troll catches of chinook salmon in the various British Columbia zones from 1970 to 1979 inclusive.

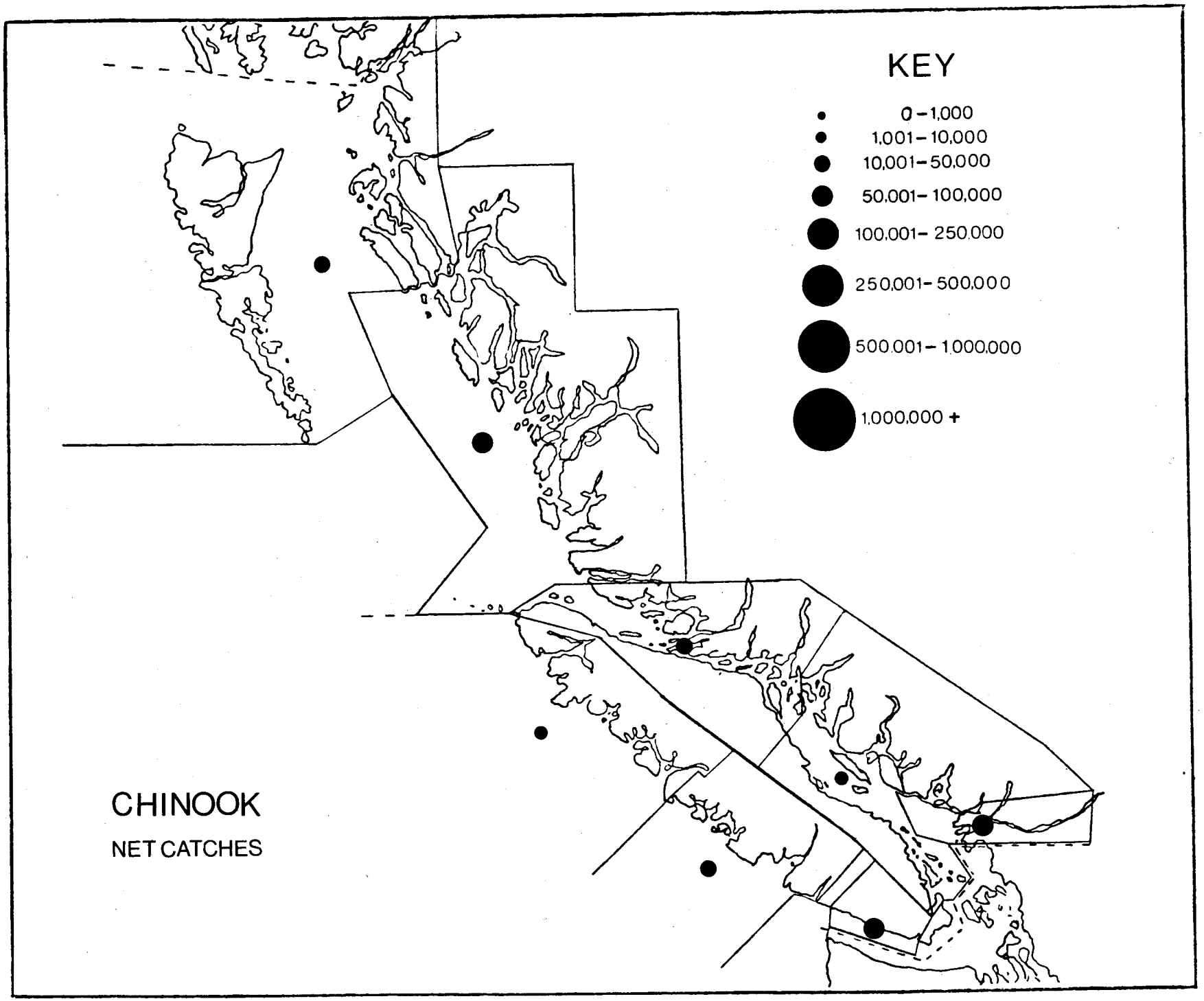


Figure 20. Average annual net catches of chinook salmon in the various British Columbia zones from 1970 to 1979 inclusive.

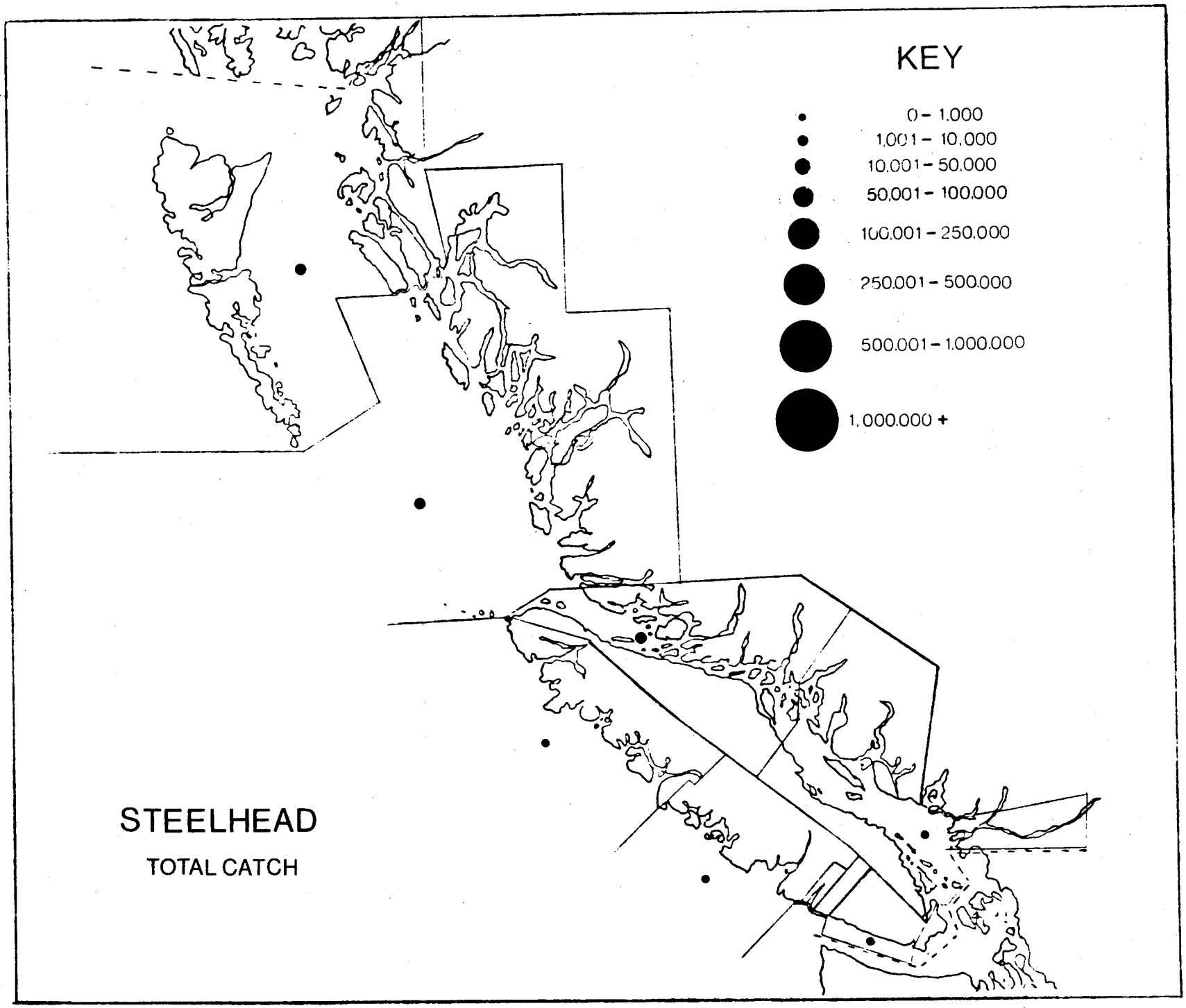


Figure 21. Average annual catches of steelhead trout in the various British Columbia zones from 1970 to 1979 inclusive.

