SCR

13

Testimony of Loren Flagg
to the
House Resources Committee on Chinook Salmon Bycatch
April 10, 1991

The Kenai Peninsula Fishermen's Association is greatly concerned with the high level of chinook salmon bycatch presently occurring in the Gulf of Alaska (GOA). During March the chinook bycatch by the factory trawl fleet increased dramatically from 4,600 at the beginning of the month to over 30,000 by the end of the month.

This year's catch of chinook salmon is already approximately twice the catch made in 1990. What is of particular concern is that the highest catches recorded last year occurred during the month of April. As we speak the GOA trawl fishery is hammering away at chinook salmon, many of which are Southcentral Alaska stocks (by some estimates 28%). We feel this fishery needs to be brought under control immediately and we support the Committee Substitute for Senate Resolution No. 13 that is currently before you. We support the amendment on page 2, line 9 which adds the words "and Gulf of Alaska". We also recommend that the word "immediately" be substitued for the words "be prepared to" on page 2, line 18.

The reason for our concern with the high chinook salmon bycatch is that inshore management decisions, that can have major impacts on user groups, are often made based on relatively small numbers of salmon. Last year both early and late run stocks of king salmon returning to the Kenai River in Cook Inlet were weak. The early run - which has not been fished commercially in Cook Inlet since the early 1960's - went to 'hook and release only' on June 7 and stayed in that status for the remainder of the run. This caused major cancellations in the guide industry.

The management decision to close the Kenai River to the retention of late run king salmon last year was based on only 500 fish. This decision caused major disruption in the fisheries and led to the "Save the Kings" protest and consequently to changes in the Kenai River King Salmon Management Plan by the Board of Fish last December. And now the Hickel administration is threatening further restrictions to the commercial fishery along the eastside of Cook Inlet including the elimination of offshore nets. All of this grief was caused by the lack of only 500 king salmon.

We know that many of the king salmon killed by factory trawlers in the GOA are Southcentral Alaska stocks (some estimates indcate about 28%). We also know the Cook Inlet bound fish are present in this fishery based on coded wire tag returns from the early to mid 1980's. The Kenai River is one of the major king salmon producers in Cook Inlet and Southcentral Alaska. There is no doubt that these stocks are being adversely impacted by the trawl fishery.

We appreciate your time and we support your efforts to get this fishery under control before further damage is done.

ESTIMATES OF TOTAL BYCATCH OF CHINOOK AND 'OTHER' SALMON IN THE GROUNDFISH FISHERIES OF THE BERING SEA/ALEUTIAN ISLANDS AND GULF OF ALASKA AS OF 4/04/91.

NMFS/AKR
04/04/91

1991 GULF OF ALASKA FISHERIES
CHINOOK & OTHER SALMON BYCATCH

TRAWL GEAR

	CHINOOK SALMON		'OTHER' SALMON	
WEEK	WEEKLY NUMBER	CUMULATIVE NUMBER	WEEKLY NUMBER	CUMULATIVE NUMBER
01/06	341	341	0	0
01/13	985	1326	0	0
01/20	493	1819	0	0
01/27	503	2322	0	0
02/03	1119	3441	5	5
02/10	529	3970	4	9
02/17	420	4390	1	10
02/24	260	4650	0	10
03/03	326	4976	2	11
03/10	3189	8165	0	11
03/17	6285	14450	29	40
03/24	9220	23670	95	135
03/31	7791	31461	198	333

NMFS/AKR
04/04/91

1991 BERING SEA/ALEUTIAN ISLANDS FISHERIES
CHINOOK & OTHER SALMON BYCATCH

TRAWL GEAR

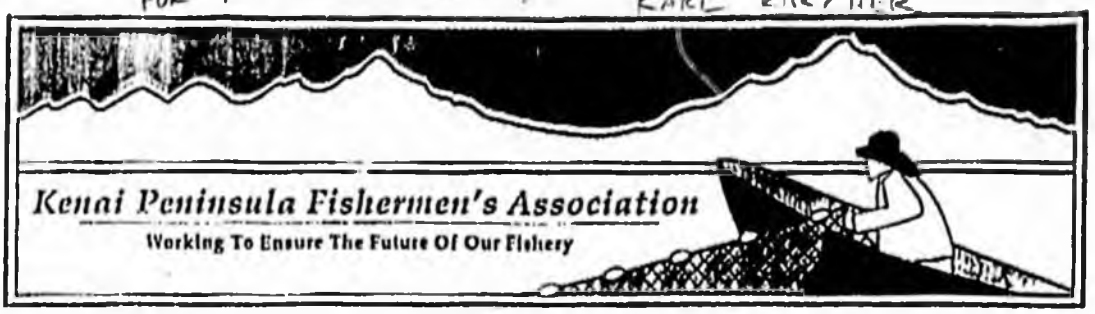
	CHINOOK SALMON		'OTHER' SALMON	
WEEK	WEEKLY NUMBER	CUMULATIVE NUMBER	WEEKLY NUMBER	CUMULATIVE NUMBER
01/06	11424	11424	745	745
01/13	4489	15913	362	1106
01/20	1255	17167	32	1139
01/27	866	18033	0	1139
02/03	2006	20039	46	1185
02/10	2137	22176	2	1187
02/17	1921	24097	113	1300
02/24	1968	26065	654	1954
03/03	440	26505	19	1973
03/10	1158	27663	3	1977
03/17	430	28094	34	2010
03/24	323	28417	443	2453
03/31	87	28504	0	2453

NOTE: No PSC Limits apply to salmon

Data based on observer reports, extrapolated to total groundfish harvest.

NOTE: ESTIMATES OF BYCATCH MAY CHANGE (INCREASE OR DECREASE) AS ADDITIONAL OBSERVER DATA BECOME AVAILABLE.

FOR MEETING TOMORROW RE KARL KIRCHER



34824 Kalifornsky Beach Road • Suite E • Soldotna • Alaska • 99669 • (907) 262-2492

4/04/91

1991 GULF OF ALASKA FISHERIES
HALIBUT BYCATCH MORTALITY

WED	HOOK & LINE ALLOWANCE 1st Trimester 200 MT MORTALITY: WK HAL MORT MT	WK %	CUM HAL MORT MT	CUM %	TRAWL ALLOWANCE 1st Quarter 600 MT MORTALITY: WK HAL MORT MT	WK %	CUM HAL MORT MT	CUM %
01/06/91	3	1.6%	3	1.6%	2	0.3%	2	0.3%
01/13/91	3	1.7%	7	3.5%	8	1.0%	7	1.2%
01/20/91	2	1.0%	9	4.3%	6	1.0%	13	2.2%
01/27/91	3	1.3%	11	5.5%	21	3.6%	35	5.8%
02/03/91	5	2.7%	17	8.3%	30	5.1%	65	10.8%
02/10/91	1	0.6%	18	8.8%	17	2.8%	82	13.6%
02/17/91	5	2.4%	22	11.2%	24	3.8%	105	17.6%
02/24/91	8	3.8%	30	16.0%	35	5.9%	141	23.4%
03/03/91	8	3.9%	38	18.9%	56	9.3%	196	32.7%
03/10/91	15	7.7%	53	26.6%	83	13.8%	279	46.6%
03/17/91	12	5.9%	66	32.6%	87	14.5%	367	61.1%
03/24/91	16	8.0%	81	40.6%	152	25.3%	518	86.4%
03/31/91	3	1.7%	85	42.3%	149	24.8%	668	111.3%

Data based on observer reports, extrapolated to total groundfish harvest.

NMFS/AKR
04/04/91

1991 GULF OF ALASKA FISHERIES
CHINOOK & OTHER SALMON BYCATCH

TRAWL GEAR

WEEK	CHINOOK SALMON: WEEKLY NUMBER	CUMULATIVE NUMBER		'OTHER' SALMON: WEEKLY NUMBER	CUMULATIVE NUMBER
01/06	341	341		0	0
01/13	985	1326		0	0
01/20	493	1819		0	0
01/27	503	2322		0	0
02/03	1119	3441		6	6
02/10	629	3970		4	9
02/17	420	4390	28% South Central	1	10
02/24	260	4650		0	10
03/03	326	4976		2	11
03/10	3189	8165		0	11
03/17	6285	14450		29	40
03/24	9220	23670	✓	95	135
03/31	7791	31461		198	333

NOTE: No PSC limits apply to salmon.

* on observer reports, extrapolated to total groundfish harvest.
*Marine Fisheries Service

Senator Lyman F. Hoffman

Alaska State Senate
P.O. Box V • Juneau, Alaska 99811 • (907) 465-4453

MEMORANDUM

TO: Members of House Resources Committee

FROM: Senator Lyman F. Hoffman

RE: SCR 13, relating to chinook bycatch

DATE: April 10, 1991

I have introduced SCR 13 as a result of data from state and federal observer programs which indicate an excessively high number of Alaska chinook caught by the U.S. trawl fleet while fishing for groundfish in both the Bering Sea and Gulf of Alaska, as well as a significant bycatch of chinook salmon in the central Bering Sea Donut Hole. These chinooks are predominantly of Bristol Bay and western Alaska origin, stocks which are already experiencing severe conservation problems.

My resolution asks the Governor of the state of Alaska to take a strong position on this issue and use all means at his disposal to ensure the federal government acts to significantly reduce or eliminate this bycatch.

This issue is of concern not only to Bristol Bay and western Alaska fishermen, but also to southeast and central Alaska fishermen, since their salmon are also affected by bycatch problems from the various trawl fleets.

I ask for your support.

P.O. Box 763 • Bethel, Alaska 99559 • (907) 543-3543

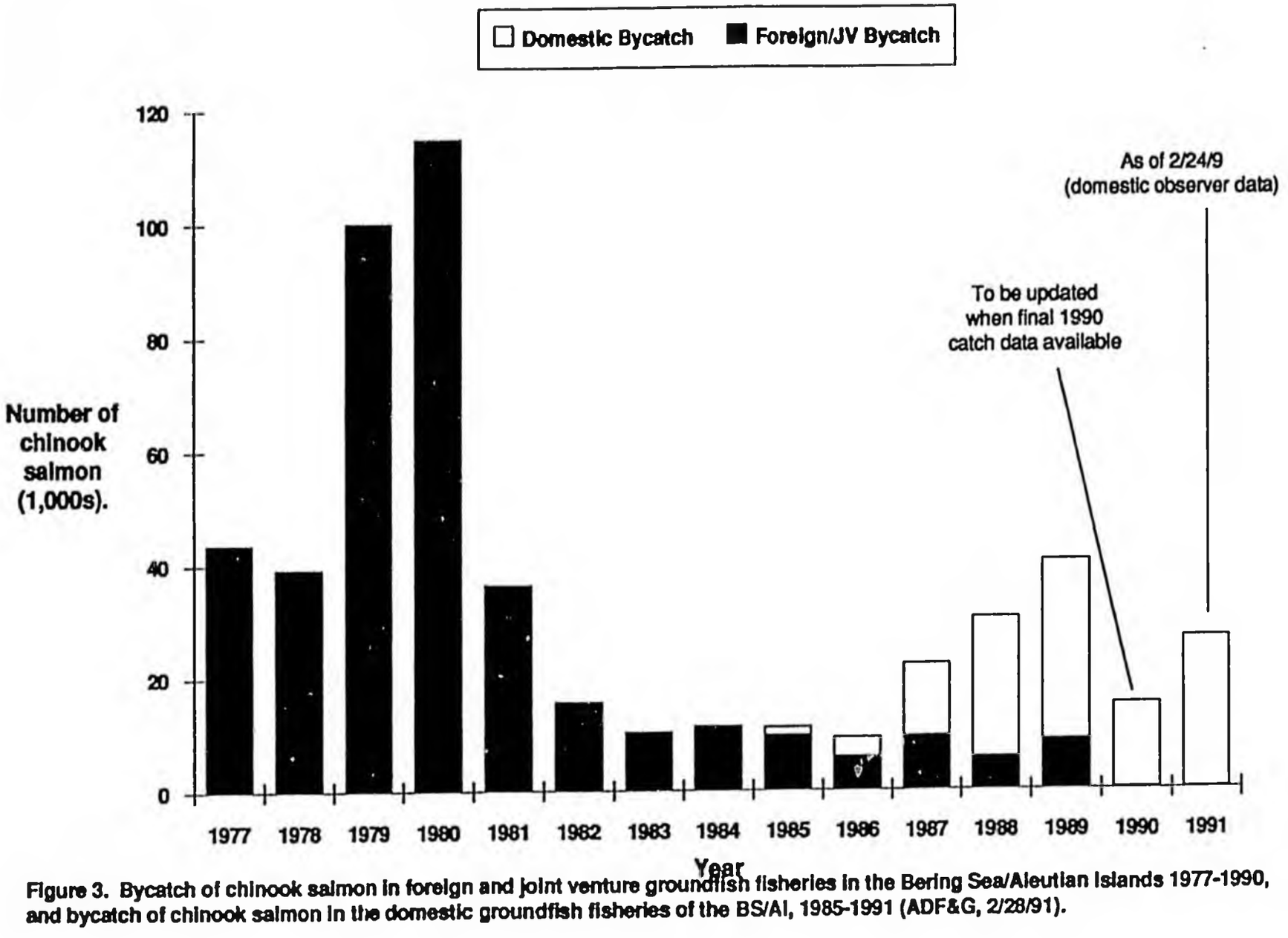


Figure 3. Bycatch of chinook salmon in foreign and joint venture groundfish fisheries in the Bering Sea/Aleutian Islands 1977-1990, and bycatch of chinook salmon in the domestic groundfish fisheries of the BS/AI, 1985-1991 (ADF&G, 2/28/91).

