4K95-41

KODIAK MANAGEMENT AREA
SAC ROE HERRING BRIEFING DOCUMENT

By

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Regional Information Report[1] No. 4K95-41

Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
211 Mission Road
Kodiak, Alaska 99615

September 1995

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INTRODUCTION

This document reviews the Kodiak Management Area (KMA) sac roe herring fishery harvest strategy. It is the intent of this document to convey the concerns the Alaska Department of Fish and Game (ADF&G) has regarding the current harvest strategy in preparation for the Alaska State Board of Fisheries (BOF) meeting in November, 1995.

SEASON DURATION AND FISHING TIME

The current harvest strategy is liberal in both the areas which are open to fishing and in the duration of fishing time. Since 1982 the fishing season has opened on April 15 and closed on June 30. Since 1981 fishing periods have been set for 24 hours in duration starting at 12:00 noon on odd number days of the month and closing at 12:00 noon on the even days of the month, followed by 24 hour closed periods. The 24 hour closures allow ADF&G time to assess herring harvests, gear concentrations, and relocate field crews.

FISHERY MONITORING

The KMA sac roe herring fishery is primarily monitored by two state vessels and four field crews. This fishery has been under limited entry since 1981. Field crews are stationed in management units, or bays, which have historically produced the major harvests for a district. These crews are positioned in remote bays by chartered float planes or vessel and are equipped with an inflatable boat or skiff. Daily contact with fishermen, spotters and tender operators is maintained to acquire fishery data. The information consisting of current harvest, effort levels, and fleet movements is reported via single side band (SSB) radio at least three times per day. Field crews also identify herring spawning areas and collect age-weight-length (AWL) samples from the commercial harvest. ADF&G aerial surveillance of the entire area supplements and often directs the placement of fishery monitoring field crews. The ADF&G office staff tally field crew, processor, and tender reports to assess herring harvests and decide which management units may need to be closed to fishing.

HISTORIC HARVESTS

From 1964-1978 sac roe herring harvests fluctuated from 5 to 2,769 tons annually. For the years 1979-1991 the sac roe herring harvest remained relatively stable and averaged 2,100 tons annually. Starting in 1992 the herring harvests escalated with record high harvests occurring in three consecutive years (1992-1994) and have averaged 4,900 tons for the last four years (Figure 1).

In 1990 and 1991 the KMA herring stocks notably increased in the West Afognak, Uganik, Alitak, and Eastside Districts (Figure 2). These districts experienced a large influx of Age-2 and Age-3 herring which have comprised 60-70% of the annual sac roe herring harvest from 1992-1995. The herring stocks of the Uyak, Northeast, Inner Marmot, South Afognak, and North Afognak Districts have declined during the last four years. For the 1995 sac roe season the Uyak, South Afognak, and most of the North Afognak District were closed in hopes of rebuilding these herring stocks. The herring stocks of the Mainland District are perceived to be stable at this time.

EFFECTS OF THE 10 HOUR FISHING PERIODS

For the 1995 sac roe fishery the initial fishing periods were 24 hours in duration. The 1995 Kodiak Management Area Sac Roe Herring Harvest Strategy forewarned fishermen that if fishery conditions warranted that adjustments in fishing time may occur. Depending on effort, harvest rates, and ADF&G's ability to monitor the fishery, the length of fishing periods during the first two weeks of the season may be reduced. There are two gear types which participate in the KMA sac roe herring fishery, which includes purse seine and gillnet gear. Any changes to the "normal" 24 hour periods would be made by emergency order and that changes would apply to both gear types.

Starting on April 21, fishing periods were reduced to 10 hours, running from 12:00 noon until 10:00 P.M. followed by 38 hour closures. This change in the duration of fishing periods resulted from several factors 1) ADF&G inability to monitor the purse seine fleet during the night, 2) near record numbers of purse seine gear participating in the fishery, and 3) low roe recovery standards which were set by some processors. On April 27 the duration of fishing periods was increased to 24 hours in only the management areas which ADF&G had a fishery monitoring crew present. Starting on May 3 the fishing periods returned to the 24 hour openings followed by 24 hour closures for all management units, which were not previously closed due to a herring harvest.

The gillnet fleet disliked the reduction in fishing time to 10 hour periods during daylight hours as they felt that this management action was inequitable and affected their gear type by eliminating their most productive fishing time at night. Similarly, purse seiners who rely solely on sonar to locate herring also felt they had lost their most productive fishing time.

The peak purse seine harvest (based on fish ticket data) occurred during a 10 hour fishing period on April 25 with a catch of approximately 780 tons (Figure 3) and was delivered on April 25 and 26. This peak harvest occurred in the Foul Bay management unit of the West Afognak District.

From April 21-25 the peak gillnet harvest for all management units combined was approximately 10 to 15 tons for each period. When fishing periods were increased to 24 hours, from April 27 to May 2 in the areas which ADF&G had field crews present catches improved, ranging from 5 to 50 tons per opening.

ADF&G will continue to depend on field crews to assess herring harvests within the major fishery areas. It has been a concern of ADF&G that night time seine fishing is difficult to

monitor by field crews. Trying to assess the catch in darkness from a small raft or skiff is a potentially dangerous situation for the field crews. With darkness precluding the abilities of field crews to monitor the fishery the potential for overexploiting the stocks exists. Further, there have been enforcement problems associated with night time seine fishing in that monitoring boundaries between open and closed management units is difficult to achieve in darkness.

PROCESSOR AND GEAR LEVELS

With the increase in the KMA herring biomass and the decline of Prince William Sound herring biomass interest by both fishermen and processors in the KMA fishery has increased. During the last three years the number of processors and the daily processing capacity has greatly increased, (Table 1). For the 1995 season, there were 12 floating processors and 7 shore based plants represented by 14 different companies registered to process herring in the KMA. The combined estimated daily processing capacity was 2,100 tons with 8,000 tons of tender capacity.

The limited entry permit status has changed during the last three years with an increase in the number seine permits, (Table 2). For the 1995 sac roe fishery a total of 73 purse seiners and 71 gillnetters participated in the fishery (Figure 4). There were 28 gillnet and 5 seine permit holders who renewed their permits for 1995 but did not fish. There were also 11 gillnet permits and 1 seine permit which were not renewed in 1995.

HARVEST RATES

During the last two years of the KMA sac roe fishery, there has been a tendency of purse seine vessels to concentrate within a single management unit. This concentration of effort can mainly be attributed to fishermen targeting fishing areas that have been productive in previous seasons. During the 1995 fishery as many as 50 seiners were present within the Uganik District for several openings. Similarly high levels of seine gear were experienced in the Paramanof Bay and Foul Bay management units of the West Afognak District. With these concentrated effort levels the harvest can be large.