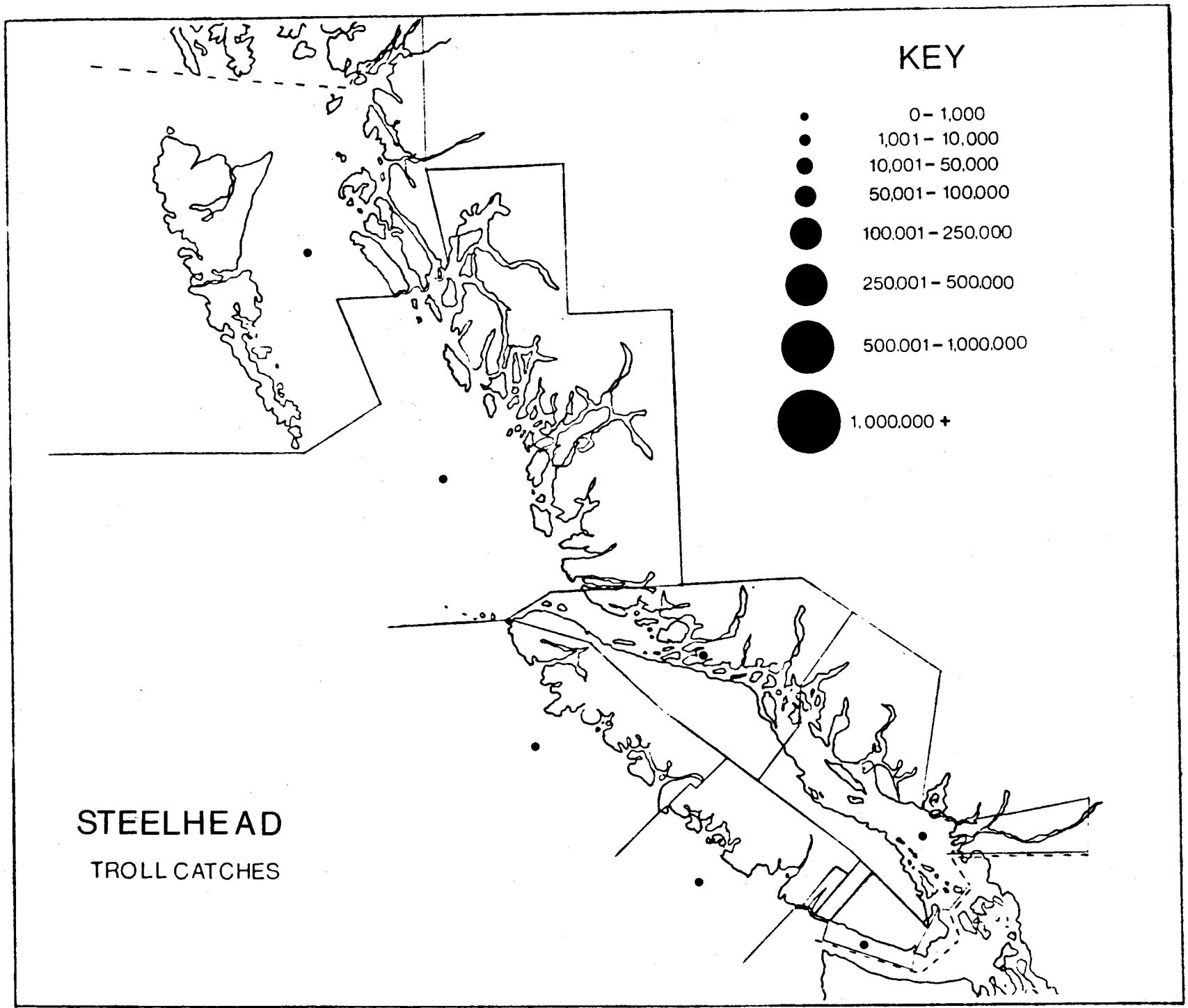


Figure 22. Average annual troll catches of steelhead trout in the various British Columbia zones from 1970 to 1979 inclusive.

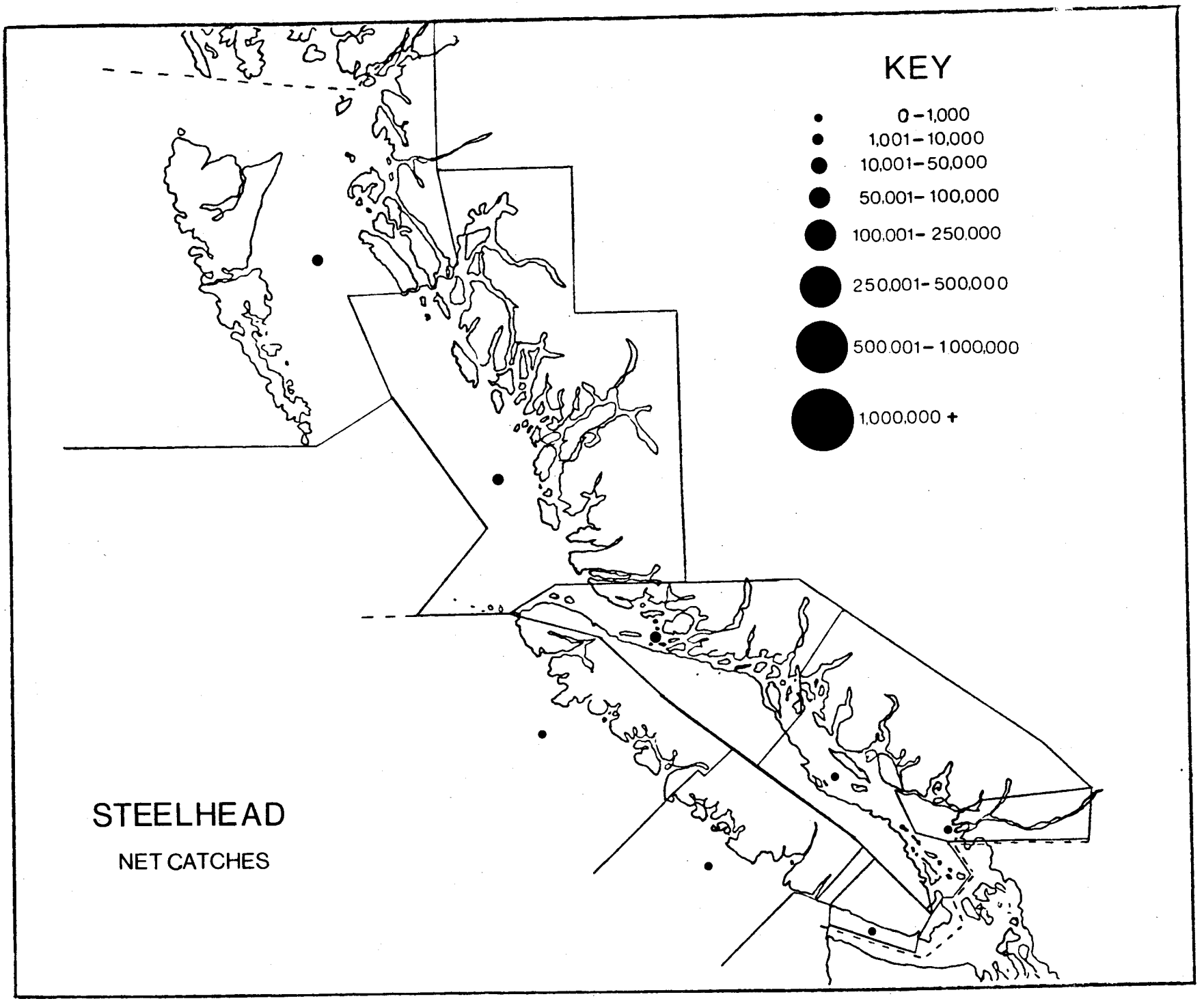


Figure 23. Average annual net catches of steelhead trout in the various British Columbia zones from 1970 to 1979 inclusive.