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

BOARD OF FISHERIES

WALTER J. HICKEL, GOVERNOR

PO. BOX 3 2000
JUNEAU, ALASKA 99802-2000
PHONE: (907) 465-4110
FAX: 463-6331

February 12, 1991

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To Molly McCammon	From Nancy
Co. Sen. Hoffman	Co. ADF&G
Dept.	Phone # 465-4110
Fax # 465-4523	Fax #

Steve Pennoyer
Regional Director
Alaska Region
National Marine Fisheries Service
P.O. Box 1668
Juneau, Alaska 99802

Dear Mr. Pennoyer:

The State of Alaska, Board of Fisheries is extremely concerned with the high rate of salmon by-catch in area 517 by the mid-water pollock trawl fishery.

We formally request you take immediate action to address this unacceptable high rate of salmon by-catch. We would strongly support an immediate closure of all or parts of area 517 and, if necessary, area 518 under your "hot spot" authority and would naturally support such closures in Federal Waters with closures of state waters in the contiguous areas.

We seek an immediate response from you and the North Pacific Fishery Management Council at the earliest date possible. An analysis of what actions might conceivably be taken by the council in the coming year to address this issue would also be in order and greatly appreciated.

Thank you.

Sincerely,

Michael R. Martin
Mike Martin
Chair
Board of Fisheries

Deborah Lyons
Deborah Lyons
Chair
By-Catch Committee

cc: Governor Hickel
Clarence Pautzke, Chairman, NPFMC
Commissioner of Fish and Game

STATE OF ALASKA

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

WALTER J. HICKEL, GOVERNOR

P.O. BOX 3-2000
JUNEAU, ALASKA 99802-2000
PHONE: (907) 465-4100

February 13, 1991

Steve Pennoyer
Director
Alaska Region
National Marine Fisheries Service
P.O. Box 1668
Juneau, Alaska 99802

Dear Mr. Pennoyer:

As you are aware, the Bering Sea trawl fishery has exhibited some startlingly high bycatch rates for chinook salmon during the first several weeks of 1991. The incidental harvest of some 20,000 chinook by February 3 has fishermen, biologists, and the Alaska Board of Fisheries very alarmed. Past reports of chinook bycatch in the Gulf of Alaska and in the "donut hole" of international waters of the central Bering Sea are also of great concern.

The Department of Fish and Game has developed a summary of the 1991 bycatch to date, based upon initial observer reports, and comparisons to past levels of chinook catches, both as bycatch and as directed harvest in state waters (enclosed). The few stock identification studies available indicate that the majority of chinook taken in Bering Sea trawl fisheries are likely from western and central Alaska stocks. Most of these stocks are already fully allocated to commercial, sport, and/or subsistence fisheries, and several of them are suffering declines in run strength.

The additional pressure of bycatch on these stocks may, in at least a few instances, constitute a conservation problem; it certainly constitutes a reallocation of state-managed resources. Given the obvious disputes between our own fishermen over even small numbers of kings in many systems, I am sure you understand our concern for yet another source of mortality, let alone one that is truly incidental and of no apparent benefit.

I believe that this problem warrants your immediate attention. We encourage the National Marine Fisheries Service (NMFS) to monitor the salmon bycatch very closely and make projections of any additional take expected during the 1991 groundfish fisheries. In addition, I ask that you review your authorities to institute time/area ("hot spot") closures or other emergency measures to protect Alaskan chinook stocks. Because of the importance of these

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stocks to our traditional fisheries, we are urging you to consider emergency action as requested by the Board of Fisheries.

As a potential point of reference, we note that foreign and joint-venture fishermen were able to control their annual chinook bycatch rates from 115,100 chinook salmon per 1.33 million mt of groundfish (0.087 chinook/mt) in 1980 down to about 0.004 chinook/mt in 1986. Presumably we should expect our own domestic fishermen to exhibit the same, if not better, control of their impacts on the resources upon which other domestic fishermen depend. I suggest that NMFS, in the short term, and perhaps the North Pacific Fishery Management Council, consider a bycatch management program that would limit chinook take to, at maximum, a commensurate 0.004 chinook/mt. For 1990, this rate would have restricted bycatch to approximately 6,600 chinook for the 1.65 million mt of groundfish taken, rather than the 14,000 chinook reported by observers. Similar protection may also need be afforded in the Gulf of Alaska and the donut hole.

Steve, I know that this is not a simple issue. On the other hand, it is not an issue easily dismissed. The burden of responsibility lies properly with the newly exploding groundfish fishery rather than with the established and traditional users of chinook salmon. I look forward to your consideration of the control of this bycatch and offer the assistance of ADF&G staff for any further data analysis which may be necessary. Please keep us apprised of your actions. Thanks.

Sincerely,

Ron Somerville

Ron Somerville
Deputy Commissioner

Enclosure

cc: Michael Martin
Clem Tillion
Clarence Pautzke
Denby Lloyd

1991 Chinook Salmon Bycatch Summary
February 13, 1991

Alaska Department of Fish and Game
Division of Commercial Fisheries

Current Status of Chinook Bycatch in the Groundfish Fisheries of the Bering Sea/Aleutian Islands and the Gulf of Alaska

As of February 3, 1991 an estimated 20,708 chinooks had been caught incidentally in the groundfish fisheries of the Bering Sea/Aleutian Islands (BS/AI). An additional estimated 2,213 chinooks had been caught in the Gulf of Alaska groundfish fisheries, primarily in the midwater trawl fishery for pollock.

In the BS/AI, the vast majority of the bycatch has occurred in the pollock midwater trawl fishery, predominantly from federal statistical area 517 and, to a lesser extent, statistical area 515. The pollock fishery was initially concentrated in statistical area 517 and, during the last two weeks of January, expanded to include statistical area 515. As of February 3, the bycatch rates for these two areas were 0.325 and 0.013 chinooks/mt of groundfish, respectively. Federal statistical areas are indicated in Figure 1a.

In addition, preliminary data from groundfish vessels in the Donut Hole suggest bycatches of chinook salmon that could be in excess of 60,000 in 1990.

BS/AI Groundfish Catch and Chinook Bycatch: 1990 VS. 1991

This year, by January 27, both reported groundfish catch and reported chinook bycatch in statistical area 517 had increased dramatically compared to the same period in 1990. However, the observer program was newly established in 1990 and actual observer coverage was very minimal prior to March 1990. Therefore, it is possible that the actual chinook bycatch for the first month of 1990 in the entire Bering Sea was higher than the approximate 3,000 chinooks reported.

By January 27, reported groundfish catch and chinook bycatch for 1990 and 1991 in statistical area 517 of the BS/AI was:

YEAR	GROUNDFISH (MT)	CHINOOKS (NOS.)	BYCATCH RATE (NOS./MT)
1990	7,657	383	0.05
1991	53,872	12,316	0.23

Cumulative bycatches of chinook salmon through the week ending February 3 are shown in Figure 1.

Commercial Catch History and Health of Chinook Salmon

The total statewide commercial harvest of chinook salmon has been relatively stable since the late 1980's. The projected total statewide commercial harvest for 1991 is 672 thousand chinook salmon (Geiger and Savikko, 1991). The total statewide harvest in 1990 was 665 thousand chinooks.

On the district level, the Bristol Bay chinook salmon stocks have suffered the greatest decline. Chinook salmon numbers have dropped since the early 1980's raising concern over the health of the Nushagak and Togiak River runs. The number of chinook harvested in the Cordova district (Copper River) and the Cook Inlet district (Kenai River) have also declined since 1987. According to area management biologists, the Yukon and Kuskokwim stocks are currently in a rebuilding phase after lower-than-optimum returns in the mid-1980's.

The total annual commercial catch for districts or combined districts from the years 1980 - 1990 are provided in Figure 2. The total bycatches of salmon for each year are provided in this figure as well. The projected 1991 harvest by district, the 1980-1990 average, the 1990 catch, and comments are provided below:

Yukon/Kuskokwim	The 1991 projected harvest of 166 thousand chinook salmon is below the 1990 harvest of 190 thousand chinook salmon and below the 11 year average of 198 thousand fish. The 1990 catch was 95.7% of the 11 year average.
Bristol Bay	The 1990 harvest of 33 thousand chinook salmon was 28.0% of the 1980-90 average of 118 thousand fish. The projected 1991 harvest is 45 thousand fish, an increase from the 1990 catch. However, the chinook salmon catch in the Nushagak district has been in decline since 1984. There has been no directed commercial fishery for chinook salmon since 1986.
Ak Pen/Chignik	The eleven year average of 33 thousand chinook salmon is less than the 1990 catch of 35 thousand chinook. However, the 1991 projected harvest of 22 thousand fish is well below the average.
Kodiak	Although historically small, the commercial catch in Kodiak has risen from between 1 and 5 thousand chinook salmon during the period

1980-87, to 22 thousand in 1988 and 19 thousand in 1990. The 1991 projected harvest is 15 thousand fish.

Cook Inlet — Although high chinook harvests were reported in 1986 and 1987 (40 and 41 thousand fish, respectively), the 1990 harvest of 18 thousand chinook salmon was 75.9% of the eleven year average of 24 thousand fish. The 1991 projection is for 32 thousand chinook salmon.

Cordova — The 1990 harvest of 22 thousand chinook salmon was lower than the 1980-90 average of 34 thousand fish. However, the run is thought to be stable and the 1991 projected harvest is 42 thousand chinook salmon.

Origins of Chinook Salmon Caught Incidentally in Groundfish Fisheries

Information on the origins of chinook salmon caught incidentally in trawl and other fisheries of the Bering Sea comes primarily from salmon scale pattern analysis. The study most relevant to the groundfish fisheries is Myers and Rogers (1988). Scales collected by groundfish observers were analyzed to identify the origin of chinook salmon bycaught in the foreign and joint-venture groundfish fisheries in the Bering Sea EEZ during 1979, 1981 and 1982. The percent origin of chinook salmon from various regions and within the Western Alaska region over all three years was:

Western Alaska		60 %
Yukon	17 %*	
Kuskokwim	24 %*	
Bristol Bay	29 %*	
Central Alaska		17 %
Asia		14 %
S.E. Alaska/British Columbia		9 %

* Not intended to sum to Western Alaska total percentage.

Myers and Rogers indicated that the predominant ages of chinook salmon in the western Alaska commercial catches were ages 1.3 (years in fresh water.years in salt water) and 1.4. They speculated that the greatest effect of large incidental catches of ages 1.2 and 1.3 chinooks offshore on inshore harvests would likely occur 1 or 2 years later.

Davis (1990) also used scale pattern analysis to determine origins of chinook salmon near Japanese mothership and landbased driftnet

salmon fisheries in 1985 and 1986. Based on scales collected in the vicinity of the mothership fisheries (north of the Aleutians and between 175°E and 175°W) the percent origin of immature (age-1.2) chinook salmon was:

	1985	1986
Western Alaska	58 %	10 %
Central Alaska	3 %	17 %
Asia (Kamchatka)	39 %	73 %

A previous study of chinooks from the area of the Japanese mothership salmon fishery, 1975 to 1981 (Myers et al., 1987), indicated the following percentage origin of chinooks from the Bering Sea:

Western Alaska		70 %
Yukon	48 %*	
Kuskokwim	21 %*	
Bristol Bay	14 %*	
Central Alaska		10 %
Asia		18 %
S.E. Alaska/British Columbia		2 %

* Not intended to sum to Western Alaska total percentage.

Davis (1990) cites additional scale pattern studies (Major et al. 1975, 1977a,b) which also indicated "that western Alaskan fish predominated in the Bering Sea and that the proportion of western Alaskan fish increased to the east".

Tagging data to determine region of chinook origin have been very limited but tend to corroborate results of scale pattern analyses (Myers and Rogers, 1988). Although scales from chinooks are currently being collected by observers, no scale pattern analysis is currently conducted to determine the origin of chinook salmon bycatch in groundfish fisheries. Observers are also collecting the heads of salmon with clipped adipose fins for potential recovery of coded wire tags.

Potential Future Chinook Bycatch

As of February 3, 59 % of the pollock roe season quota had been taken in the Bering Sea, 61 % of the Bogoslof management area (Figure 1a) quota had been taken and 18 % of the Aleutian Islands quota had been taken. At these rates of fishing, the Bering Sea

and Bogoslof quotas will probably be attained near the end of February. Once the roe season pollock quota has been taken in the Bering Sea, it is expected that a large percentage of the fleet will shift to the Aleutians for what remains of a minimal quota on pollock, to bottom trawling for Pacific cod and other species, and to the Gulf of Alaska for pollock.

As of February 3, only 9 % of the Pacific cod quota in the BS/AI had been taken. In 1990, the chinook bycatch rate in the Pacific cod bottom trawl fishery (range: 0 - 0.043 chinooks/mt groundfish) exceeded the rate in the pollock midwater trawl fishery (range: 0 - 0.020 chinooks/mt groundfish) in eight of the ten management areas. The 1990 chinook bycatch rate in the Pacific cod trawl fishery in statistical area 517 (0.037 chinooks/mt groundfish) was over twice the corresponding rate in the pollock midwater trawl fishery in statistical area 517 (0.016 chinooks/mt groundfish). This suggests the possibility of continued high bycatch of chinook salmon even after the fleet shifts to fishing for Pacific cod and other species.