In the Foul Bay management unit of the West Afognak District 35 seiners and four gillnetters harvested 801 tons of herring in 50 minutes of fishing time. The gillnetters harvested 18 tons during this fishery. The guideline harvest level (GHL) was 75 tons for this management unit. During the 1994 sac roe fishery 1,093 tons were harvested by seiners from the South Arm Uganik Bay management unit during a 24 hour fishing period, GHL of 75 tons.

For gillnet gear the concentration of gear has also occurred primarily in the Eastside District. During the 1994 fishery the largest daily gillnet harvest was 91 tons from 13 boats from the Raspberry Strait management unit. The 1995 peak daily harvest for gillnet gear was 37 tons from seven boats from the Paramanof Bay management unit.

HARVEST TIMING

Prior to the 1992 season this fishery had a unique characteristic in that it commenced prior to any major build-up of herring. This allowed for a more general distribution of effort and a slower rate of harvest on these small stocks. Historically the KMA herring harvests occurred over a relatively long time period with a slow rate of harvest. For the years 1981 through 1990 the distribution of harvest would extend from April 15 through mid-June, a relatively long time period in comparison to other statewide herring fisheries (Figure 5). With the increase in the majority of Kodiak's herring stocks, the build-ups of herring have occurred prior or near the fishery opening date of April 15 within the West Afognak, Uganik, and Eastside Districts.

HARVEST STRATEGY CONSIDERATIONS

ADF&G is primarily concerned with the overexplotation of herring stocks within the KMA. Under the current harvest strategy GHL's are established for each management unit which have consistently produced herring harvests in previous seasons. Generally, each management unit defines a spawning area used by a group of herring.

During the last three years a trend has developed in the movements of herring within some management units of the Uganik, West Afognak, and Alitak Districts. This trend is most distinct within the Uganik District in that a large biomass of herring moves into this district in mid-April and are harvested within the Village Islands, Northeast Arm Uganik Bay, East Arm Uganik Bay, and in the South Arm Uganik Bay management units as the fish move around within the district. It appears that these early returning herring are primarily destined to spawn within the Village Islands management unit as this area has recently had the most consistent spawn observations.

A similar situation may have occurred during the 1995 fishery in the West Afognak District fishery. The biomass of the Malina Bay and Raspberry Strait herring stocks in 1995 were surprisingly low. The 1994 biomass observations and fishery harvests indicated that Malina Bay and Raspberry Strait herring abundance was strong and that the 1995 fishery would continue this trend. The most likely explanation of this absence of herring within these management areas is that they moved to the Foul Bay and Paramanof Bay management units to spawn. This event is supported by the robust harvest and biomass observations within the Paramanof and Foul Bay management units during the 1995 fishery.

In the Alitak Bay District there again appears to a be a large biomass of herring which moves within the Sulua Bay, Portage Bay, Inner Deadman Bay, and Outer Deadman Bay management units. These herring maybe harvested in several management units prior to their spawning.

The potential exists to overexploit herring that move through several management units. Under the current harvest strategy there is no allowance for this trend in herring behavior. To prevent the overexploitation of these herring stocks there maybe a need to modify the current harvest strategy.

For the Uganik District which has a large spawning biomass and a high level of purse seine effort it may be more appropriate to treat the Village Island, South Arm Uganik Bay, East Arm Uganik Bay, and Northeast Arm Uganik Bay as a single management unit and establish a GHL for this area. Depending on inseason fishery performance the entire GHL may not be allowed to be taken from just one management unit. Once this GHL is achieved or approached all four management units would close to fishing for the remainder of the sac roe herring season.

The absence of herring in the Raspberry Strait and low harvest in Malina Bay is a serious concern, however since it is a single occurrence adjustments in the harvest strategy are unwarranted at this time. However, if inseason fishery information indicates that this area should be treated as a unit then a similar strategy as that suggested for a portion of the Uganik District may be employed to prevent greatly exceeding the district GHL.

For the 1996 fishery, permit holders should be aware that ADF&G may make adjustments in how the fishery will be managed. It will be in the discretion of ADF&G to make adjustments in the management of the fishery based upon inseason changes in fish behavior or harvest patterns. These changes may result in district wide or adjacent management unit closures if a large harvest were to occur in a single management unit.

ALLOCATION ISSUE

The main issue which the KMA gillnet fishers have expressed strong concerns over is the allocation of sac roe herring harvest. Gillnetters believe that they are not receiving an equatable share of the harvest, especially if fishing periods are reduced to daylight hours only.

For the years 1979-1995 purse seine gear has harvested an average of 76% of the annual sac roe herring harvest, while gillnet gear has accounted for 24% (Figure 6). During this 17 year period gillnet gear has ranged from 15-40% of the total harvest while purse seine gear has ranged from 60-85%. During the last four years of record to near record harvests (1992-1995) the gillnet harvest has averaged 17.4% of the total harvest. It is important to note that gear levels have fluctuated annually with the lowest participation of gillnetters (57) occurring in 1994 which was the record high harvest for the KMA, (Table 3). When comparing the average harvest by permit holder for the years 1979 through 1995 for gillnet gear the average catch ranges from 2 to 16 tons and for seine gear it has ranged from 20 to 103 tons (Figure 7).

When considering maintaining some sort of equitable balance of harvest between the two gear types it must first be decided whether or not the industry personnel (permit holders and processors/buyers) wish to continue with a similar type of harvest strategy which is utilized in the Kodiak sac roe fishery. In the current type of herring fishery neither gear type is guaranteed a portion of the harvest; instead both gear types have the opportunity to fish anywhere its open to fishing, with the percent harvest by gear in any individual management unit varying considerably from one year to the next. If an actual harvest percentage were adopted by gear types based on the preseason GHL, then the entire fishery would be managed so that when each gear type reached their preseason harvest level, the entire KMA would then be closed for the remainder of the season.

However, if industry personnel prefer to continue with the current type of harvest strategy, then it is imperative that some type of alternative fishing schedule by gear be resolved for the time periods the Department has restricted the purse seine fleet to daylight fishing only. Under this scenario there would not be a direct allocation by gear, but would allow for the opportunity for each gear type to fish in a manor so that the year end harvest by gear would end up within the historical range.