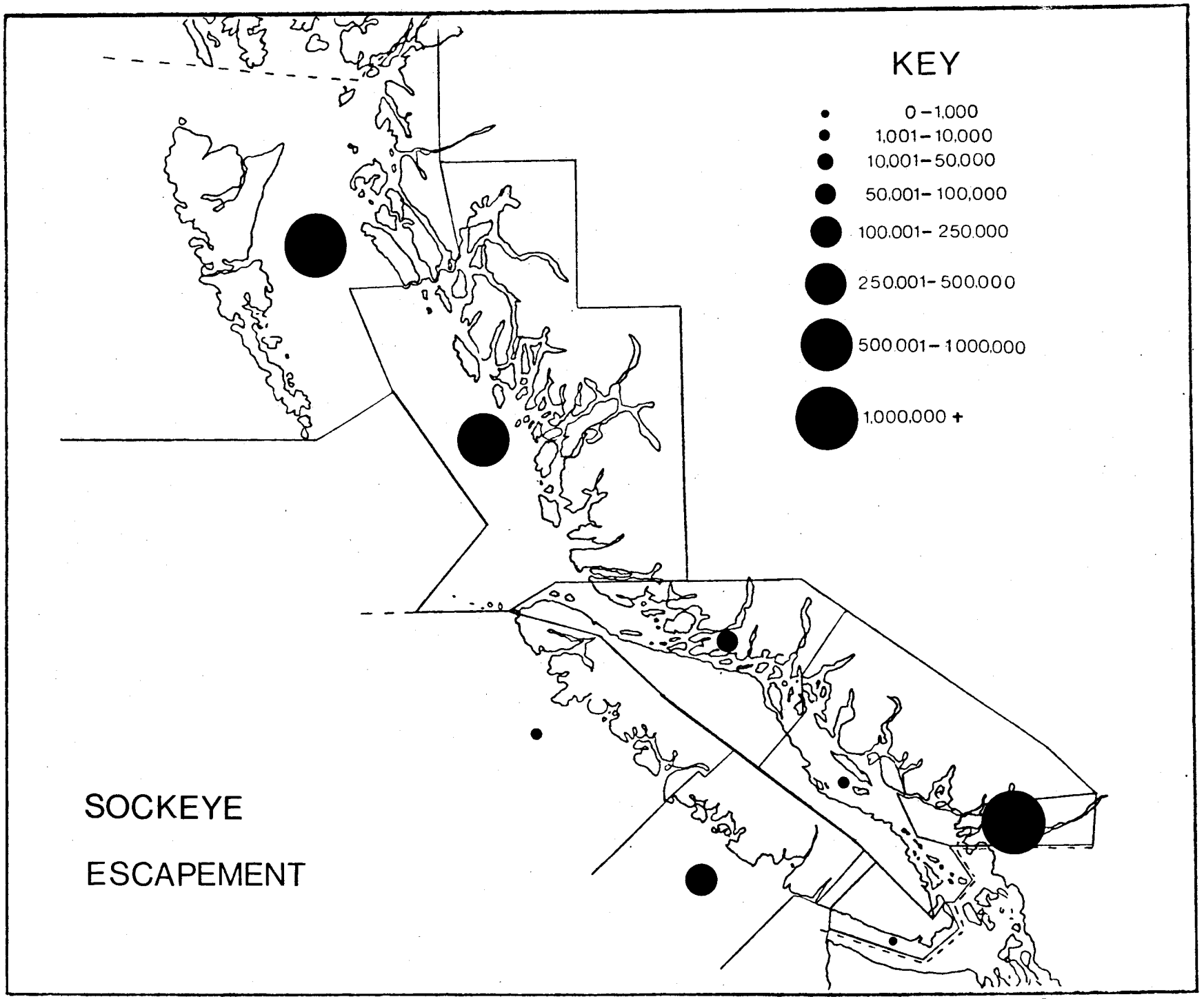


Figure 24. Average annual escapement of sockeye salmon in the various British Columbia zones from 1970 to 1979 inclusive.

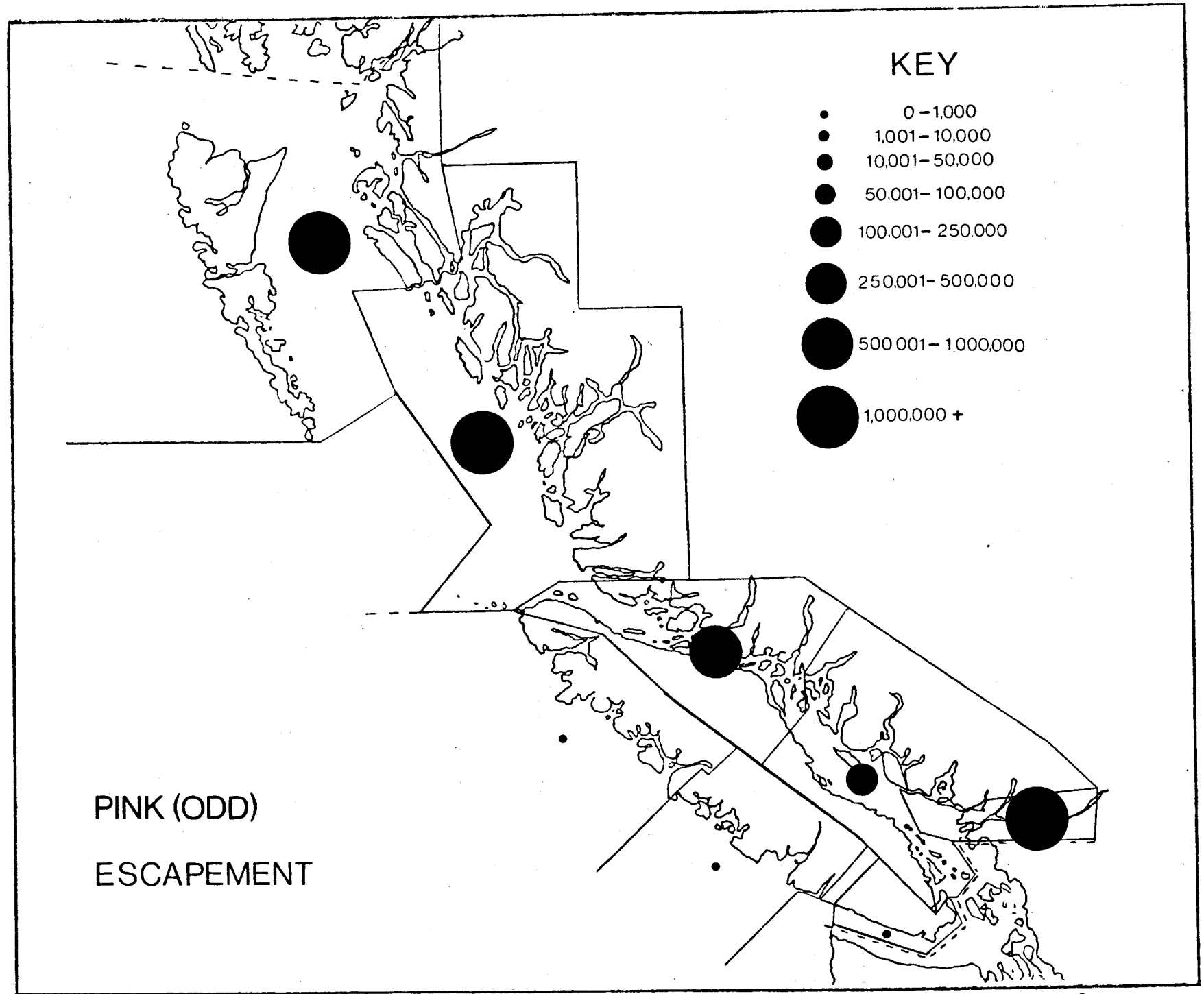


Figure 25. Average annual escapement of pink (odd) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (odd years only)

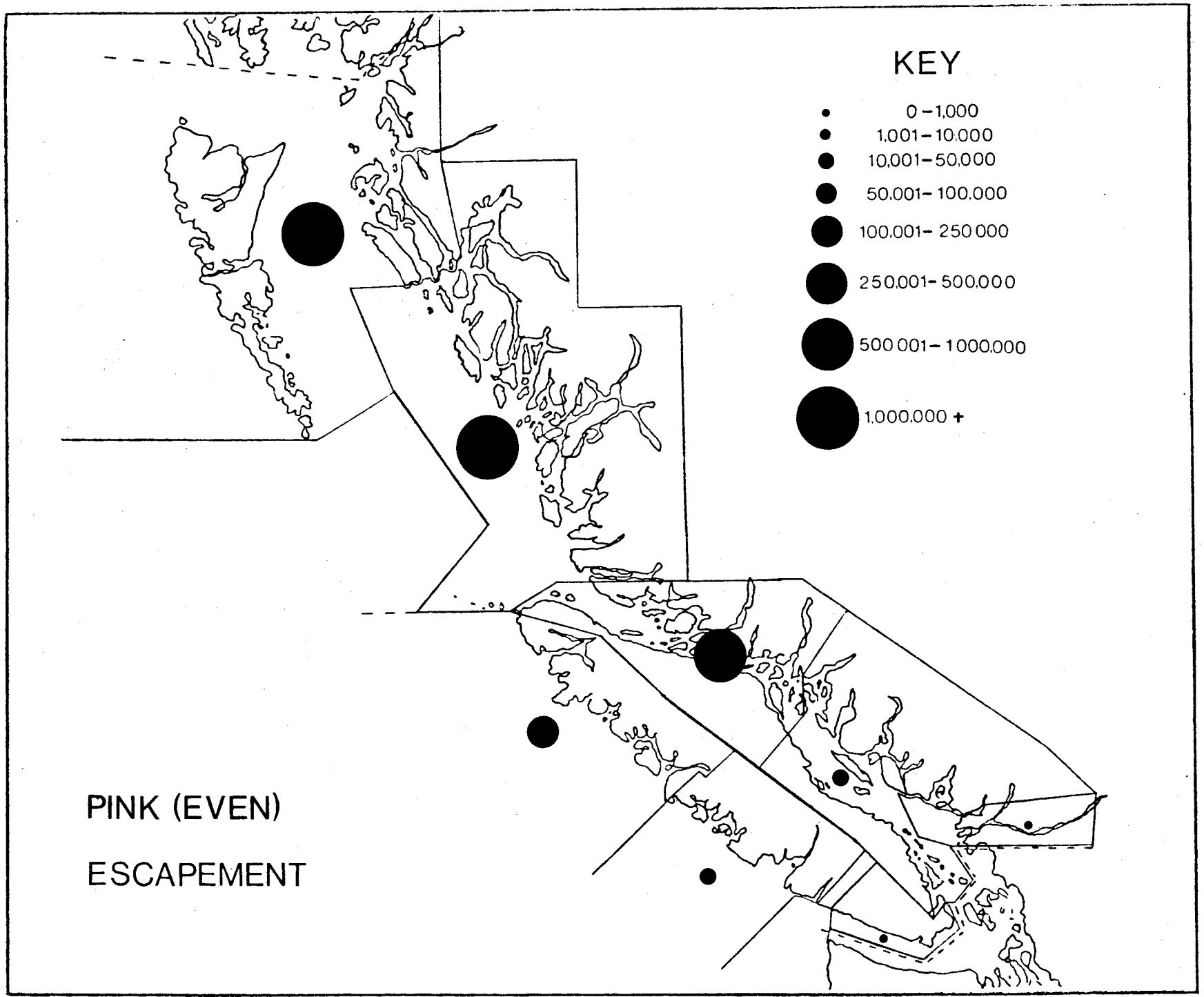


Figure 26. Average annual escapement of pink (even) salmon in the various British Columbia zones from 1970 to 1979 inclusive. (even years only)

