Fishery Management Report No. 11-16

Kodiak Management Area Herring Fisheries Annual Management Report, 2009

by

Geoff Spalinger

March 2011

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheri**

Symbols and Abbreviations

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Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat. or long.
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	*e*
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	*E*
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$log_{2,}$ etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

FISHERY MANAGEMENT REPORT NO. 11-16

KODIAK MANAGEMENT AREA HERRING FISHERIES ANNUAL MANAGEMENT REPORT, 2009

by
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ABSTRACT

This report presents information concerning the commercial Pacific herring *Clupea pallasii* sac roe, food and bait, and subsistence fisheries in the Kodiak Management Area (KMA) in 2009.

The KMA 2009 herring sac roe fishery was open from April 15 through June 30. Fishermen harvested 4,759 tons, compared to the preseason guideline harvest level (GHL) of 4,340 tons. Prior to May 1, the herring sac roe fishery is managed under an allocative harvest strategy that provides approximately 75% of the total Kodiak GHL to seine gear and approximately 25% to gillnet gear. From May 1 through June 30, the Alaska Department of Fish and Game (ADF&G) may open any area with unharvested GHL to any gear group if the fishery is unlikely to result in overharvest. Purse seine fishermen harvested 4,549 tons, approximately 96% of the total catch, and gillnet fishermen harvested 210 tons, approximately 4% of the total catch. Roe recovery percentages averaged 10.6% for the fishery. The total exvessel value of the fishery was an estimated $2,498,475. Herring abundance in the KMA has been increasing in recent years and recruitment was strong in several sections during 2009. The commercial catch was composed primarily of 40.9% age-4, 20.5% age-5, 7.7% age-6, 5.5% age-7, 18.6% age-8, 3.0% age-9, 1.4% age-10, and 1.1% age-11 herring.

A combine was conducted for the KMA herring food and bait fishery for the 2001 to 2009 seasons due to the small GHLs. Two trips were made to the Uganik District in 2009 harvesting 174 tons (179-ton GHL). One trip was made to the South Afognak District harvesting 89 tons (44-ton GHL). The Eastside District (85-ton GHL) opened but no harvest occurred and the Alitak District (112-ton GHL) could have been opened; however, no requests were made to ADF&G to open these districts.

Subsistence herring harvests were reported from a total of 35 subsistence permits through April 7, 2010. The total subsistence herring harvest for the KMA in 2009 was 3,922 pounds.

Key words: Kodiak, Herring, *Clupea pallasii*, sac roe commercial fishery, food and bait commercial fishery, subsistence fishery, stock status, GHL, KMA, AMR.

INTRODUCTION

This report presents information on the commercial Pacific herring *Clupea pallasii* sac roe, food and bait, and subsistence fisheries in the Kodiak Management Area (KMA) in 2009. This includes harvest data by fishery, age and weight data collected from the commercial harvest, stock status, and a summary of fishery management activity.

The KMA comprises the waters of the Kodiak Archipelago and that portion of the Alaska Peninsula extending from Cape Douglas southwest to Kilokak Rocks (Figure 1). The archipelago is approximately 150 miles (250 kilometers) long, extending from Shuyak Island in the North, south to the Trinity Islands. The Alaska Peninsula portion of the KMA is about 160 miles (267 kilometers) long and is separated from the archipelago by Shelikof Strait (Figure 1).

The KMA is divided into 13 districts which define geographical areas used to manage both the herring sac roe and the food and bait fisheries (Figure 2). For the sac roe fishery, each district is divided into sections that define the spawning area used by specific herring stocks or a geographical area.

HERRING SAC ROE FISHERY

FISHERY CHARACTERISTICS

The KMA herring sac roe fishery began in 1964 (Table 1; Figure 3) and occurs in approximately 30 bays and coastal locations. The fishery currently opens at noon on April 15, with most of the management area opening concurrently. The concurrent opening of sections on April 15, prior to any major buildup of herring, was historically intended to distribute effort and harvest; however, in recent years, purse seine fishermen have concentrated in areas known to have early spawning

herring and the largest guideline harvest levels (GHLs). The fishery ends on June 30 (5 AAC 27.510(a)).

Gear

Purse seines and gillnets are the only gear types allowed in the commercial sac roe fishery. Purse seines may not exceed 18 fathoms stretch measure in depth or 100 fathoms in length (5 AAC 27.525(a)). Gillnets may not exceed an aggregate length of 150 fathoms (5 AAC 27.520(a)).

Fishing Periods

From April 15 through May 7, fishing periods for purse seiners are from noon until 9:00 PM on odd-numbered days and from 9:00 AM to noon on even-numbered days. From May 8 through June 30, fishing periods for purse seiners are from noon until 10:00 PM on odd-numbered days and from 9:00 AM to noon on even-numbered days (5 AAC 27.510(a)(1)). For gillnets, fishing periods are from noon on odd-numbered days until noon on even-numbered days (5 AAC 27.510(a)(2)).

Harvest Strategy

The herring sac roe fishery is managed under an allocative harvest strategy that has been in effect since 2000 with some modifications in 2008 and 2009. The harvest strategy requires the Alaska Department of Fish and Game (ADF&G) to establish GHLs by section, based on historical harvest data, current and past fishery performance, age composition of commercial catch samples, aerial surveys, and hydroacoustic biomass assessments. For each district that has more than one section open to fishing, ADF&G is required to assign 20% to 30% of the GHL to gillnet permit holders and 70% to 80% of the GHL to purse seine permit holders (5 AAC 27.535(e)(2)(D)). This is accomplished by designating one gear type for each section with a GHL. In districts where assigning one gear type for each section would not achieve the required allocation, ADF&G establishes GHLs for both gear types, within a section, and fishing is separated by time or area. Adjacent sections may be combined and managed as a single section if the same stock is present or moves between sections (5 AAC 27.535(e)(1)(A)). ADF&G may also use emergency order (EO) authority to restrict fishing time and open areas in any section if overharvest concerns exist during the season.