ADF&G RECOMMENDATION

As previously stated ADF&G is primarily concerned with the overexploitation of herring stocks within the KMA. The purse seine fleet is the primary threat to the overharvest of KMA herring stocks due to their harvest capability. Under the current harvest strategy ADF&G can not provide differential fishing time between the two gear types. ADF&G does not want to change the historic harvest balance between seine and gillnet gear. However, with the harvest power of the seine fleet, changes in fishing time are necessary. ADF&G would like to see restrictions on fishing time placed on the purse seine fleet to daylight hours only. This restriction to daylight fishing periods would apply only during the early portion of the season when the seine gear levels are high, generally from approximately April 15 to May 7. In addition ADF&G believes that establishing maximum depth restrictions for both gear types will help control the rate of harvest and stabilize the fishery.

BOARD OF FISHERIES PROPOSALS

Following is a listing of proposals and comments pertaining to the sac roe herring fishery for the 1995 BOF meeting.

Gear Proposals

There are a total of four proposals concerning gear specifications for the sac roe fishery. Three proposals concerning purse seines and one proposal concerning gillnets.

Seine Specifications Proposals

The three following proposals are directed at defining limits on the depth of purse seine gear. The current regulation concerning seine depth lists only a limit of 1,025 meshes, including meshes as chafing gear, with no restrictions on mesh size. During the last two seasons some fishermen have increased the depth of gear fished because the mesh size is not regulated. This was achieved by using salmon web (3-3 1/2" web) in one or more strips to increase overall seine depth, which made these nets capable of fishing to depths of 30 fathoms or more. This increase in depth substantially increases the efficiency of the gear. The use of salmon web also results

in higher herring mortality, in that fish are easily gilled in the salmon web while pursing and would be wasted if the catch is low in roe quality and released.

Proposal #101: From April through July 31 no purse seine may be more than 825 meshes deep including meshes as chaffing gear or more than 100 fathoms in length. (Submitted by Roy Wolkoff Sr.)

Proposal #101 maybe allocative in nature and ADF&G will remain neutral on this proposal. ADF&G generally supports reductions in gear efficiency however, this proposal does not establish a maximum web size which is needed to limit seine depths. If a web size restriction was included in this proposal it would lead to a decrease in seine efficiency. Roe quality may improve as a result of herring being harvested in shallower waters prior to spawning. This proposal may also lead to an increase in gillnet harvest if the seine efficiency is reduced.

Proposal #102: From April 1 through July 31 no purse seine may be more than 1,025 meshes in depth, including meshes as chaffing gear, or more than 100 fathoms in length. A maximum of 25 meshes may be no larger than 7", all remaining meshes used in the seine may not exceed 1 1/2 ". (Submitted by ADF&G)

Proposal #102. This proposal was submitted by ADF&G and will establish herring purse seine mesh size restrictions and keep the current number of meshes allowed. The implications of this proposal include elimination of the use of salmon web in herring seines and a reduction in the depth efficiency of large web seine gear. This proposal will standardize purse seine gear for all seine permit holders.

Proposal #103: From April 1 through July 31, no purse seine may be more than 1,025 meshes in depth including meshes used as chaffing gear or more than 100 fathoms in length. No herring purse seine may exceed 23 1/3 fathoms in depth. The perpendicular distance between the cork line and the leadline with the web stretched is the 23 1/3 fathom dimension.

The 23 1/3 fathoms is derived:

5 strips X 200 meshes/strip X 1.5"a mesh/ 72"(fathom)	=	20.83 fathoms
Chafing gear 25 meshes X 7"a mesh	=	2.43 fathoms
Total depth	=	23.26 fathoms

This is an equivalent depth to a seine of 5 strips of 1.5" mesh with 25 meshes of 7" chaffing gear. This will allow the flexibility to use various sizes of existing web that is currently used in the seines and new web that does not always hold to specific dimensions. this would be easier to measure on deck than to count and measure 1,025 meshes of net. (Submitted by Mary Jacobs).

Proposal #103 has similar implications as proposal #102 by establishing a total allowable depth of 23 1/3 fathoms depth for purse seines. This proposal allows fishermen to select the mesh size they wish to fish. The author of this proposal suggests that this depth requirement would be easier to enforce than the counting of the meshes. The enforceability of this proposal can best be addressed by Fish and Wildlife Protection. Additionally, ADF&G is concerned that without

a mesh size restriction the use of salmon web may continue which causes gilling problems of herring as previously discussed.

Gillnet Specifications Proposal

The following proposal addresses a depth limit for gillnet gear. The current gillnet specification regulation does not place any limits on gear depth only on the aggregate length which is not to exceed 150 fathoms.

Proposal #104: Establish a maximum depth limitation for commercial herring gillnets in the Kodiak Area: (a) the aggregate length of herring gillnets in use by any herring Commercial Fisheries Entry Commission (CFEC) permit holder may not exceed 150 fathoms and 200-250 meshes in depth. (Submitted by ADF&G).

Proposal #104 would standardize gillnet gear by the establishment of a depth restriction. The actual number of meshes to limit gear will be established during the Herring Work Group Meeting. This proposal may reduce the gear efficiency of some fishermen who currently fish nets which are in excess of 200-250 meshes.

Fishing Seasons and Periods

Proposal #105: Herring may be taken from April 9 through June 30 (sac roe season) and from August 1 through February 28 (food bait season). The sac roe season may open by emergency order between April 9 and April 15 to help avoid overharvest. (Submitted by ADF&G).

The management strategy for the KMA sac roe fishery includes having the season open before large build-ups of herring become available to the fishery. At the April 15 opening of the 1993 and 1994 seasons herring were highly vulnerable to harvest in several locations of the management area and as a result GHL's were exceeded in those locations. This proposal would allow the season to open in specific locations where the department has difficulty controlling the harvest when the season opens on April 15.

This proposal was originally submitted with the intent of controlling the harvest rate. However, if adjustments are made in both new gear restrictions and shortened fishing periods for seine gear, it may not be necessary to change the opening dates. New gear and fishing period restrictions should help slow the harvest.

Harvest Strategies

Proposal #100 is an open proposal which is intended to establish by regulation a harvest strategy for the Kodiak sac roe herring fishery. The wording of this harvest strategy will be established by the Kodiak Fish and Game Advisory Committee herring study group.
Currently there is no regulatory harvest strategy for the Kodiak sac roe herring fishery. (Submitted by Bruce Schactler).

Permits for Herring Pounds

Proposal #107: Date June 1 through October 31 (does not interfere with commercial sac roe season) (Holding pen will be a floating barge and skiff). Area: Northeast District Chiniak Bay, proposed harvest of 10 tons. (Submitted by John Parker Sr.)

Proposal #107 is requesting to establish a herring pound within Chiniak Bay to sell fresh herring as bait for sportfishing needs in Kodiak. This proposal is allocative in nature and ADF&G would remain neutral. The proposed dates of operation overlaps with the sac roe season which extends through June 30. The food and bait herring fishery season runs from August 1 through February 28.