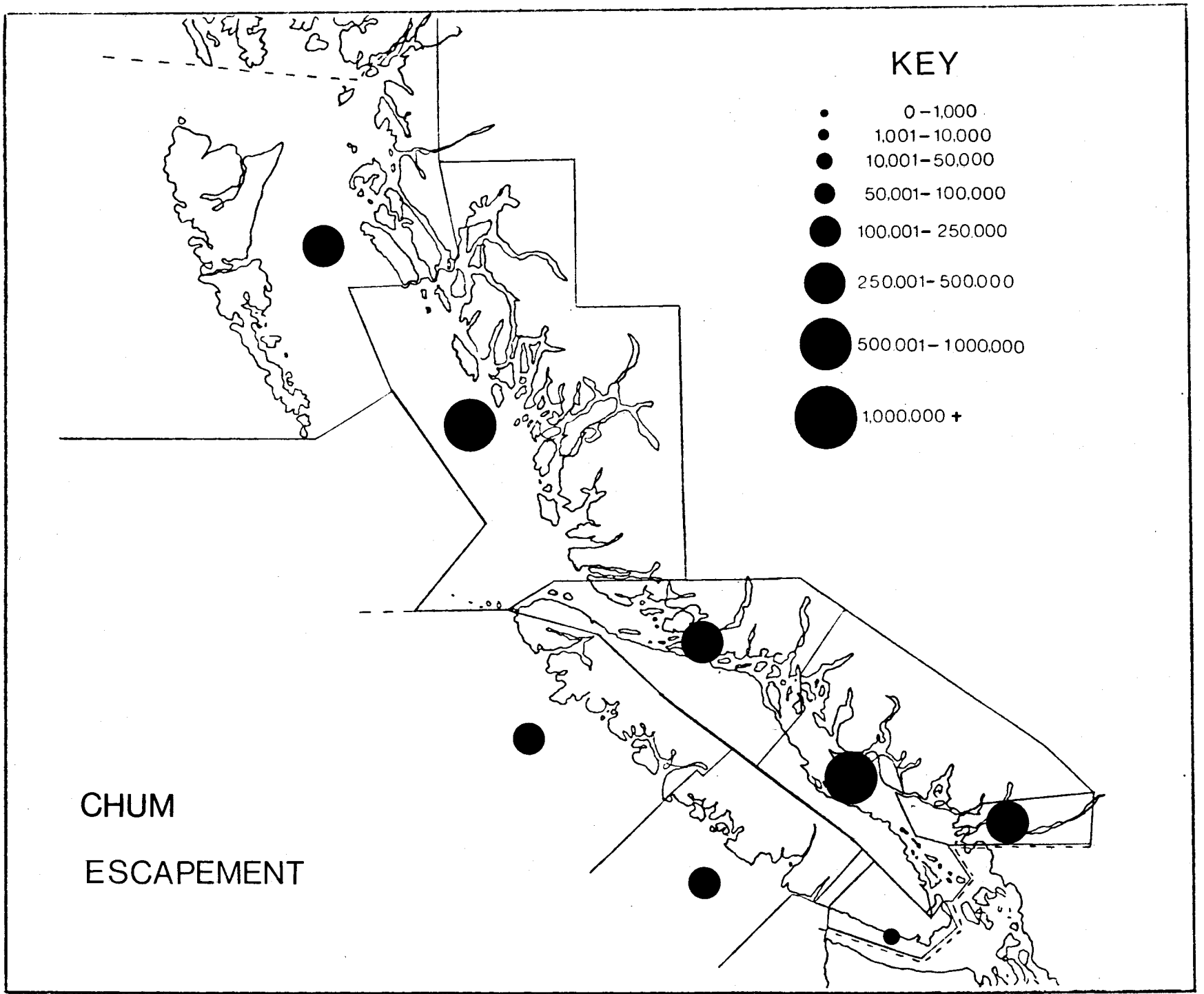


Figure 27. Average annual escapement of chum salmon in the various British Columbia zones from 1970 to 1979 inclusive.

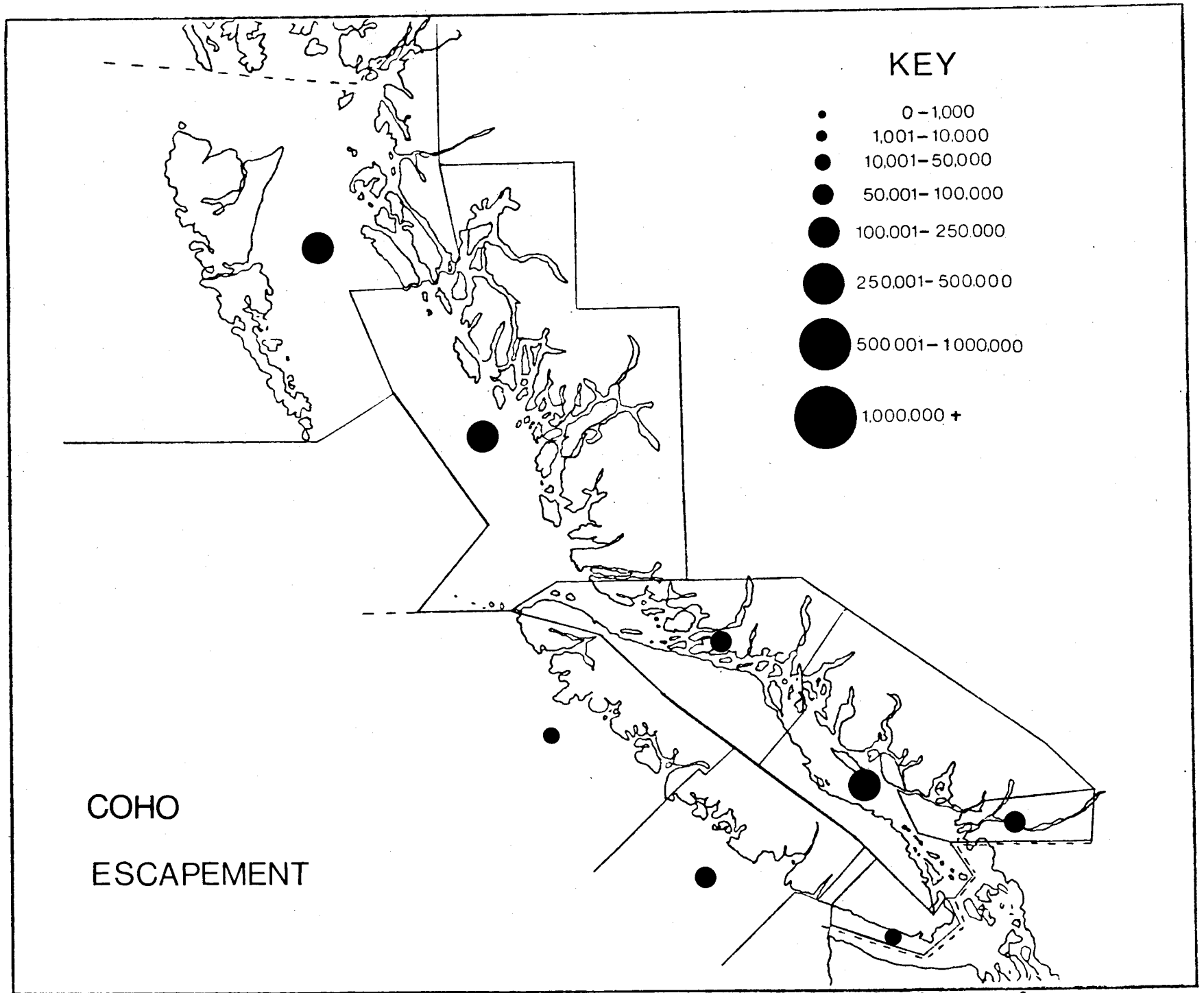


Figure 28. Average annual escapement of coho salmon in the various British Columbia zones from 1970 to 1979 inclusive.

