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THE FALSE PASS SALMON FISHERIES

by

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1986 Annual Report

to

Concerned Area M Fishermen

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INTRODUCTION

Salmon fisheries have existed on the south side of the Alaska Peninsula (west of the Chignik District) since the early 1900s. In June, the fishery targets on sockeye salmon in the vicinity of False Pass (Shumagin Islands to South Unimak Island) but also catches significant numbers of chum salmon (Figs. 1 and 2). The sockeye catches are known to be largely from non-local stocks, predominantly bound for rivers bordering Bristol Bay and the north side of the Alaska Peninsula. Since 1956, the June sockeye catch have averaged about 3% of the Western Alaska run and 6% of the catch (Fig. 3).

The origins of chum salmon caught in this fishery are not as clear since it appears that contributing stocks are widely scattered—local, western Alaskan and Asian. In late July to early August the south Peninsula fisheries target first on pink salmon and second on chum salmon, which are believed to be primarily of local origin (Figs. 4 and 5).

Early in the development of the south Peninsula fishery the Bureau of Fisheries was concerned about the origins of the sockeye (the most valuable species). When it was determined that they were mainly from Bristol Bay, where the annual sockeye catches were about ten times greater than the south Peninsula catches, the fishery was allowed to continue at about the same effort. However, in the early 1970s, when the Bristol Bay stocks were greatly depressed, fishing effort in the June fishery was reduced; since 1975, the fishery has been managed by a quota—8.3% of the forecasted Bristol Bay catch. The South Unimak-

Shumagin fisheries have achieved their quotas in only 2 years (1980 and 1982) of the past 12 years (Shaul et al. 1985). Although the recent Bristol Bay catches have been above the historical peak, the forecasted catches have generally been lower than the actual catches. Since 1975 the June fisheries have caught only 85% of the sockeye that they could have caught had the forecasts been accurate (75% excluding 1980 when a strike reduced the Bristol Bay catch).

Even though the South Peninsula June fisheries for sockeye salmon are presently performing below the management guidelines there continues to be sentiment from the Bristol Bay fishery to further reduce the catches. Aside from economic and political (legal) questions which are beyond the scope of this report, the concern centers on a biological question—whether or not the South Peninsula fisheries may adversely impact some stocks or groups of stocks within Bristol Bay. As a first step in addressing this question I will review the information on the origins of stocks in the June sockeye fisheries.

With the rather recent development of commercial chum salmon fisheries in the Arctic-Yukon-Kuskokwim (AYK) region there have been efforts to also reduce the chum salmon catch in the June fisheries of the South Peninsula. There has been special concern with the possible interception of Yukon fall chums. Again, the concern centers on the origins of chum salmon in the South Peninsula fisheries which I will review.

In recent years salmon catches have greatly increased in the North Peninsula fisheries (west of the Ugashik District) and there has been

some concern that the increase is from non-local stocks. Therefore, I will review the present status of the North Peninsula stocks.

The False Pass fishery is presently managed on the assumption that nearly all of the salmon caught there are bound for other areas, e.g., sockeye to Bristol Bay and chum to the Yukon, Kuskokwim, and Nushagak rivers, and that the fishery may significantly impact the fisheries in these other areas. Therefore, if a problem is perceived in one of these terminal fisheries (e.g., an expected small run), there is a tendency to reduce the catch in the False Pass fishery as a solution to the perceived problem in the other area. The economic impact of such management decisions on the False Pass fishery is quite clear; however, the benefits to the terminal fisheries and salmon stocks need to be demonstrated.

ORIGINS OF SOCKEYE

Tagging experiments were conducted in the False Pass area in 1922, 1923 and 1961 (Gilbert 1923; Gilbert and Rich 1926; and Thorsteinson and Merrill 1964). These experiments indicated that the majority of sockeye were bound for Bristol Bay river systems and the tag returns were approximately proportional to the commercial catches in the various Bristol Bay fishing districts (Tables 1 and 2). During the 1960s tagging was conducted in the North Pacific to determine the oceanic distribution of salmon stocks in response to Japanese high seas fisheries. This research was summarized for sockeye by French et al. (1976). I examined the reported tag returns from the Gulf of Alaska and Aleutian Island tagging experiments to determine whether there was any difference

in the returns to the east and west (Nushagak-Togiak) sides of Bristol Bay (Rogers 1986).

Sockeye tagged in the Gulf of Alaska tended to return to the west side of Bristol Bay in higher proportions than expected from the size of the commercial catches. This suggested that Nushagak-Togiak stocks may have been more vulnerable to the False Pass fishery than the other Bristol Bay stocks. However, the tagging experiments conducted in the fishery do not confirm this conclusion. In 1923 the tag returns to the Nushagak were as expected from the commercial catch and in 1961 the returns were lower than expected.

Management of the False Pass fisheries in recent years has attempted to spread the season's catch throughout June in case there is some difference in stock composition during the month. These efforts have been only partially successful (Figs. 6 and 7). With the increase in fishing effort since 1980, mainly from an increase in purse seine vessels (Fig. 8), there have been fewer fishing days permitted to achieve the season's quota. There is a need to determine whether or not stock composition indeed differs during the course of the fishery.

The information on the origins of sockeye in the South Peninsula fisheries that was collected in the 1920s and 1960s is probably not very relevant to today's fishery because the abundance and composition of the Bristol Bay runs have changed greatly and the abundance of the North Peninsula stocks has increased dramatically.

ORIGINS OF CHUM SALMON

Relatively few chum salmon were tagged during the 1920s and at that time there were no commercial fisheries in the AYK region. Brannian (1984) analyzed tag returns from chums tagged in the vicinity of the south Peninsula during the 1960s. Her analysis was seriously flawed because 92% of the tag recoveries examined were from fish that would not logically have migrated through the South Unimak-Shumagin fisheries en route to Bering Sea coastal rivers, i.e., fish tagged and released in the Bering Sea and North Pacific west of Unimak Pass. There were returns from only 14 chums tagged in the area of South Unimak and none from the Shumagin area.

Conrad (1984) used scale pattern analysis to determine the origins of chum salmon in the False Pass fisheries in 1983. This analysis was also seriously flawed because no scale standard was included for the Anadyr River (U.S.S.R.). This northern Bering Sea stock would be the most likely Asian stock in the June fishery (Neave et al. 1976). About 30% of all Asian tag returns from tagging in the Gulf of Alaska during the 1960s were to the Anadyr River. Given the northern location (65°N), the Anadyr chums would probably be more similar in growth (scale pattern) to the Yukon chums than any other stock, and thus tend to be classified as Yukon origin in Conrad's analysis.

From the 1961 tagging in the South Unimak-False Pass area about 33% of the 60 tag returns came from Bristol Bay, which had the largest commercial catch in Western Alaska in that year. In recent years chum salmon abundance and the commercial catches have changed considerably,

e.g., the largest Western Alaska catches are now in the AYK region and Japanese hatcheries now have annual returns in excess of 20 million chums.

Yukon River chums are known to be distributed over a broad area of the North Pacific prior to their return. From high seas tagging during the 1960s, there were more tags returned from the Yukon than from any other single area. Although the commercial fisheries were rather small then, there were substantial subsistence catches in the Yukon. The Yukon fall chums appeared to be nearly as abundant as the summer chums in the Aleutian area (west of 165°W). About 41% of the 63 Yukon tag recoveries from Aleutian tagging were recovered after July 25. In contrast, only about 11% of the 85 Yukon tag recoveries from tagging in the Gulf of Alaska were recovered after July 25. The difference in summer and fall tag recoveries to the Yukon was probably greatly affected by the dates of tagging, which tended to be in April-May in the Gulf and June-July in the Aleutians. Nevertheless, these data certainly don't indicate that Yukon fall chums are uniquely vulnerable to fisheries on fish returning from the Gulf of Alaska, but they may be more vulnerable than summer chums in Japanese high seas fisheries.

NORTH PENINSULA SALMON

Shaul et al. (1985) and earlier ADF&G Area Management Reports present catch and escapement statistics for the North Peninsula salmon stocks. Some of the available data were summarized and are presented graphically in Figures 9-16. Since the early 1960s ADF&G has annually estimated salmon escapements from aerial surveys and tower enumeration.

The annual sockeye and chum salmon runs to the North Peninsula systems (catch plus escapement) have increased recently to an even greater extent than the Bristol Bay runs (Figs. 1 and 2). The sockeye runs since 1978 have been about 5 times larger than the earlier runs (1962-1977) and the chum salmon runs since 1980 have increased about four fold.

The sockeye catches peak in early July, similar to Bristol Bay; however, sockeye are present in the fishery through August, in contrast to the Bristol Bay stocks. In recent years sockeye have been caught later in the summer than was the case during the 1960s (Figs. 11 and 12). This is probably because late-season fishing effort has increased in recent years in response to the increased abundance of coho salmon. Seasonal catches of chum salmon vary from year to year, but most are caught in July. Since chums are not a target species, their catches are determined by fishing effort on sockeye and coho as well as the abundance of the local chum runs.

The seasonal timing of the escapement into Bear Lake (the largest producer of sockeye in the North Peninsula) corresponds to the long season for the sockeye fishery (Fig. 13). Sockeye begin entering the lake in mid-June, prior to any of the Bristol Bay stocks, and continue to enter Bear Lake as late as September, whereas Bristol Bay escapements are usually completed by the end of July.

Nelson River sockeye enter in late July to early August (Figure 14), whereas the chums enter the river mainly in early July (Figure 15). The Nelson lagoon fishery, which is only on the Nelson River stock,

takes place largely between June 20 and July 20 (Fig. 16). The peak escapements occur in early July, which corresponds to the peak in the fishery.