Subsistence Permits

Proposal #98: Specify that, in the Kodiak Area, subsistence fishing permits are needed to take herring and groundfish with seine and gillnet gear for subsistence purposes during the commercial sac roe herring fishing season. (Submitted by ADF&G).

Proposal #98 is a "house keeping proposal" which will align the dates of requirement for subsistence permits for herring with the actual sac roe herring fishery dates, April 15 to June 30.

Descriptions of Districts and Sections

Proposal #99: Modify and create new herring management units in the Kodiak Area. (Submitted by ADF&G).

Proposal #99 establishes a complete and accurate description of existing and new districts and sections used in the management of Kodiak sac roe and food/bait herring fisheries. This proposal will clarify the descriptions of management units with the 1983 datum marine charts which will benefit Fish and Wildlife Protection, herring fishers, and ADF&G.

Waters Closed to Herring Fishing

Proposal #106: Align waters closed to herring fishing with the correct commercial herring sac roe fishing season in the Kodiak Area. 5 AAC 27.530 Waters Closed to Herring Fishing.

> (a) During the period July 1 through October 31, herring may not be taken in waters described in 5AAC 18.350 and 5AAC 39.290.
>
> (b) During the sac roe herring fishing season, herring may not be taken in the following waters:

Proposal #106 is a "housekeeping proposal" and aligns the closed water areas for sac roe herring fishing with the sac roe season.

Table 1. Processor summary by type and estimated daily processing capacity for the sac roe herring fishery Kodiak Management Area, 1991-1995.

Year	Number of Processors Processors	Number of Shorebased Processors	Number of Floating Capacity	Est. Daily Processing (Tons)
1991	9	8	1	990
1992	8	8	0	840
1993	12	9	3	1,100
1994	15	10	5	1,500
1995	19	7	12	2,100

Table 2. Summary of Commercial Fisheries Entry Commission status of sac roe herring limited entry permits, Kodiak Management Area, 1989-1995.

	Year						
Gear Type	1989	1990	1991	1992	1993	1994	1995[a]
Gillnet							
Transferable	68	72	74	97	95	99	94
Non-Transferable	44	27	28	11	8	8	5
Total Permits	112	99	102	108	103	107	99
Total Fished	83	63	64	74	86	57	71
Seine							
Transferable	47	47	48	59	66	69	65
Non-Transferable	25	25	22	13	12	14	13
Total Permits	72	72	70	72	78	83	78
Total Fished	37	27	32	40	41	66	73
Combined Totals							
Transferable	115	119	122	156	161	168	159
Non-Transferable	69	52	50	24	20	22	18
Total Permits	184	171	172	180	181	190	177
Total Fished	120	90	96	114	127	123	144

[a] This data does not include the number of unrenewed permits which consists of one seine and 11 gillnet permits in 1995.

Table 3. Kodiak sac roe herring fishery summary by year and by gear, 1979-1995.

YEAR	SEASON LENGTH (DAYS)	GUIDELINE HARVEST LEVEL (TONS)	TOTAL HARVEST (TONS)	HARVEST BY GEAR TYPE (TONS)		PERCENT HARVEST BY GEAR TYPE (TONS)		NUMBER OF LANDINGS		NO. UNITS		AVG. $'S EARNED	
				SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N
1979	36	2,400	1,735	1,457	278	84	16	-	-	57	125	38,347	3,333
1980	35	2,400	2,383	2,009	374	84	16	-	-	92	109	14,978	2,573
1981	48	2,400	2,065	1,596	469	77	23	207	406	79	114	14,402	3,471
1982	59	2,400	1,771	1,447	324	82	18	138	191	45	67	17,819	2,719
1983	51	2,400	2,319	1,797	522	78	22	164	284	41	64	35,061	6,520
1984	54	2,400	2,163	1,691	472	78	22	138	212	39	69	34,691	5,467
1985	59	2,000	1,968	1,244	724	63	37	118	348	34	81	32,935	8,039
1986	61	1,690	1,558	1,110	448	71	29	132	385	31	71	34,010	6,002
1987	61	1,640	2,146	1,591	554	74	26	122	411	29	62	54,872	8,945
1988	59	2,065	2,171	1,304	867	60	40	169	555	33	76	51,350	14,837
1989	76	2,415	2,249	1,513	736	67	33	171	627	37	83	34,749	7,537
1990	75	2,375	2,347	1,644	703	70	30	156	544	27	63	51,724	9,652
1991	83	2,510	2,432	1,697	735	70	30	169	587	32	64	45,077	9,762
1992	77	2,720	4,283	3,260	1,023	76	24	185	706	40	74	40,750	6,912
1993	77	3,525	4,929	4,203	726	85	15	237	294	41	86	56,380	4,640
1994	71	4,550	5,893	4,976	917	84	16	285	485	66	57	60,320	12,860
1995	73	4,480	4,604	3,837	767	83	17	280	642	73	71	66,850	13,750
17-YR AVG.	62	2,610	2,766	2,140	626	76	24	157	393	47	79	40,250	7,470