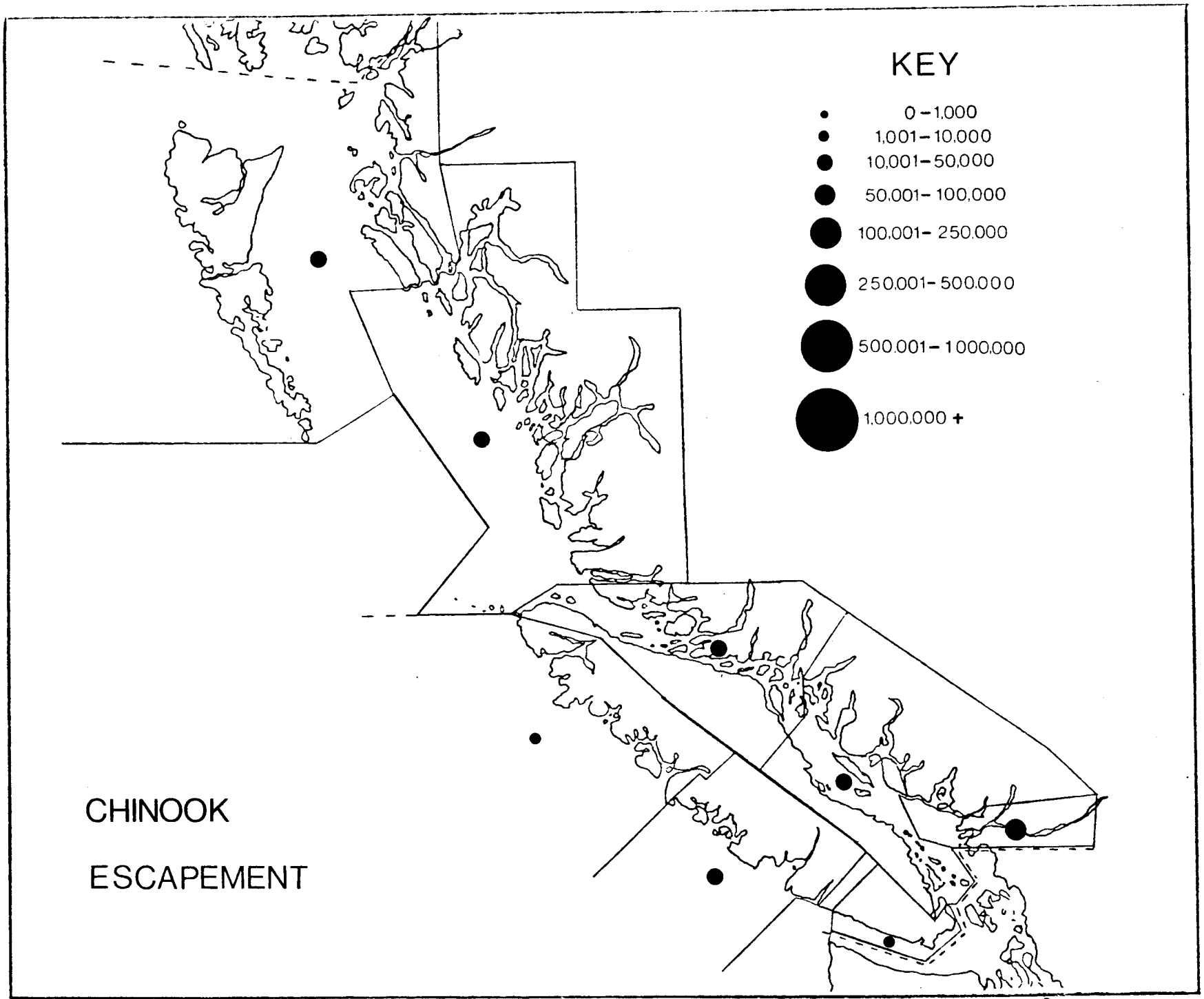


Figure 29. Average annual escapement of chinook salmon in the various British Columbia zones from 1970 to 1979 inclusive.

ACKNOWLEDGEMENTS

The author would like to thank F.E.A. Wood and W. Schouwenburg for their critical analyses of the manuscript. The technical information received from M. Peters and S. Steele is greatly appreciated, as are the efforts of all those involved in the production of the British Columbia Catch Statistics and the Escapement Catalogues. S. Gourlay, A. Jung and B. Leung are acknowledged for typing the manuscript and the tables.

References

Aro, K.V. & Shepard. 1967. "Spawning Populations of North Pacific Salmon". British Columbia.

Fredin, R.A. 1980. "Trends in North Pacific Salmon Fisheries in Salmonid Ecosystems of the North Pacific". Oregon.

Oguss, E. & Andrews, T.R. 1977. "Incidental Catches of Steelhead Trout in the Commercial Salmon Fisheries". Fisheries Management Report No. 7. British Columbia.

Scott, Q.B. & Crossman, E.J. 1973. "Freshwater Fishes of Canada". Ottawa.

APPENDIX 1:

COMMERCIAL SALMON CATCH (PIECES)

	DATE	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
ALASKA NET	1965	741	649	24	9	33	1	1,488
	1966	-	-	-	-	-	-	-
	1967	-	-	-	-	-	-	-
	1968	-	-	-	-	-	-	-
	1969	-	-	-	-	-	-	-
	1970	-	-	-	-	-	-	-
	1971	-	-	-	-	-	-	-
	1972	-	-	-	-	-	-	-
	1973	-	-	-	-	-	-	-
	1974	-	-	-	-	-	-	-
	1975	-	-	-	-	-	-	-
	1976	no landings						
	1977	no landings						
	1978	no landings						
	1979	no landings						
ALASKA TROLL	1965	-	120	40	7	4,764	-	4,931
	1966	-	518	795	51	4,015	-	5,379
	1967	4	842	177	224	16,628	-	17,875
	1968	7	1,732	853	99	18,168	-	20,859
	1969	12	7,043	1,493	30	17,476	-	26,054
	1970	42	4,511	2,443	61	15,577	2	22,636
	1971	3	2,923	705	10	5,911	-	9,552
	1972	-	2,294	267	2	1,006	-	3,569
	1973	1	239	16	9	6,591	-	6,856

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	DATE	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
ALASKA TROLL	1974	-	551	-	1	1,525	-	2,077
continued...	1975	-	1,190	367	-	2,571	-	4,128
	1976	no landings						
	1977	-	1	-	-	95	-	96
	1978	no landings						
	1979	no landings						
NORTHERN NET	1965	591,770	300,748	1,213,381	280,394	48,113	5,113	2,439,519
areas 1-5	1966	908,389	436,515	6,052,741	459,309	48,390	18,698	7,924,042
	1967	1,575,357	162,620	1,041,967	622,071	75,187	13,131	3,490,333
	1968	1,165,044	359,142	4,446,723	1,074,942	54,390	11,695	7,111,936
	1969	829,294	141,627	748,268	246,543	35,107	7,179	2,008,018
	1970	847,846	310,180	4,153,068	885,199	31,596	6,736	6,234,625
	1971	1,169,304	239,979	1,427,513	560,014	36,963	10,777	3,444,550
	1972	1,050,442	257,647	4,134,900	1,038,132	37,288	10,993	6,529,402
	1973	1,930,182	89,582	985,450	903,592	37,400	5,813	3,952,019
	1974	1,957,414	94,706	1,064,290	528,777	37,265	5,473	3,687,925
	1975	679,965	100,898	1,087,752	117,292	37,232	4,225	2,027,364
	1976	911,271	86,023	2,527,236	106,517	21,271	3,751	3,656,069
	1977	1,694,850	151,450	3,937,868	579,288	62,450	6,990	6,432,896
	1978	746,201	194,797	3,861,072	383,006	54,662	6,472	5,246,210
	1979	1,625,564	141,080	1,284,332	149,335	59,953	6,807	3,267,071
NORTHERN TROLL	1965	717	488,937	52,389	3,177	123,953	86	669,259
areas 1-5	1966	706	899,186	238,432	1,706	152,420	61	1,292,511

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	DATE	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
NORTHERN TROLL	1967	1,488	375,593	67,884	1,391	144,113	118	590,587
area 1-5	1968	1,686	911,684	296,415	2,124	169,508	157	1,381,574
continued...	1969	4,638	357,167	51,337	970	178,970	134	593,216
	1970	12,751	414,289	233,326	4,154	172,325	103	836,948
	1971	3,001	409,166	70,381	3,058	204,045	187	689,838
	1972	2,447	672,641	288,879	4,755	231,214	769	1,200,705
	1973	3,287	365,243	54,902	2,559	181,884	69	607,944
	1974	18,462	349,750	63,712	3,719	213,433	105	649,181
	1975	10,503	227,639	37,032	1,557	227,613	167	504,511
	1976	1,961	337,106	14,604	854	189,793	80	544,398
	1977	3,665	202,028	101,949	4,087	131,602	59	443,390
	1978	4,728	516,033	132,141	7,204	144,673	96	804,875
	1979	6,617	448,329	164,620	6,410	148,771	197	774,944
CENTRAL NET	1965	1,135,809	643,405	2,487,978	285,997	84,678	4,968	4,642,835
area 6-11	1966	913,841	475,057	7,085,829	759,349	54,821	5,445	9,294,342
	1967	1,753,082	323,646	330,602	286,523	65,299	5,019	2,764,171
	1968	3,481,368	487,973	10,186,499	1,107,626	56,257	3,541	15,323,264
	1969	1,010,636	130,803	123,000	429,292	40,091	2,030	1,735,852
	1970	360,523	363,841	5,877,968	1,581,549	71,780	1,966	9,257,627
	1971	779,269	130,667	587,709	446,151	49,573	2,842	1,996,211
	1972	695,582	375,811	8,311,324	1,404,361	89,953	2,845	10,879,876
	1973	2,385,175	233,660	938,297	1,793,301	82,044	2,579	5,435,056
	1974	740,349	249,760	4,184,401	978,113	77,038	1,856	6,231,517

