KODIAK MANAGEMENT AREA
1997 COMMERCIAL SAC ROE HERRING FISHERY
SEASON SUMMARY

By

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Regional Information Report[1] No. 4K97-46

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

September 1997

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SEASON SUMMARY

The 1997 Kodiak Management Area (KMA) sac roe herring fishery season opened at 12:00 noon on April 15 and continued through June 30. The last harvest occurred on June 2 (Figure 1). A total of 123 permit holders made 598 deliveries during the 1997 season, with 64 purse seiners and 59 gillnetters harvesting 3,235 tons (Table 1 and Figure 2). Approximately 78 purse seiners participated in this years fishery and about 19 vessels did not make any landings for the season. All gillnetters who participated in the fishery made at least one landing during the season. The total 1997 guideline harvest level (GHL) was 3,435 tons which was distributed among 43 management units within the KMA and harvests occurred within 30 management units (Table 2). The 1997 harvest of 3,235 tons was the sixth largest in the history of this fishery and was 200 tons less than the total KMA GHL of 3,435 tons (Figure 3). Purse seine gear accounted for 81% (2,629 tons) of the harvest with gillnet gear accounting for 19% (606 tons Figure 4). Since 1979, the percentage of harvest for purse seine gear has ranged from 85% to 60% of the total catch and gillnet gear has ranged from 40% to 15%. Uncertainties concerning the 1997 herring price and the opening of a new cod jig fishery reduced the number of gillnetters participating in this year's fishery. A total of 86 tenders were registered to transport herring to processors. There were four floating processors and six shore based plants represented by nine different companies registered to process herring. Roe recovery percentages averaged 10.7% for seine gear and 9.9% for gillnet gear.

From April 15 through May 2 purse seine fishing periods were restricted to 13 hour periods. In late April the purse seine, tender, and floating processor fleet participating in the KMA fishery diminished and most vessels moved to the Bristol Bay herring fishery. Harvest rates had also diminished in late April (Figure 1) and all of the ADF&G field crews were actively monitoring the primary management units where harvests were anticipated to occur. With this reduction in effort, reduced harvest rates, and good coverage of the fishery by ADF&G field crews purse seine fishing periods were increased to 24-hour openings followed by 24-hour closures beginning May 3, for all management units not previously closed to fishing. Gillnet fishing periods were 24 hours in duration, from 12:00 noon on odd-numbered days of the week to 12:00 noon on even -numbered days of the week for the duration of the season.

The 1997 fishery was monitored by four ADF&G shorebased mobile field crews, two ADF&G vessels, along with assistance from two Fish and Wildlife Protection vessels which were stationed in anticipated herring harvest locations. These crews monitored the fishery to gather effort and harvest data used to manage the fishery, and collected commercial catch samples to obtain age, weight, and length (AWL) data. A total of 22 emergency orders were issued during the season which established fishing periods, closed management units when GHL's had been reached, or closed management units due to poor fishery performance.

REGULATORY CHANGES

The Alaska Board of Fisheries (BOF) adopted new regulations for the KMA sac roe herring fishery during its November 1995 meeting. The BOF approved regulations were in effect for the 1996 and

1997 seasons. These changes included the development of a regulatory harvest strategy and changes in purse seine and gillnet gear depth specifications. Portions of the new regulatory harvest strategy (5 AAC 27.535 e) have in essence been used by the Alaska Department of Fish and Game (ADF&G) Commercial Fisheries Management and Development Division staff since the early 1980's. The ADF&G annually publishes a harvest strategy which informs fishers on how the fishery will be managed and establishes GHL's for management units (Gretsch et al. 1997).

The major change addressed by the BOF regulatory harvest strategy is the shortening of fishing periods for purse seiners. This change resulted from ADF&G's inability to monitor purse seiners fishing during the night when near record levels of purse seine gear participated in the 1995 fishery. These factors prompted ADF&G to shorten the duration of fishing periods to slow the harvest rates of purse seiners (Gretsch 1995). Due to regulatory constraints the shorter periods applied to both purse seine and gillnet fishers.

The BOF regulatory harvest strategy reduced fishing time for purse seine gear from 24 hour to 13 hour fishing periods, (12:00 noon to 10:00 p.m. on odd-numbered days and 9:00 a.m. to 12:00 noon on even numbered days of the week), from April 15 through May 4 (ADF&G 1996). From May 5 through June 30 the fishing periods for purse seiners are 12:00 noon on odd-numbered days to 12:00 noon on even-numbered days of the week, (24 hour periods). The ADF&G may adjust the May 5 date earlier or later depending on the assessment of effort levels, harvest rates, and ADF&G's ability to monitor the fishery. Gillnet fishing periods remain unchanged, with 24 hour fishing periods from 12:00 noon on odd-numbered days until 12:00 noon on even-numbered days of the week for the duration of the season.

In 1995 the purse seine gear specifications were changed to allow for a maximum of 20 fathoms stretch measure in depth from the corkline to the bottom of the net including any lines which hang below the lead line. In addition, the gillnet gear specifications were changed to restrict nets to a maximum depth of 230 meshes and allows a total of four hours for fishers to pull their gear after an emergency closure, an increase of two hours from the previous regulation.

HARVEST STRATEGY EVALUATION

The reduction in purse seine fishing periods for the 1996 and 1997 seasons greatly aided the management of this fishery. During the first two weeks of the season when effort levels are the highest the 13 hour fishing periods were crucial in controlling the harvest in this fishery and preventing overexploitation of KMA herring stocks. Prior to the 1996 season, it was very difficult and dangerous for ADF&G's field crews to monitor the seine fleet in darkness (10:00 p.m. to 6:00 a.m.) from small rafts and skiffs. With the 10:00 p.m. seine fishery closure time, the ADF&G field crews still must monitor the fishery during some periods of darkness during the first two weeks of the season. Generally, the seine fishery catches improve as darkness approaches with fishery activity intensifying at or near the 10:00 p.m. closure time as herring move up in the water column near darkness. Catches which occur near 10:00 p.m. may take several hours to be loaded aboard a tender, which requires the field crews to be present to assess the harvest and evaluate the need to close a management unit if the GHL has been met. The 10:00 p.m. closure time has elminated the

unrestricted seine fishery during the night and has reduced the time field crews must work in potentially dangerous situations.