Beginning about 1978, the increase in the catches of salmon in the North Peninsula fisheries appear to be caused by an increase in the abundance of the local runs. Although some fish bound for other areas are undoubtedly caught there (as is the case in most salmon fisheries), the interception of Bristol Bay stocks on the North Peninsula seems unlikely to have been a significant factor in the recent large catches.

SUMMARY AND CONCLUSIONS

The commercial salmon fishery of the southwestern Alaska Peninsula has been in existence since the early 1900s. Early in the season (June), it operates largely on salmon bound for other Alaska and even Asian areas. The early fishery is targeted on sockeye salmon, long known to be mostly of Bristol Bay origin. The early fishery has since 1975 been managed with respect to its interceptions of Bristol Bay sockeye. Of the total predicted harvest of Bristol Bay sockeye, 8.3% is allocated to the fishery, and the allocation is further divided into quotas for various time periods and for sub-areas (Unimak and Shumagin). Chum salmon are also caught by the June fishery, incidentally to sockeye. Since 1975 the fishery has caught less than 8.3% of the Bristol Bay sockeye catch in all but two years.

There is need to update information on the origins of sockeye and chum salmon caught in June by the Unimak-Shumagin fishery. Present management assumes that essentially all of the early season sockeye

catches are destined for Bristol Bay, yet even the earliest tagging experiments in the area (Gilbert 1923; Gilbert and Rich 1925) showed that sockeye in the False Pass and Shumagin Islands areas were destined not only for the north side of the Alaska Peninsula and Bristol Bay, but also for certain central Alaskan areas, including Chignik, Kodiak, and Cook Inlet. There has been no recent study of the detailed stock composition of the Unimak-Shumagin sockeye catches. There may be a tendency for the age composition of the Unimak-Shumagin sockeye catches to differ from that of the inshore Bristol Bay run, which would suggest that various stocks may be more heavily intercepted by the fishery than others. The stock composition of the catches may also vary between the major fishery sub-areas (viz., south Unimak and Shumagin Islands). A study directed at determining the origins of sockeye in the Unimak-Shumagin area is needed to address these possibilities and to provide information that may lead to improved management of the fishery—e.g., at present the Unimak-Shumagin catch is determined by the projected catch of only Bristol Bay sockeye.

Detailed information on the origins of chum salmon in the June Unimak-Shumagin fishery is also lacking. This subject is especially germane, as certain elements in the western Alaska fishing industry have voiced serious concern over the recently increased chum catches by the fishery. They suggest that the fishery may be significantly reducing potential catches in terminal western Alaskan areas, particularly the Alaska-Yukon-Kuskokwim area. Existing information on the origins of chum salmon in the area comes in part from early tagging experiments, including Gilbert and Rich (1923), Thorsteinson and Merrell (1964), and

various 1956-66 tagging experiments in the general vicinity conducted as part of the research program of the International North Pacific Fisheries Commission (INPFC). Several problems make results from these early tagging experiments of limited use in obtaining quantitative estimates of the stock composition of chum in the present-day catches by the fishery.

There is an urgent need to update information on sockeye and chum origins in the Unimak-Shumagin fishery in June principally by large tagging efforts in the actual times and areas of the fishery, and by ancillary analysis of age and size composition data. Expected tag recovery effort in various production areas is likely to provide a more realistic picture of chum stock composition than is possible from analysis of earlier tagging experiments, and analysis of tag recovery data and biological data will provide a more detailed understanding of the Bristol Bay component of the Unimak-Shumagin sockeye catches. Because various stocks that may be present in the June fishery undoubtedly vary in abundance from year to year, a multi-year study will be required—3 to 5 years.

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Table 1. Comparison of tag returns to Bristol Bay fishing districts with the commercial catches in 1923.[1]

Location	Commercial catch number (1,000s)	%	Tag returns Number	%
Naknek-Kvichak	14,361	75.9	513	71.2
Egegik	1,116	5.9	55	7.6
Ugashik	782	4.1	14	1.9
North Peninsula	732	3.9	63	8.7
Nushagak	1,922	10.2	76	10.5
Total	18,913		721	
Other				
Kuskokwim	0		3	
Togiak	0		1	
Cook Inlet	1,099		3	
Kodiak	1,090		5	
Chignik	643		11	

[1]Sockeye tagged in the South Unimak area during June 2-July 13.

Table 2. Comparison of tag returns to Bristol Bay fishing districts with the commercial catches in 1961.[1]

Location	Commercial catch number (1,000s)	%	Tag returns Number	%
Naknek-Kvichak	8,167	66.4	39	70.9
Egegik	2,686	21.8	13	23.6
Ugashik	357	2.9	0	0
North Peninsula	388	3.2	2	3.6
Nushagak	511	4.2	0	0
Togiak	192	1.6	1	1.8
Total	12,301		55	
Other				
Kodiak	408		1	
Chignik	323		2	

[1]Sockeye tagged in the False Pass-Unimak area during June 11-July 14.

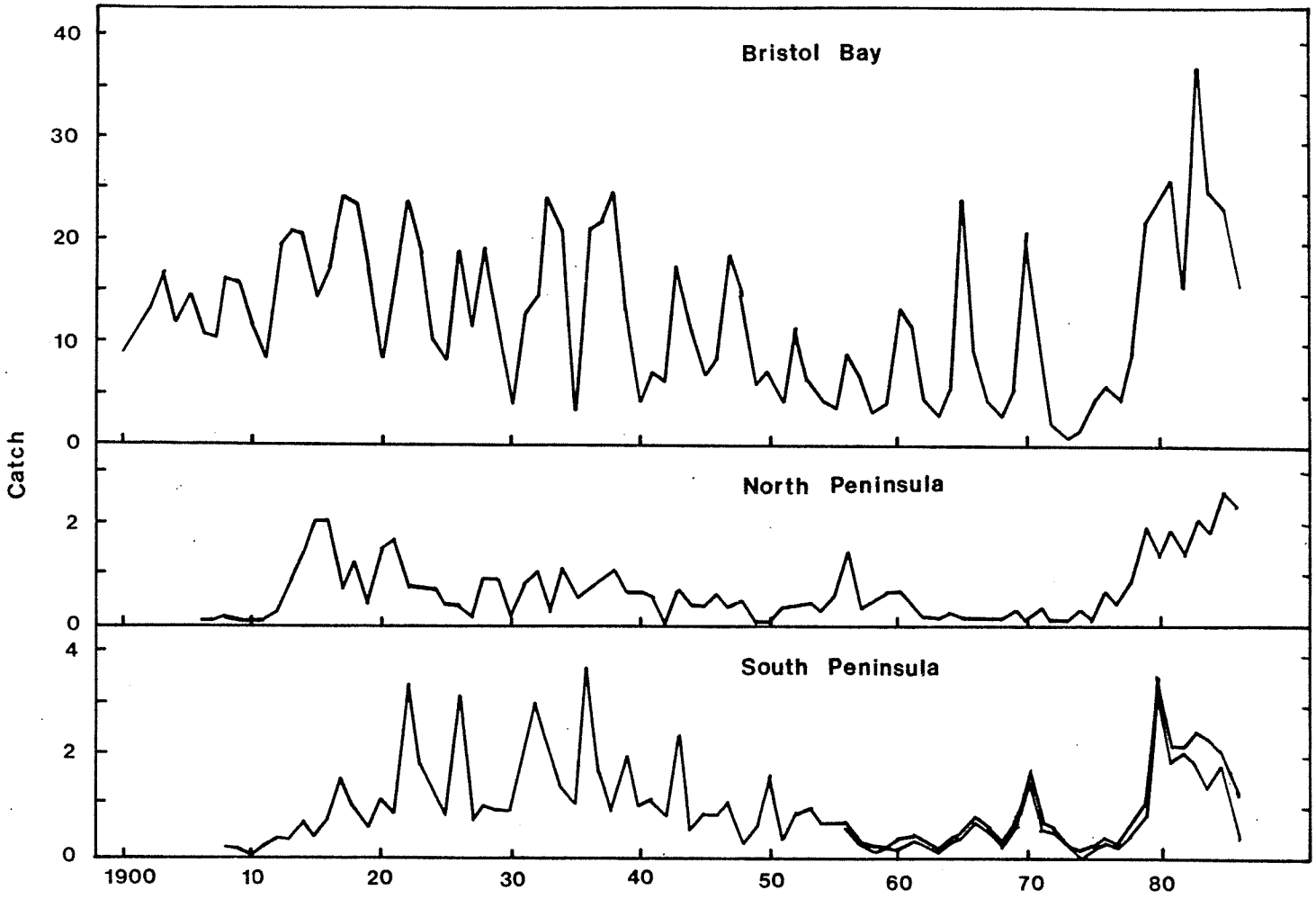

Fig. 1. Historical commercial catches (in millions) of sockeye salmon in Bristol Bay, North Peninsula and South Peninsula fisheries, 1900-1986. (South Peninsula June catches during 1956-1986 shown by lower lines.) Source: INPFC (1979) and unpublished data from ADF&G.