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	DATE	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
CENTRAL NET	1975	393,619	163,896	350,131	331,566	79,787	2,180	1,321,179
areas 6-11	1976	978,960	217,667	3,478,950	553,293	55,774	1,638	5,256,281
continued...	1977	884,353	108,349	999,631	277,852	51,247	2,077	2,323,509
	1978	960,940	182,133	4,976,835	801,677	62,589	1,887	6,986,061
	1979	422,614	142,334	2,004,853	525,818	80,955	1,396	3,177,970
CENTRAL TROLL	1965	693	154,079	5,802	2,895	47,325	37	260,831
areas 6-11, 30	1966	1,018	252,677	285,256	1,027	59,165	26	599,169
	1967	17,335	182,759	172,976	718	59,453	50	433,291
	1968	72,973	331,141	800,639	2,560	55,523	78	1,263,914
	1969	10,960	120,888	10,257	691	53,277	40	196,113
	1970	23,378	365,322	669,824	17,626	64,177	59	1,140,386
	1971	4,343	364,468	54,144	3,685	71,359	74	498,073
	1972	2,709	437,664	682,996	4,358	126,729	138	1,254,594
	1973	37,027	396,032	164,407	11,293	89,285	66	698,110
	1974	28,252	311,103	369,049	4,373	100,931	59	813,767
	1975	1,579	148,186	45,864	2,691	100,270	53	298,643
	1976	10,545	505,621	280,264	2,849	126,533	82	925,894
	1977	21,298	228,180	470,793	3,788	110,723	61	834,843
	1978	138,723	318,909	133,706	14,932	88,576	131	694,977
	1979	5,414	143,355	88,044	5,396	69,530	74	311,813
JOHNSTONE STR. NET								
areas 12-13	1965	168,237	127,661	625,997	22,437	29,169	1,362	974,863

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
JOHNSTONE	1966	732,946	269,302	3,230,319	45,516	39,945	2,044	4,320,072
STR. NET	1967	1,319,075	141,163	2,891,738	147,423	51,661	2,938	4,553,998
areas 12-13	1968	439,710	172,734	3,265,937	647,759	35,565	1,690	4,563,395
continued...	1969	519,432	56,544	369,198	483,756	41,553	2,381	1,472,864
	1970	1,013,199	188,825	2,207,232	750,459	47,636	1,636	4,208,987
	1971	634,509	224,643	3,316,684	93,296	34,054	934	4,304,120
	1972	556,255	72,238	709,192	1,362,285	33,068	1,812	2,734,850
	1973	369,585	142,462	1,666,965	2,295,376	44,972	1,127	4,520,487
	1974	1,168,680	103,137	1,491,212	247,700	38,960	935	3,050,624
	1975	182,703	112,072	1,299,651	379,088	44,672	1,108	2,019,294
	1976	537,158	202,962	3,422,100	785,521	53,969	1,415	5,003,125
	1977	603,405	223,099	1,551,491	159,823	65,677	1,231	2,604,716
	1978	3,190,693	195,562	1,217,872	1,242,734	80,961	1,914	5,929,736
	1979	976,214	132,990	1,822,987	102,510	42,804	311	3,077,816
JOHNSTONE STR.	1965	1,253	471,743	48,029	897	39,118	31	917,114
TROLL	1966	9.459	823,580	208,145	919	72,900	103	1,112,793
areas 12 - 13	1967	30,511	372,496	608,784	667	61,149	135	1,043,231
	1968	19,080	453,948	429,755	1,041	61,881	279	965,984
	1969	9,926	164,077	94,367	1,155	54,999	130	324,654
	1970	41,195	159,065	133,816	2,744	42,524	63	379,407
	1971	5,286	111,145	171,368	1,206	56,095	28	345,128
	1972	1,631	60,510	20,446	222	45,195	21	128,025
	1973	5,164	58,525	151,440	1,272	31,421	55	247,876
	1974	21,162	66,691	57,950	329	46,049	29	192,210

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
JOHNSTONE	1975	1,816	42,613	67,263	975	43,924	96	156,680
STR. TROLL	1976	10,031	109,787	355,481	1,418	67,094	49	543,860
area 12 - 13	1977	12,108	81,110	296,012	3,449	66,781	36	459,496
continued...	1978	121,829	91,340	51,834	8,275	54,210	56	327,544
	1979	25,325	59,864	278,477	3,119	70,487	41	437,313
GEORGIA								
STR. NET								
areas 14-18, 28	1965	3,382	1,593	419	314	3,710	34	9,452
	1966	7,402	1,617	275	582	3,737	16	13,447
	1967	15,661	1,573	29,055	118	2,427	22	48,790
	1968	8,458	729	3,311	11,952	2,463	48	26,953
	1969	45,259	2,505	5,029	34,650	2,506	11	89,960
	1970	7,499	20,157	575	96,025	6,480	29	130,578
	1971	138,122	26,663	114,313	1,251	4,570	39	284,958
	1972	38,989	11,841	4,631	317,526	3,213	33	376,233
	1973	31,274	17,347	34,264	410,815	3,965	24	486,699
	1974	233,458	16,033	1,597	27,102	3,650	13	281,853
	1975	12,757	21,401	99,700	61,475	6,699	22	202,054
	1976	97,721	12,123	7,440	73,829	6,592	23	197,728
	1977	155,715	11,378	56,156	221	5,410	11	228,891
	1978	55,202	24,228	331	100,306	1,854	2	162,913
	1979	9,627	35,874	1,502	6,465	9,627	0	63,095

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
GEORGIA STR.	1965	451	123,264	2,857	23	70,311	18	196,924
TROLL	1966	1,279	189,617	494	5	78,075	18	269,488
areas 14-18, 29	1967	20,117	80,725	13,902	30	102,254	28	217,056
	1968	888	88,898	777	14	69,899	19	160,495
	1969	7,389	33,404	11,651	24	80,361	9	132,838
	1970	20,256	153,693	1,629	666	107,308	20	283,572
	1971	28,850	215,372	15,824	75	239,747	48	499,916
	1972	6,003	54,394	161	84	197,844	15	258,501
	1973	17,125	63,164	18,557	217	125,239	8	224,310
	1974	81,321	139,137	1,243	3,138	142,579	39	294,268
	1975	38,758	95,301	35,580	1,673	151,543	46	322,901
	1976	21,944	68,004	830	1,162	162,710	38	254,588
	1977	21,437	107,818	30,391	253	210,974	21	370,894
	1978	90,711	280,121	3,996	873	174,076	63	549,840
	1979	47,761	195,362	37,391	375	200,242	31	481,162
S.W. VAN. IS.	1965	12,556	1,192,209	78,227	210	347,879	227	1,631,308
TROLL	1966	25,807	1,040,034	18,302	109	538,501	330	1,623,083
areas 23, 24	1967	176,847	679,713	934,094	271	306,872	236	2,098,033
	1968	49,239	1,244,851	16,200	434	329,545	392	1,640,661
	1969	58,475	743,818	168,189	942	375,394	233	1,347,051
	1970	150,197	409,460	26,099	2,356	285,983	114	874,209
	1971	249,064	1,355,287	505,635	1,121	484,162	333	2,595,602
	1972	16,343	518,154	3,296	454	477,545	125	1,015,917
	1973	75,839	978,904	435,839	3,564	499,941	307	1,994,394

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
S.W. VAN. IS. TROLL areas 23, 24 continued...	1974	336,303	1,140,470	25,609	1,964	493,791	1,028	1,999,165
	1975	41,607	484,962	231,066	2,046	431,700	152	1,191,533
	1976	41,993	1,047,419	68,930	1,090	518,815	2,215	1,680,402
	1977	36,291	1,146,242	931,593	4,486	443,477	212	2,118,824
	1978	214,881	892,344	8,910	4,782	404,725	275	1,525,917
	1979	225,210	1,319,662	1,698,836	7,518	381,541	261	3,633,028
S.W. VANCOUVER ISLAND NET areas 22-24	1965	53,393	224	44	3	573	413	54,650
	1966	70,108	528	596	11	508	839	72,590
	1967	57,379	213	190	2	423	928	59,135
	1968	75,504	1,602	76	9	1,118	642	78,951
	1969	78,332	1,097	57	6	1,166	637	81,295
	1970	51,495	5,963	870	20,432	2,289	483	81,532
	1971	41,750	10,075	787	28,078	6,961	575	88,226
	1972	112,393	9.917	10,890	1,364,547	4,119	907	1,502,773
	1973	228,393	13,444	393	270,663	5,971	417	519,281
	1974	223,318	13,196	1,605	165,352	11,293	419	415,183
	1975	225,179	4,041	1,108	1,608	25,414	278	257,628
	1976	728,979	10,400	4,257	70,691	32,508	262	847,097
	1977	1,102,118	9,032	1,257	2,283	32,730	387	1,147,807
	1978	193,774	26,053	1,660	194,747	49,228	179	465,641
	1979	727,951	23,015	6,525	3,282	60,169	179	821,121
N.W. VANCOUVER ISLAND NET areas 25-27	1965	11,115	11,037	1,606	308	364	51	24,481
	1966	15,612	22,847	82,804	1,106	1,259	8	123,636
	1967	17,822	26,829	5,059	384	1,350	25	51,469