In attempting to evaluate the success of the new harvest strategy at preventing an excessive harvest from occuring on a particular herring stock there are many factors which contribute to harvest rates within the KMA fishery. These factors include effort levels, the availability of the biomass to harvest, and weather conditions. Weather conditions for the 1997 season were excellent for herring spotters, with light winds and clear skies frequently occuring throughout the season. These weather conditions improved the effectiveness of spotters and likely increased the harvest rate of the seine fleet.

One aspect of the 1997 fishery which can be used to evaluate the second season of the 1995 BOF regulatory harvest strategy at this time is a comparison of the GHL to the actual harvest during the 1997 fishery. For the West Afognak District the total GHL was 820 tons and the actual harvest for the season was 869 tons (Table 2). During the period of April 15-30 when effort levels were the highest, the Foul Bay (GHL 100 tons) and Paramanof Bay (GHL 700 tons) management units had harvests of 183 tons and 686 tons. These management units were closed on April 15 and 17 respectively.

In the Uganik District, the total GHL was 940 tons the actual harvest was 1,272 tons. During the high effort level time period (April 15-30), the Village Island, Terror Bay, Northeast Arm, West Uganik Passage, East Arm, and South Arm Uganik management units had a combined GHL of 855 tons and 1,216 tons were harvested, with closures occuring on April 15, 17, 18, 19, 21, and 23 respectively. The harvests from the West Uganik Passage (GHL 20 tons) and Northeast Arm (GHL 30 tons) greatly exceeded the GHL's of these management units with harvests of 169 tons and 101 tons respectively and was caught primarily by seiners.

For the Alitak District, the total GHL was 485 tons and the actual harvest was 320 tons and there were no closures of management units during the April 15-30 time period. For the Eastside District, the total GHL was 900 tons and the actual harvest was 701 tons. The Barling Bay (GHL 50 tons) and Shearwater Bay (GHL 90 tons) management units were the only areas that closed during the April 15-30 period with a harvests of 49 tons and 143 tons respectively. The Northeast District, had a total GHL of 60 tons and the actual harvest was 23 tons and there were no management unit closures during the April 15-30 time period. For the three Mainland Districts, the combined GHL was 200 tons and the actual harvest was 50 tons and there were no closures of management units during the April 15-30 time period.

Overall the ADF&G was successful in managing the 1997 fishery, harvest occurred in 30 management units, 22 management units were closed during the season. Of the 22 management units closed inseason, six had harvests that exceeded the management unit GHL's by 50% or more (Foul Bay, West Uganik Passage, Northeast Arm Uganik, Shearwater Bay, Inner Kiluida Bay and Kalsin Bay). The ADF&G closed three management units prior to reaching the GHL due to lower than expected fishery performance (East Sitkalidak Strait, West Sitkalidak Strait, and Sulua Bay). Four of the six management units which experienced high harvests occurred during the April 15-30 time period and resulted from large schools of herring present within these management units with 6-17 seiners participating. Management units with small GHL's (30 tons or less), such as Northeast Arm (GHL 30 tons), West Uganik Passage (GHL 20 tons), and Kalsin Bay (GHL 10 tons) are the most difficult to manage due to the large harvest capability of seiners. In comparison the 1996 season had

only two management units where the harvest exceeded the GHL by 50% or more (South Arm Uganik Bay and Geese/Two Headed). In comparing the 1996 and 1997 fishery results under the 1995 BOF regulatory changes the occurrence of excessive harvests has been reduced with the reductions in fishing period duration and gear depths. Unlike the 1995 season when a harvest of 801 tons came from the Foul Bay management unit which had a 75 ton GHL or the 1994 harvest of 1,093 tons from the South Arm Uganik Bay management unit which had a 75 ton GHL.

CATCH SAMPLING

A total of 9,323 herring were collected for age-weight-length (AWL) analysis from the purse seine harvest of 19 management units. In general the harvests from the West Afognak and Uganik Districts were predominantly of age-9 fish (Table 3). While the harvests from the Eastside and Alitak Districts were predominately of age-4 fish. With all samples combined age-9 herring were the dominant age class harvested in the 1997 season, representing an estimated 37% of the total purse seine harvest. The remaining age classes represented the following percentage of the harvest; age-3 (7%), age-4 (28%), age-5 (4%), age-6 (8%), age-7 (6%), age-8 (3%), age 10 (5%), and age-11+ (2%).

EXVESSEL VALUE OF THE FISHERY

The average price paid for 10% roe recovery was approximately $300 per ton of herring for the KMA. This was the lowest price paid per ton in the history of this fishery. The average exvessel earnings for purse seine fishers was $12,300 and for gillnetters $3,100 (Figure 5). The total exvessel value of the 1997 fishery was $970,500 which is the lowest total value in the history of the fishery (Figure 6). The previous record low value of this fishery occurred in 1982 when 1,771 tons were harvested and was worth $974,000.

1998 HARVEST EXPECTATIONS AND STOCK STATUS

Herring harvests in the West Afognak and Uganik Districts have relied strongly on a dominant single age class of herring to support these fisheries in recent years, primarily age-9 herring in the 1997 season. Harvests from these districts accounted for 63% of the total 1997 KMA harvest. Several management units within these districts experienced fair recruitment of age-3 herring in 1996 and 1997, however the level of recruitment may not support the current GHL's in future fisheries.

Similarly, the management units of the Eastside District and some management units of the Alitak District have also relied on a strong single age class to support these fisheries through 1996. In 1997 age-10 fish contributed approximately 10% to the harvest for these districts and will likely diminish further in 1998. The 1997 harvest of age-3 herring in these districts indicates fair to poor recruitment. The 1996 age-3 recruitment was excellent and in 1997 age-4 herring contributed to a high percentage of the 1997 harvest, and will likely contribute to the majority of the 1998 harvest. In late March of

1996 and in 1997, a herring biomass of unknown size has spawned in the East Sitkalidak Strait and additional spawns occurred in early April prior to the start of the fishery. This spawn activity indicates the total biomass within this management unit is larger than the actual 1997 fishery performance indicates, however the size of the biomass is unknown.