A shift of boats to the Gulf of Alaska could increase the bycatch of chinook salmon in the Gulf, where bycatch of chinooks exceeded that of the BS/AI in 1990 (see Figures 3 and 4). It should be emphasized that the early-year bycatch of chinooks in 1990 in the Bering Sea may have been similar to that reported for January 1991, but may have been largely unreported due to the delays in implementing the observer program in 1990. Thus, the apparent increase in chinook bycatch in 1991 compared to 1990 may in part be an artifact of inadequate observer coverage in early 1990. Weekly and cumulative bycatches of chinook salmon for 1990 in the Bering Sea are shown in Figure 5. The same information for chinook salmon bycatch in the Gulf of Alaska is shown in Figure 6.

In addition to incidental catches of chinook in the groundfish fisheries of the U.S. EEZ, the bycatch of chinooks in the groundfish fisheries in the Donut Hole should be taken into account in evaluating the potential impact of bycatch on the directed catches of chinook salmon.

To fully understand the impact of chinook salmon bycatch on Alaskan salmon stocks will require a detailed analysis of the data provided by onboard observers. Additional information concerning the origin of the stocks of salmon being intercepted by the trawl fleet is also necessary to reveal specifically affected stocks. Scale pattern analysis, tag recovery, and genetic stock identification are means which can be incorporated to identify stock origins. Knowledge concerning the affect of chinook salmon bycatch on Alaskan stocks is especially necessary in the case of districts such as Bristol Bay, and perhaps Cook Inlet and the Copper River, which have experienced a significant drop in the numbers of returning fish in spite of adequate escapement.

References

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Myers, K.W. and D.E. Rogers. 1988. Stock origins of Chinook salmon in incidental catches by groundfish fisheries in the eastern Bering Sea. N. Amer. J. Fish. Manage. 8:162-171.

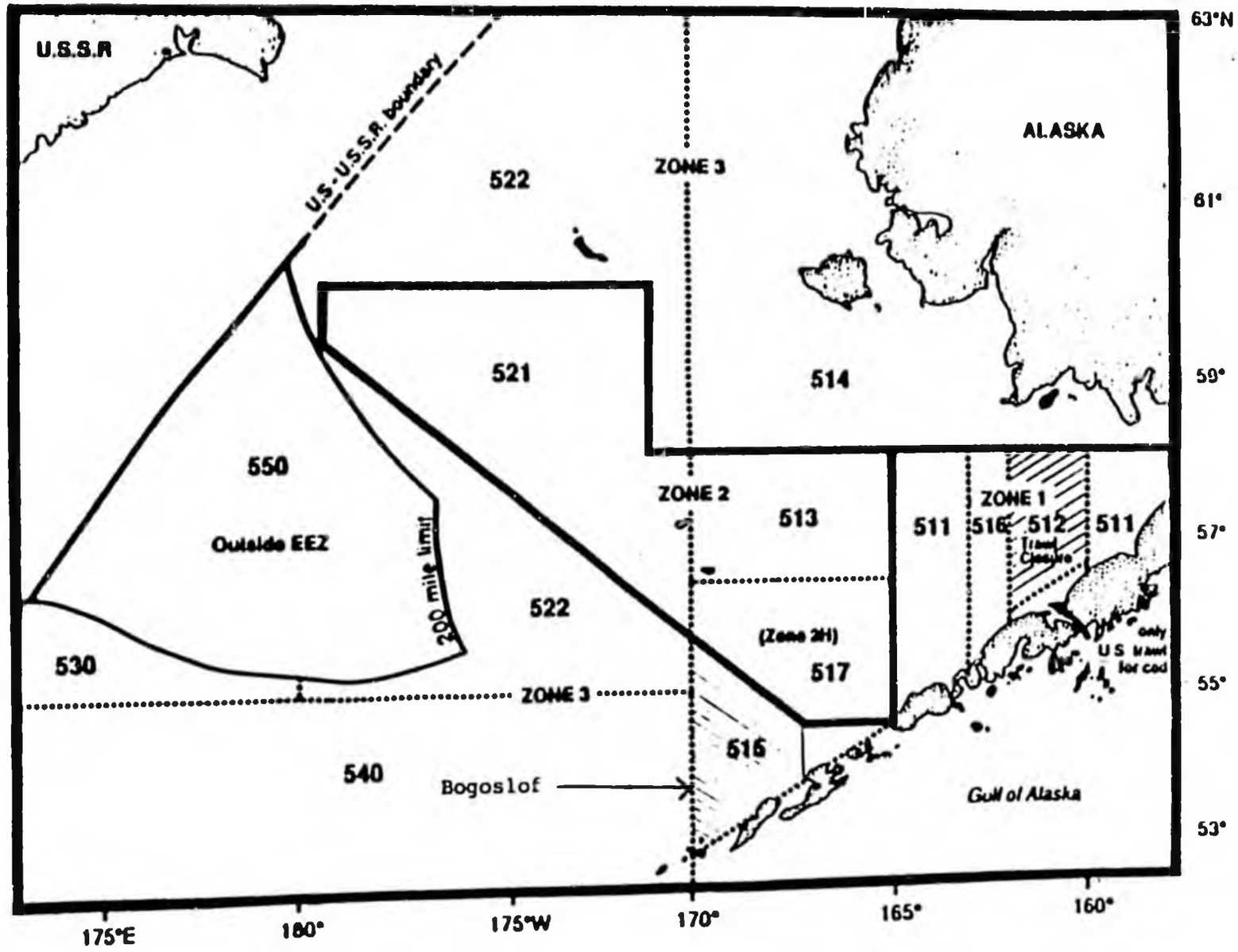


Figure 1a. Bering Sea federal statistical zones and areas (from: Guttormsen et.al.).

Figure 1. Cumulative numbers of chinook salmon caught incidentally in the groundfish fisheries in the Bering Sea/Aleutian Islands, 1990 and 1991.

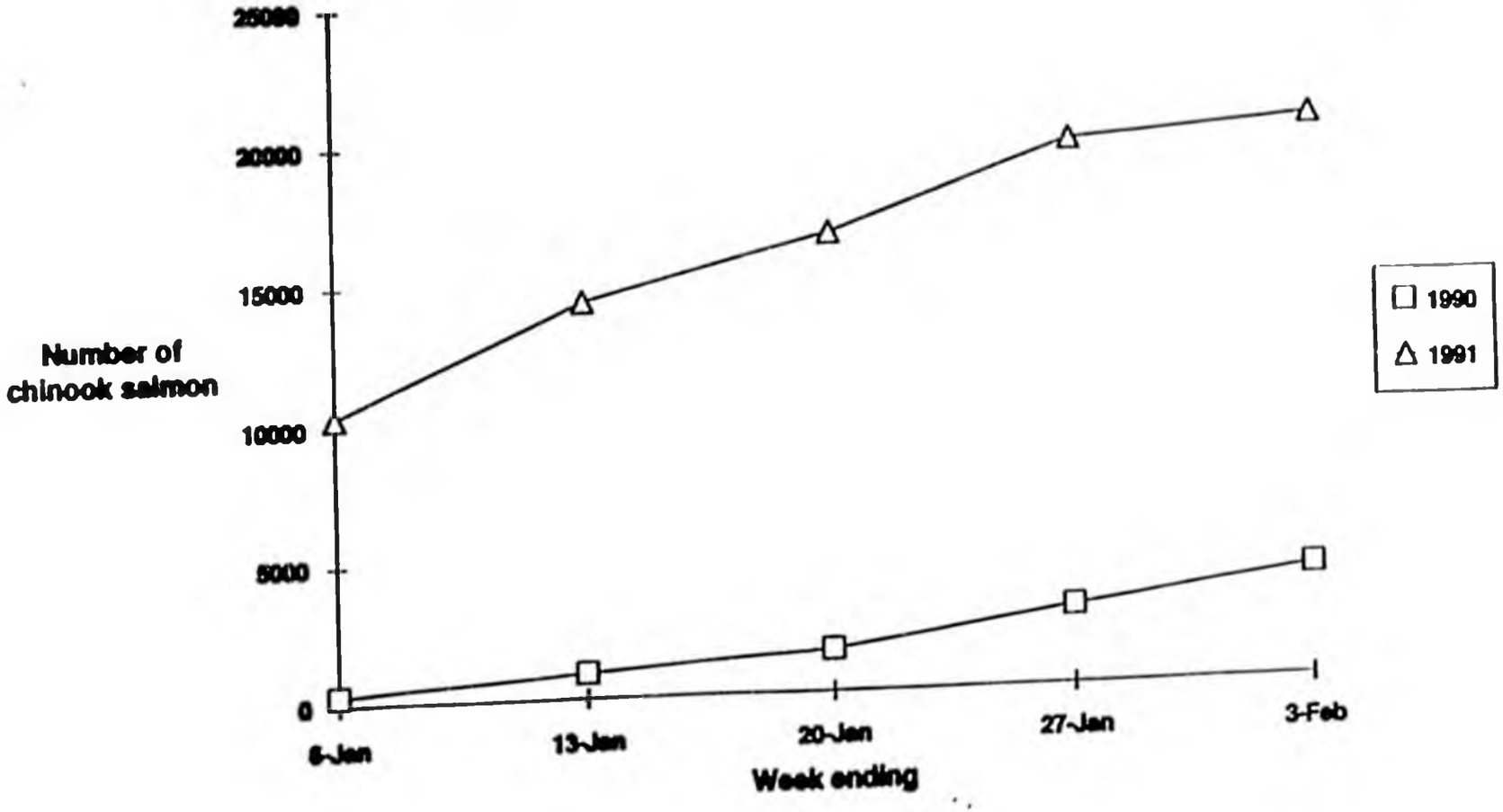


Figure 2. Catch of chinook salmon in directed commercial salmon fisheries and bycatch of chinook salmon in the groundfish fisheries in the Bering Sea/Aleutian Islands and Gulf of Alaska, 1980 - 1991.

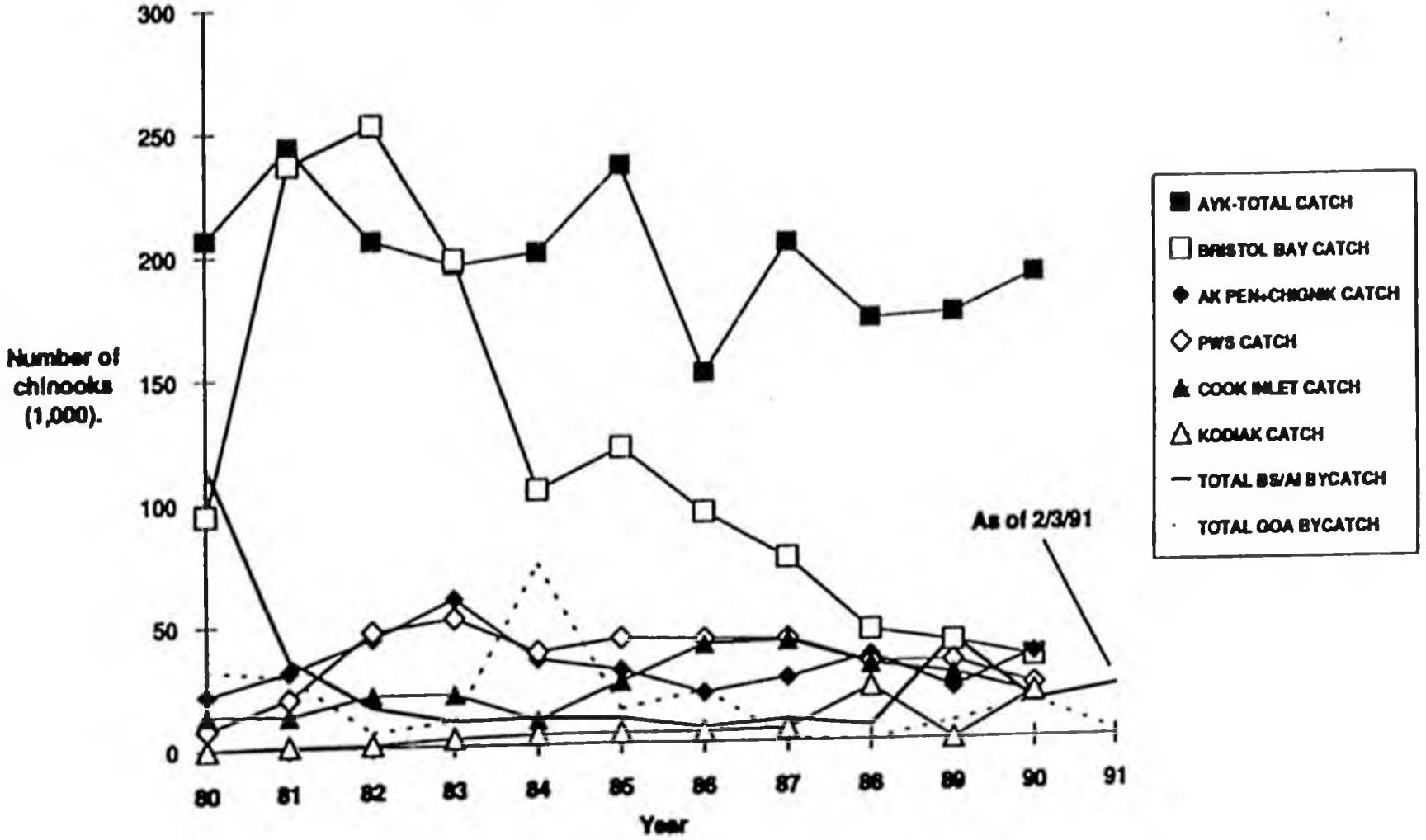


Figure 3. Bycatch of chinook salmon in foreign and joint venture groundfish fisheries in the Bering Sea/Aleutian Islands 1977 - 1990, and bycatch of chinook salmon in the domestic groundfish fisheries of the BS/AI, 1989 - 1991.