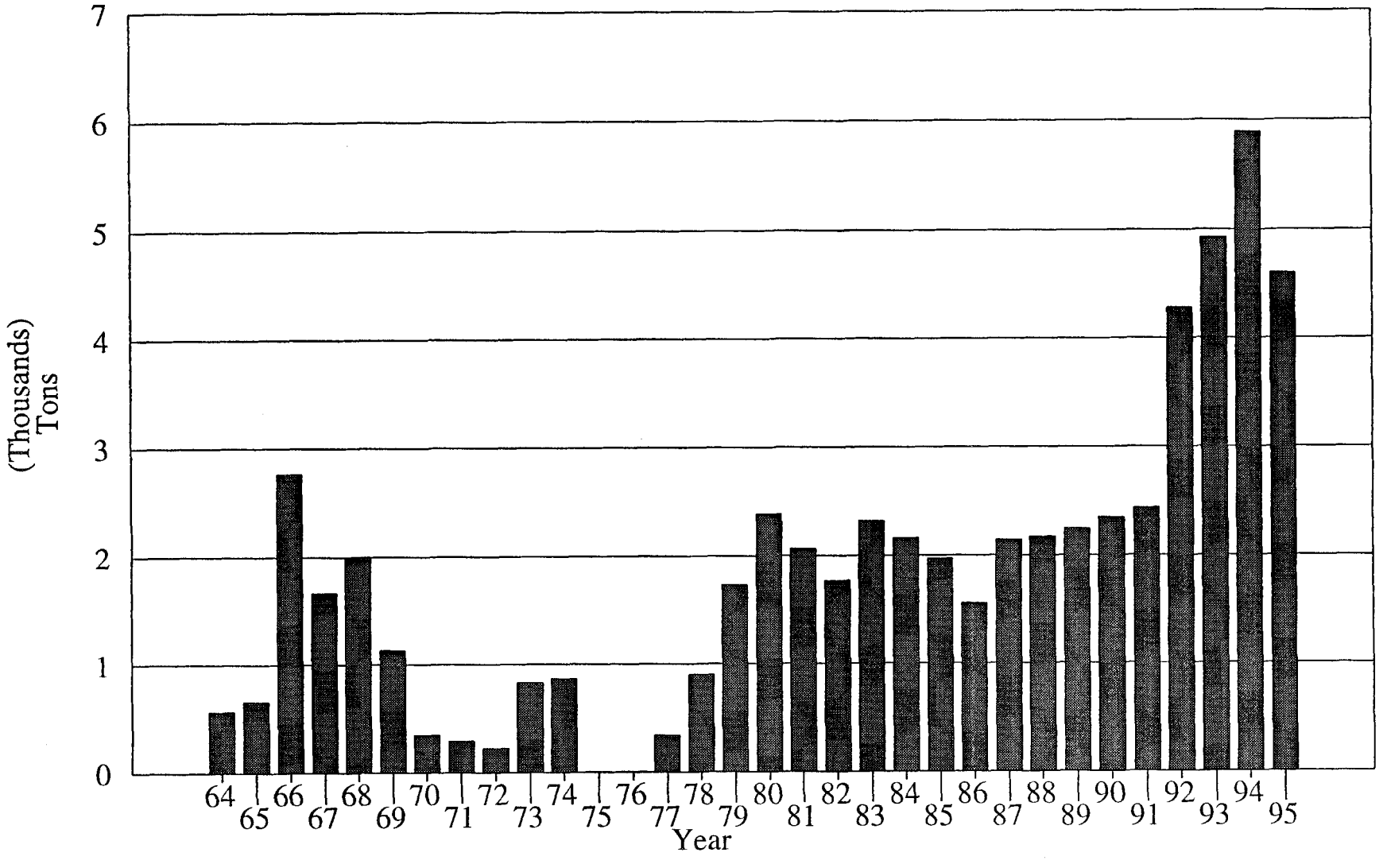

Figure 1. Historic harvest for the sac roe herring fishery of the Kodiak Management Area, 1964-1995.

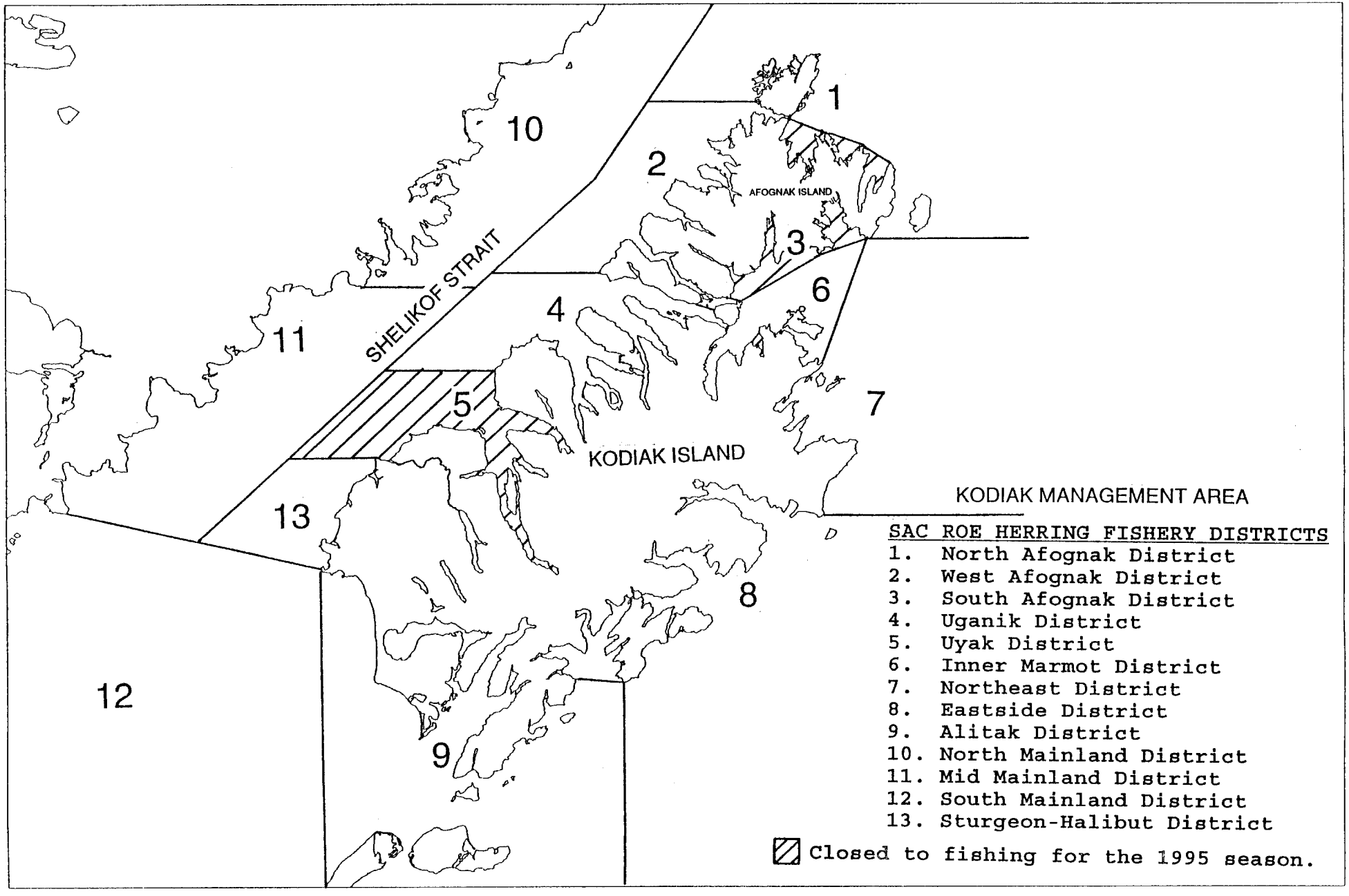

Figure 2. Map of the Kodiak Management Area sac roe herring fishing districts and areas closed to fishing in 1995.