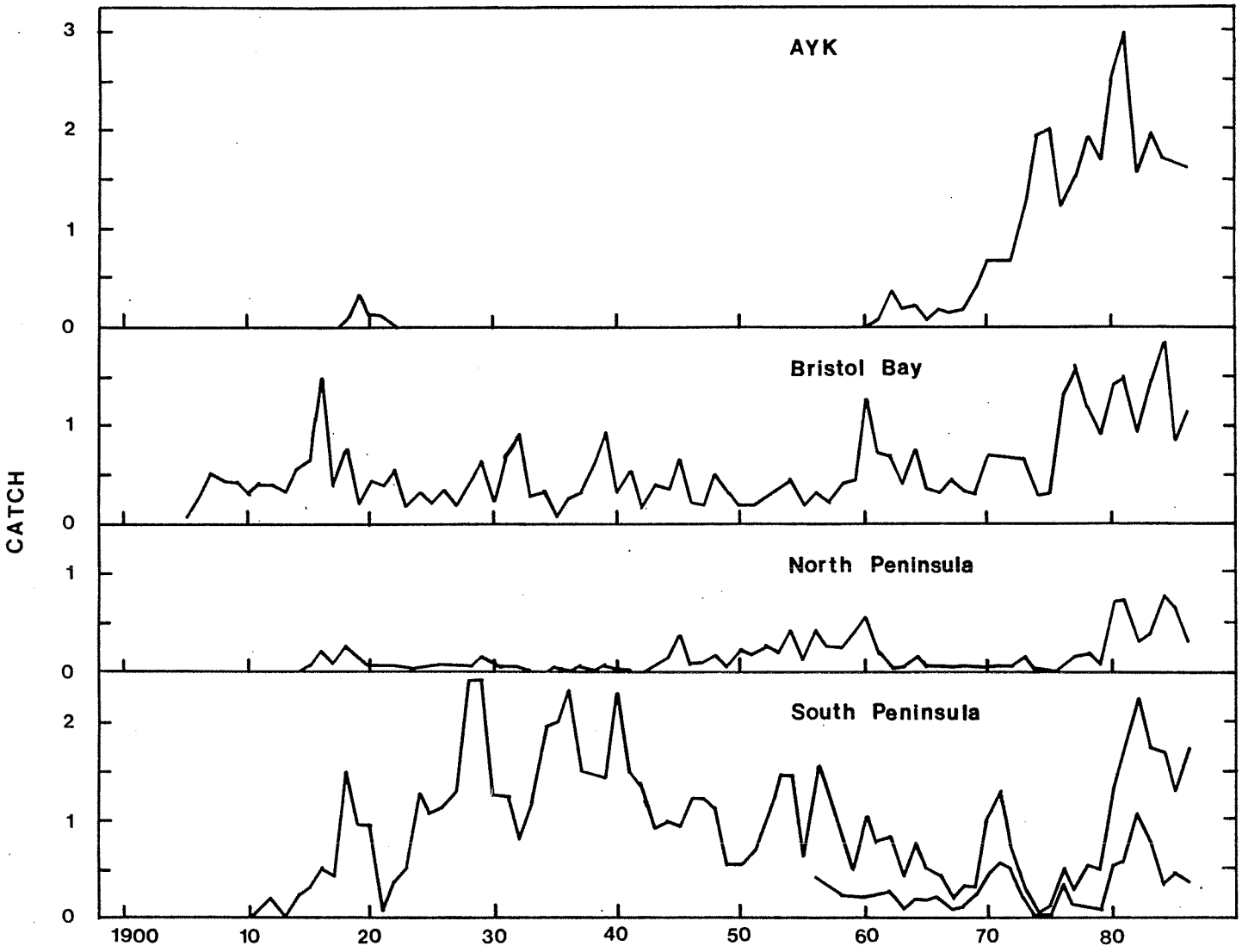

Fig. 2. Historical commercial catches (in millions) of chum salmon in the Arctic-Yukon-Kuskokwim area (AYK), Bristol Bay, North Peninsula and South Peninsula fisheries, 1900-1986. (South Peninsula June catches during 1956-1985 shown by lower lines.)

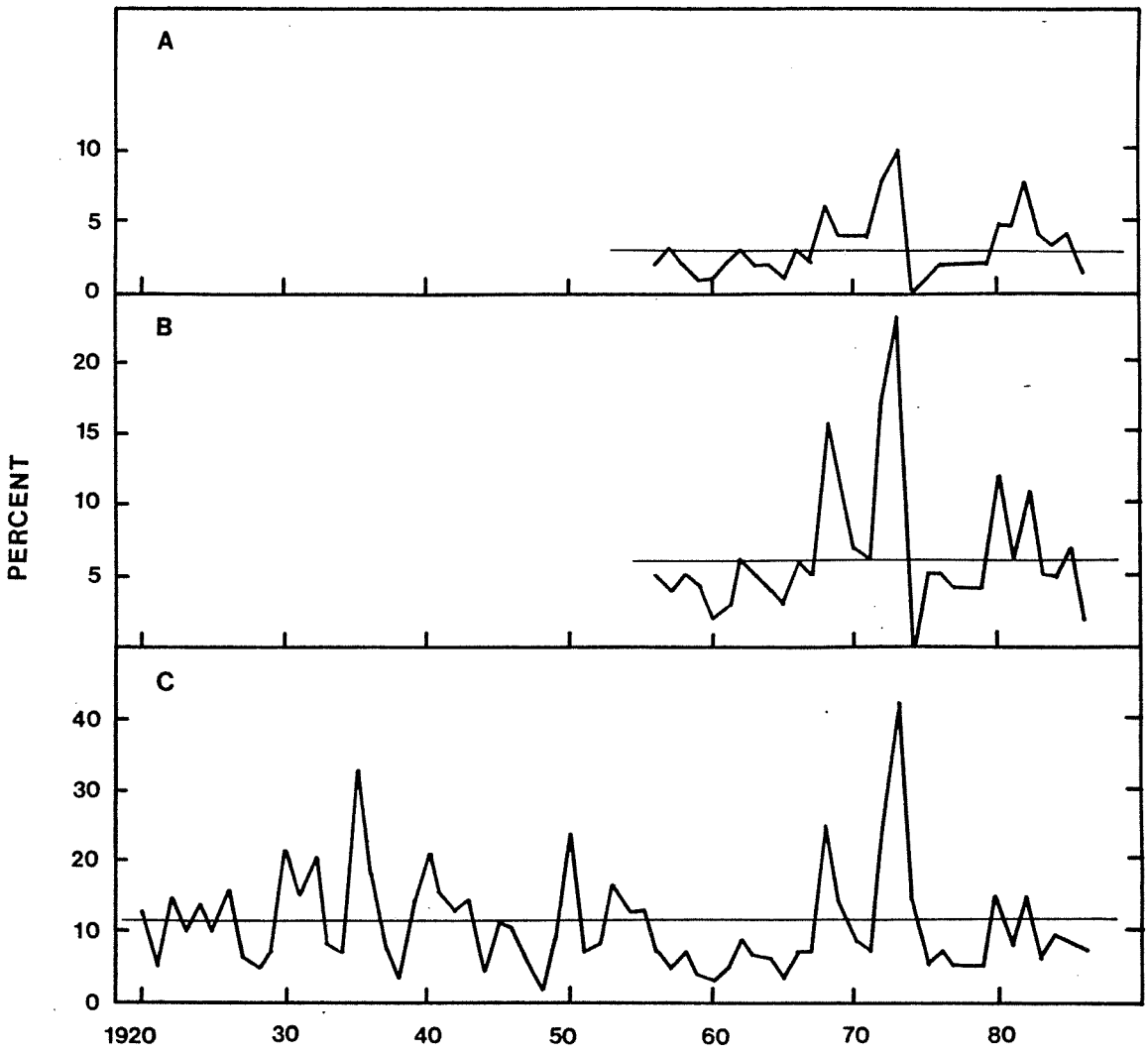

Fig. 3. The June catches of sockeye in the South Peninsula fisheries, 1956-1986 as a percent of the total Western Alaska run, catch plus escapement (A); as a percent of the total Western Alaska catch (B); and the total season's South Peninsula catch as a percent of the Bristol Bay catch, 1920-1986 (C).