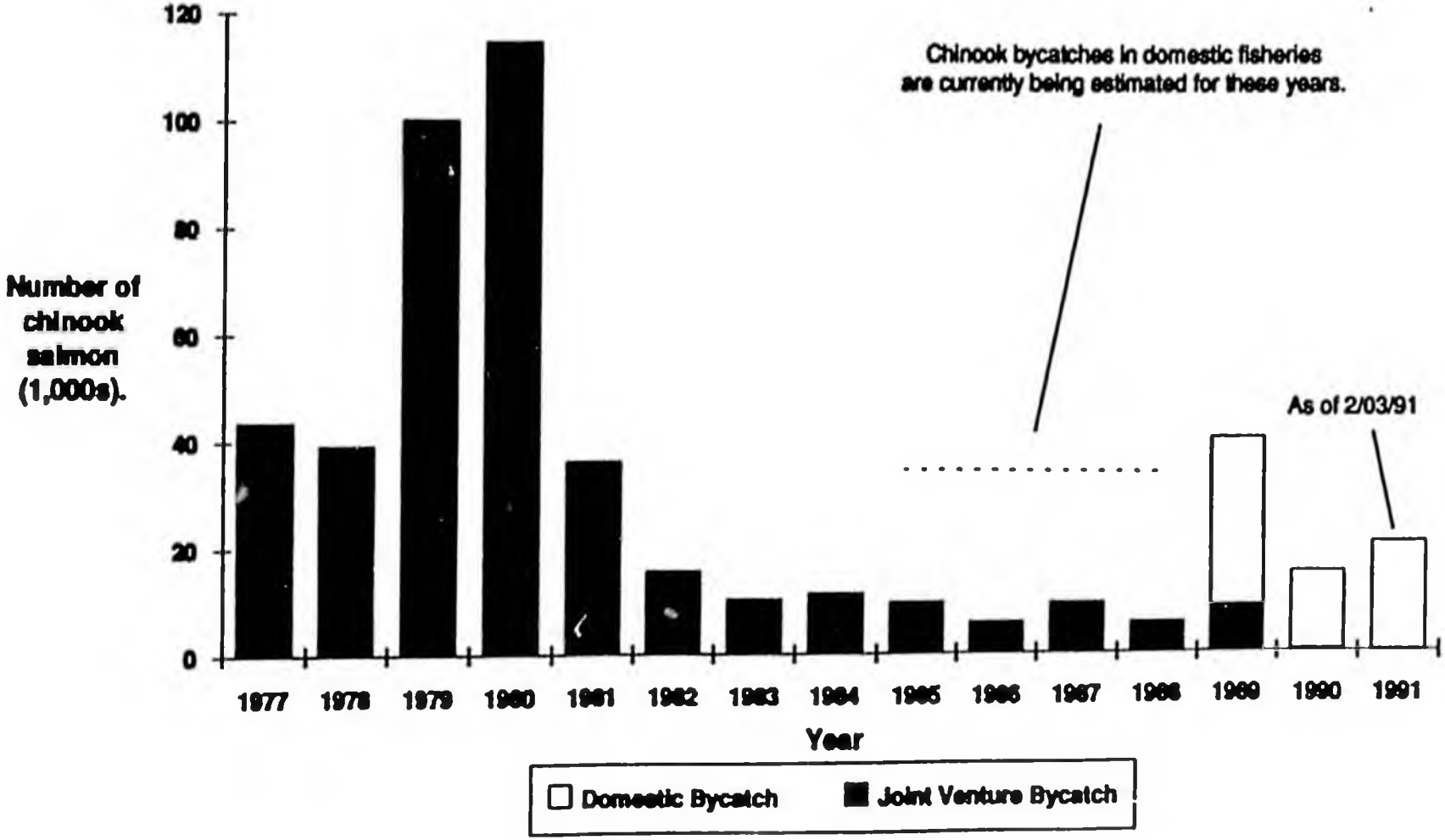
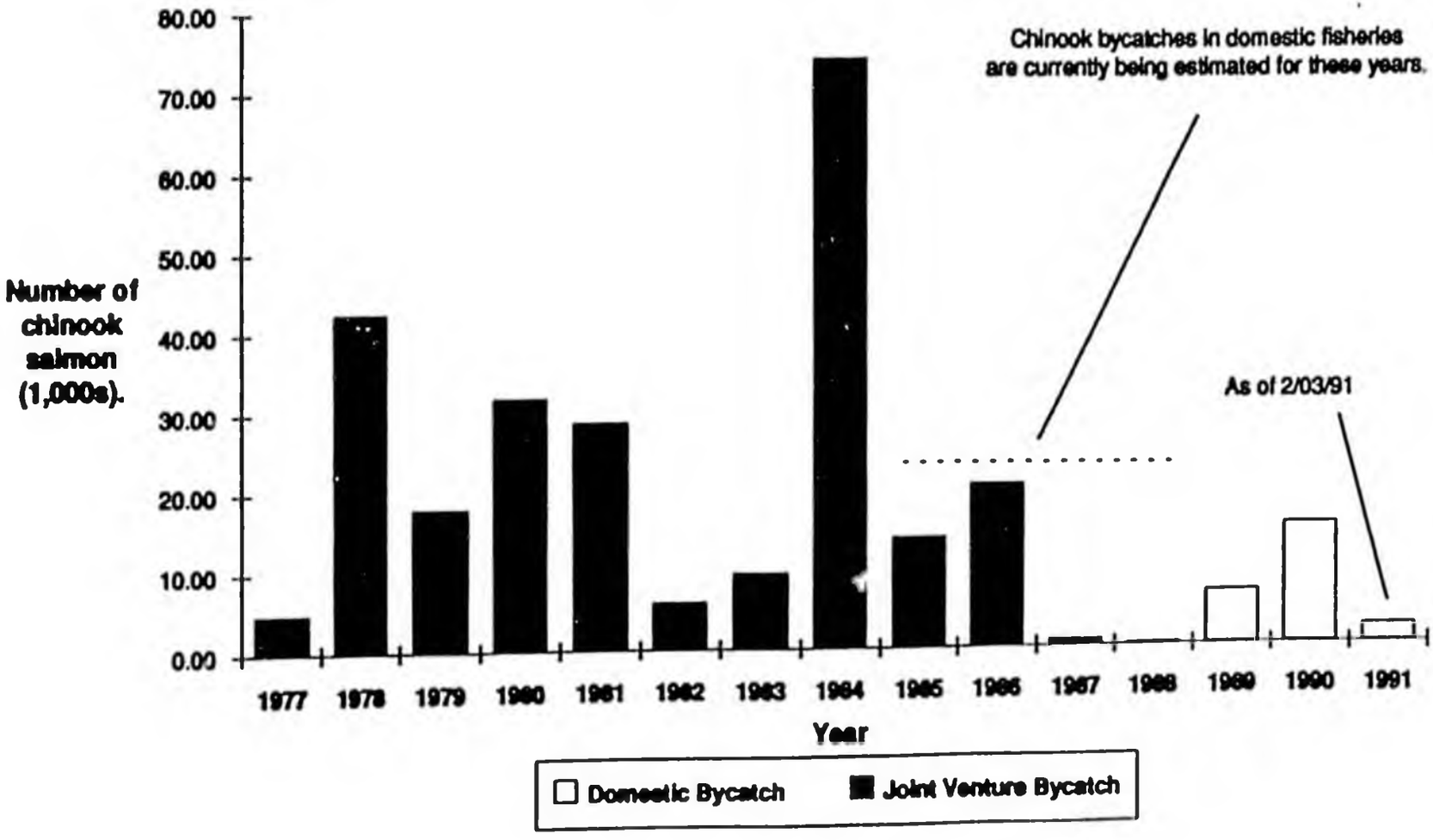


Figure 4. Bycatch of chinook salmon in foreign and joint venture groundfish fisheries in the Gulf of Alaska 1977 - 1988, and bycatch of chinook salmon in the domestic groundfish fisheries of the Gulf of Alaska, 1989 - 1991.



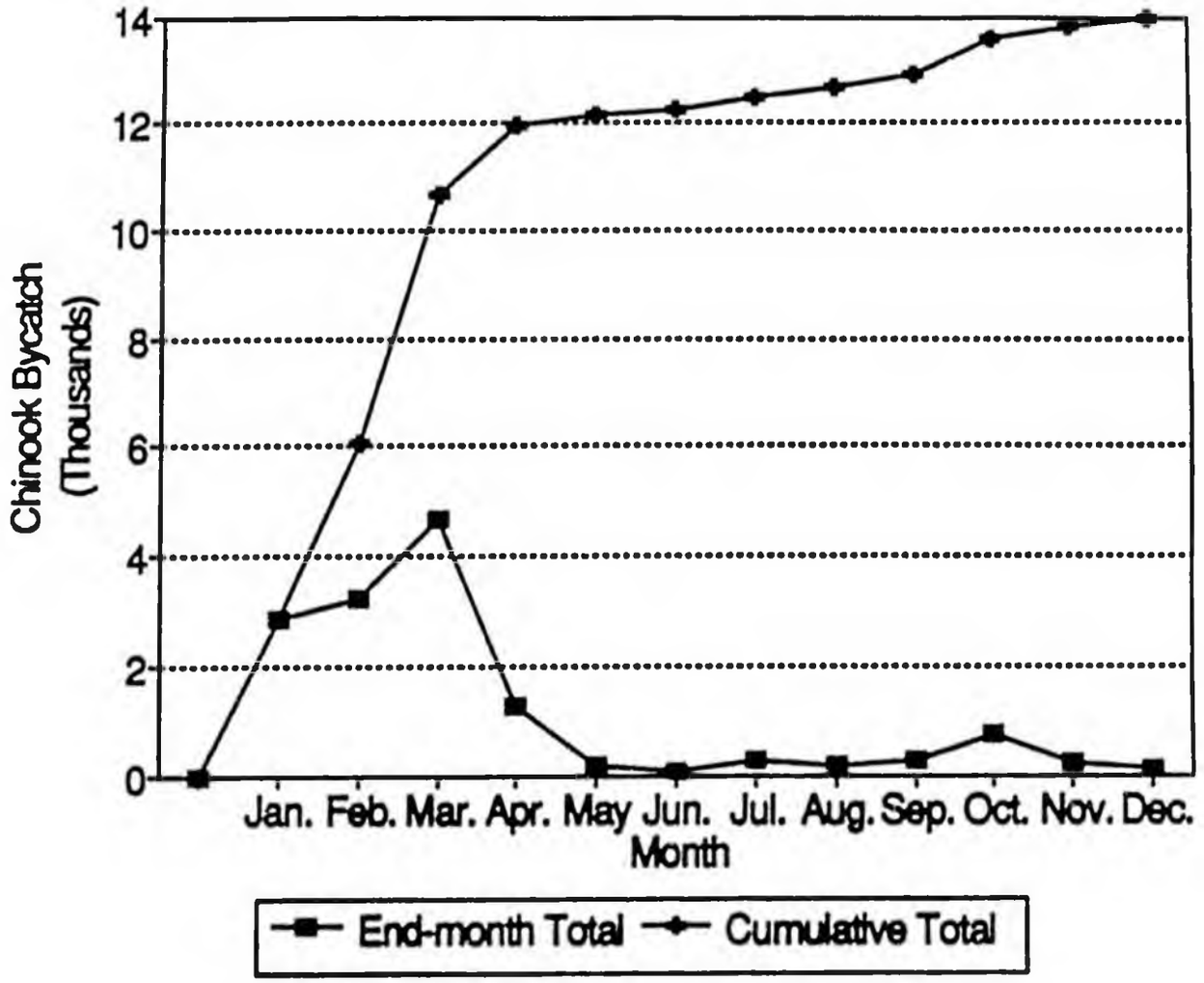


Figure 5. 1990 chinook salmon bycatch in the Bering Sea.