In January 2008, the Alaska Board of Fisheries (BOF) met in Kodiak and made adjustments to fishery regulations. The most significant change allowed ADF&G, based on their assessment of harvest or effort, to allow one gear type to operate in an area during any open period without regard to the allocation (5 AAC 27.535(e)(1)(C)). Also, new section lines for the Alitak District were placed into regulation (5 AAC 27.505(g)).

In February 2009, the BOF made further changes to the allocative harvest strategy. From May 1 through June 30, ADF&G may open any area with unharvested GHL to any gear group if the fishery is not likely to result in overharvest (5 AAC 27.535(e)(1)(C)). The BOF also changed registration requirements in the fishery. After April 30, permit holders must be registered with ADF&G before participating in the fishery (5 AAC 27.510(a)(4)).

FISHERY MANAGEMENT

Establishing GHLs

Preseason GHLs are established for all sections that have produced consistent herring harvests in previous seasons. These GHLs reflect the status of a particular herring stock by section. In 2009, section GHLs ranged from 10 to 1,700 tons (short; Table 2). Establishing the 2009 GHLs involved evaluation of a variety of information to determine stock status trends and conservative adjustment of GHLs, including

1. fishery performance during preceding season or seasons (i.e., harvest timing, harvest duration, average school size);
2. trends in age composition (i.e., level of recruitment of age-3 herring, the proportion of age-5 and younger herring, and the proportion of age-2 herring as an indicator of future recruit strength);
3. observations of spawn and juvenile herring;
4. industry and department aerial surveys;
5. hydroacoustic surveys;
6. test fishery data including age composition and biomass estimates; and
7. aged-structured analysis (ASA) modeling.

Preseason GHLs have generally reflected the actual harvests and have aided fishermen and processors in planning prior to the start of each season.

ADF&G has historically relied on the fishing industry to establish roe recovery and minimum size standards. The quality of Kodiak herring has generally been high, due to selective harvest of mature herring by fishermen and the inseason processing of relatively small amounts of herring over long time periods by local processors. In the 1990s, competition in the purse seine fishery intensified and fishermen were less selective in harvesting high-quality herring. In 2003 and 2004, ADF&G took a more active role in some sections to manage for roe quality, which resulted in delayed openings of sections and an increase in roe quality. During the 2005 BOF meeting, the harvest strategy was changed so that ADF&G is directed to strive for the highest quality product (5 AAC 27.535(e)(6)).

Inseason Fishery Management

Inseason, processors and independent tender operators are required to provide daily tallies of herring tonnage and deliveries by section, as well as accurate estimates of herring tonnage onboard tenders that have not yet delivered to the processor. Reports from field personnel, processors, permit holders, spotter pilots, and tenders are tallied by ADF&G to assess herring harvests. Generally, once the harvest estimate approaches, meets, or exceeds the GHL, a section is closed for the season by EO. Due to the rapid pace at which some harvests occur, inperiod closures are frequent. In sections that have field personnel present on the grounds, inperiod closures may occur with only a few minutes of advance notice. Industry cooperation has greatly aided managers.

2009 SEASON SUMMARY

The 2009 sac roe season opened at noon April 15, and 41 EOs concerning this fishery were issued during the season (Appendix A1.). The last harvest occurred on June 5 (Figure 4). The total 2009 KMA GHL was initially established at 4,340 tons, but raised to 4,765 tons in season (Tables 2 and 3; Spalinger and Wadle 2009). A total of 4,759 tons were harvested (Table 3; Figure 5).

In 2009, 31 purse seine permit holders made 218 landings, harvesting 4,549 tons (Table 3; Figure 6). A total of six gillnet permit holders harvested 210 tons in 19 landings (Table 3; Figure 6). Purse seine fishermen harvested approximately 96% and gillnet fishermen harvested approximately 4% of the total KMA harvest in 2009 (Table 3; Figure 7). The 2009 average individual purse seine permit holder harvest was 147 tons, the highest average harvest for the years 1979 through 2009 (Table 3). The 2009 average individual gillnet permit holder harvest was 35 tons. Five companies operated 6 shore-based processing facilities that were registered to buy and process herring.

ADF&G monitored the fishery with two shore-based field crews and two ADF&G vessels, all of which were stationed in anticipated herring harvest locations. Crews gathered effort and harvest data used to manage the fishery, and collected commercial catch samples to obtain age, weight, length (AWL), and maturity data.

A total of 50 sections were open to fishing; however, 14 of these sections were exploratory, having little or no historic harvest (Table 2). In the 2009 fishery, harvests occurred in 26 sections. The Paramanof/Foul Bay sections remained closed for the 2009 season. The Inner Uyak Bay Section was assigned a preseason GHL but never opened due to low herring abundance. Many of the sections that were not fished were within the Mainland districts.