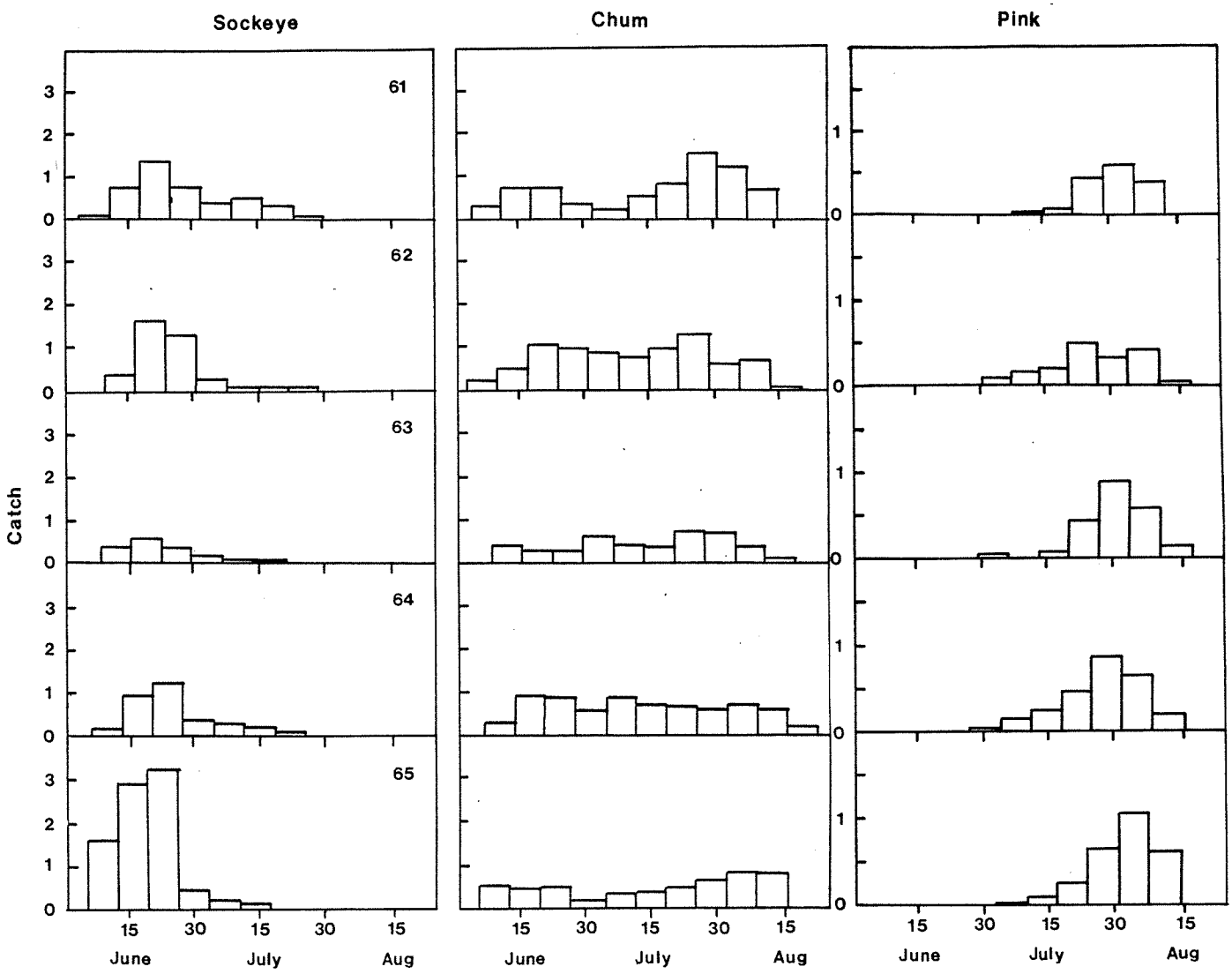

Fig. 4. Weekly catches in the South Peninsula fisheries, 1961-1965 (sockeye and chums in 100,000s and pinks in millions).

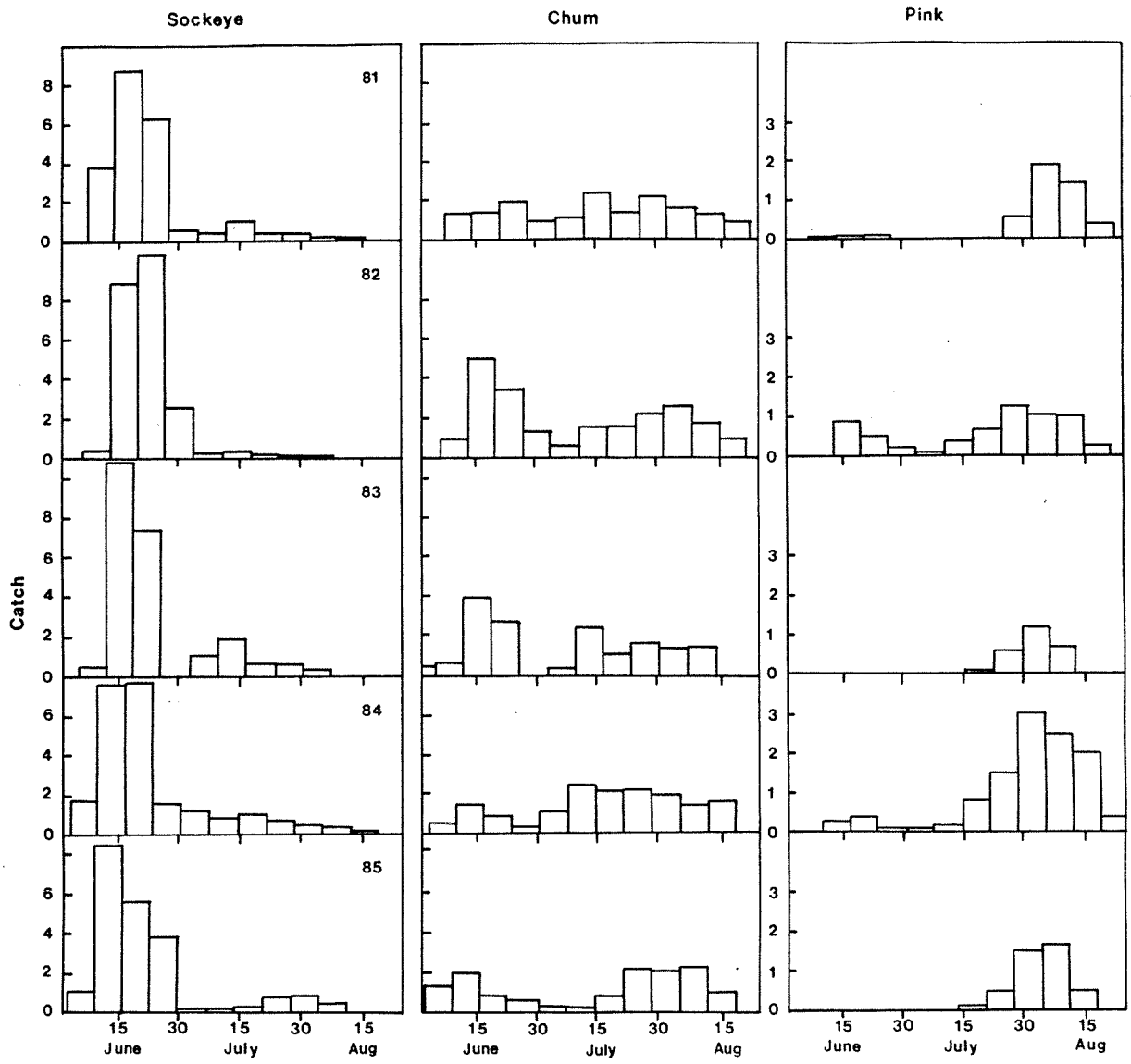

Fig. 5. Weekly catches in the South Peninsula fisheries, 1981-1985 (sockeye and chums in 100,000's and pinks in millions).

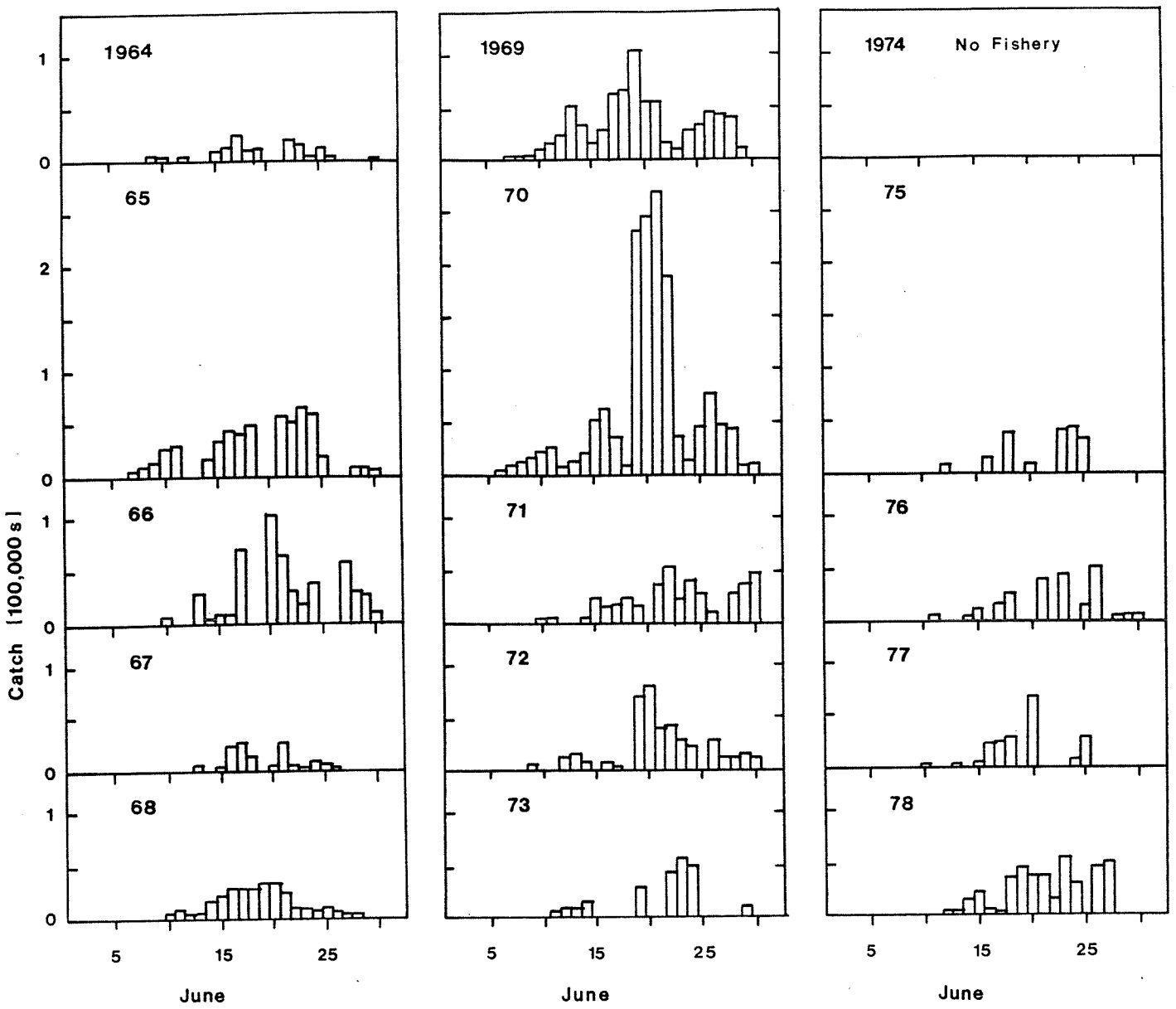

Fig. 6. South Unimak sockeye catches by date in June, 1964-1978.