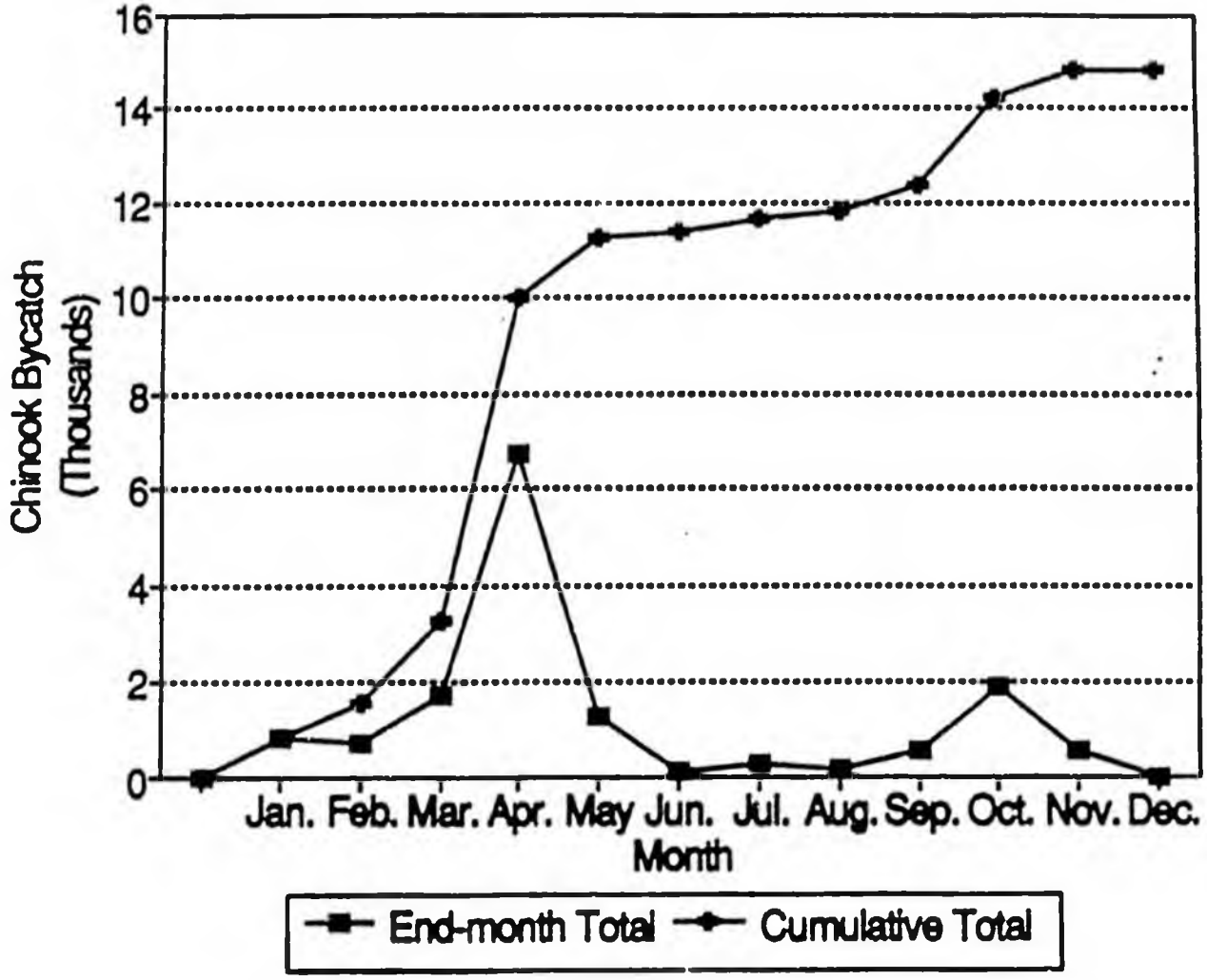


Figure 6. 1990 chinook salmon bycatch in the Gulf of Alaska.

Revised December 11, 1990

PRELIMINARY ESTIMATES OF CHINOOK SALMON BYCATCH IN THE GROUNDFISH FISHERIES OF THE GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS, 1989 & 1990

Prepared by

Alaska Department of Fish and Game

November 28, 1990

The primary purpose of this report is to present preliminary estimates of the number of chinook salmon caught incidentally in the domestic groundfish fisheries of the Gulf of Alaska (GOA) and Bering Sea/Aleutian Islands (BS/AI) areas in 1989 and 1990. Estimated numbers of bycaught chinook are compared to the directed catch. Also included is information about the spatial distribution of chinook bycatch, the percent of 1990 groundfish catch sampled by observers, the distribution of groundfish catch among vessel size categories, and the historical bycatch of chinook salmon in the foreign and joint venture groundfish fisheries.

METHODS OF ESTIMATING CHINOOK BYCATCH

1989

Two different data sets were used to estimate chinook bycatch for 1989. As the first method, average chinook bycatch rates from 1985 through 1989, by target fishery and 1/2° latitude x 1° longitude blocks, were estimated using joint venture observer data. These rates were multiplied by the total 1989 domestic groundfish catch in the respective 1/2° x 1° blocks to yield estimates of the total number of chinook salmon caught incidentally in that block. Estimated bycatches from individual blocks were summed within each area to produce an overall estimate of the numbers of chinooks bycaught in the 1989 domestic groundfish fisheries. For those blocks with 1989 domestic groundfish catch, but lacking an actual bycatch rate estimate, a weighted average bycatch rate was used. Rates for such blocks were computed as the weighted average of the five closest rates, weighted by the inverse distance between the individual rate and the center of the block without a rate. The second method of estimating chinook bycatch used domestic observer data from 1989. These data were limited, and generated from observer efforts associated with a marine mammal observer program, the NPFMC pilot domestic observer program and a program funded, in part, by industry. The estimation method used to estimate bycatch rates based on the domestic observer data, and subsequent bycatch

totals was identical to that used with the the JV data. These methods were used for both the GOA and the BS/AI.

1990

The same average, JV-based bycatch rates applied to 1989 domestic groundfish catches to estimate the total numbers of chinook salmon bycaught in the 1989 domestic groundfish fisheries were applied to the 1990 domestic groundfish catch to estimate the total numbers of chinooks bycaught in the 1990 domestic groundfish fisheries. Alternative estimates of chinook bycatch were based on data from the current domestic observer program. The domestic-based estimates included here are the estimates included on the NMFS Alaska Region Bulletin Board through November 10 ("1990 Gulf of Alaska Fisheries Chinook & Other Salmon Bycatch", "1990 Bering Sea/Aleutian Islands Fisheries, Chinook & Other Salmon Bycatch"). These domestic-based bycatch rates and totals are based on management sub-area rather than the 1/2° x 1° blocks used with the JV-based estimates. As for 1989, these methods were used for both the GOA and the BS/AI in 1990.

RESULTS

1989 Chinook Bycatch

Based on the limited 1989 domestic observer data, an estimated 3,740 chinook salmon were caught in the domestic groundfish fisheries in the GOA in 1989 (Figure 1., Table 1.). When the average 1985-89, JV-based bycatch rates are applied to the 1989 domestic groundfish catch, an estimated 9,640 chinook salmon were taken incidentally in the GOA. The directed catch of chinook salmon in the 1989 salmon fisheries in the GOA was approximately 357,590. Of that number, 69,590 chinooks were taken in the directed fisheries in the Central and Western Gulf. Therefore, estimated bycatch of chinook salmon in the 1989 domestic groundfish fisheries was approximtely one to three percent of the total GOA directed chinook catch, and five to fourteen percent of the directed catches in the Central and Western GOA.

In the BS/AI, estimates of chinook bycatch ranged from 34,320, based on domestic observer data, to 29,210, based on JV data. The directed chinook catch in the BS/AI in 1989 was approximately 225,330. The estimated bycatch of chinook salmon was approximately 13 to 15 % of the directed catch in 1989.

1990 Chinook Bycatch

An estimated 16,020 chinook salmon were taken incidentally in the the GOA domestic groundfish fisheries through November 10, based on

domestic observer data. In comparison, the total bycatch of chinook estimated from JV data was 6,480. These estimates of incidental catch are compared to a directed catch of 413,890 chinooks in the GOA. Of the total directed catch, about 81,830 chinooks were caught in the Central and Western GOA. Thus, bycatch of chinooks was equivalent to approximately two to four percent of the directed catch in the entire GOA in 1990. The estimated bycatch of chinook salmon in the entire GOA was equivalent to approximately 8 to 20 % of the directed catch in the Central and Western GOA.

Based on domestic observer data, an estimated 13,750 chinooks were taken incidentally in the BS/AI domestic groundfish fisheries through November 11, 1990. Using JV-based bycatch rates, an estimated 10,290 chinooks were taken incidetally during this time period. The preliminary estimate of the number of chinook taken in the directed salmon fisheries in the BS/AI is 233,480. Using these estimates, the estimated bycatch of chinook in the domestic groundfish fisheries was approximately four to six percent of the directed harvest.

1990 Observer Coverage

Through October of 1990, approximately 49 % of the domestic groundfish catch in trawl fisheries in the GOA has been observed as part of the NMFS Domestic Observer Program (Fig. 7). In the BS/AI, approximately 72 % of the catch in trawl fisheries has been observed.

Distribution of Groundfish Catch Among Vessel Size Categories

Through July of 1990, approximately 260,000 mt, or 25 % of the total groundfish catch in the GOA and BS/AI was harvested by boats i the 60 to 124 feet size category (Fig. 9). Another 730,000 mt, or 71 % of the total, groundfish catch was taken by vessels in the 125+ feet size category. Thus, approximately 96 % of the groundfish catch through July of 1990 was taken by vessels requiring some level of observer coverage.

Historical Bycatch in Joint Venture and Foreign Fisheries

Historically, the estimated numbers of chinook caught as bycatch in the joint venture and foreign groundfish fisheries in the GOA ranged from a low of approximately 90 in 1988 to a high of almost 75,000 in 1984 (Fig 10.) In the BS/AI, estimates of chinook bycatch varied from lows of about 5,000 in 1986 and 1988, to a high of approximately 115,000 in 1980 (Fig. 11).

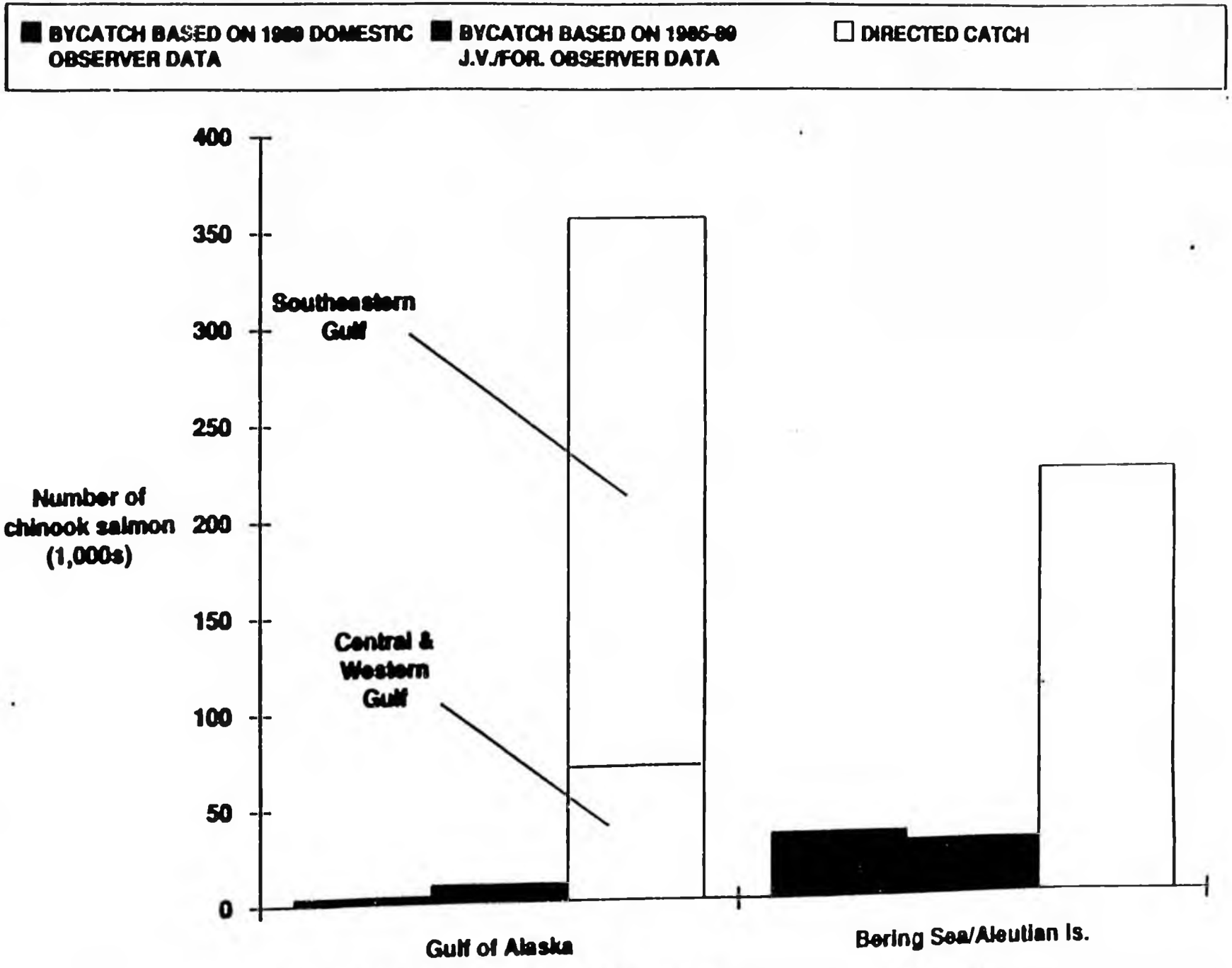


Figure /. Numbers of chinook salmon caught in the Gulf of Alaska and Bering Sea/Aleutian Islands groundfish fishery bycatch (2 estimates) and the Area ...almon fishery catch. 1989.