The Uyak District, South Afognak District, and most of the North Afognak District were closed for the 1995-1997 seasons due to a decline in herring abundance for the years 1991-1994. Several management units of the Inner Marmot District were also closed for the 1996 and 1997 seasons. In addition the Raspberry Strait and Malina Bay management units were closed to fishing in 1997 as fishery performance was poor in 1995 and in 1996 in these management units. The ADF&G will discuss management options for these areas during the winter and these same areas will likely be closed to fishing again in 1998.

The setting of the 1998 GHL's for the KMA sac roe herring fishery will be under evaluation during the winter and will be published in the Kodiak Sac Roe Herring Harvest Strategy, in mid-March of 1998. The ADF&G will also be developing threshold levels for management units during the winter which will help evaluate the status of the various herring stocks.

STOCK ASSESSMENT PROGRAMS

The ADF&G proposed to conduct a test fishery revenue gathering program in 1997 to harvest approximately 50 tons of herring. These funds were to be utilized to conduct additional aerial surveys of the closed management units, along with contracting a seine vessel to make test sets on herring schools in the Uyak District. Due to the low herring price the test fish program was halted as the necessary funds ($50,000) could not be raised in a reasonable manner. As an alternate plan the ADF&G did additional aerial surveys, primarily in the Uyak District, and had the R/V Resolution conduct a hydroacoustic survey of the Uyak District. These limited surveys indicate that these stocks are still depressed and the ADF&G hopes to conduct a more intensive stock assessment program in 1998 as funding allows. The ADF&G also proposes doing hydroacoustic surveys of the East and West Sitkalidak Strait management units in 1998 to assess the biomass within these areas if funding, personnel, and equipment are available.

The ADF&G headquarters staff with help from a University of Alaska graduate student conducted an age-structures-analysis study of the West Afognak District during the spring of 1997. The results of this study will be available this fall, which will help guide the setting of GHL's in this district.

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Table 1. Sac roe herring fishery summary of season length, guideline harvest level (GHL), harvest data by gear type, percentage of harvest by gear type, number of landings, and exvessel earnings, Kodiak Management Area, 1979-1997.

Year	Season Length (Days)	G-H-L (Tons)	Total Harvest (Tons)	Harvest by Gear Type		Percent Harvest by Gear Type		Number of Landings by Gear Type		Units of Gear Making Landings		Average Catch by Gear Type		Average Earnings		Price per Ton ($)	Exvessel Total Value ($)
				Seine (Tons)	Gillnet (Tons)	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine (Tons)	Gillnet (Tons)	Seine ($)	Gillnet ($)		
1979	36	2,400	1,735	1,457	278	84%	16%	-	-	57	125	26	2	$38,342	$3,336	$1,500	$2,602,500
1980	35	2,400	2,383	2,009	374	84%	16%	-	-	92	109	22	3	$15,068	$2,368	$690	$1,644,270
1981	48	2,400	2,065	1,596	469	77%	23%	207	406	79	114	20	4	$14,647	$2,983	$725	$1,497,125
1982	59	2,400	1,771	1,447	324	82%	18%	138	191	45	67	32	5	$17,686	$2,660	$550	$974,050
1983	51	2,400	2,319	1,797	522	77%	23%	164	284	41	64	44	8	$35,063	$6,525	$800	$1,855,200
1984	54	2,400	2,163	1,691	472	78%	22%	138	212	39	69	43	7	$34,687	$5,472	$800	$1,730,400
1985	59	2,000	1,968	1,244	724	63%	37%	118	348	34	81	37	9	$32,929	$8,044	$900	$1,771,200
1986	61	1,690	1,558	1,110	448	71%	29%	132	385	31	71	36	6	$34,016	$5,994	$950	$1,480,100
1987	61	1,640	2,146	1,591	554	74%	26%	122	411	29	62	55	9	$54,862	$8,935	$1,000	$2,146,000
1988	59	2,065	2,171	1,304	867	60%	40%	169	555	33	76	40	11	$51,370	$14,830	$1,300	$2,822,300
1989	76	2,415	2,249	1,513	736	67%	33%	171	627	37	83	41	9	$34,749	$7,535	$850	$1,911,149
1990	75	2,375	2,347	1,644	703	70%	30%	156	544	27	63	61	11	$51,756	$9,485	$850	$1,994,950
1991	83	2,510	2,432	1,697	735	70%	30%	169	587	32	64	53	11	$45,077	$9,762	$850	$2,067,200
1992	77	2,720	4,283	3,260	1,023	76%	24%	185	706	40	74	82	14	$40,750	$6,912	$500	$2,141,500
1993	77	3,525	4,929	4,203	726	85%	15%	237	294	41	86	103	8	$56,382	$4,643	$550	$2,710,950
1994	71	4,550	5,893	4,976	917	84%	16%	285	485	66	57	75	16	$60,315	$12,870	$800	$4,714,400
1995	73	4,480	4,604	3,837	768	83%	17%	280	642	73	71	53	11	$66,858	$13,759	$1,272	$5,856,288
1996	69	4,180	3,386	2,322	1,064	69%	31%	202	890	57	74	41	14	$81,474	$28,757	$2,000	$6,772,000
1997	49	3,435	3,235	2,629	606	81%	19%	183	418	64	59	41	10	$12,323	$3,081	$300	$970,500
Averages																	
1979-1996	62	2,697	2,900	2,150	650	75%	25%	160	420	47	78	48	9	$42,557	$8,604	$936	$2,593,977
Five Year																	
1992-1996	73	3,891	4,619	3,720	900	80%	20%	238	603	55	72	71	13	$61,156	$13,388	$1,024	$4,439,028
Ten Year																	
1987-1996	72	3,046	3,444	2,635	809	74%	26%	198	574	44	71	60	12	$54,359	$11,749	$997	$3,313,674

Table 2. Sac roe herring fishery guideline harvest level (GHL) by management unit, harvest by gear type, total harvest, and the date each management unit was closed, Kodiak Management Area, 1997.