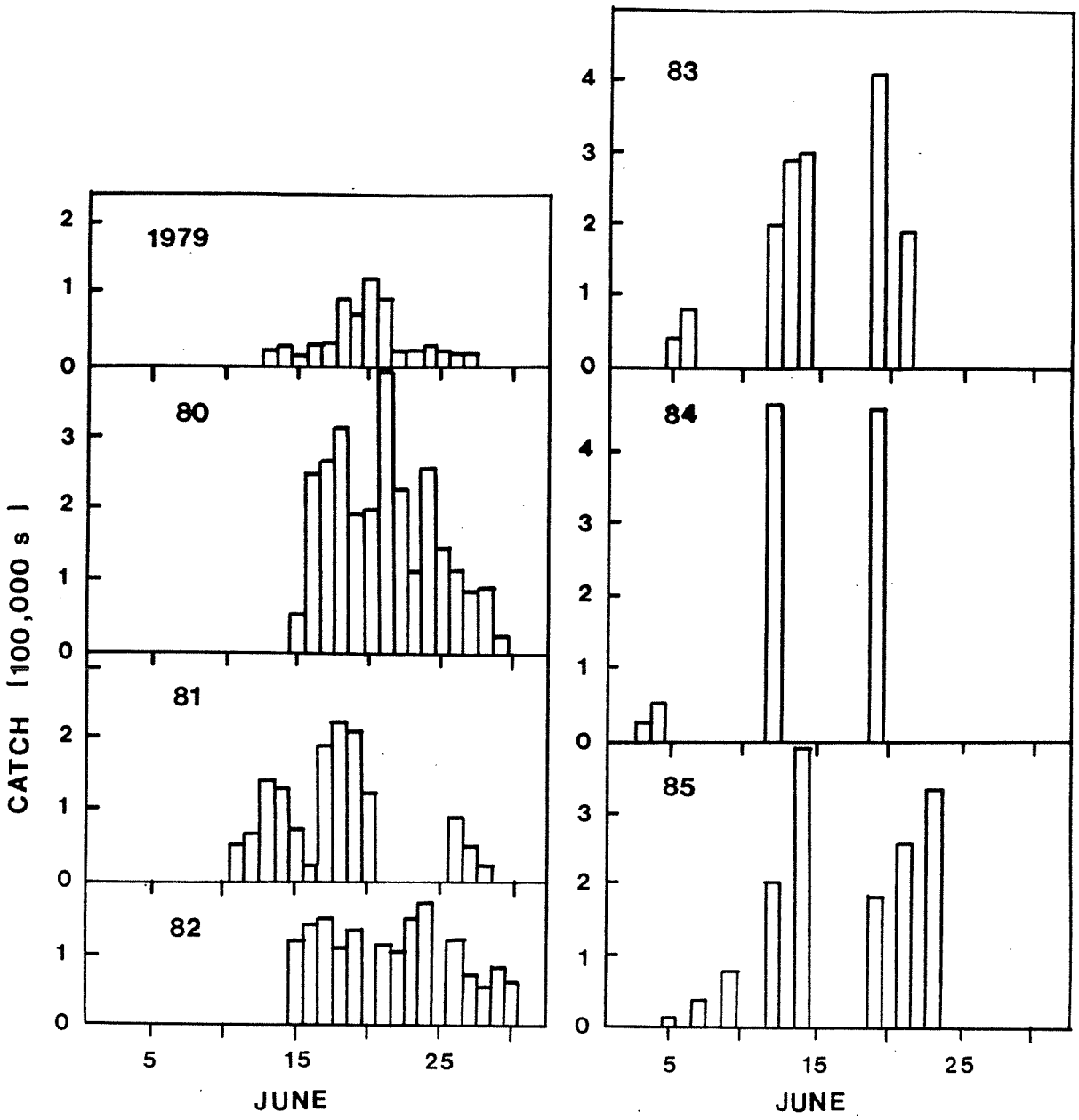

Fig. 7. South Unimak sockeye catches by date in June, 1979-1985.

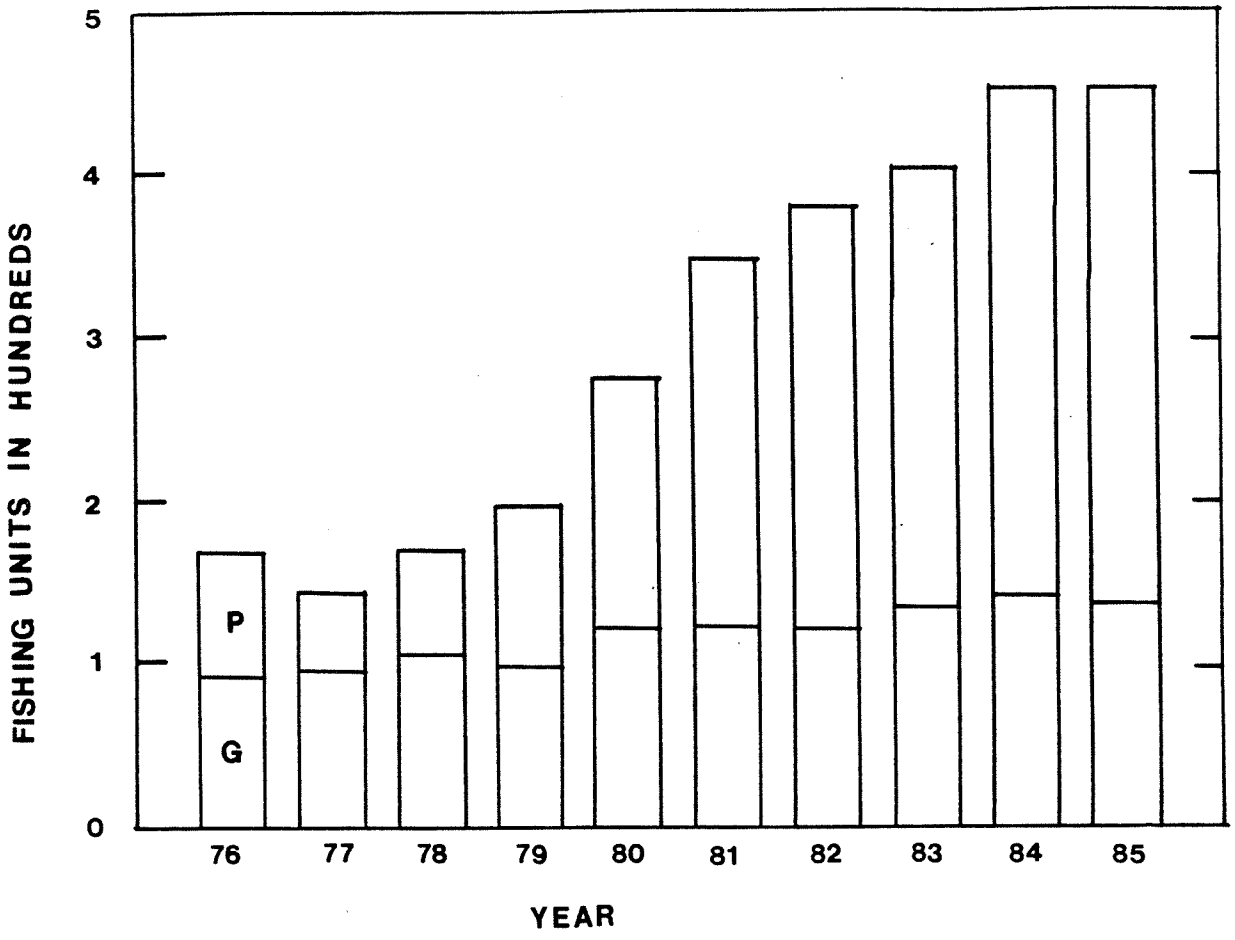

Fig. 8. Annual units of fishing gear for the June salmon fisheries (South Unimak-Shumagin), 1976-1985. Number of gill net boats (G) plus three times the number of purse seine boats (P).