Purse Seine Fishery

Purse seine harvests in 2009 occurred in more areas than previous years as a result of the most recent regulation changes by the BOF allowing ADF&G to open any section to any gear group after April 30 (5 AAC 27.535(e)(1)(C)). The majority of effort was concentrated in the combined Village Islands/Uganik Bay sections of the Uganik District which resulted in a purse seine harvest of 1,221 tons out of a purse seine GHL of 1,350 tons (Table 2). A total of 1,440 tons were harvested from ten sections in the Eastside District. Two of these sections were exploratory and three were originally assigned to gillnet gear (Table 2). On May 13, the department combined the Inner and Outer Deadman Bay, Inner Alitak Bay and Sulua Bay sections into one management unit open to both gear types and increased the combined GHL from 475 to 900 tons. Purse seiners harvested 825 tons out of this area. The East Upper Olga Bay, West Upper Olga Bay and Lower Olga Bay sections in the Alitak District had a purse seine harvest of 163 tons compared to the combined GHLs of 225 tons (Table 2). Purse seiners harvested 559 tons from the Danger Bay and Izhut Bay sections of the South Afognak District (Table 2). Although the herring never showed up in the Inner Uyak Bay Section (the GHL was 250 tons), a harvest of 112 tons by purse seiners occurred in the nearby Zachar Bay Section after purse seiners were allowed to fish that section (Table 2). Other sections where purse seiners harvested herring included the Kizhuyak Bay Section (183 tons), the Womens Bay Section (45 tons), the Tonki Bay Section (22 tons) and the Perenosa Bay Section (8 tons). Roe recovery from purse seine harvests averaged 10.7% (Figure 8).

Gillnet Fishery

Gillnet effort was expected to be minimal in 2009. As a result, ADF&G opened areas initially allocated to the gillnet fleet by EO to continuous fishing beginning at noon on April 15. Normally gillnet areas follow a fishing schedule that allows them to fish from noon on even-numbered days until noon on odd-numbered days (24-hour open periods followed by 24-hour closed periods; 5 AAC 27.510(a)(2)).

Gillnet permit holders harvested 131 tons from the 350-ton GHL in the Village Islands/Uganik Bay sections (Table 2). Other sections with harvest from the gillnet fleet included Browns Lagoon (61 tons), Danger Bay (17 tons), and Perenosa Bay (1 ton). Roe recovery from gillnet harvests averaged 9.3% (Figure 8).

Inseason Gear Changes

Based on BOF changes to the regulations enacted in February, 2009, ADF&G has the authority after April 30 to allow any gear group access to a section with remaining GHL if the fishery is unlikely to result in overharvest (5 AAC 27.535(e)(1)(C)). Beginning noon May 1, the following sections were opened to both gear types: the Inner Alitak Bay, Inner/Outer Deadman bays, East Upper Olga Bay, West Upper Olga Bay, Sulua Bay, Lower Olga Bay, Shearwater Bay, Inner Kiliuda Bay, Inner Ugak Bay, Viekoda Bay, Terror Bay, West Uganik Passage, and Tonki Bay sections. At 9 AM May 8, the Zachar Bay section was opened to both gear types and the Womens Bay Section was opened to both gear types at noon May 15. In fisheries where both gear types were allowed to fish simultaneously, there were no reports of gear conflicts.

Exvessel Value of the Fishery

In 2009 the exvessel price paid for 10% roe recovery herring was approximately $525 per ton at the dock, similar to that paid in 2008 (Table 3). The estimated average exvessel earnings per purse seine permit holder was $77,040 and $18,375 for gillnet permit holders (Table 3; Figure 9). The total exvessel value of the 2009 fishery was an estimated $2,498,475 (Table 3; Figure 10), which does not include any adjustments in value for roe recovery above or below 10% recovery, herring that are sold as bait, or herring that were discarded. Roe recovery from the 2009 fishery averaged 10.6% (Figure 8).

STOCK ASSESSMENT

ADF&G evaluates fishery performance and survey information to assess trends in stock status. Hydroacoustic and aerial surveys are conducted by ADF&G to assess herring abundance prior to, during, and after the commercial fishery and to survey closed sections. Herring samples come from commercial harvests and from research vessels (using trawl gear). Age composition information from these samples provide insight into recruitment and aid managers in making GHL adjustments. For example, areas with strong percentages of age-4 and younger herring (recruitment) will not be aggressively fished and will have conservative GHLs, whereas areas with older age classes (9 or more years old) will be more aggressively fished with increased GHLs.

Industry aerial observers and permit holders have aided managers by providing biomass estimates, spawn observations, fleet movements, and harvest estimates. Although aerial and hydroacoustic assessments provide an evaluation of the biomass, there are several problems associated with herring assessment in the KMA:

1. Herring tend to be deeper during the day and rise toward the surface during the evening and early morning hours, limiting the time fish are observable from the air
2. Most fishing sections have several distinct schools of herring that spawn from April through June, making complete biomass estimates difficult
3. Herring may stay within an area for the duration of the sac roe season or may move to another district, which may lead to duplicated or incomplete biomass estimates, or incorrect assignment to a spawning stock location
4. The KMA encompasses a large geographical area
5. Adverse weather conditions limit the extent of surveys
6. Hydroacoustic surveys are limited in shallower waters, and vessel avoidance by herring is known to occur (Hjellvik et al. 2008).
7. A substantial amount of subtidal spawning may occur in water 10 to 20 fathoms in depth, which is not detectable from aerial surveys.

Fishery performance is used to evaluate stock status; however, due to the low gillnet effort since 1998, fishery performance is not a good indicator of stock status within gillnet sections. Regulation changes in 2009 allowing both gear types to fish in the same sections after April 30 (5 AAC 27.535(e)(1)(C)) has allowed ADF&G to gain information from gillnet sections that have not been fished in recent years. In 2009, commercial catch samples were collected from many sections initially allocated to the gillnet fleet. Participation in most purse seine sections has been consistent, and commercial catches have been sampled regularly.