Statistical Area	Management Unit	GHL (Tons)	Seine Harvest (Tons)	Gillnet Harvest (Tons)	Total Harvest (Tons)	Date Management Unit Closed
North Afognak Distict						
NA10	Shuyak Island	20	0.0	0.0	0.0	30-Jun
NA20	Delphin Bay	Closed	0.0	0.0	0.0	-
NA30	Perenosa Bay	Closed	0.0	0.0	0.0	-
NA40	Seal Bay	Closed	0.0	0.0	0.0	-
NA50	Tonki Bay	Closed	0.0	0.0	0.0	-
District Total		**20**	**0.0**	**0.0**	**0.0**	
West Afognak District						
WA10	Raspberry Strait	Closed	0.0	0.0	0.0	-
WA20	Malina Bay	Closed	0.0	0.0	0.0	-
WA31	Paramanof Bay	700	537.3	148.5	685.8	17-Apr
WA32	Foul Bay	100	183.3	0.0	183.3	15-Apr
WA40	Devils Inlet/Bluefox B.	20	0.0	0.0	0.0	30-Jun
WA50	Offshore W. Afognak	a	0.0	0.0	0.0	-
District Total		**820**	**720.6**	**148.5**	**869.1**	
South Afognak Distict						
SA10	Izhut Bay	Closed	0.0	0.0	0.0	-
SA20	Kitoi Bay	Closed	0.0	0.0	0.0	-
SA30	MacDonalds Lagoon	Closed	0.0	0.0	0.0	-
SA40	Danger Bay	Closed	0.0	0.0	0.0	-
SA50	Litnik	Closed	0.0	0.0	0.0	-
SA60	Duck Bay	Closed	0.0	0.0	0.0	-
District Total		**Closed**	**0.0**	**0.0**	**0.0**	
Uganik District						
UG10	Kupreanof	10	0.0	0.0	0.0	30-Jun
UG20	Viekoda Bay	75	3.5	52.9	56.4	14-May
UG21	Terror Bay	250	224.9	26.7	251.6	17-Apr
UG30	Village Island	250	323.7	12.8	336.5	15-Apr
UG31	W. Uganik Pass	20	166.3	2.8	169.1	19-Apr
UG32	NE. Arm Uganik	30	100.7	0.0	100.7	18-Apr
UG33	E. Arm Uganik	125	104.1	16.2	120.3	21-Apr
UG34	S. Arm Uganik	180	225.6	11.8	237.4	23-Apr
UG40	Offshore Uganik	a	0.0	0.0	0.0	30-Jun
District Total		**940**	**1148.8**	**123.2**	**1272.0**	

Table 2. (page 2 of 3)

Statistical Area	Management Unit	GHL (Tons)	Seine Harvest (Tons)	Gillnet Harvest (Tons)	Total Harvest (Tons)	Date Management Unit Closed
Uyak District						
UY10	Offshore Uyak	Closed	0.0	0.0	0.0	-
UY20	Harvester Island	Closed	0.0	0.0	0.0	-
UY30	Inner Uyak Bay	Closed	0.0	0.0	0.0	-
UY31	Larsen Bay	Closed	0.0	0.0	0.0	-
UY32	Browns Lagoon	Closed	0.0	0.0	0.0	-
UY40	Zachar Bay	Closed	0.0	0.0	0.0	-
UY50	Spiridon Bay	Closed	0.0	0.0	0.0	-
District Total		**Closed**	**0.0**	**0.0**	**0.0**	
Alitak District						
AL10	Outer Alitak	Exploration	0	0	0	30-Jun
AL20	Inner Alitak	Exploration	1	0	1	30-Jun
AL21	Inner Deadman Bay	40	0.0	0.0	0.0	30-Jun
AL22	Outer Deadman Bay	50	10.2	0.0	10.2	30-Jun
AL30	Sulua Bay	240	72.9	126.3	199.2	16-May
AL31	Portage Bay	75	91.8	2.1	93.9	2-Jun
AL40	Lower Olga/Moser	15	0.0	0.0	0.0	30-Jun
AL41	N.Upper Olga Bay	10	0.0	0.0	0.0	30-Jun
AL50	Upper Olga Bay	40	0.0	0.0	0.0	30-Jun
AL60	Geese/Twoheaded	15	11.5	4.0	15.5	30-Jun
District Total		485	187.4	132.4	319.8	
Sturgeon/Halibut District						
SH10	Sturgeon/Halibut	Exploration	0.0	0.0	0.0	30-Jun
Eastside District						
EA10	Kaiugnak	20	0	0	0	30-Jun
EA20	SW. Sitkalidak	20	0.0	0.0	0.0	30-Jun
EA21	Three Saints Bay	40	15.3	15.5	30.8	12-May
EA22	Newman Bay	20	0.0	0.0	0.0	30-Jun
EA23	W.Sitkalidak Bay	100	0.0	5.9	5.9	8-May
EA24	Barling Bay	50	15.4	33.2	48.6	30-Apr
EA30	E.Sitkalidak Strait	200	10.0	32.2	42.2	8-May
EA31	Tanginak Anchorage	15	0.0	0.0	0.0	30-Jun
EA40	Outer Sitkalidak	Exploration	0.0	0.0	0.0	30-Jun
EA41	Boulder Bay	Exploration	0.0	2.4	2.4	30-Jun
EA42	Shearwater Bay	90	75.7	67.0	142.7	26-Apr
EA43	Outer Kiliuda Bay	90	106.1	6.7	112.8	3-May
EA44	Inner Kiliuda Bay	90	121.0	24.7	145.7	8-May
EA50	Outer Ugak Bay	60	38.9	1.0	39.9	7-May
EA51	Inner Ugak Bay	90	112.7	1.0	113.7	5-May
EA52	Pasagshak Bay	15	13.1	2.9	16.0	8-May
Distict Total		900	508.2	192.5	700.7	

Table 2. (page 3 of 3)