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
N.W. VANCOUVER	1968	16,901	12,569	84,312	2,490	1,259	56	117,587
ISLAND NET	1969	5,801	1,978	175	3,797	1,816	49	13,616
areas 25-27	1970	7,519	22,013	55,483	106,675	835	37	192,562
continued...	1971	26,244	30,967	5,748	74,275	2,430	160	139,824
	1972	7,282	23,723	8.198	119,577	1,455	188	160,423
	1973	28,370	23,355	16,395	177,836	6,505	96	252,557
	1974	88,501	63,976	21,063	229,231	9,808	227	412,806
	1975	166,428	72,406	34,538	127,001	10,503	385	411,261
	1976	200,044	28,341	80,332	44,373	4,867	93	358,050
	1977	44,735	41,301	4,700	11,095	2,007	37	103,875
	1978	4,030	2,602	951	6,756	322	6	14,667
	1979	1,584	2,323	2,323	2,379	228	3	8,840
N.W. VANCOUVER	1965	3,414	458,166	26,802	670	44,412	96	533,560
ISLAND TROLL	1966	8,247	337,804	51,365	303	56,531	65	454,315
areas 25-27	1967	32,556	282,938	238,907	279	77,054	86	631,820
	1968	45,282	525,805	101,577	1,343	84,647	176	758,830
	1969	87,231	212,386	252,321	1,313	68,150	68	621,469
	1970	116,643	252,839	187,918	6,759	42,862	63	607,084
	1971	329,077	666,312	395,113	4,492	67,830	341	1,463,165
	1972	9,630	387,038	35,732	816	58,523	97	491,836
	1973	19,661	278,508	325,529	2,409	61,753	60	687,920
	1974	406,463	413,434	89,164	3,476	96,728	150	1,009,415
	1975	11,624	256,741	368,785	6,218	78,676	108	722,152
	1976	22,582	503,871	79,182	2,134	102,081	127	709,977

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
N.W. VANCOUVER	1977	26,956	323,302	662,286	5,316	59,839	55	1,077,754
ISLAND TROLL	1978	486,287	405,458	96,601	26,413	111,103	209	1,126,071
areas 25-27	1979	90,613	547,809	1,266,059	11,258	79,699	637	1,996,075
FRASER NET	1965	863,903	42,031	109,135	11,939	90,870	1,319	1,119,197
areas 29 -	1966	628,093	37,094	201	13,873	95,750	2,064	777,075
A, B, C, & D	1967	860,613	33,466	524,851	46,527	115,375	1,567	1,582,399
	1968	831,160	81,973	289	202,366	103,024	2,765	1,221,577
	1969	952,518	22,870	251,533	88,927	86,189	1,249	1,403,286
	1970	570,528	99,085	850	178,903	124,753	1,213	975,332
	1971	1,310,376	69,672	623,174	21,682	132,320	1,200	2,158,424
	1972	526,430	80,923	184	256,370	121,145	1,763	986,815
	1973	1,057,963	53,550	279,897	190,524	94,518	757	1,677,209
	1974	695,732	56,421	209	93,129	67,778	525	913,794
	1975	411,859	43,238	337,318	73,211	73,744	802	940,172
	1976	555,121	14,144	533	174,016	79,876	465	824,155
	1977	1,163,167	42,230	282,486	14,364	90,893	448	1,593,588
	1978	518,117	67,349	527	124,431	56,744	440	767,608
	1979	1,059,379	7,710	85,869	7,719	51,511	196	1,210,384
JUAN DE FUCA	1965	169,828	453,659	409,513	23,574	25,972	565	1,083,111
NET	1966	696,955	564,169	5,266	26,841	25,146	1,184	1,319,561
area 20	1967	853,750	459,976	2,623,019	20,575	19,243	560	3,977,123
	1968	56,700	398,946	962	26,750	21,671	326	505,365
	1969	633,839	258,609	388,757	18,358	38,383	530	1,338,476

APPENDIX 1 continued... COMMERCIAL SALMON CATCH (PIECES)

	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
JUAN DE FUCA	1970	828,541	463,978	9,079	25,517	109,140	192	1,436,447
NET	1971	1,569,827	597,715	1,095,616	24,436	55,959	259	3,343,812
area 20	1972	544,493	158,261	5,728	202,158	38,207	758	949,605
	1973	1,404,445	474,053	1,379,516	174,064	58,310	339	3,490,727
	1974	1,214,315	438,102	1,786	79,597	48,452	315	1,782,567
	1975	90,117	408,213	615,586	40,497	30,173	1,560	1,186,146
	1976	691,974	249,093	21,749	113,024	39,150	851	1,115,841
	1977	573,870	505,648	846,341	21,941	73,999	1,061	2,022,860
	1978	471,787	103,230	496	55,020	27,504	133	658,170
	1979	323,275	255,358	2,564,122	3,899	34,877	267	3,181,798
JUAN DE FUCA	1965	172	6,362	4,426	10	3,038	3	14,011
TROLL	1966	51	7,873	216	14	3,904	1	12,059
area 20	1967	3,685	2,659	44,898	27	1,384	11	52,664
	1968	7	1,825	2	2	518	-	2,354
	1969	2,580	8,792	30,201	30	1,978	12	43,581
	1970	16,904	16,789	792	308	6,257	6	60,695
	1971	4,299	7,130	5,118	33	2,395	3	18,978
	1972	1,501	7,434	729	142	3,371	2	13,179
	1973	1,966	1,508	11,148	70	549	6	15,241
	1974	3,536	5,454	86	19	1,480	8	10,583
	1975	288	3,461	2,452	138	875	2	7,216
	1976	2,464	2,892	8	167	1,600	1	7,132
	1977	2,053	8,676	27,221	188	1,428	16	39,582
	1978	4,219	2,789	22	353	868	4	8,255
	1979	1,537	1,748	20,886	20	457	1	24,649

APPENDIX 1 continued...

COMMERCIAL SALMON CATCH (PIECES)

	DATE	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
WASHINGTON	1965	120	54,956	9,529	14	12,865	17	77,501
OREGON TROLL	1966	352	52,118	268	1	19,047	20	71,806
areas 21, C	1967	7,301	205,661	289,889	52	27,368	127	530,398
	1968	733	181,474	3,135	45	16,225	87	201,699
	1969	7,084	150,197	65,837	28	22,620	97	245,863
	1970	22,182	711,517	22,044	160	79,257	-	835,160
	1971	9,090	331,070	68,779	134	133,241	106	542,420
	1972	1,852	228,530	798	27	81,928	102	313,237
	1973	5,351	340,993	70,024	879	94,076	88	511,411
	1974	8,196	272,920	2,220	133	81,243	76	364,788
	1975	2,692	145,418	19,414	148	66,310	39	234,021
	1976	1,045	302,963	6,969	123	80,427	91	391,618
	1977	2,758	150,887	156,604	366	86,488	45	397,148
	1978	11,559	63,150	446	264	55,192	5	130,616
	1979	15,670	45,559	99,567	216	19,789	63	180,864

APPENDIX 2: COMMERCIAL CATCH: 1970 - 1979 (10 yr. Average)(Pieces)

NET	SOCKEYE	COHO	PINK(E)	PINK(O)	CHUM	CHINOOK	STEELHEAD	
NORTHERN	1,261,304	166,634	3,148,113	1,744,583	525,115	41,608	6,804	
CENTRAL	860,138	216,812	5,365,895	976,124	869,368	70,074	2,126	
JOHNSTONE STR.	923,240	159,799	1,809,521	1,931,555	741,879	48,678	1,242	
GEORGIA STR.	78,036	19,704	2,915	61,187	109,501	5,206	20	
S.W. VAN. IS.	363,353	12,514	3,856	2,014	212,168	23,068	409	
N.W. VAN. IS.	57,474	31,100	33,205	12,741	89,920	3,896	123	
FRASER	680,929	53,432	461	321,749	113,435	89,328	781	
JUAN DE FUCA	771,264	365,365	7,768	1,300,236	73,995	51,577	574	
TROLL								
NORTHERN	6,742	394,422	146,532	85,777	3,836	184,535	183	
CENTRAL	27,327	321,884	427,168	164,650	7,099	94,811	80	
JOHNSTONE STR.	24,555	84,065	123,905	192,912	2,301	52,378	47	
GEORGIA STR.	37,417	137,237	1,572	27,549	852	171,226	72	
S.W. VAN. IS.	138,845	929,290	26,569	760,594	2,938	442,168	502	
N.W. VAN. IS.	151,954	403,531	97,719	603,554	6,929	75,909	185	
JUAN DE FUCA	3,877	5,788	327	13,381	144	1,928	5	
WASHINGTON/OREGON	8,040	259,301	6,495	82,878	245	77,795	62	
TOTAL								TOTAL
NORTHERN (area 1 - 5)	1,268,046	561,056	3,294,645	1,830,360	528,951	226,143	6,987	7,716,188