Catch Sampling

A total of 7,142 herring were collected and analyzed for AWL data from harvests, test sets, and ADF&G trawl samples during the 2009 sac roe season. Samples were taken from 24 sections, 22 of which had commercial harvests. Age-4, -5, and -8 herring were the dominant age classes harvested in 2009, representing approximately 80% of the total commercial harvest (Table 4). The complete commercial harvest consisted of 0.8% age-3, 40.9% age-4, 20.5% age-5, 7.7% age-6, 5.5% age-7, 18.6% age-8, 3.0% age-9, 1.4% age-10, 1.1% age-11, and 0.4% age-12 herring (Table 4). Generally, herring from the Alitak District were larger at age than those found throughout the remaining Kodiak Archipelago (Table 5).

Stock Status by District

Herring can generally be found seasonally in all bays of the KMA (Figure 2). Approximately 70 sections that are known to have spawning populations of herring are monitored by ADF&G, with the priority effort spent on larger herring stocks. Generally, there is less information available for the smaller stocks of herring so the evaluation of these stocks is more tenuous. In some areas, such as the Mainland District, several years may elapse before new information becomes available. Information provided by commercial herring fishermen, spotter pilots, air taxi operators, and remote area residents concerning herring distribution, biomass estimates, and spawn sightings is also considered by ADF&G.

North Afognak District

Five sections compose the North Afognak District. Spawning stocks of herring occur in all five sections, although these stocks tend to be small (less than 20 tons; Figure 2). The Tonki Bay

Section currently has the largest biomass, and had a GHL of 30 tons in 2009. Purse seine fishermen harvested 22 tons (Table 2). Commercial catch samples consisted primarily of 3.7% age-3, 51.8% age-4, 29.4% age-5, 11.9% age-6, 1.5% age-7, and 1.1% age-8 herring (Table 4).

The Perenosa Bay Section was open as an exploratory section in 2009. Purse seine permit holders harvested 8 tons and gillnet permit holders harvested 1 ton. Herring collected from the commercial harvest were composed of 37.8% age-4, 42.0% age-5, 12.6% age-6, 5.0% age-7, and 1.7% age-8 herring (Table 4)

West Afognak District

The West Afognak District has six sections, five of which are known to have spawning stocks of herring (Figure 2). Paramanof Bay has the largest spawning stock within this district; however, this stock has been at low levels since 2005. This stock is rebuilding, and in 2009 hydroacoustic surveys estimated approximately 2,500 tons in the Paramanof Bay Section. ADF&G trawled and collected samples that consisted of 6.8% age-3, 69.6% age-4, 22.3% age-5, and 1.2% age-6 herring (Table 4). The Paramanof Bay Section remained closed in 2009.

South Afognak District

The South Afognak District comprises six sections; the Danger Bay Section currently has the largest stock of herring in this district (Figure 2). This section opened with a 400-ton GHL for both purse seine (300-ton GHL) and gillnet (100-ton GHL) permit holders. Purse seine fishermen harvested 375 tons and gillnet fishermen harvested 17 tons. Commercial catch samples consisted of 32.8% age-4, 39.1% age-5, 11.7 % age-6, 5.6% age-7, 4.2% age-8, 3.1% age-9, and 2.1% age-10 herring (Table 4).

In 2009, the MacDonalds Lagoon, Kitoi Bay, and Izhut Bay sections were combined and managed as one unit allocated to purse seine gear with a 40-ton GHL (Table 2). Purse seine permit holders harvested 154 tons. Commercial catch samples consisted of 1.2% age 3, 60.0% age-4, 27.8% age-5, 6.4% age-6, 1.2% age-7, and 2.9% age-8 herring (Table 4).

Uganik District

The Uganik District consists of nine sections on the northwest side of Kodiak Island (Figure 2). During the last 10 years this district has provided the greatest harvest opportunity in the KMA, and hydroacoustic and aerial survey information indicate that the Village Islands spawning biomass is currently the largest in the KMA. The total biomass of herring observed in the Village Islands/Uganik Bay sections has been estimated at 10,000 to 30,000 tons (herring congregate in Uganik Bay throughout the year, complicating biomass estimation). The 2009 GHL for this section was 1,700 tons (1,350 purse seine and 350 gillnet; table 2). Purse seine fishermen harvested 1,221 tons and gillnet fishermen harvested 131 tons (Table 2). Catch samples were composed mainly of 1.3% age-3, 30.9% age-4, 27.6% age-5, 15.0% age-6, 5.5% age-7, 7.1% age-8, 6.6% age-9, 2.9% age-10, and 2.3% age-11 herring (Table 4).

Uyak District

The Uyak District is made up of seven sections on the west side of Kodiak Island (Figure 2). Through the 1980s, the Uyak District was the largest herring producing district in the KMA (Figure 2). In the early 1990s these stocks began declining and were at low levels for several years. In 2002, aerial surveys indicated that these stocks were improving, and by 2004 several sections were reopened for the first time since 1994. In 2009, the GHL for the Inner Uyak Bay

Section was established at 250 tons (Table 2). However, no fishing occurred, as herring could not be easily found.

The Brown's Lagoon Section was open to gillnet gear in 2009 with a 50-ton GHL (Table 2). Based on hydroacoustic surveys the biomass was estimated at 800 tons. Gillnet fishermen harvested 61 tons (Table 2). Herring collected by the R/V *Resolution* and from the commercial fishery consisted of 3.0% age-3, 63.0% age-4, 23.7% age-5, 7.2% age-6, and 1.5% age-8 (Table 4).

In 2009, a surprisingly large biomass was observed in Zachar Bay. Approximately 2,000 tons were observed during aerial and hydroacoustic surveys. The Zachar Bay Section was initially established as gillnet section with a 30-ton GHL. After little effort and no harvest by the gillnet fleet, this section was opened to the purse seine fleet on May 8. Purse seine fishermen harvested 112 tons. Herring samples collected from the commercial catch and aboard ADF&G research vessels were composed of 1.5% age-3. 57.0% age-4, 30.4% age-5, 7.5% age-6, and 2.7% age-7.