Statistical Area	Management Unit	GHL (Tons)	Seine Harvest (Tons)	Gillnet Harvest (Tons)	Total Harvest (Tons)	Date Management Unit Closed
Northeast District						
NE10	Womens Bay	30	0.0	0.8	0.8	30-Jun
NE20	Kalsin Bay	10	22.0	0.0	22.0	16-May
NE30	Middle Bay	10	0.0	0.0	0.0	30-Jun
NE40	Inshore Chiniak	10	0.0	0.0	0.0	30-Jun
NE50	Offshore Chiniak	Exploration	0.0	0.0	0.0	30-Jun
District Total		60	22.0	0.8	22.8	
Inner Marmot District						
IM10	Monashka Bay	Exploration	0.0	0.0	0.0	30-Jun
IM20	Anton Larsen Bay	Closed	0.0	0.0	0.0	-
IM30	Sharatin Bay	Closed	0.0	0.0	0.0	-
IM40	Kizhuyak Bay	Closed	0.0	0.0	0.0	-
IM50	Spruce Island	10	0.0	0.0	0.0	30-Jun
District Total		10	0.0	0.0	0.0	
North Mainland District						
NM10	Hallo Bay	Exploration	0.0	0.0	0.0	30-Jun
NM20	Inner Kukak	25	0.0	8.1	8.1	30-Jun
NM30	Outer Kukak	a	0.0	0.0	0.0	30-Jun
NM40	Missak Bay	Exploration	0.0	0.0	0.0	30-Jun
District Total		25	0.0	8.1	8.1	
Mid Mainland District						
MM10	Inner Katmai	50	31.4	0.0	31.4	30-Jun
MM20	Outer Katmai	a	0.0	0.0	0.0	30-Jun
MM30	Alinchak	30	0.0	0.0	0.0	30-Jun
MM40	Puale Bay	Exploration	0.0	0.0	0.0	30-Jun
MM50	Portage Bay	Exploration	0.0	0.0	0.0	30-Jun
MM60	Outer Portage-Puale	a	0.0	0.0	0.0	30-Jun
District Total		80	31.4	0.0	31.4	
South Mainland District						
SM10	Wide Bay	95	11.0	0.0	11.0	30-Jun
SM20	Lower Shelikof	Exploration	0.0	0.0	0.0	30-Jun
District Total		95	11.0	0.0	11.0	
Grand Total		3,435	2,629.4	605.5	3,234.9	

a These are offshore management units which are not expected to yield herring of sac roe quality. These units are more applicable to the food/bait fishery. (See Herring Food/Bait Management Plan).

Table 3. Age composition, by percent, of sac roe herring samples from the commercial purse seine harvest by management unit, Kodiak Management Area, 1997.[a]

Area	Harvest (tons)	Percent at Age										
		2	3	4	5	6	7	8	9	10	11+	n
Paramanof Bay	686	-	1.4	9.5	3.8	5.8	7.1	5.1	62.5	3.2	1.2	827
Foul Bay	183	-	1.4	10.6	6.5	4.6	7.8	8.5	56.4	2.3	1.6	562
Viekoda Bay	56	-	73.9	23.6	1.9	.2	-	.2	-	-	-	364
Terror Bay	252	-	18.9	30.1	7.2	5.5	5.5	1.9	26.7	2.1	1.4	411
Village Islands	336	-	1.4	5.9	2.8	8.5	9.9	4.0	63.8	2.6	.9	423
W. Uganik Passage	169	-	4.6	25.7	12.5	6.1	8.9	3.5	36.5	1.3	.5	536
E. Arm Uganik	120	-	10.2	10.5	3.6	7.2	12.0	4.2	47.4	3.0	1.5	331
S. Arm Uganik	237	-	3.2	5.3	3.7	7.8	9.2	3.0	62.0	3.5	1.8	485
Sulua Bay	199	-	14.8	24.3	3.6	23.9	1.8	1.4	12.7	14.4	2.8	493
Portage Bay	94	-	6.5	29.9	2.1	32.1	.7	1.4	5.8	14.5	6.5	137
Three Saints Bay	31	-	32.6	53.5	.8	3.0	.8	-	.8	6.8	1.3	364
Barling Bay	49	-	4.5	67.7	2.4	15.6	2.0	-	3.1	4.1	.3	288
Shearwater Bay	143	-	6.3	75.3	.9	5.4	.4	.4	1.4	8.5	.9	422
Outer Kiliuda Bay	113	-	3.7	69.9	.7	5.9	.3	.6	1.3	16.1	1.1	795
Inner Kiliuda Bay	146	-	4.0	74.3	.7	5.9	.0	.5	1.3	12.3	.3	1,026
Outer Ugak Bay	40	-	1.4	94.6	.5	1.6	.1	.1	-	1.0	.3	561
Inner Ugak Bay	114	-	4.2	93.1	1.2	.9	-	-	-	.1	.1	542
Kalsin Bay	22	.2	14.6	82.0	.8	.8	.8	-	-	.5	-	362
Inner Katmai	31	.7	29.4	25.3	10.4	17.2	3.5	5.5	7.1	.5	-	394
All samples combined for 19 management units[b]	3,021	0	7.2	28.2	4.0	8.1	5.6	3.1	37.0	5.0	1.3	9,323

[a] Of the 30 management units exploited in 1997, samples were collected from 19 (66%). These 19 units yielded 3,021 tons or 93% of the management area's total harvest of 3,235 tons.

[b] All samples combined data, weights the percent of the harvest by management unit to the age class data to estimate the combined purse seine age composition.