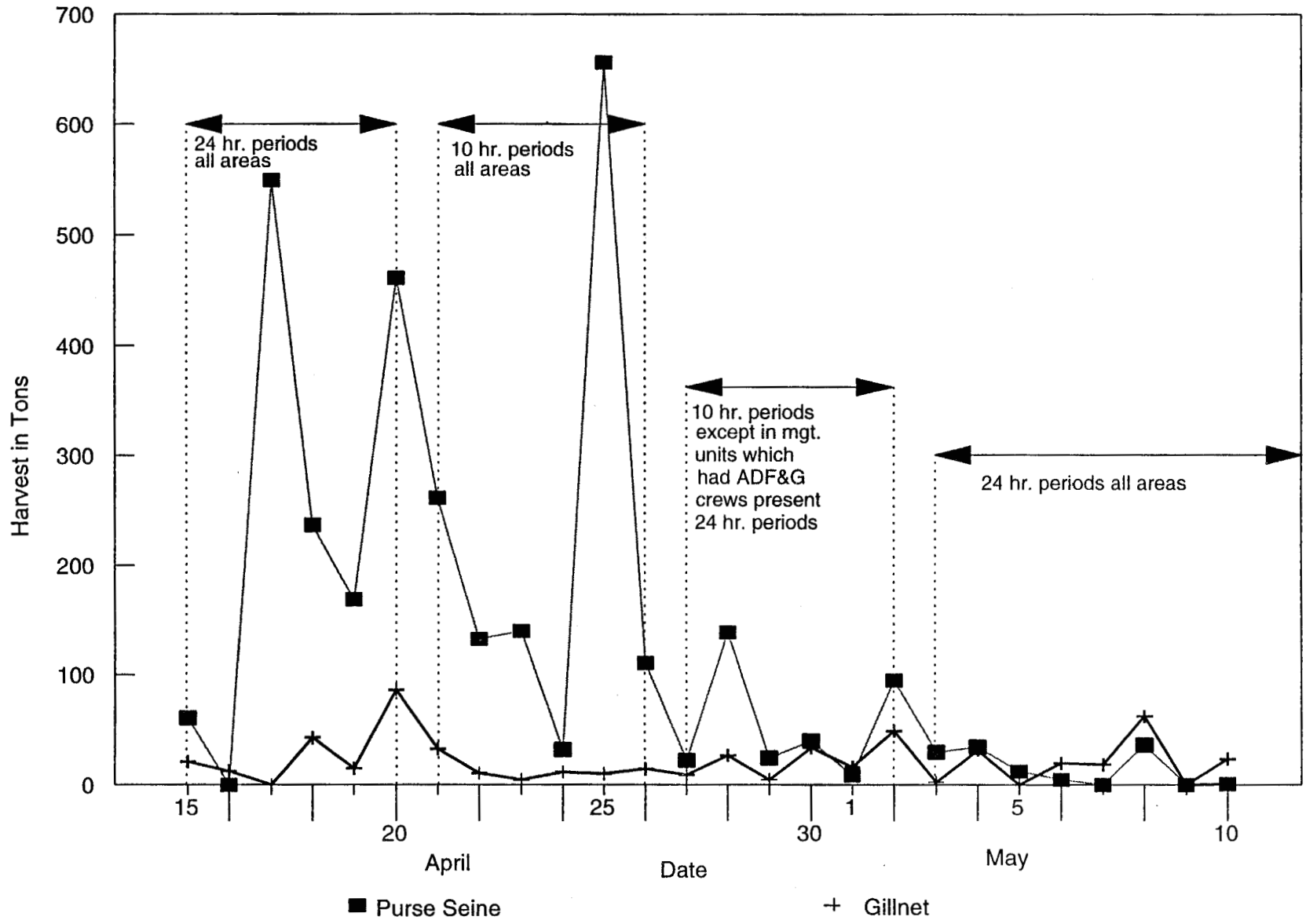

Figure 3. Management chronology and harvest by day and gear type for the sac roe herring fishery of the Kodiak Management Area, April 15 - May 10, 1995.