Alitak District

All sections in the Alitak District (Figure 2), except the Outer Alitak Section, are known to have herring stocks. Herring stocks began to decline in the early 1990's, and by 1998 most sections were closed. In 2002, aerial survey reports indicated an increase in herring abundance. In 2003 and 2004 some sections were opened to gillnet gear to act as test fisheries. By 2005, several sections that had been closed were reopened.

In 2009, The Inner and Outer Deadman Bay sections were initially combined to be managed as one section. In season it was apparent that large schools of herring were traveling between these sections as well as the Inner Alitak and Sulua Bay sections. Therefore, the Inner Alitak and Sulua Bay sections were managed together with the Inner and Outer Deadman Bay Sections. The GHL for these combined sections would have been 475 tons but was increased to 900 tons based on the large herring biomass present. An estimated 13,625 tons were observed during hydroacoustic surveys. Purse seine fishermen harvested 825 tons from these sections (Table 2). The harvest was composed mostly of 25.2% age-4, 16.8% age-5, 5.8% age-6, 9.3% age-7, and 40.9% age-8 herring (Table 4).

The East Upper Olga Bay Section was open in 2009 with a 75-ton GHL and 60 tons were harvested by purse seine gear (Table 2). Age compositions of the harvest consisted of 20.2% age-4, 22.5% age-5, 2.3% age-6, 8.7% age-7, 40.4 % age-8, 2.9% age-9, 1.7% age-11, and 1.2% age-12 herring (Table 4)

The West Upper Olga Bay Section was open in 2009 with a 75-ton GHL, and 75 tons were harvested by purse seine gear (Table 2). Herring sampled from the harvest were composed mostly of 24.1% age-4, 26.7% age-5, 2.9% age-6, 6.8% age-7, 36.0% age-8, and 2.1% age-9 (Table 4).

The Lower Olga Bay Section was initially a gillnet only section with a 75-ton GHL (Table 2). After April 30 this section was also opened to purse seine gear. Purse seine fishermen harvested 28 tons. Samples consisted mainly of 21.3% % age-4, 17.1% age-5, 10.6% age-7, 39.0% age-8, 3.0% age-9, 4.7% age-10, 1.2% age-11, and 2.4% age-12 herring (Table 4).

Eastside District

The Eastside District is composed of four bay complexes: Ugak Bay, Kiliuda Bay, East Sitkalidak Strait, and West Sitkalidak Strait (Figure 2). Sixteen sections have been established and only one, the Outer Sitkalidak Section, has no history of herring sac roe harvests. Hydroacoustic surveys in this district are conducted less frequently than in other portions of the KMA.

Generally, the East and West Sitkalidak sections have the earliest spawning herring in the KMA, with initial spawns sometimes occurring as early as late March. In 2009, the GHL for the East Sitkalidak Section was established at 125 tons, with 228 tons harvested by purse seine gear (Table 2). Age composition of the harvest was composed mainly of 51.3% age-4, 12.5% age-5, 3.1% age-6, 2.1% age-7, 27.9% age-8, 1.7% age-9, and 1.0% age-10 herring (Table 4).

The West Sitkalidak Section GHL was established at 100 tons in 2009 and 429 tons were harvested (Table 2). The fishery consisted mainly of 21.0% age-4, 15.6% age-5, 2.4% age-6, 4.6% age-7, 51.6% age-8, 2.2% age-9, and 1.1% age-10 herring (Table 4).

The Barling Bay Section, adjacent to the West Sitkalidak Section, has been the most consistent herring producer in the Eastside District. The section had a 100 ton GHL in 2009 and 109 tons were harvested (Table 2). Commercial catch samples of the harvest were composed mostly of 89.0% age-4, 6.8% age-5, and 1.9% age-8 herring (Table 4).

The GHL for the Outer Kiliuda Bay Section was set at 50 tons, and 50 tons were harvested by purse seine fishermen in 2009 (Table 2). Age compositions of the harvest were 1.6% age-3, 52.4% age-4, 13.1% age-5, 4.9% age-6, 3.3% age-7, and 24.5% age-8.

The Inner Kiliuda Bay Section was initially established as a gillnet section with a 40-ton GHL in 2009 (Table 2). After April, this section was also opened to the purse seine fleet as well. Purse seine fishermen harvested 26 tons (Table 2). Commercial catch samples were composed primarily of 61.5% age-4, 11.5% age-5, 1.0% age-6, and 25.0% age-8 herring (Table 4).

The Inner and Outer Ugak Bay sections have been strong herring producers in the past. The 2009 GHL for the Outer Ugak Bay Section was 250 tons and allocated to purse seiners and they harvested 292 tons (Table 2). Samples from the harvest consisted of 88.8% age-4, 6.8% age-5, 2.1% age-6, 0.6% age-7, and 1.2% age-8 herring (Table 4).

The Inner Ugak Bay Section was initially allocated to the gillnet fleet and opened to the purse seine fleet after April 30. The GHL was established at 150 tons and purse seine fishermen harvested 195 tons (Table 2). Samples from the commercial harvest were composed primarily of 60.8% age-4, 2.3% age-5, 10.8% age-7, 11.2% age-8, 5.0% age-9, 2.3% age-10, 4.1% age-11, and 3.2% age-12 herring (Table 4).