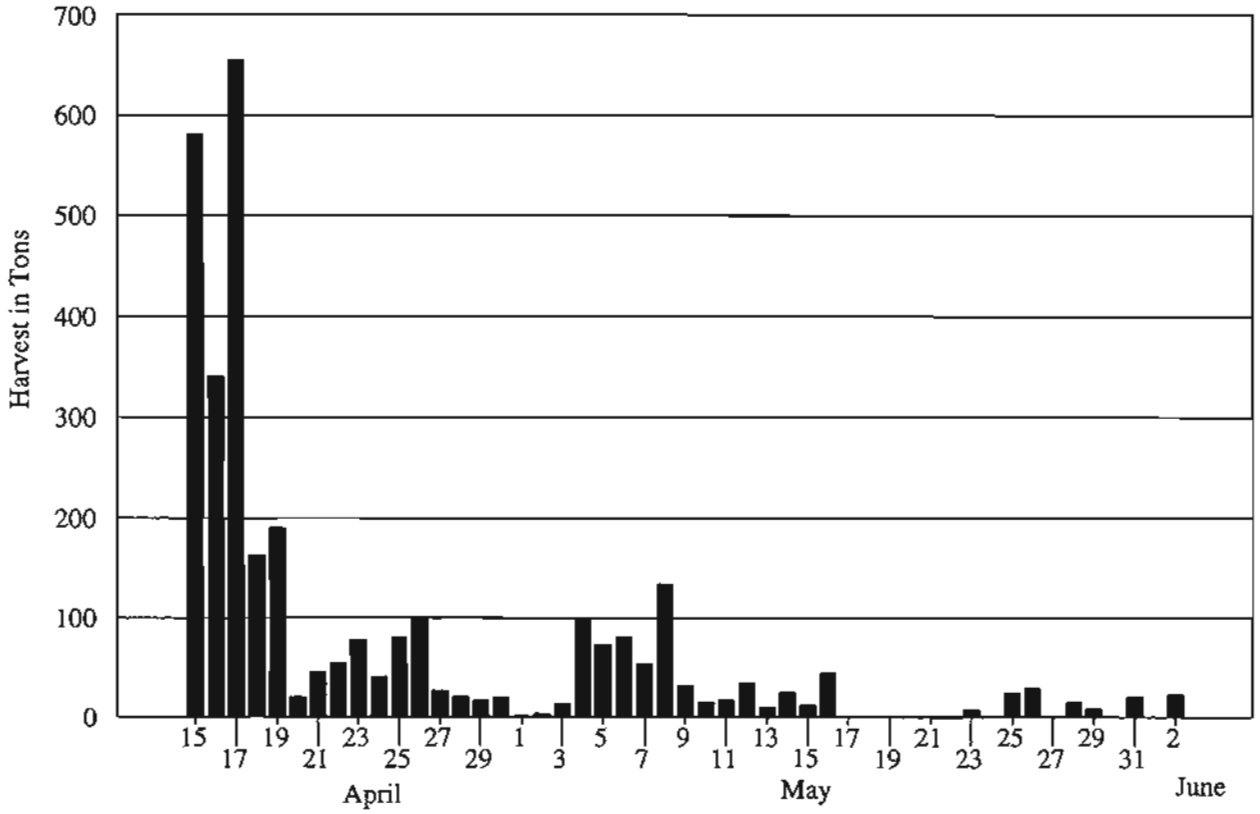

Figure 1. Sac roe herring harvest by day for the Kodiak Management Area, 1997.

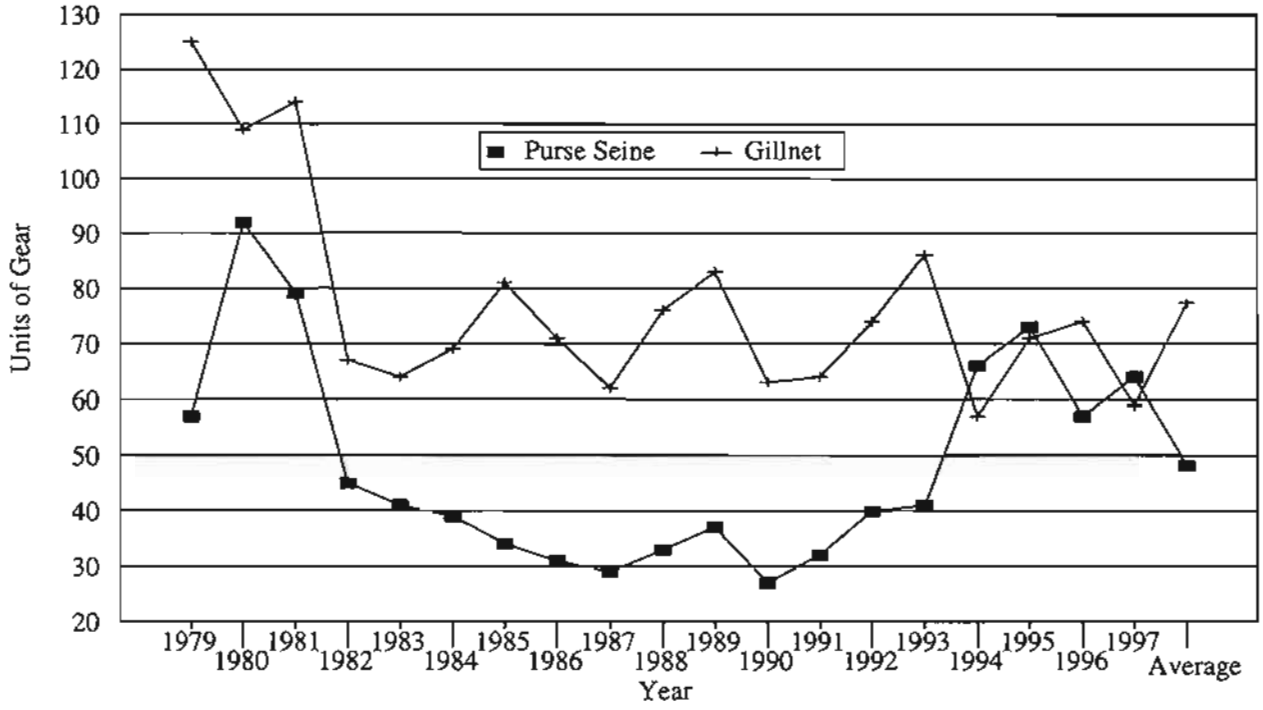

Figure 2. Number of units of each gear type which made landings in the sac roe herring fishery, Kodiak Management Area 1979-1997.