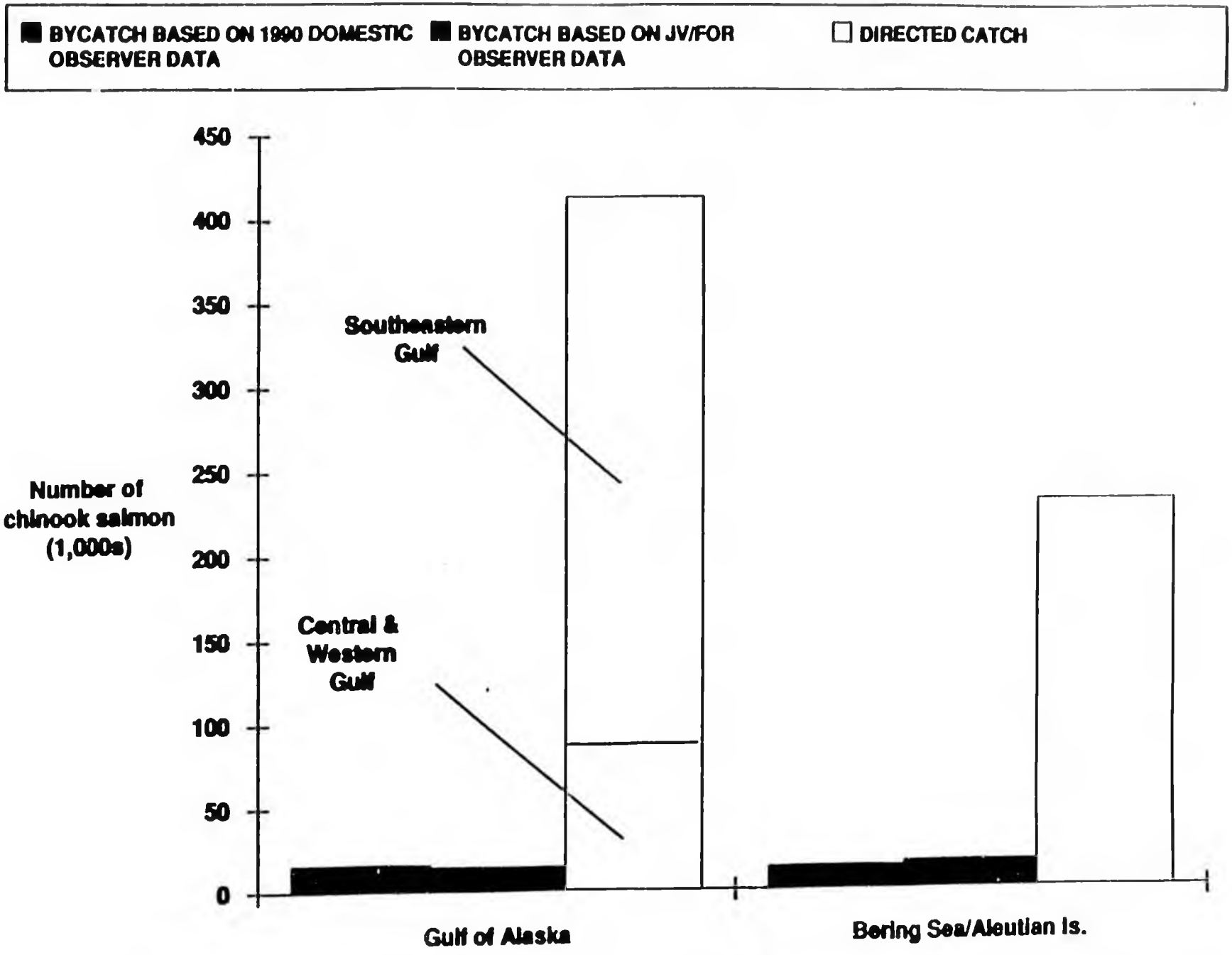


Figure 2. Numbers of chinook salmon caught in the Gulf of Alaska and Bering Sea/Aleutian Islands groundfish fishery bycatch (2 estimates) and as directed salmon fishery catch. 1990.

Table 1. Preliminary estimates of the numbers of chinook salmon (1,000s) caught as bycatch in the groundfish fisheries and as directed catch in salmon fisheries in the Gulf of Alaska and the Bering Sea/Aleutian Islands in 1989 and 1990.

Year	Area	Bycatch based on domestic observer data.	Bycatch based on joint venture observer data	Directed catch
1989	Gulf of Alaska	3.74	9.64	357.59
	Bering Sea/Aleutian Islands	34.32	29.21	225.33
1990	Gulf of Alaska	16.02	14.5	413.89
	Bering Sea/Aleutian Islands	13.75	16.22	233.48

Note: Domestic observer data for 1989 were collected from three observer programs, including a marine mammal observer, program, the NPFMC pilot program, and a program supported, in part, by the fishing industry. Domestic observer data for 1990 were generated from the new NMFS domestic observer program. Average bycatch rates from the 1985-89 joint venture fisheries were applied to both 1989 and 1990 domestic groundfish catch to obtain JV-based estimates of chinook salmon bycatch.