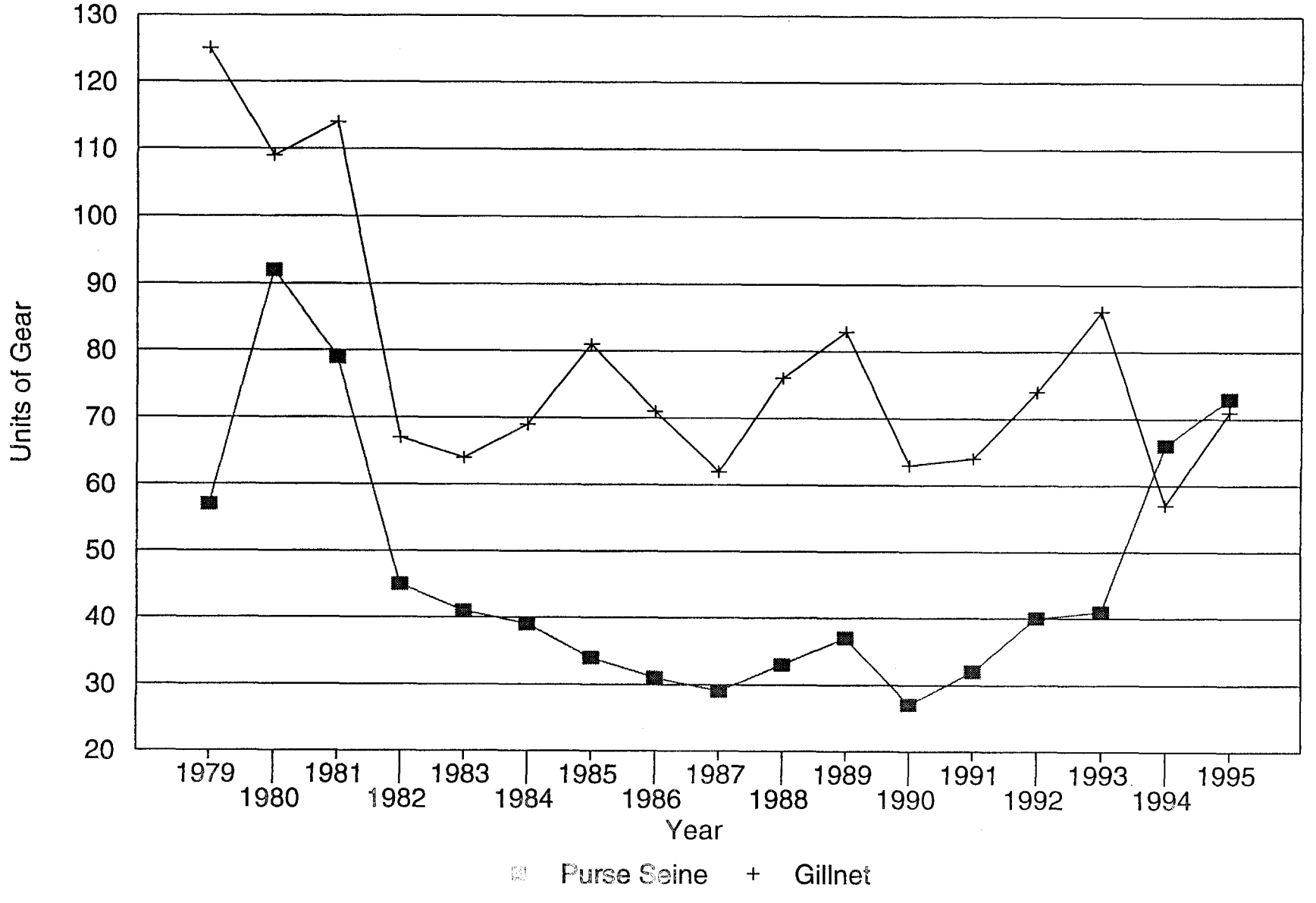

Figure 4. Number of landings by year and gear type for the sac roe fishery of the Kodiak Management Area, 1979-1995.

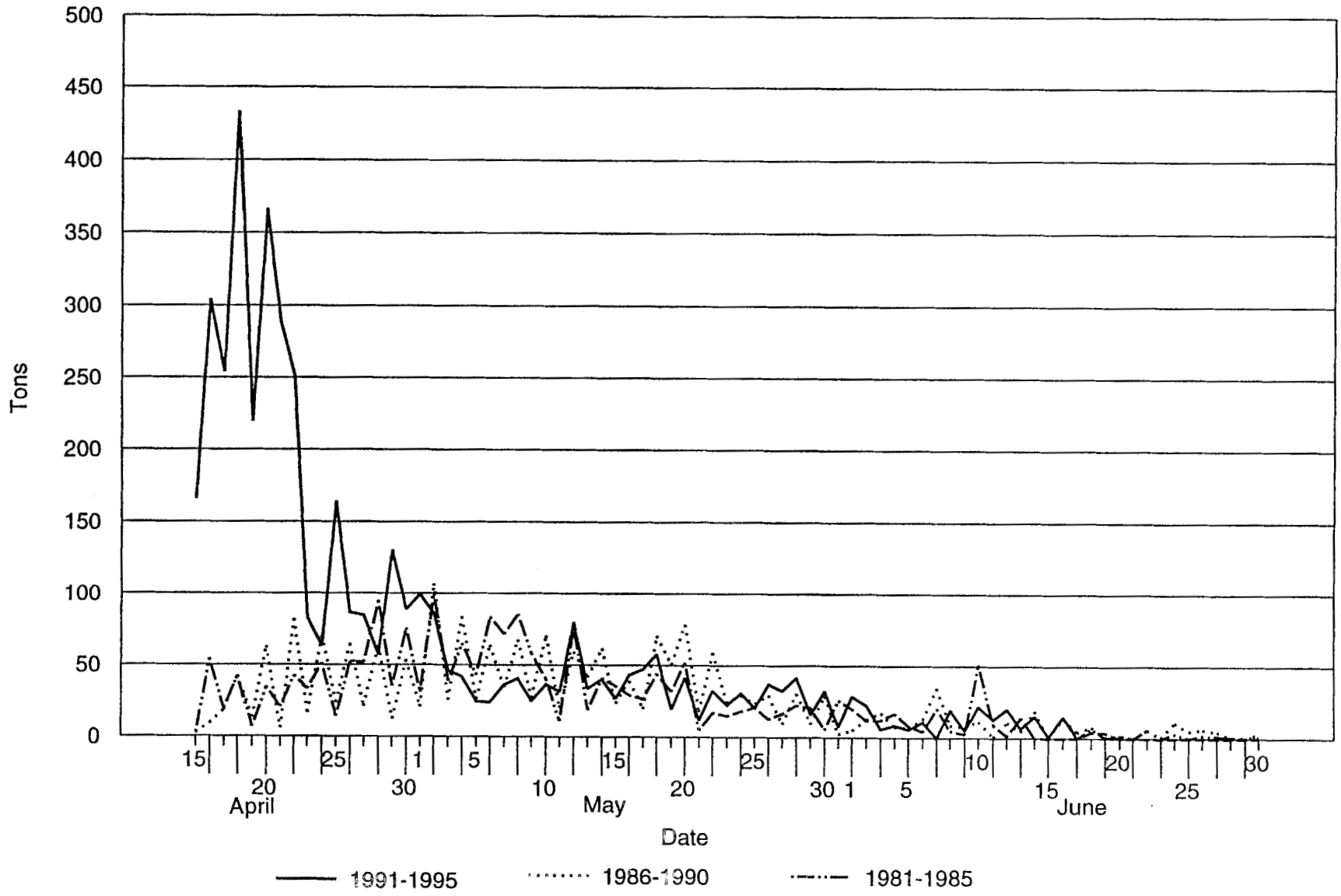

Figure 5. Five year average harvests by day for the sac roe herring fishery of the Kodiak Management Area, 1981-1995.