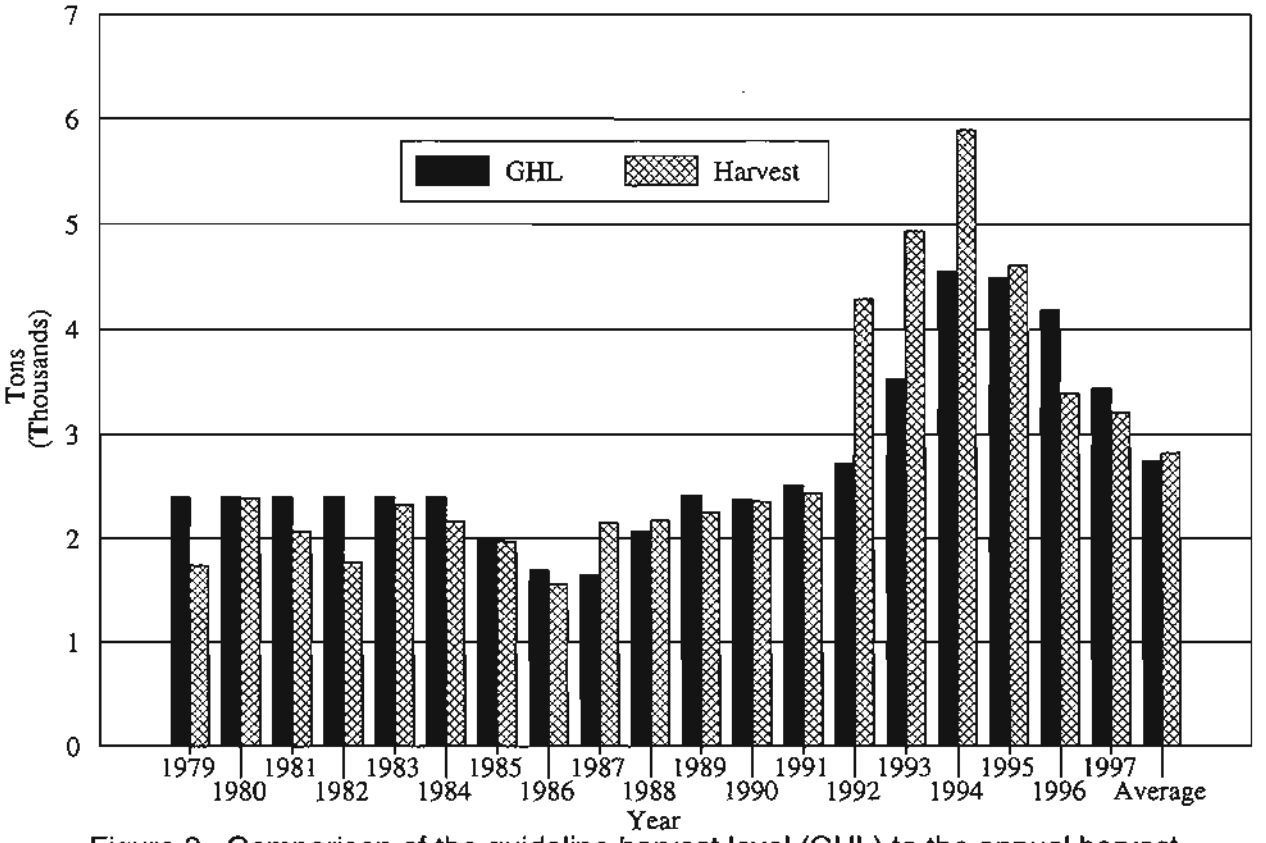

Figure 3. Comparison of the guideline harvest level (GHL) to the annual harvest in the Kodiak Management Area, 1979-1997.

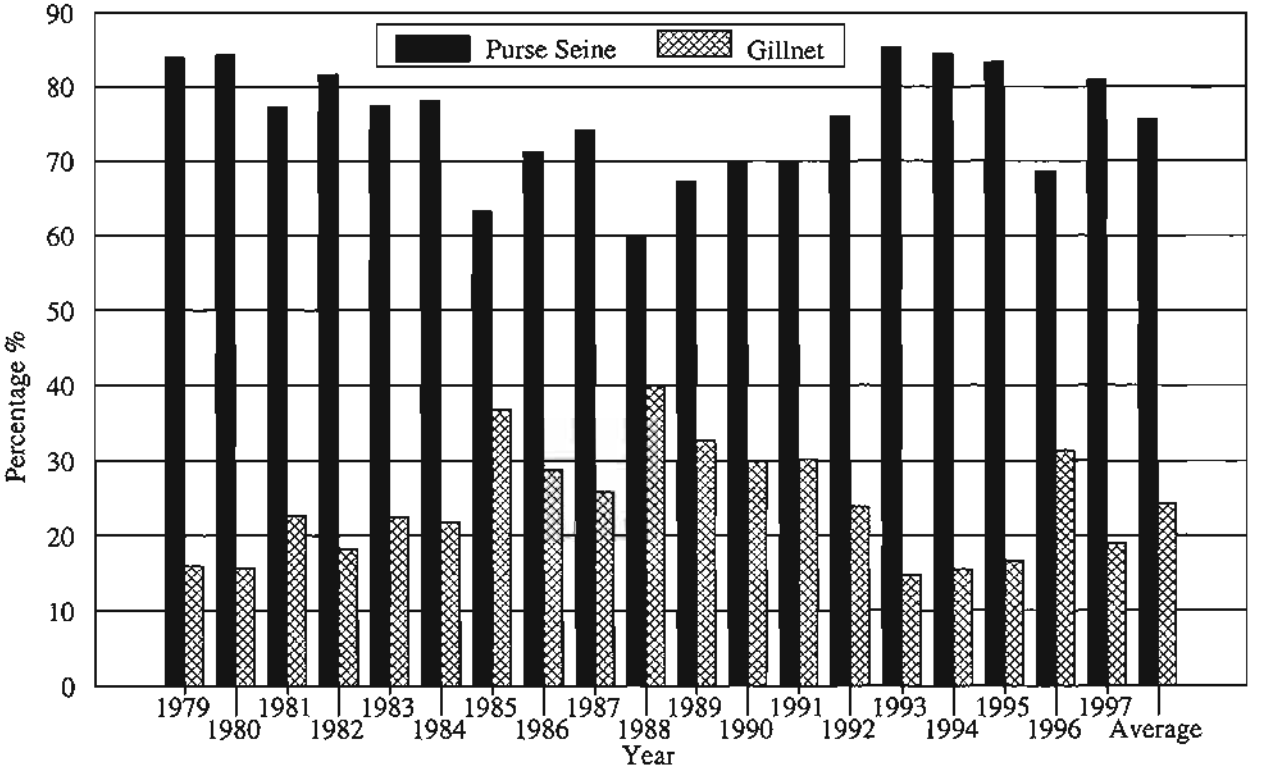

Figure 4. Percent of sac roe herring harvest by gear type for the Kodiak Management Area, 1979-1997.