Fig. 3. KING SALMON BYCATCH (NO) & TRAWL CATCH (1000 MT), 1989, GOA

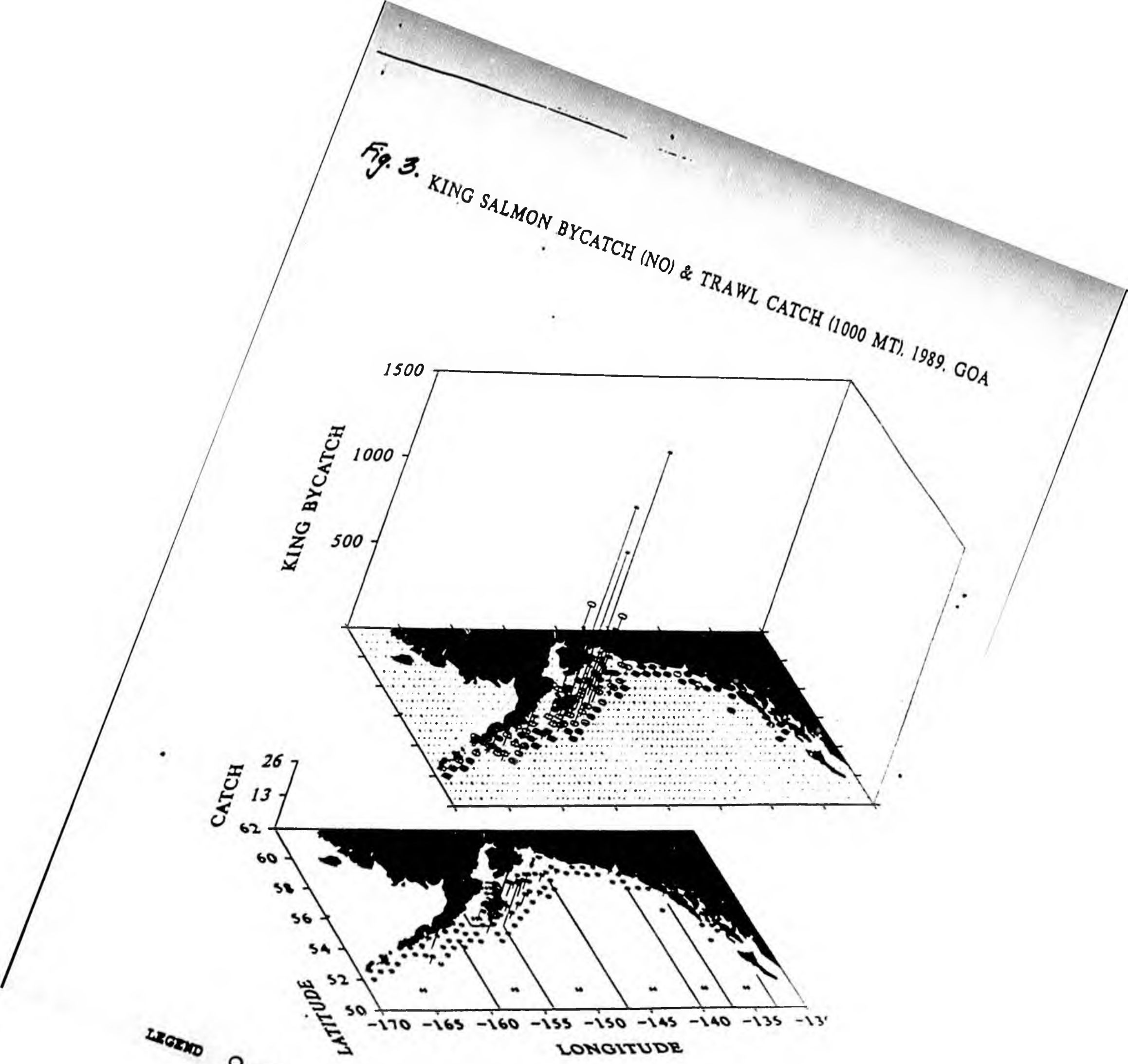


Fig. 4: KING SALMON BYCATCH (NO) & TRAWL CATCH (1000 MT), 1990, GOA

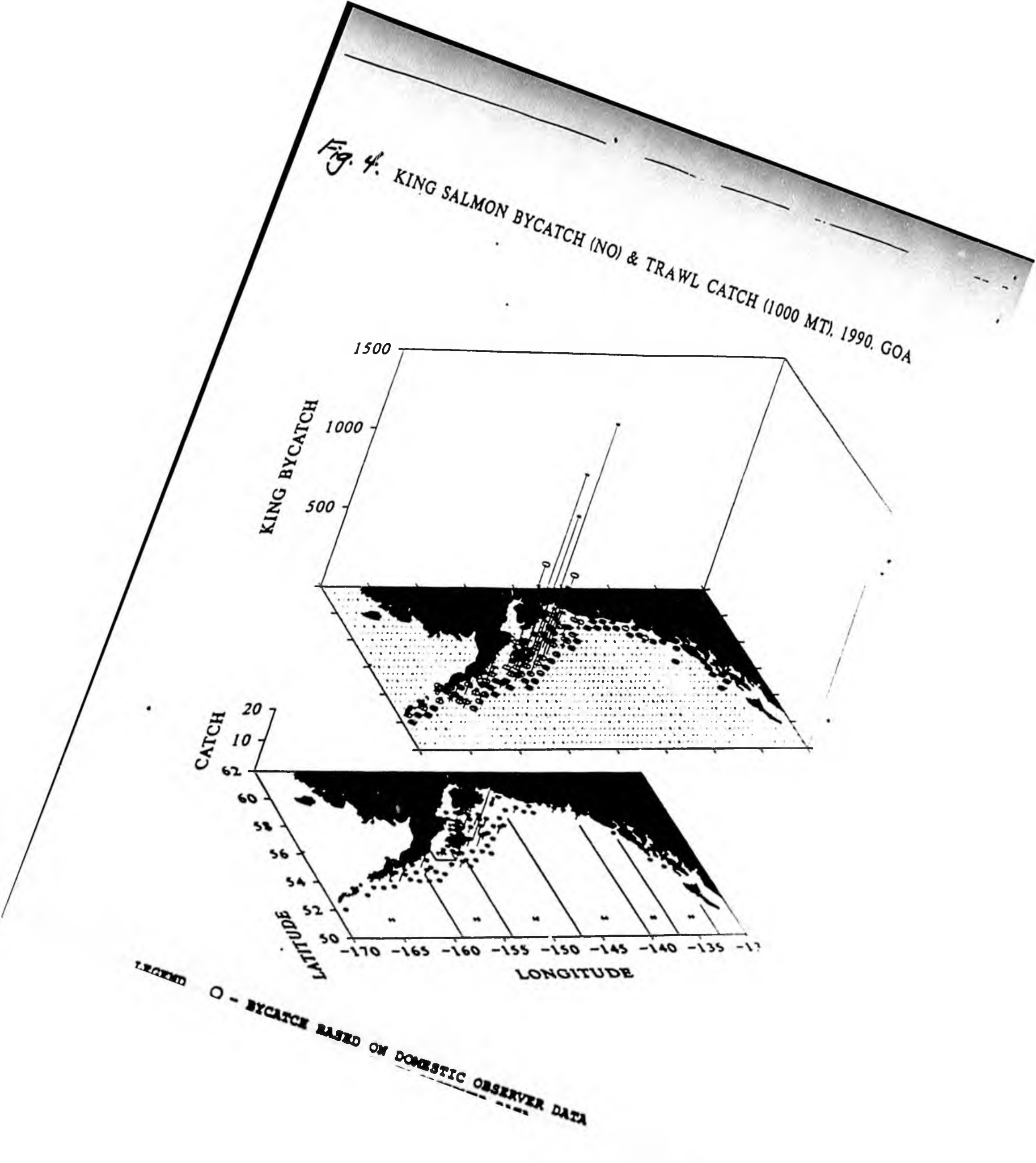
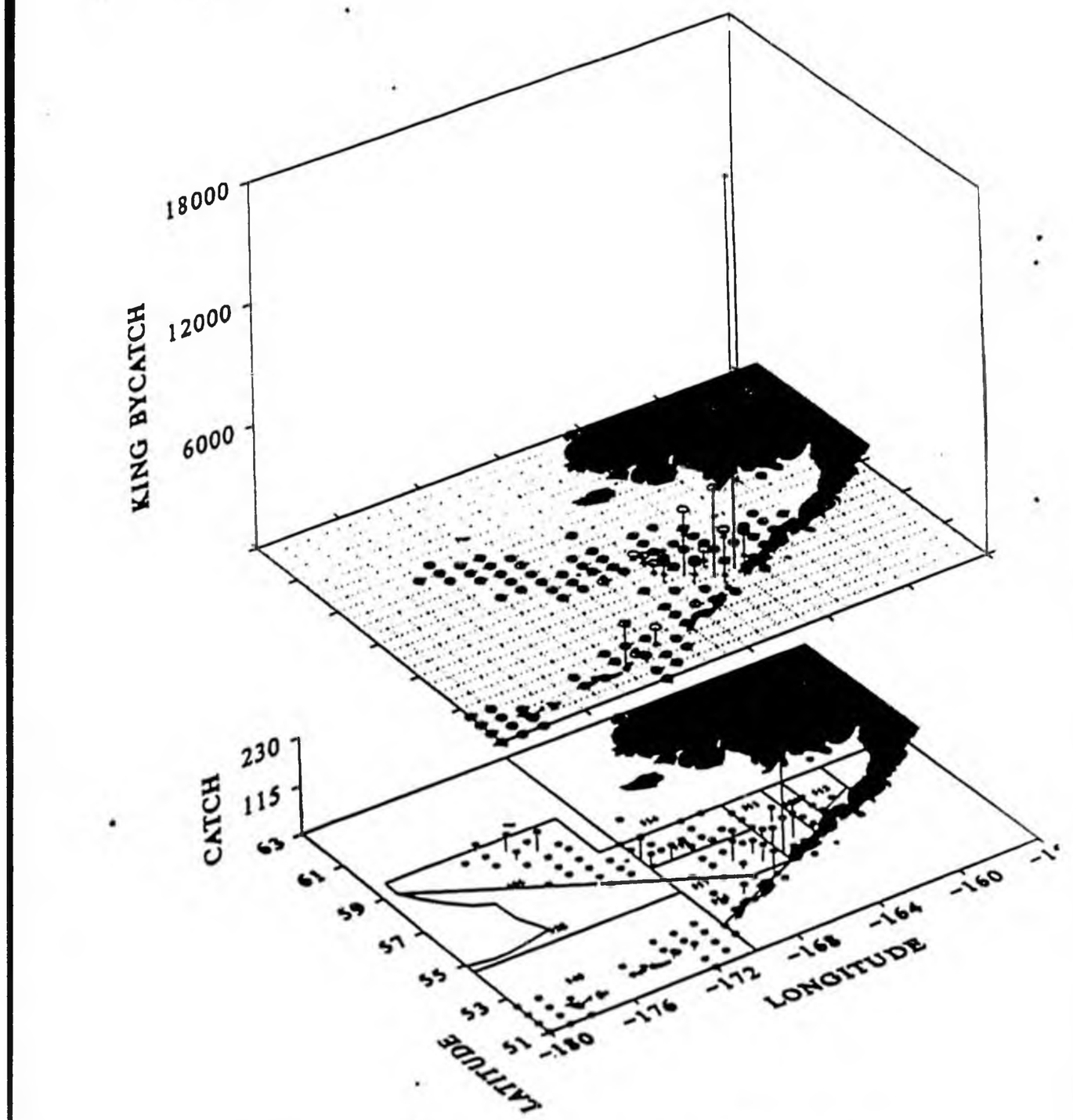
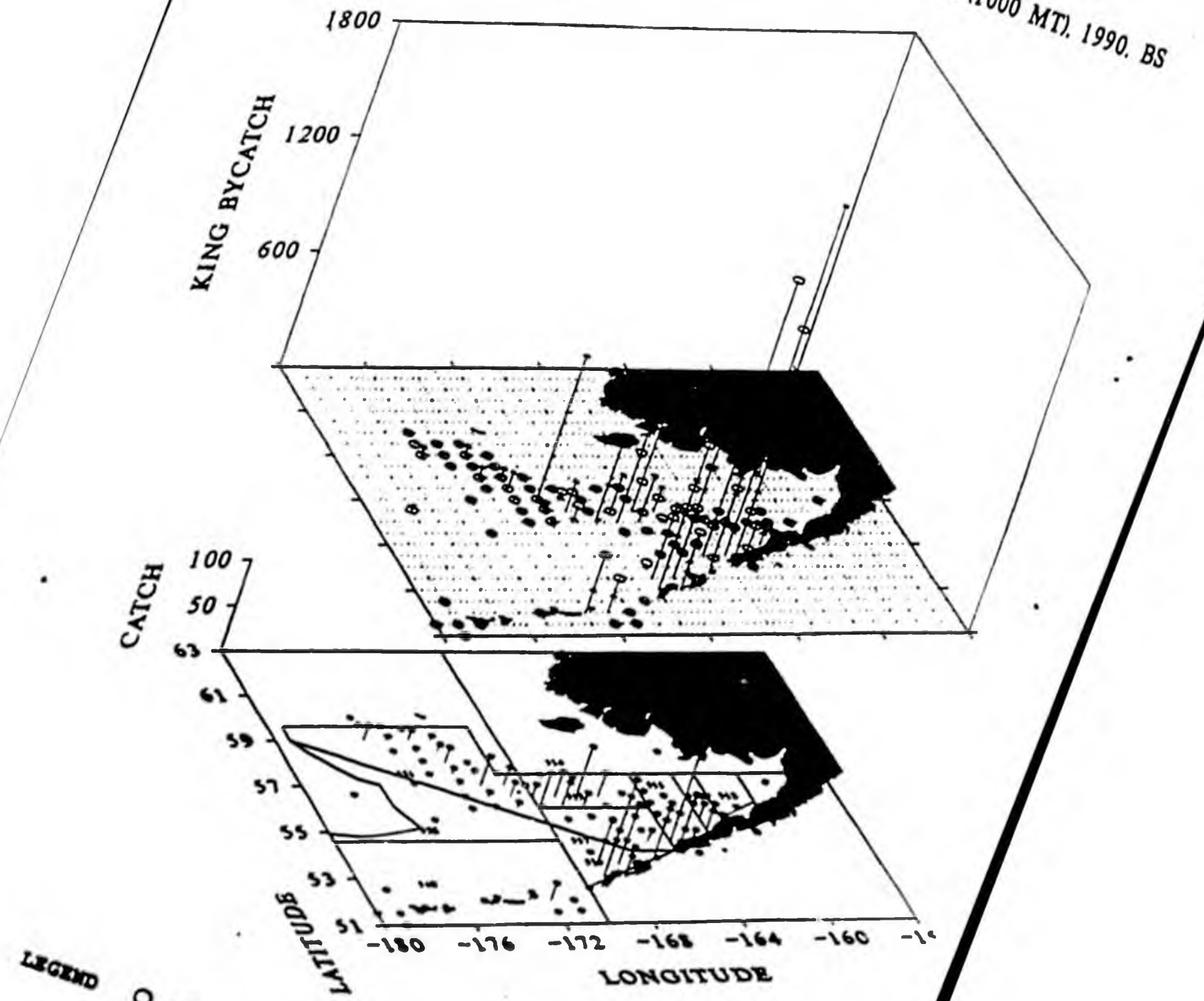


Fig. 5. KING SALMON BYCATCH (NO) & TRAWL CATCH (1000 MT). 1989. BS



LEGEND ○ - BYCATCH BASED ON DOMESTIC OBSERVER DATA
★ - BYCATCH BASED ON JV OBSERVER DATA

Fig. 6. KING SALMON BYCATCH (NO) & TRAWL CATCH (1000 MT). 1990. BS



LEGEND O - BYCATCH BASED ON DOMESTIC OBSERVER DATA
[illegible] OBSERVER DATA

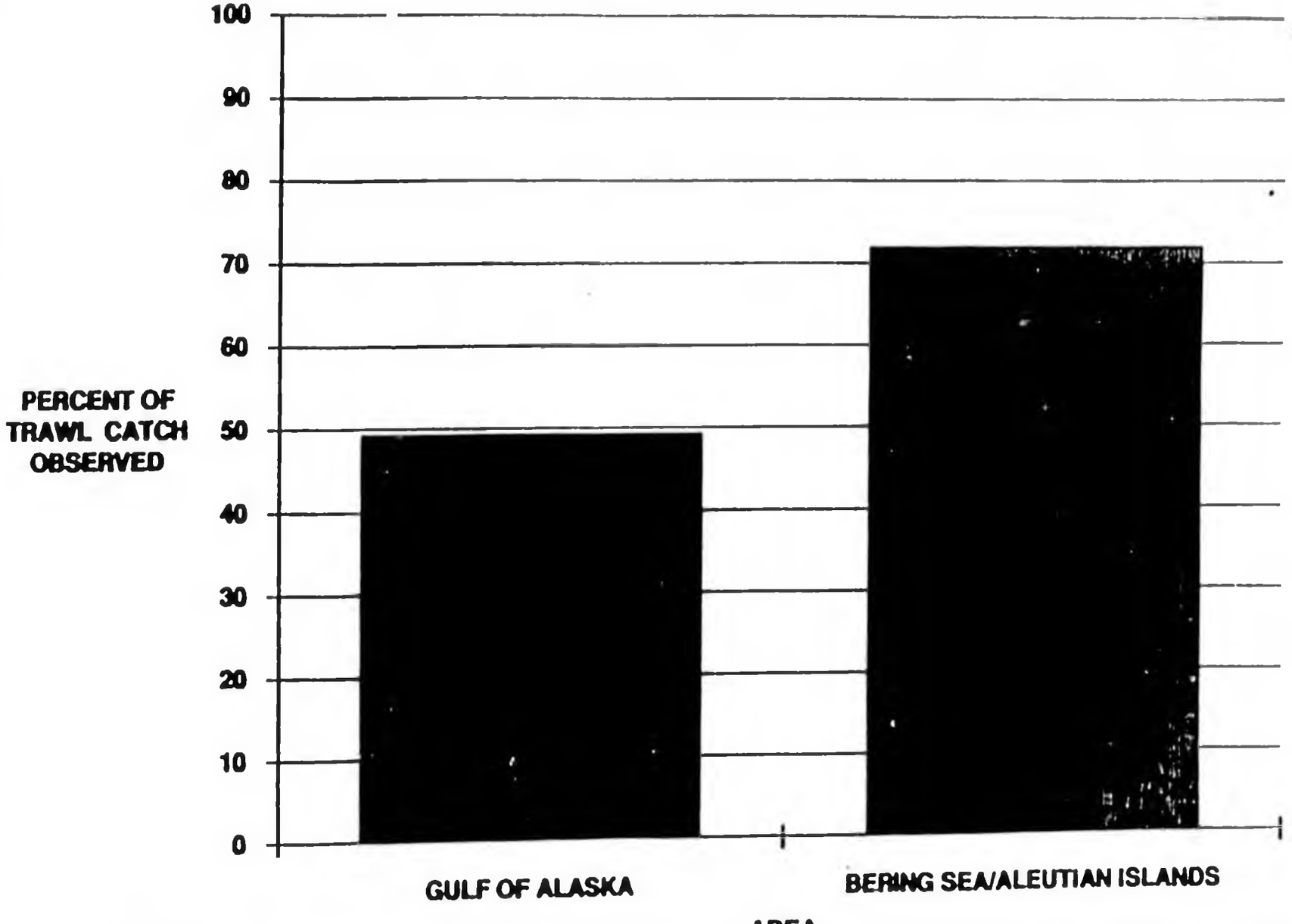


Figure 7. Percent of trawl groundfish catch observed through October 1990 in the Gulf of Alaska and the Bering Sea/Aleutian Islands