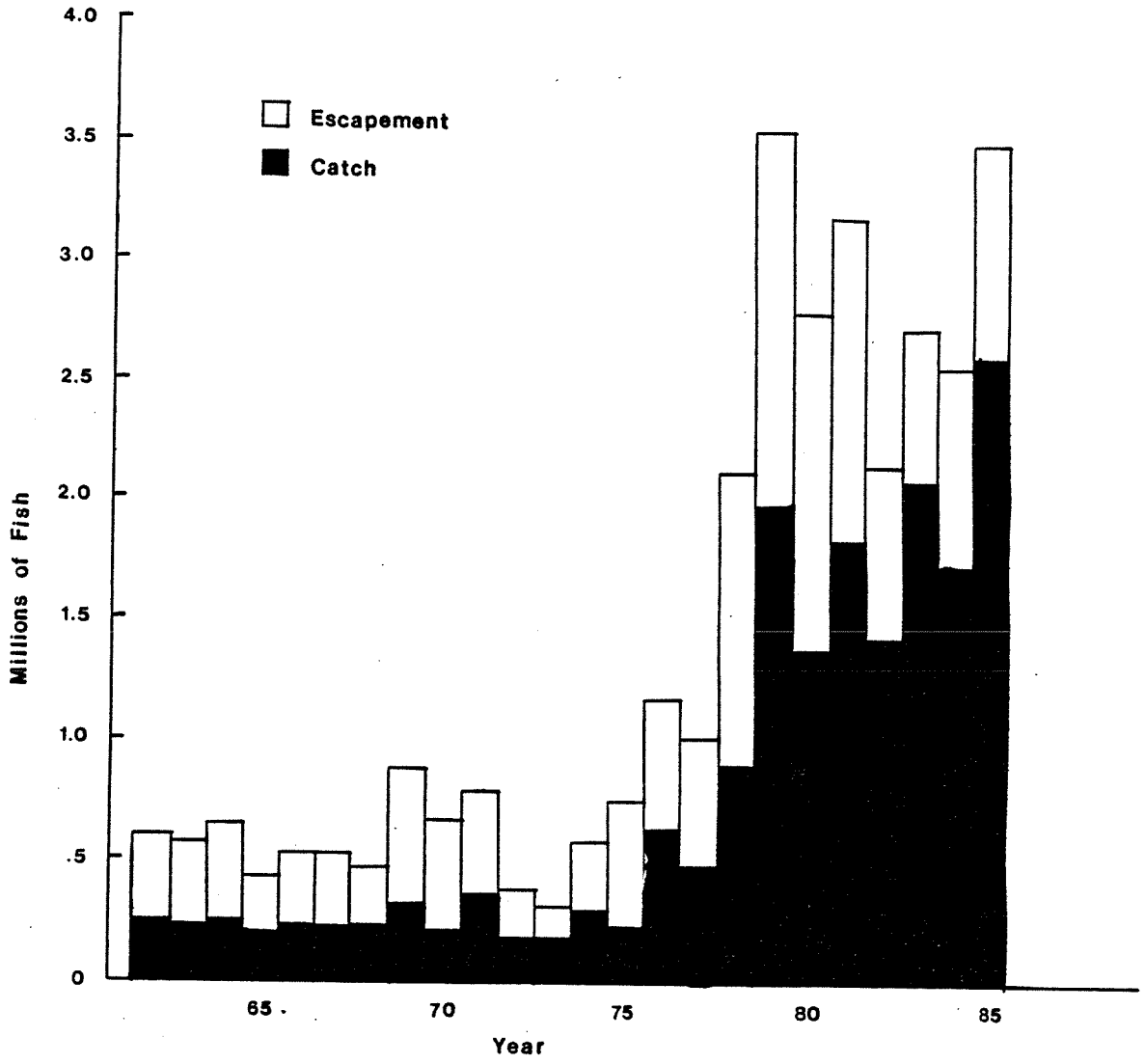

Fig. 9. North Peninsula sockeye salmon runs, 1962-1985.

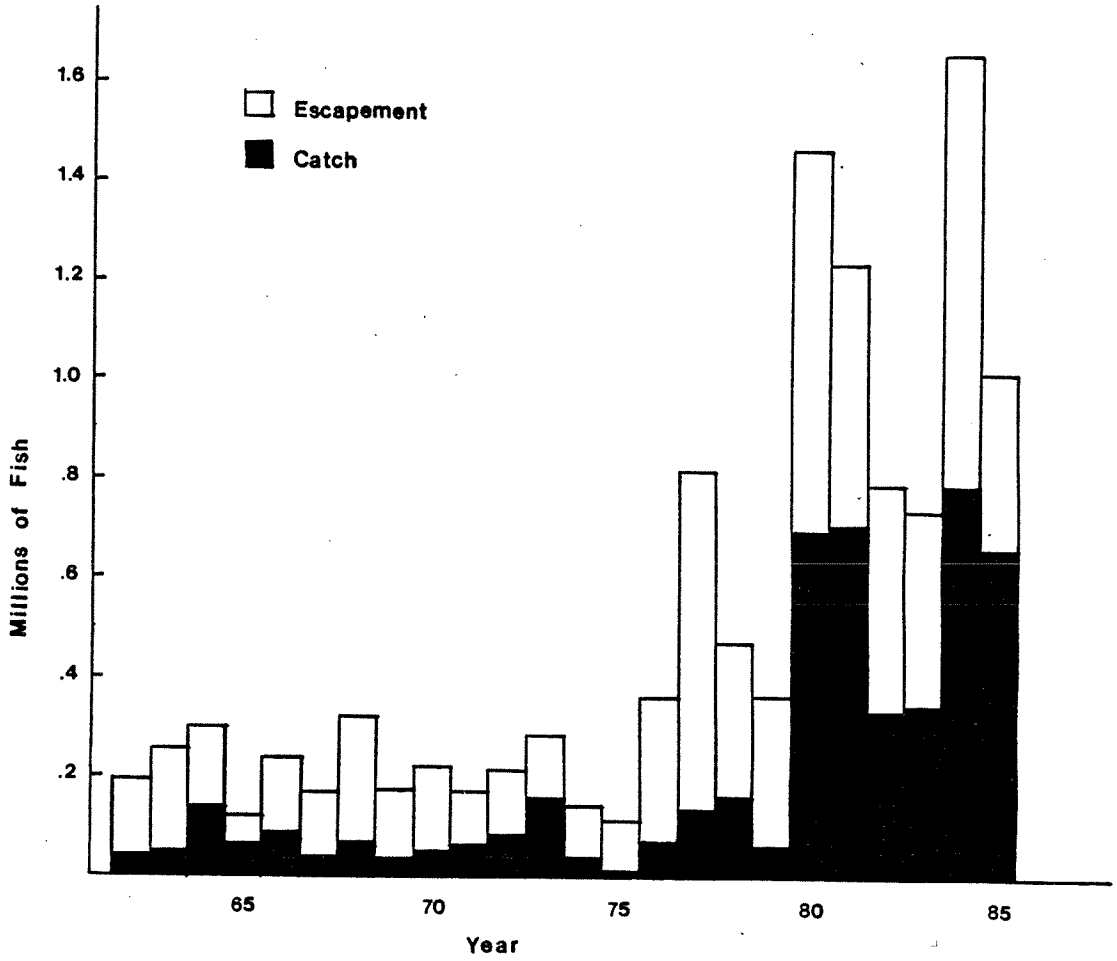

Fig. 10. North Peninsula chum salmon runs, 1962-1985.

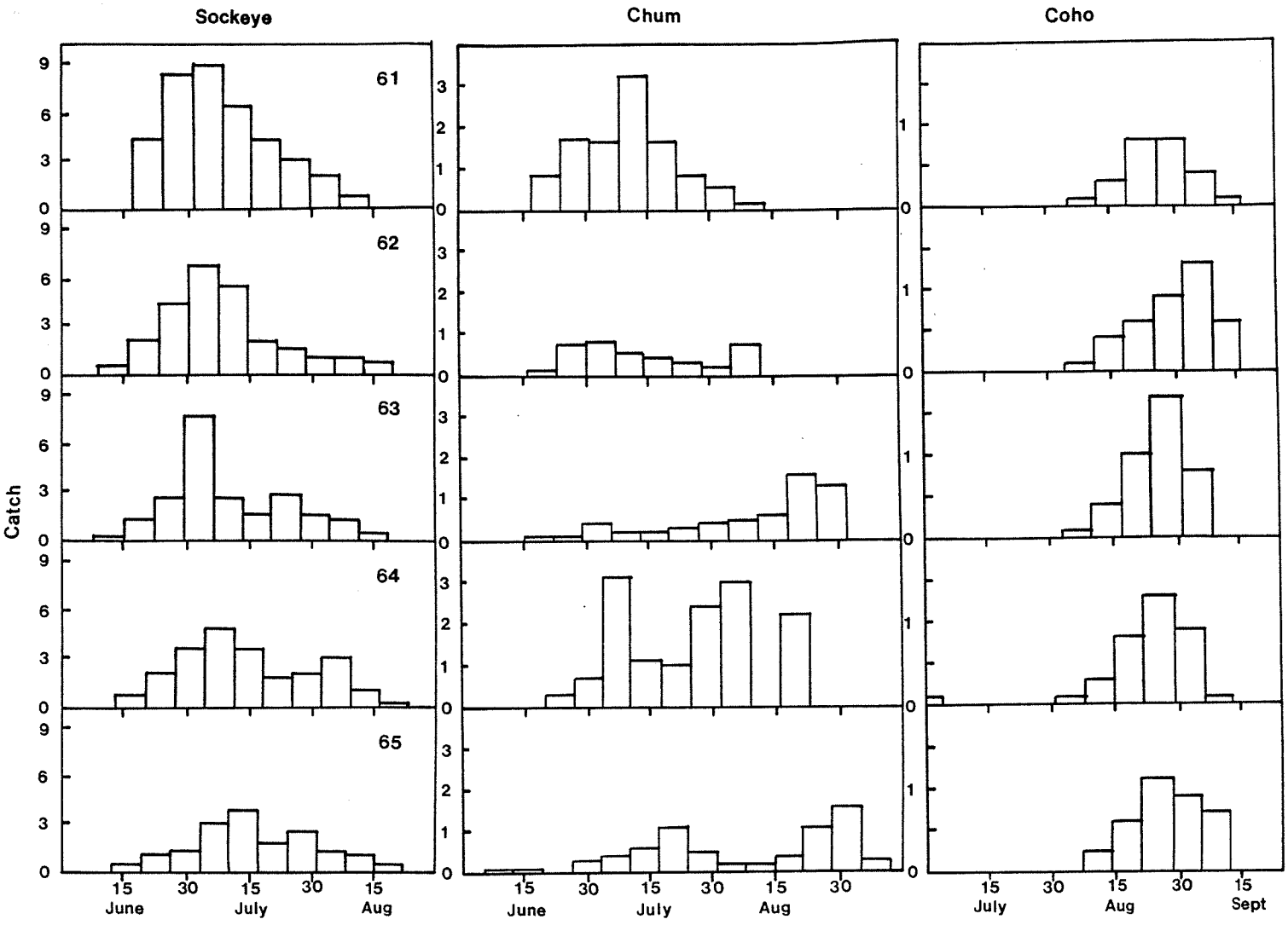

Fig. 11. Weekly catches in the North Peninsula fisheries, 1961-1965. Numbers in 10,000s.