The Shearwater Bay Section was initially allocated to the gillnet fleet with a 40-ton GHL (Table 2). After April 30, this section was opened to purse seiner gear and the purse seine fleet harvested 43 tons (Table 2). Age compositions from the harvest consisted of 3.6% age-3, 63.4% age-4, 11.7% age-5, 1.8% age-6, 2.7% age-7, and 15.4% age-8 herring (Table 4).

Two exploratory areas on the Eastside had harvests for the first time in several years. The Tanginak Anchorage Section had a harvest of 12 tons by purse seiners and the Three Saints Bay Section had a harvest of 56 tons by purse seiners. Samples collected from the Three Saints Bay

Section were composed of 1.1% age-3, 68.0% age-4, 14.8% age-5, 2.7% age-6, 1.9% age-7, 8.0% age-8, and 1.3% age-11 herring (Table 4).

Northeast District

The Northeast District is composed of five sections, four of which have known spawning stocks of herring (Figure 2). The Women's Bay Section currently has the largest stock of herring in this district, and an aerial survey observed 65 tons. This section was initially opened to the gillnet fleet only with a 30-ton GHL (Table 2). After April 30, this section became open to purse seiners and they harvested 45 tons (Table 2). Samples from the harvest consisted of 1.3% age-3, 51.8% age-4, 3.8% age-5, 11.2% age-6, 10.6% age-7, and 21.2% age-8 herring (Table 4).

Inner Marmot District

There are five sections within the Inner Marmot District. All have known spawning stocks of herring, although most stocks are small (Figure 2). The Kizhuyak Bay Section has the largest stock of herring in the district. In 2009, this section was opened to purse seine gear with a 100-ton GHL and 183 tons were harvested (Table 2). Samples from the harvest were composed of 1.6% age-3, 69.7% age-4, 10.0% age-5, 3.9% age-6, 5.4% age-7, 6.2% age-8, and 2.3% age-9 herring (Table 4).

Mainland District

There are three Mainland districts comprising 12 sections (Figure 2). The last commercial herring harvest from the Mainland districts occurred in 1997. Seven sections were open as exploratory in 2009; however, no effort occurred. The Inner Kukak Bay Section currently has the largest known biomass in the Mainland districts. Over 10,000 tons were estimated in this section based on hydroacoustic surveys in 2009. Samples from this biomass were composed of 21.9% age-3, 42.3% age-4, 28.5% age-5, and 6.1% age-6 herring.

HERRING FOOD AND BAIT FISHERY

FISHERY CHARACTERISTICS

Harvest Strategy

The herring food and bait season currently opens September 1 and lasts until February 28 (5 AAC 27.510(b)). GHLs for the fishery are established by district and are based upon 10% of the GHLs established for the preceding sac roe fishery by section (5 AAC 27.535(b)).

Combine Fisheries

The KMA herring food and bait fishery was closed for the 1999 and 2000 seasons because of low potential GHLs and ADF&G's concern for manageability of a competitive fishery on a highly aggregated stock. In 2001, the Commercial Fisheries Entry Commission (CFEC) designated the KMA herring food and bait fishery a limited entry fishery and issued 13 interim use permits to those fishermen who made landings between 1994 and 1998 (Gretsch 2001). Because of the relatively low GHLs available (60 tons in the Uganik District and 47 tons in the Eastside District), ADF&G did not allow a competitive fishery in 2001. As an alternative, the interim permit holders formed a combine, and ADF&G and CFEC agreed to allow a combine fishery to occur. The 13 interim permit holders determined which vessel would conduct the harvest, all marketing aspects, and all costs associated with harvesting and tendering the herring.

In July 2002, the CFEC made a final determination on these limited entry permits. Nine permanent limited entry permits were issued, consisting of five purse seine/gillnet permits and four trawl permits.

Combine fisheries have been conducted under similar conditions each season from 2002 through 2009. Generally, one purse seine vessel is used to harvest herring that are then loaded onto a tender for transport. Fishing efforts have been focused mainly on Uganik, the area with the largest GHL. Areas with smaller GHLs, such as the Eastside, Alitak, and Uyak districts, have generally seen less effort. Trawl permit holders have not participated in the harvesting for the combine fishery.

Kamishak Stock

During the fall and winter months of the early 1980s, large concentrations of herring were observed in eastern Shelikof Strait and adjacent bays along the west side of the Kodiak Archipelago. The biomass exceeded that of known KMA spawning stocks. Herring food and bait fishermen targeted these herring, but the stock composition was unknown. In 1986, a stock identification study, based on scale pattern analysis, was conducted on herring harvested from a large biomass located in the northeastern part of the Shelikof Strait (Johnson et al., *Unpublished*, Stock Identification of Pacific Herring in the Bait Fishery in Shelikof Strait, Alaska, 1985/86, available through Geoff Spalinger, ADF&G fishery management biologist, Kodiak, Alaska). Results of the study indicated that at least 80% of the Shelikof herring catch sampled were Kamishak Bay stocks, which spawn within the Lower Cook Inlet (LCI) Management Area. The current harvest strategy alleviates the problem of identifying the spawning stock of a harvest in areas where intermixing may occur by closing the food and bait fishery north of the latitude of Miners Point (Uganik Bay) when the Kamishak spawning biomass falls below 6,000 tons (5 AAC 27.535(d)).

KAMISHAK FISHERY CLOSURE

The 2010 biomass forecast for Kamishak Bay herring affects the 2009/2010 Kodiak food and bait fishery in the Shelikof Strait. The biomass forecast for Kamishak Bay herring for the 2010 season was estimated at 2,963 tons, well below the minimum spawning biomass of 6,000 tons that must be met before commercial fisheries may occur ((5 AAC 27.465(e)(4)); Ted Otis, Lower Cook Inlet Finfish Research Biologist, ADF&G, Homer, Alaska, *Personal Communication*). This was the eleventh consecutive year that the Kamishak Bay District sac roe fishery has been closed. Due to the 2010 Kamishak Bay sac roe fishery closure, the Shelikof Strait food and bait fishery north of the latitude of Miner's Point was closed for the 2009/2010 season.