FIGURE 8. **BSAI and GOA Groundfish Catch In Relation to Vessel Size for 1989**

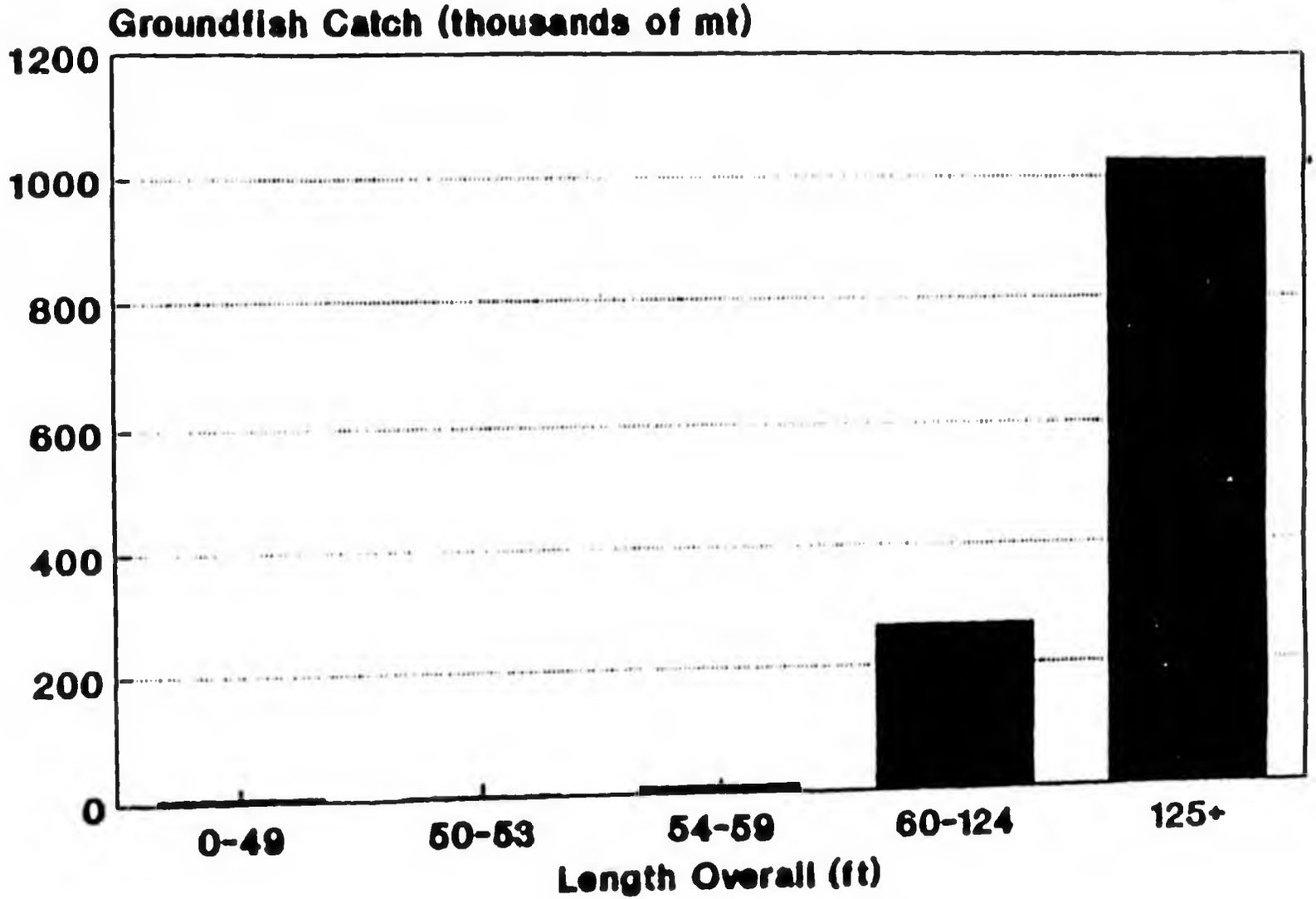
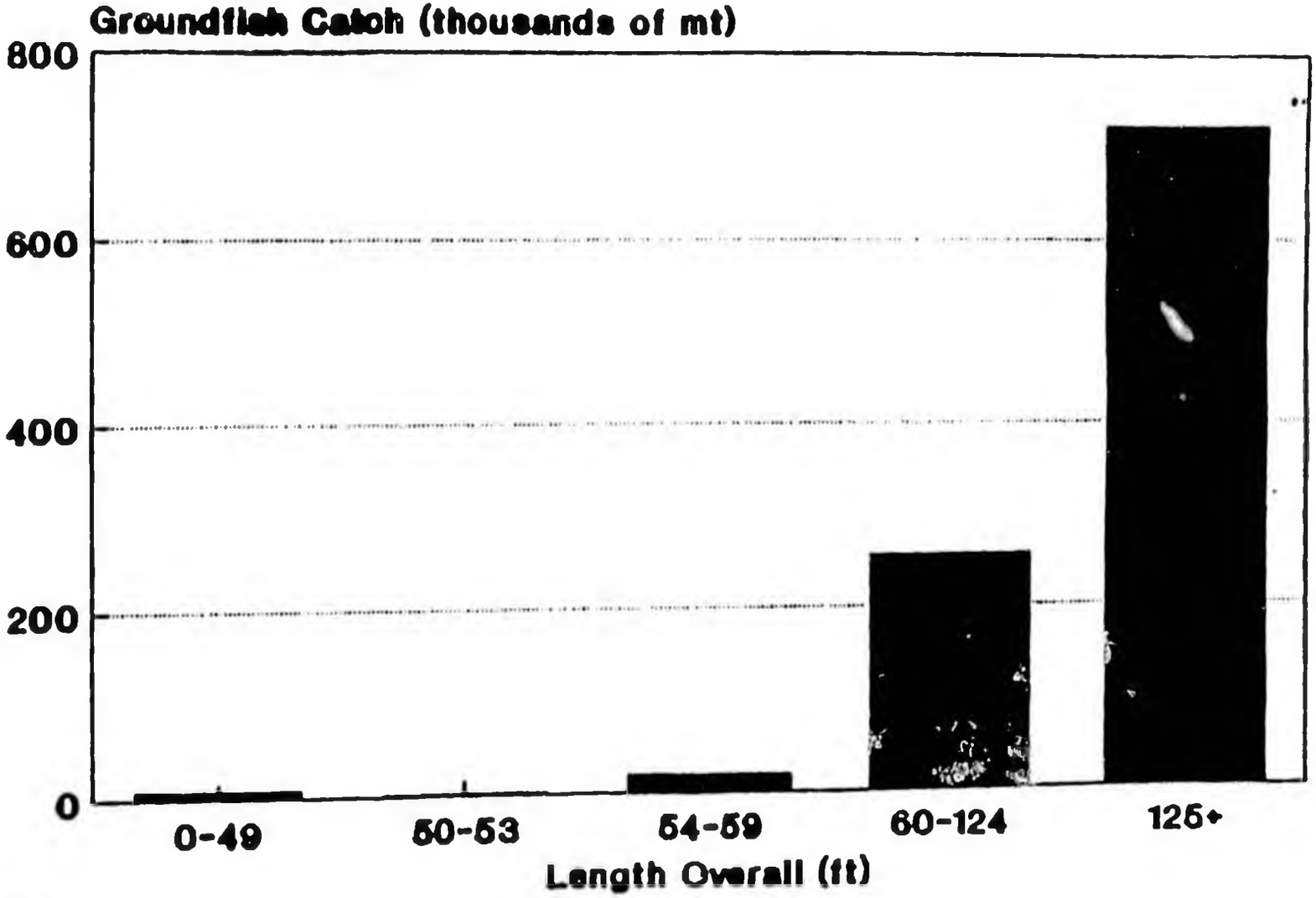


FIGURE 9. **BSAI and GOA Groundfish Catch In Relation to Vessel Size for 1990•**



•through July

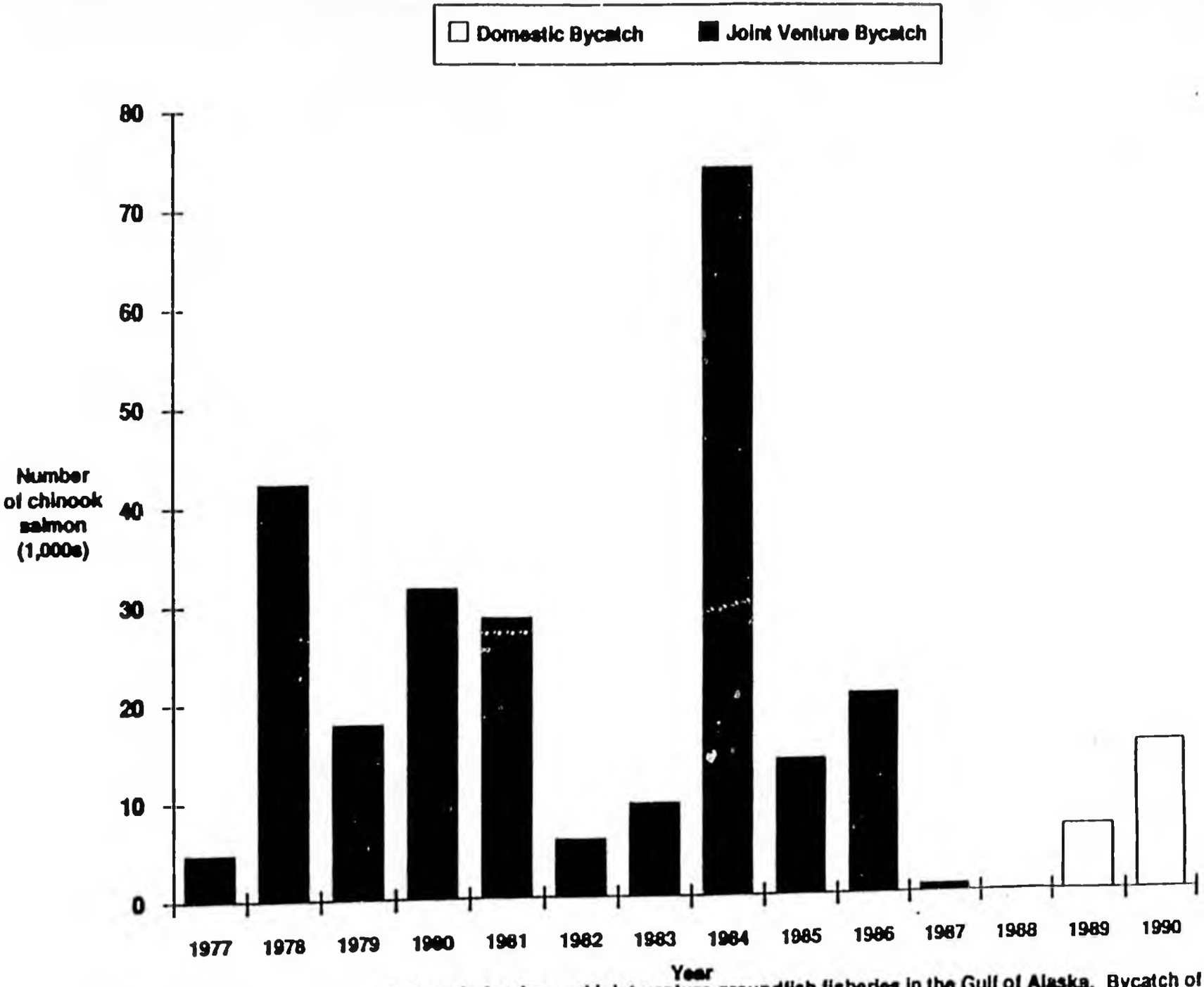


Figure 10. Bycatch of chinook salmon in foreign and joint venture groundfish fisheries in the Gulf of Alaska. Bycatch of chinook salmon in 1989 and 1990 domestic groundfish fisheries included.

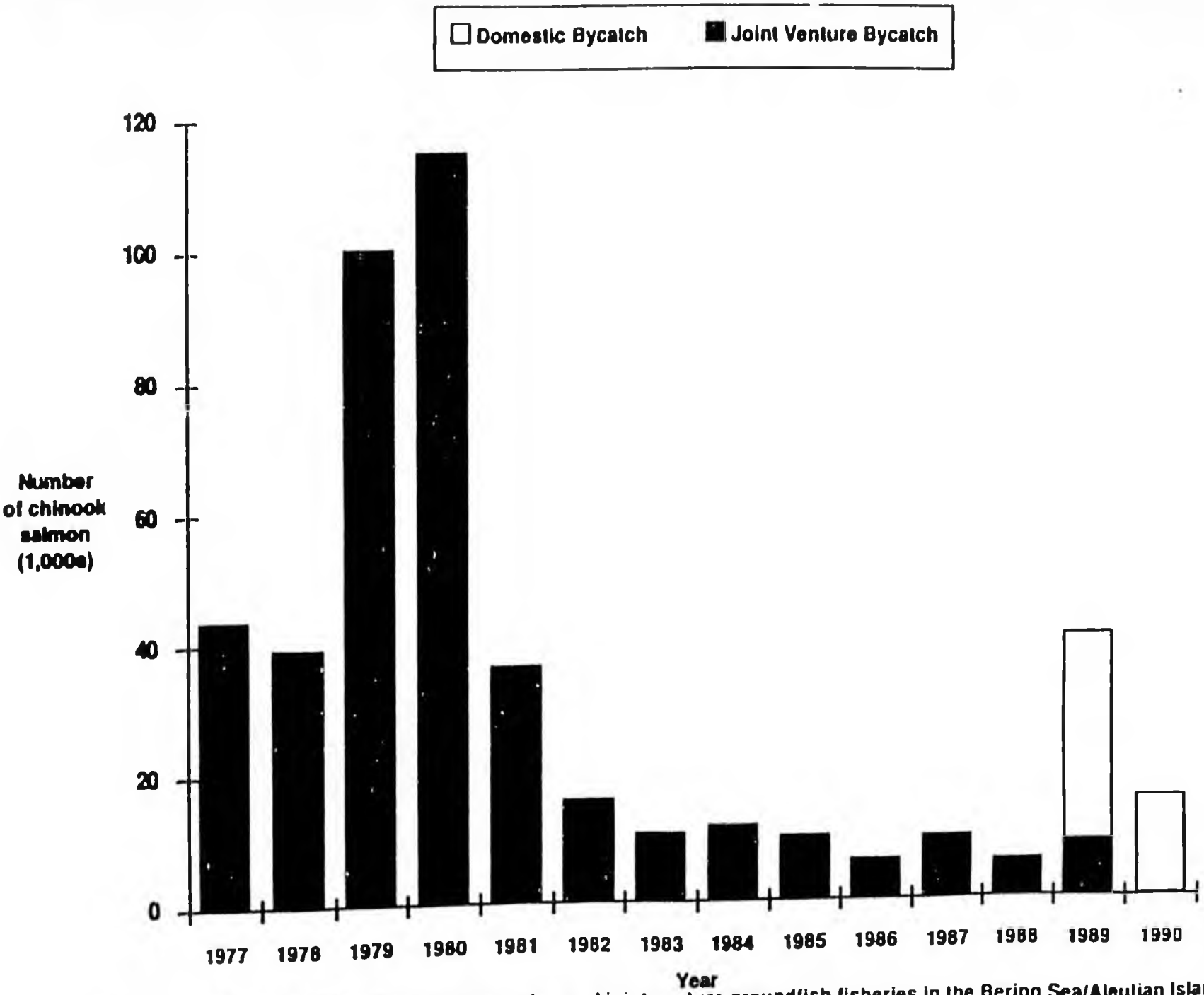


Figure 11. Bycatch of chinook salmon in foreign and joint venture groundfish fisheries in the Bering Sea/Aleutian Islands. Bycatch of chinook salmon in 1989 and 1990 domestic groundfish fisheries included.