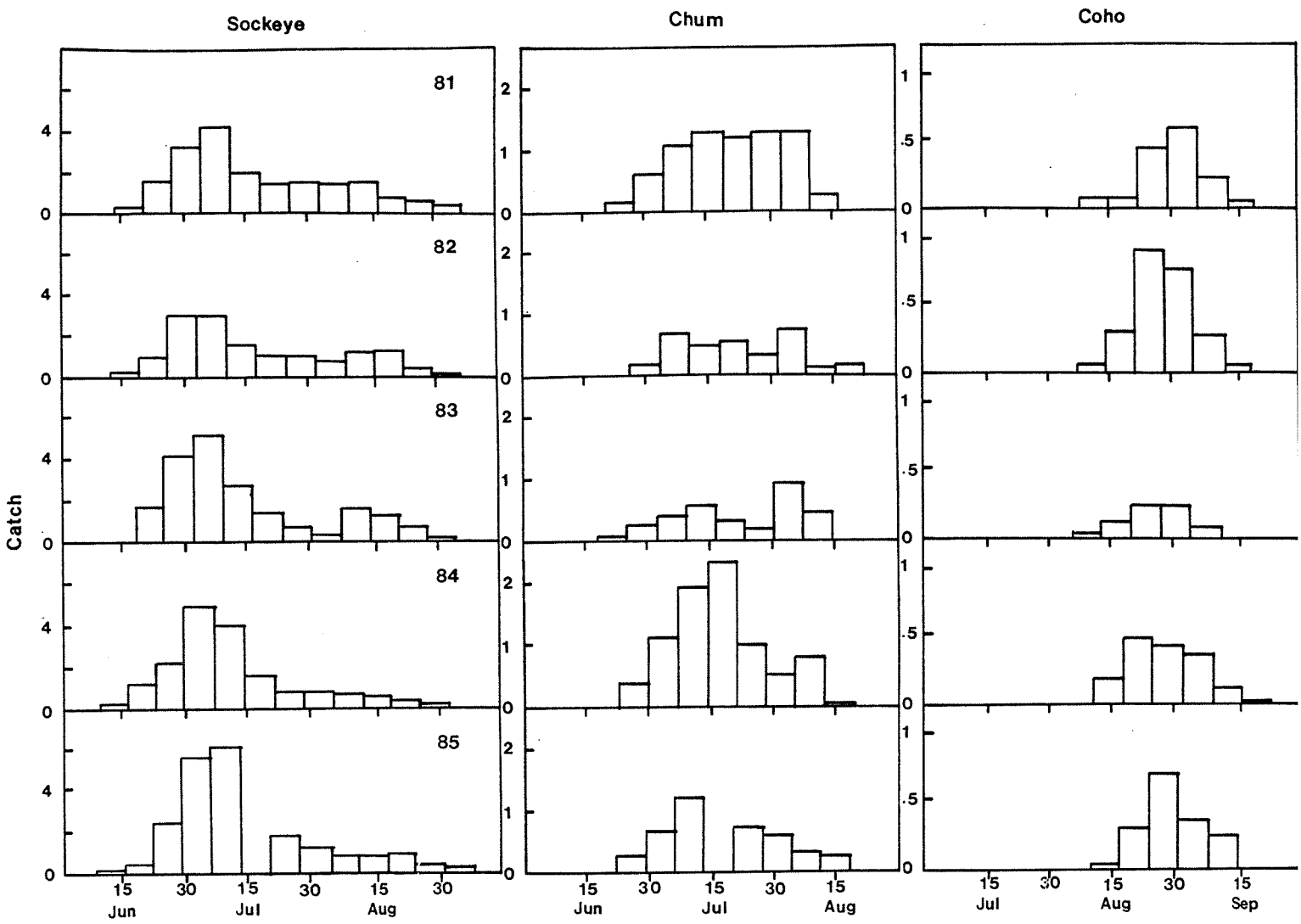

Fig. 12. Weekly catches in the North Peninsula fisheries, 1981-1985. Numbers in 100,000s.

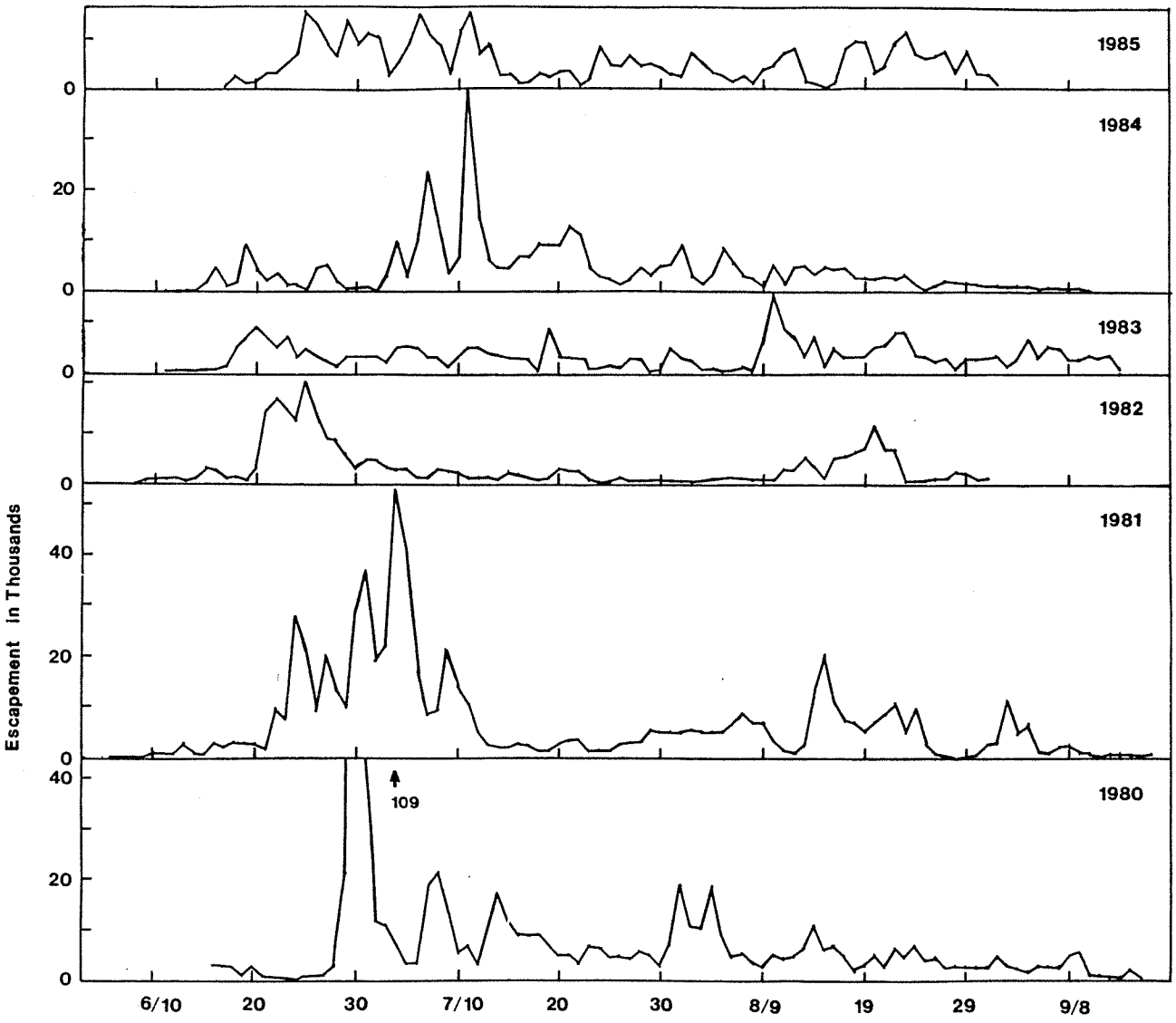

Fig. 13. Daily sockeye salmon escapements to Bear Lake, 1980-1985.