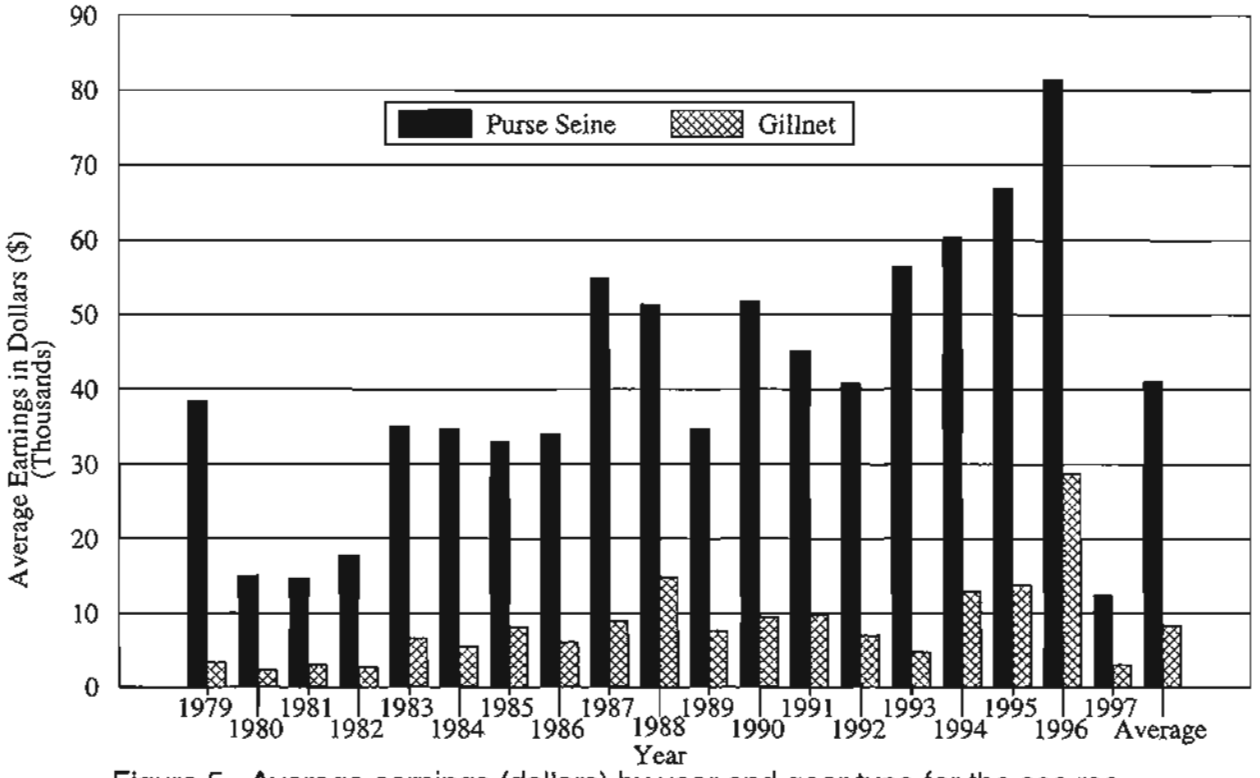

Figure 5. Average earnings (dollars) by year and gear type for the sac roe herring fishery, Kodiak Management Area, 1979-1997.

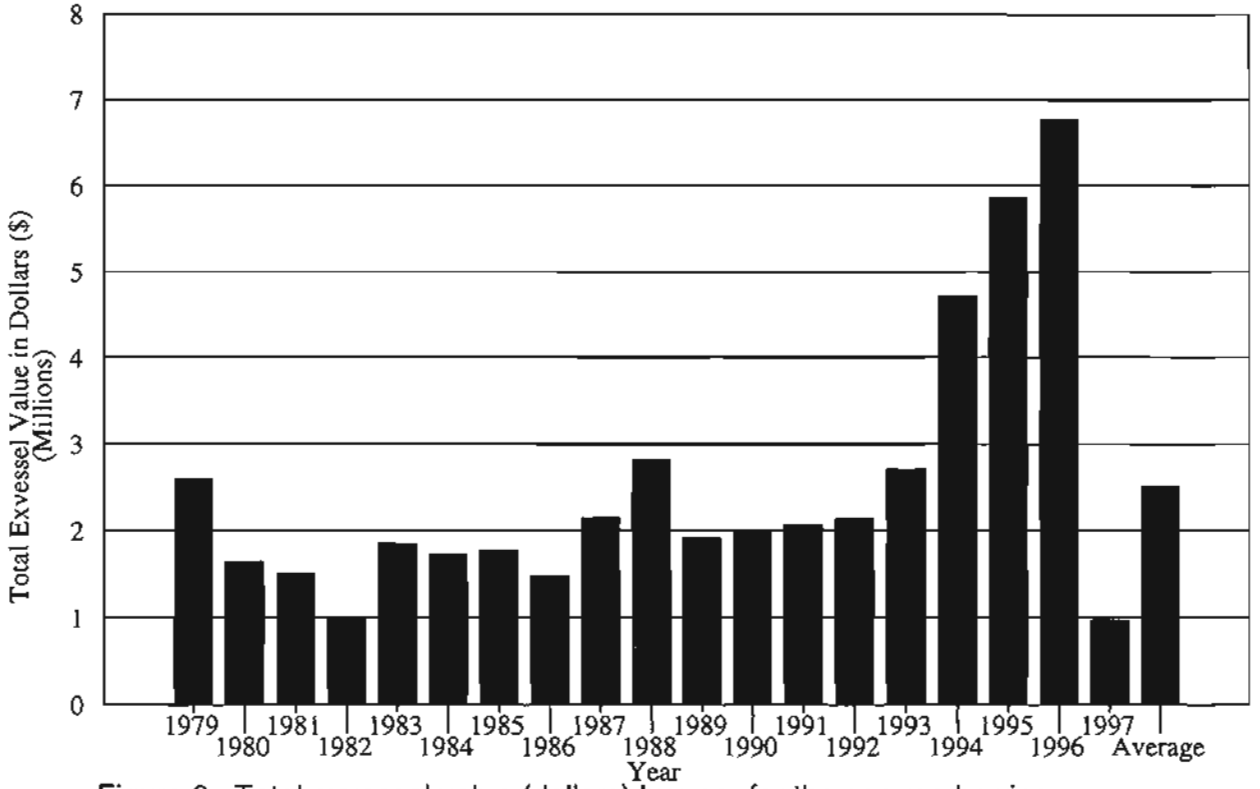

Figure 6. Total exvessel value (dollars) by year for the sac roe herring fishery in the Kodiak Management Area, 1979-1997.