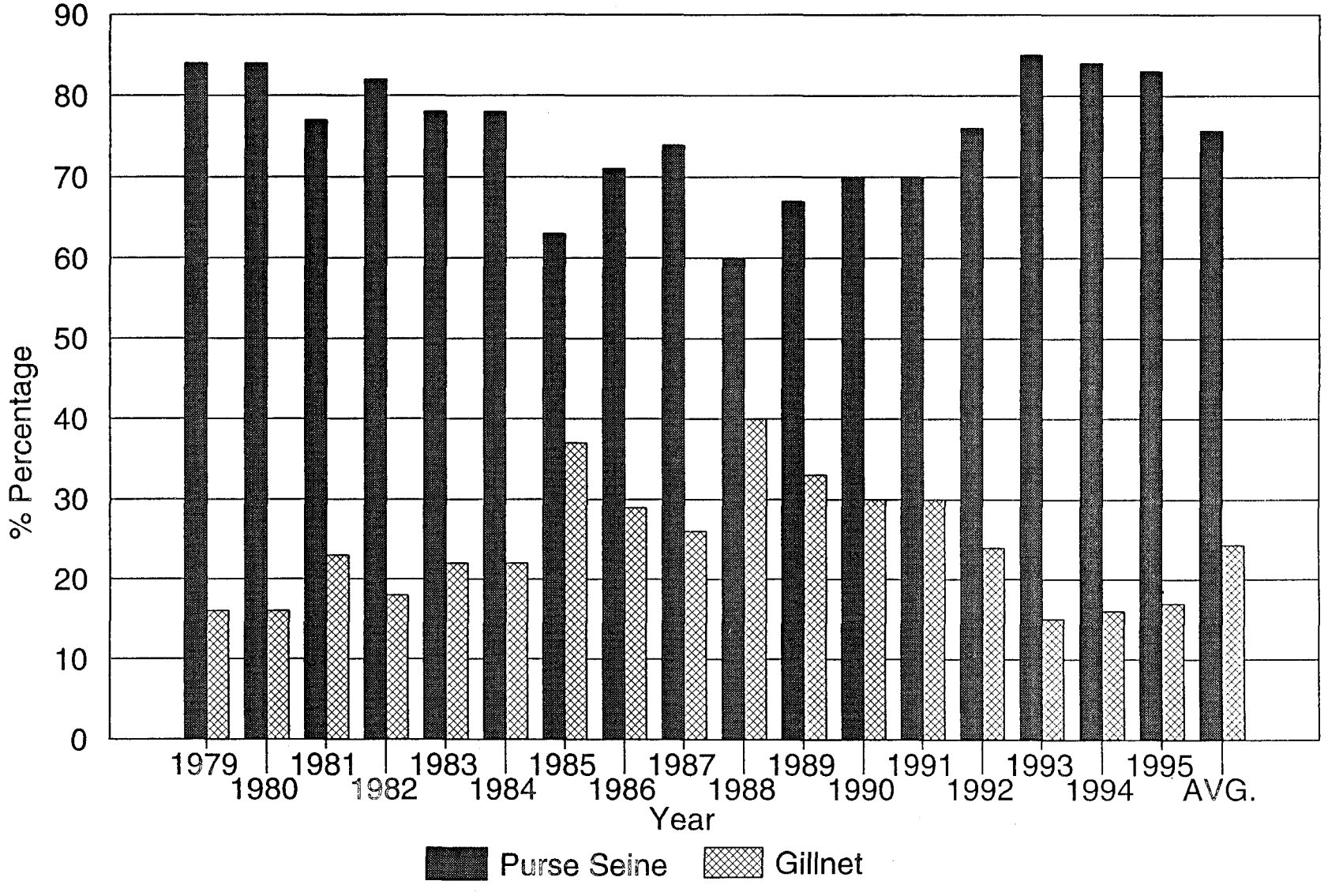

Figure 6. Percent of harvest by gear type for the sac roe herring fishery of the Kodiak Management Area, 1979-1995.

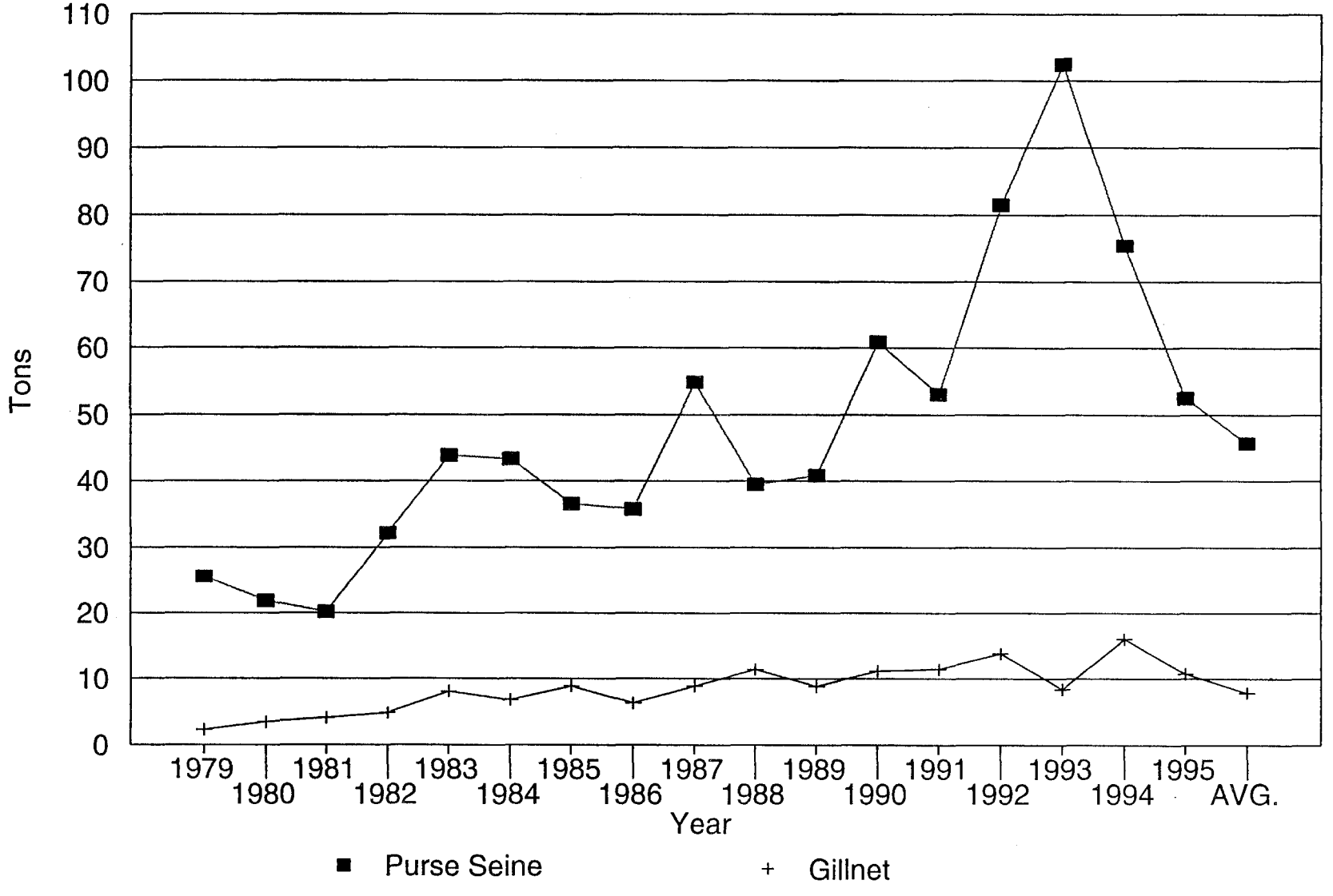

Figure 7. Average harvest by gear type for the sac roe herring fishery of the Kodiak Management Area, 1979-1995.

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