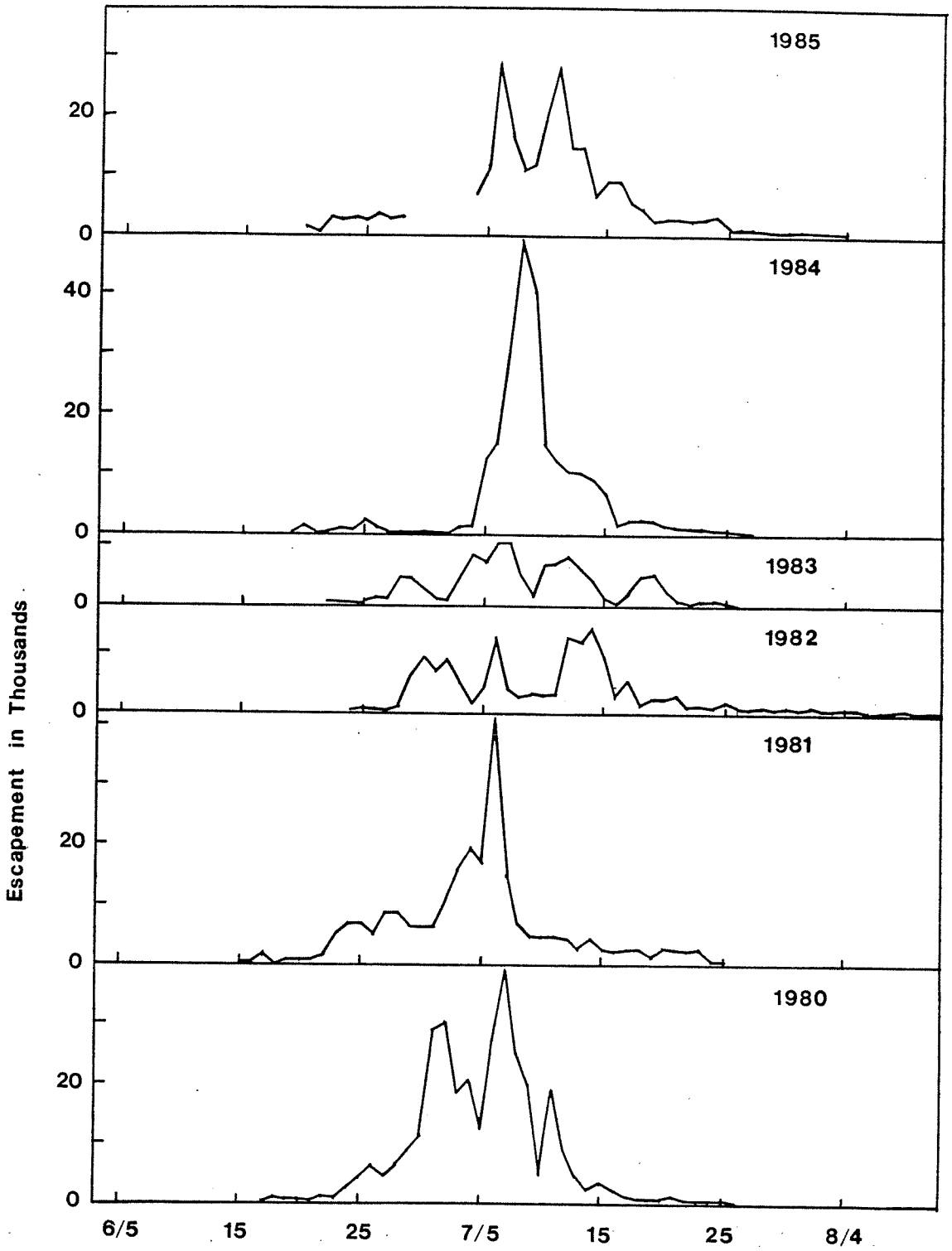

Fig. 14. Daily sockeye salmon escapements to Nelson River, 1980-1985.

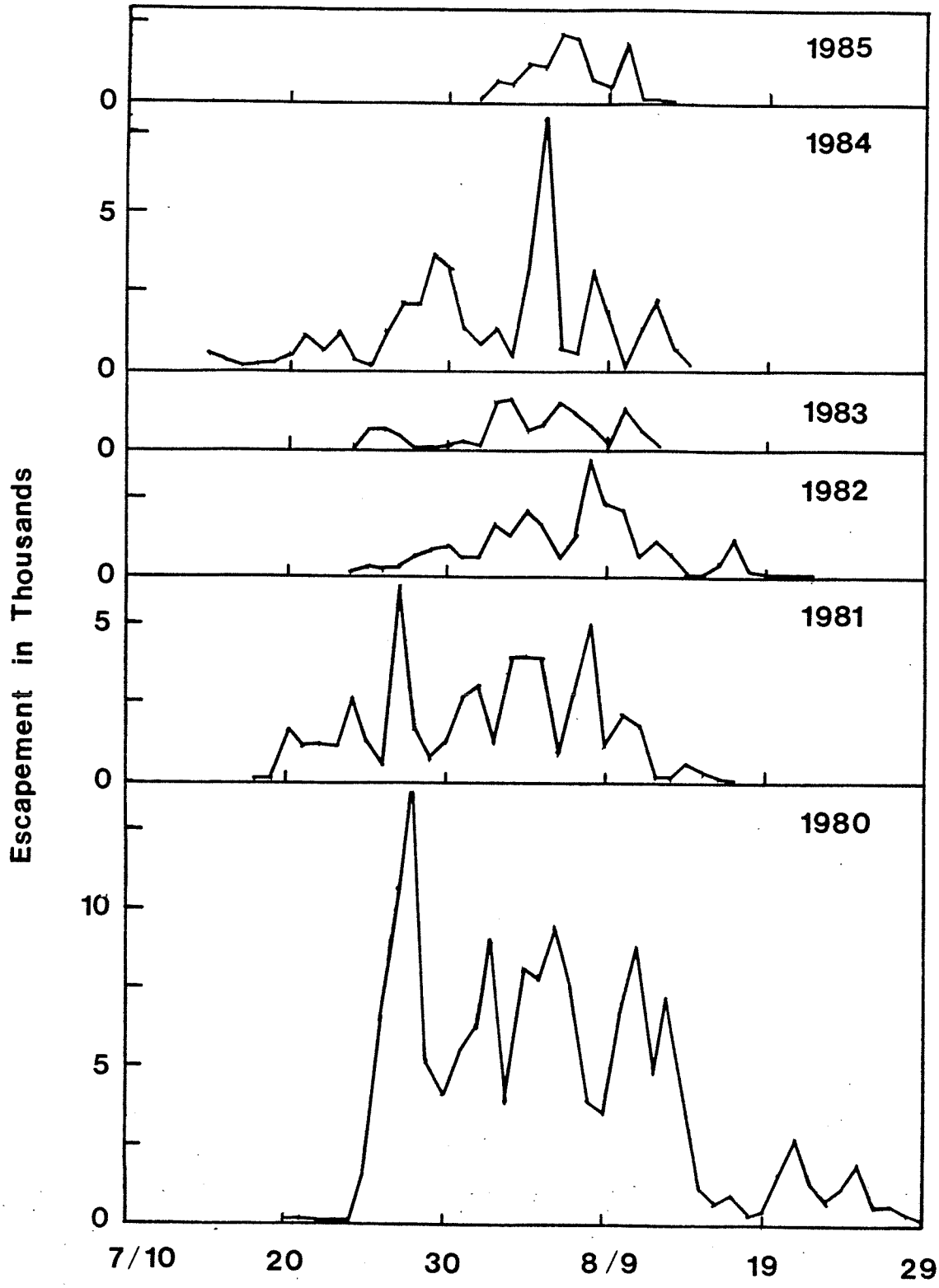

Fig. 15. Daily chum salmon escapements to Nelson River, 1980-1985.

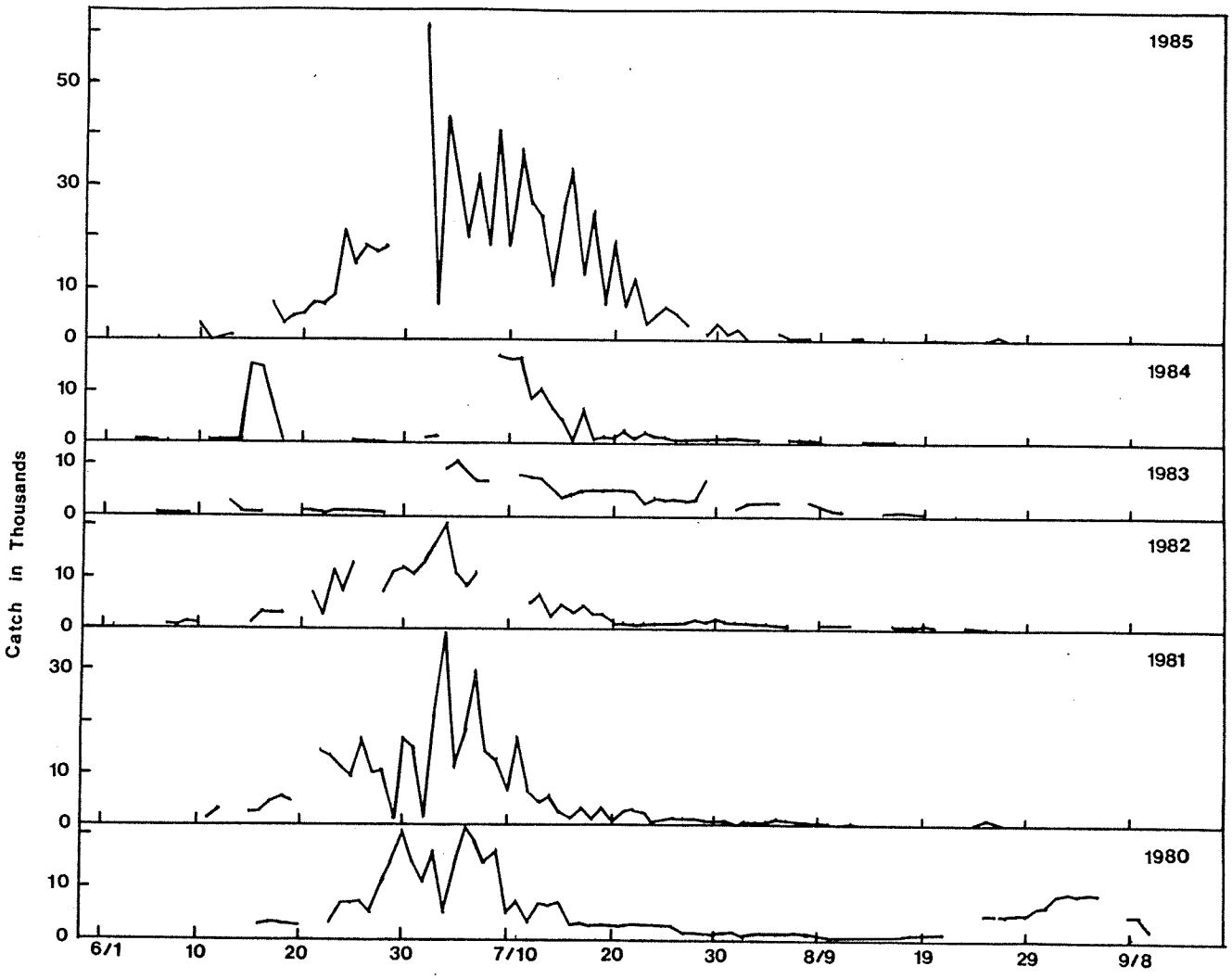

Fig. 16. Daily sockeye catches in Nelson Lagoon, 1980-1985.