2009/2010 SEASON

Permit holders again requested a combine fishery for the 2009/2010 season, although there was some discussion of having a competitive fishery. The biggest obstacle to a competitive fishery is how to determine an equitable fishing period for the two gear types. ADF&G accommodated the permit holders' request, and that portion of the Uganik District south of Miners Point was opened on September 24 with a 179-ton GHL (Table 6). The Eastside District (85-ton GHL) and the South Afognak District (44-ton GHL) were opened on October 20. The Alitak District could have opened with a 112-ton GHL but remained closed. In the Uganik District, approximately 98 tons were harvested on September 30 and October 1, and approximately 76 tons were harvested between October 27 and November 3. Approximately 89 tons were harvested from the South

Afognak District on November 16. The total cumulative harvest was 263 tons (Table 7). The Uganik District was closed on November 9, and the South Afognak District was closed on November 16. This harvest fulfilled market demand in Kodiak and there were no other requests to open other areas.

HERRING SUBSISTENCE FISHERY

FISHERY CHARACTERISTICS

Prior to 1999, the herring subsistence fishery was referred to as a Personal Use/Subsistence Fishery and had occurred for at least twenty years. The majority of the harvest occurred near the Port of Kodiak in Womens Bay and was caught by gillnets. The herring were used primarily for bait in commercial longline and pot fisheries. Also, prior to 1999, this fishery was only regulated during the herring sac roe season, from April 15 to June 30, under the conditions of the subsistence permit issued in Kodiak. Gear was limited to a 25-fathom gillnet but there was no harvest limit. The remainder of the year there were no permit requirements, gear restrictions, or harvest limits.

In 1999, more restrictive regulations were approved by the BOF. These regulations allowed for a harvest of up to 500 pounds of herring with no permit requirements, except during the sac roe fishing season (April 15 to June 30; Gretsch 2001). A subsistence permit was required for those individuals that wished to fish during the sac roe season or intended to harvest more than 500 pounds of herring annually. The maximum annual harvest was limited to 2,000 pounds per permit.

In 2000, herring subsistence harvests escalated due to bait needs created with the reopening of the commercial tanner crab fishery in the KMA. ADF&G was concerned about the increased herring subsistence harvest and the appropriateness of taking subsistence herring for use as bait in a commercial fishery. ADF&G proposed regulation changes to the BOF in 2001, which were approved to allow for both types of historic harvests. The current subsistence regulation allows for the harvest of up to a total of 500 pounds of herring annually and requires that fishermen obtain a permit prior to fishing (5 AAC 01.530. (d)). Herring were included on the existing KMA salmon and crab subsistence permit. Another permit was also created which allows for the harvest of up to 500 pounds of herring by commercial permit holders to be used as bait in commercial fisheries (5 AAC 27.545).

2009 SEASON SUMMARY

A total of 36 KMA subsistence permits were returned to ADF&G, as required for reporting purposes, with herring subsistence harvest data. The reported subsistence herring harvests totaled 3,966 pounds (Table 8). A total of 36 KMA subsistence permits were returned with herring harvest data, with most of the harvest coming from the Northeast, Inner Marmot, Uyak, Uganik, Eastside, and South Afognak districts.

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TABLES AND FIGURES

Table 1.–Annual harvests by weight and percent in the KMA commercial herring sac roe and food and bait fisheries, from 1964 through 2009.

Year	Sac Roe Harvest (Tons)	Food/Bait Harvest (Tons)	Total Herring Harvest (Tons)	Sac Roe Fishery Percent of Total Harvest (%)	Food/Bait Fishery Percent of Total Harvest (%)
1964	568	310	878	65%	35%
1965	657	35	692	95%	5%
1966	2,769	198	2,967	93%	7%
1967	1,662	300	1,962	85%	15%
1968	2,001	15	2,016	99%	1%
1969	1,130	11	1,141	99%	1%
1970	342	8	350	98%	2%
1971	284	44	328	87%	13%
1972	215	50	265	81%	19%
1973	831	178	1,009	82%	18%
1974	868	40	908	96%	4%
1975	8	5	13	62%	38%
1976	5	0	5	100%	0%
1977	338	0	338	100%	0%
1978	904	399	1,303	69%	31%
1979	1,735	125	1,860	93%	7%
1980	2,383	381	2,764	86%	14%
1981	2,065	18	2,083	99%	1%
1982	1,771	326	2,097	84%	16%
1983	2,318	33	2,351	99%	1%
1984	2,163	123	2,286	95%	5%
1985	1,968	102	2,070	95%	5%
1986	1,558	213	1,771	88%	12%
1987	2,146	217	2,363	91%	9%
1988	2,171	340	2,511	86%	14%
1989	2,249	345	2,594	87%	13%
1990	2,347	313	2,660	88%	12%
1991	2,432	215	2,647	92%	8%
1992	4,283	312	4,595	93%	7%
1993	4,929	837	5,766	85%	15%
1994	5,893	677	6,570	90%	10%
1995	4,604	507	5,111	90%	10%
1996	3,386	651	4,037	84%	16%
1997	3,235	756	3,991	81%	19%
1998	2,057	151	2,208	93%	7%
1999	1,651	0	1,651	100%	0%
2000	1,370	0	1,370	100%	0%
2001	1,694	115	1,809	94%	6%
2002	1,677	135	1,812	93%	7%
2003	1,992	199	2,191	91%	9%
2004	3,167	190	3,357	94%	6%
2005	3,463	168	3,631	95%	5%
2006	2,643	169	2,812	94%	6%
2007	2,546	154	2,700	94%	6%
2008	3,099	202	3,301	94%	6%
2009	4,759	263	5,022	95%	5%
Average 1964 to 2009	2,094	214	2,308	90%	10%
10 Year Average 2000 to 2009	2,641	160	2,801	94%	6%
5 Year Average 2005 to 2009	3,302	191	3,493	94%	6%

Table 2.–Herring sac roe fishery guideline harvest level (GHL) by section and gear type, harvest by section and gear type, and date sections were closed, Kodiak Management Area, 2009.