APPENDIX 2 continued... COMMERCIAL CATCH: 1970 - 1979 (10 yr. Average)(Pieces)

TOTAL continued...	SOCKEYE	COHO	PINK(E)	PINK(O)	CHUM	CHINOOK	STEELHEAD	TOTAL
CENTRAL (area 6 - 11, 30)	887,465	538,696	5,793,063	1,140,774	876,467	164,885	2,206	9,403,556
JOHNSTONE STR. (area 12, 13)	947,795	243,864	1,933,426	2,124,467	744,180	101,056	1,289	6,096,077
GEORGIA STR. (area 14 - 18, 28, 29)	796,382	210,373	4,948	410,485	223,788	265,760	873	1,912,609
S.W. VAN. IS. (area 22 - 24)	502,198	941,804	30,425	762,608	215,106	465,236	911	2,918,288
N.W. VAN. IS. (area 25 - 27)	209,428	434,631	130,924	616,295	96,849	79,805	308	1,568,240
JUAN DE FUCA (area 20)	775,141	371,153	8,095	1,313,617	74,139	53,505	579	2,596,229

APPENDIX 3:

10 YEAR SALMONID ESCAPEMENTS*

AREA	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
NORTHERN	1970	877,004	255,350	2,853,260	411,715	40,550		4,437,879
(areas 1 - 5)	1971	1,171,599	168,980	1,405,542	389,008	38,400	50	3,173,579
	1972	920,858	174,336	3,675,256	473,625	41,220	40	5,285,335
	1973	1,214,892	173,166	1,426,386	428,426	44,745	1,240	3,288,855
	1974	1,060,110	187,270	1,752,336	387,220	37,026		3,423,962
	1975	993,679	166,870	2,174,470	343,808	28,684		3,707,511
	1976	957,658	290,450	2,153,821	315,404	20,671		3,738,004
	1977	1,409,247	193,790	1,330,207	368,166	41,015		3,342,425
	1978	624,760	225,586	2,298,158	402,820	34,124		3,585,448
	1979	1,402,017	122,583	623,814	193,123	28,022		2,369,559
10 year average		1,063,182	195,839	O 1,392,137 E 2,546,566	371,332	35,446	-	
CENTRAL	1970	225,900	155,250	1,935,115	840,950	29,525	3,400	3,190,140
(areas 6 - 11)	1971	528,450	122,235	1,019,905	595,830	63,865	12,000	2,342,285
	1972	338,250	115,590	2,971,400	794,826	36,245		4,256,311
	1973	1,268,025	116,350	553,560	1,050,065	40,855	12,500	3,041,355
	1974	813,770	109,700	2,175,130	754,725	41,220		3,894,545
	1975	647,822	85,285	602,115	302,896	15,600		1,653,718
	1976	429,900	146,948	2,789,073	296,995	38,119		3,701,035
	1977	368,290	89,010	856,702	388,837	40,483		1,743,322
	1978	510,425	93,690	3,556,775	628,840	36,330		4,826,060
	1979	387,820	93,695	2,128,033	399,483	29,450		3,038,481
10 year average		551,870	112,775	O 1,032,063 E 2,685,499	605,345	37,169	-	

*As per Escapement Catalogues unless otherwise noted.

APPENDIX 3 continued...

10 YEAR SALMONID ESCAPEMENTS

AREA	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
JOHNSTONE STRAIT	1970	41,575	134,450	929,155	437,375	24,025	5,800	1,572,380
(areas 12 - 13)	1971	111,854	66,625	1,173,400	156,875	17,050	4,775	1,530,579
	1972	86,100	67,390	508,475	452,205	25,175	-	1,139,345
	1973	125,975	84,675	710,683	615,705	32,530	1,000	1,570,568
	1974	170,554	95,050	783,260	356,641	26,764	4,400	1,436,669
	1975	57,056	63,685	1,129,325	227,348	24,575	800	1,502,789
	1976	56,807	64,809	1,407,885	320,026	24,475	1,700	1,875,702
	1977	27,625	42,875	158,940	387,713	12,605	120	629,878
	1978	20,956	43,574	847,875	381,690	11,691	-	1,305,786
	1979	28,236	38,196	148,916	125,350	9,663	1,000	351,361
10 year average		72,674	70,133	O 664,253 E 895,330	346,093	20,855	1,960	
GEORGIA STRAIT	1970	5,100	229,364	9,882	600,806	68,086	8,866	922,104
(areas 14 - 18, 28)	1971	8,600	228,118	146,750	294,482	41,191	5,190	724,331
	1972	4,626	86,255	14,497	858,759	33,833	23,784	1,021,754
	1973	1,687	122,534	214,998	864,621	35,112	19,964	1,258,916
	1974	7,100	322,117	40,650	608,161	17,442	22,171	1,017,641
	1975	1,725	179,895	139,010	392,454	14,191	17,670	744,945
	1976	6,225	105,687	11,530	409,994	19,145	10,087	562,668
	1977	1,725	212,412	52,864	588,261	21,425	5,525	882,212
	1978	4,664	124,557	3,135	738,707	26,488	2,380	899,931
	1979	11,117	176,832	40,617	247,726	27,169	6,150	509,611
10 year average		5,257	178,915	O 118,848 E 15,939	560,397	30,408	12,179	

APPENDIX 3 continued...

10 YEAR SALMONID ESCAPEMENTS

AREA	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
FRASER RIVER SYSTEM*	1970	1,901,965	69,050	-	228,950	62,320		2,262,285
	1971	780,925	116,206	733,250	174,075	60,208		1,864,664
	1972	832,712	49,971	-	295,690	47,185		1,225,558
	1973	1,187,788	65,520	870,250	174,725	79,610		2,377,893
	1974	1,767,000	79,985	12	238,665	74,825		2,160,487
	1975	1,084,931	68,055	599,745	131,545	78,405		1,962,681
	1976	915,654	54,891	-	224,142	84,055		1,278,742
	1977	1,113,453	71,741	2,387,811	538,700	80,156		4,191,861
	1978	2,514,318	77,699	-	486,600	72,705		3,151,322
	1979	1,407,828	56,446	3,560,654	327,700	62,685		5,415,313
10 year average		1,160,461	64,051	O 1,630,342 E -	282,079	63,983	**9,400	
JUAN DE FUCA (areas 19 - 20)	1970	0	84,350	1,500	70,150	9,775	400	166,175
	1971	200	11,551	-	29,625	1,925		43,301
	1972	200	20,550	-	100,725	7,775		129,250
	1973	83	25,655	-	122,037	7,425		155,200
	1974	77	11,513	75	28,675	1,177		41,517
	1975	75	2,825	-	9,550	700		13,150
	1976	0	1,600	75	9,725	130		11,530
	1977	1,500	1,817	-	22,530	175		26,022
	1978	25	4,842	-	38,557	145	150	43,719
	1979	3,500	5,233	50	7,015	495		16,293
10 year average		571	16,994	O - E 330	43,859	2,972	-	

*Area 29 and all related subdistricts
**As per GWG report

APPENDIX 3 continued...

10 YEAR SALMONID ESCAPEMENTS

AREA	YEAR	SOCKEYE	COHO	PINK	CHUM	CHINOOK	STEELHEAD	TOTAL
S.W. VANCOUVER IS.	1970	54,600	153,725	5,050	199,450	11,425		424,250
(areas 22 - 24)	1971	90,375	104,725	200	163,525	18,150		376,975
	1972	163,425	44,125	7,775	559,726	12,200		787,251
	1973	349,150	160,942	25	376,778	13,950		900,845
	1974	181,270	142,145	27,380	320,920	17,505		689,220
	1975	37,750	54,334	220	162,960	18,265		273,529
	1976	173,561	45,766	12,310	268,400	16,493		516,530
	1977	357,130	49,400	504	239,900	14,770		661,704
	1978	214,726	50,414	1,730	268,725	10,931		546,526
	1979	333,530	42,750	0	65,328	7,248		448,856
10 year average		195,552	84,833	0 190 E 10,849	211,709	14,094		
N.W. VANCOUVER IS.	1970	4,400	55,415	191,150	277,305	7,650		535,920
(areas 25 - 27)	1971	3,275	45,500	50	154,750	7,250		210,825
	1972	10,925	41,946	454,545	319,895	7,797		835,108
	1973	18,525	50,129	175	326,900	11,125		406,854
	1974	9,350	33,600	72,425	220,501	6,850		342,726
	1975	4,750	19,775	225	116,600	2,825		144,175
	1976	3,975	17,240	162,500	70,475	2,800		256,990
	1977	17,761	25,675	191	91,775	4,613		140,015
	1978	16,262	37,058	99,095	231,501	8,597		392,513
	1979	5,593	33,449	982	74,229	4,289		118,542
10 year average		9,482	35,979	0 325 E 195,943	188,393	6,380		