Statistical	Management		Initial	Harvest		Date Closed	
Area	Section	GHL	Gear Type[a]	Purse Seine	Gillnet	Purse Seine	Gillnet
NORTH AFOGNAK DISTRICT							
NA10	Shuyak Island	Closed	-	-	-	-	
NA20	Delphin Bay	Closed	-	-	-	-	
NA30	Perenosa Bay	Exploratory	Both	8	1	5/8/2009	5/8/2009
NA40	Seal Bay	Closed	-	-	-	-	-
NA50	Tonki Bay	30	Purse Seine	22	-	4/29/2009	-
WEST AFOGNAK DISTRICT							
WA10	Raspberry Strait	10	Gillnet	-	0	-	6/30/2009
WA20	Malina Bay	10	Gillnet	-	0	-	6/30/2009
WA31	Paramanof Bay	Closed	-	-	-	-	-
WA32	Foul Bay	Closed	-	-	-	-	-
WA40	Blue Fox/Devil's Inlet	Exploratory	Both	0	0	6/30/2009	6/30/2009
WA50	Offshore W. Afognak	Closed	-	-	-	-	-
SOUTH AFOGNAK DISTRICT							
SA10[b]	Izhut Bay	40	Purse Seine	154	-	4/18/2009	-
SA20[b]	Kitoi Bay	b	b	b	b	b	b
SA30[b]	MacDonalds Lagoon	b	b	b	b	b	b
SA40	Danger Bay	400	300 PS / 100GN	375	17	4/16/2009	6/30/2009
SA50	Litnik	Closed	-	-	-	-	-
SA60	Duck Bay	Closed	-	-	-	-	-
TOTAL ALL AFOGNAK DISTRICTS		490		559	18		
UGANIK DISTRICT							
UG10	Kupreanof	Closed	-	-	-	-	-
UG20	Viekoda Bay	25	Gillnet	0	0	5/8/2009	5/8/2009
UG21	Terror Bay	30	Gillnet	0	0	5/8/2009	5/8/2009
UG30[c]	Village Islands	1,700	1,350 PS / 350 GN	1,221	131	4/25/2009	6/30/2009
UG31	W. Uganik Passage	40	Gillnet	0	0	6/30/2009	6/30/2009
UG32[c]	N.E. Arm Uganik Bay	c	c	c	c	c	c
UG33[c]	E. Arm Uganik Bay	c	c	c	c	c	c
UG34[c]	S. Arm Uganik Bay	c	c	c	c	c	c
UG40	Offshore Uganik	Closed	-	-	-	-	-
DISTRICT TOTAL		1,795		1,221	131		
UYAK DISTRICT							
UY10	Offshore Uyak	Closed	-	-	-	-	-
UY20	Harvester Island	Closed	-	-	-	-	-
UY30	Inner Uyak	250	Purse Seine	0	-	-	-
UY31	Larsen Bay	Closed	-	-	-	-	-
UY32	Browns Lagoon	50	Gillnet	-	61	-	5/11/2009
UY40	Zachar Bay	30	Gillnet	112	0	5/8/2009	5/8/2009
UY50	Spiridon Bay	10	Gillnet	-	0	-	6/30/2009
DISTRICT TOTAL		340		112	61		
ALITAK DISTRICT							
AL10	Outer Alitak	Closed	-	-	-	-	-
AL20[d]	Inner Alitak	900[d,e]	Purse Seine	825	0	5/31/2009	5/31/2009
AL21[d]	Inner Deadman Bay	f	d	d	d	d	d
AL22[d]	Outer Deadman Bay	f	d	d	d	d	d
AL30[d]	Sulua Bay	g	d	d	d	d	d
AL40	Lower Olga Bay	75	Gillnet	28	0	6/30/2009	6/30/2009
AL41	E. Upper Olga Bay	75	Purse Seine	60	0	5/28/2009	5/28/2009
AL50	W. Upper Olga Bay	75	Purse Seine	75	0	5/25/2009	5/25/2009
AL60	Geese-Twoheaded	Closed	-	-	-	-	-
DISTRICT TOTAL		1,125		989	0		
STURGEON-HALIBUT BAY DISTRICT							
SH10	Sturgeon-Halibut	Closed	-	-	-	-	-

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Table 2.–Page 2 of 2

Statistical Area	Management Section	GHL	Initial Gear Type[a]	Harvest Purse Seine	Harvest Gillnet	Date Closed Purse Seine	Date Closed Gillnet
EASTSIDE DISTRICT							
EA10	Kaiugnak	Exploratory	Both	0	0	6/30/2009	6/30/2009
EA20	S.W. Sitkalidak	Exploratory	Both	0	0	6/30/2009	6/30/2009
EA21	Three Saints Bay	Exploratory	Both	56	0	4/17/2009	4/17/2009
EA22	Newman Bay	Exploratory	Both	0	0	6/30/2009	6/30/2009
EA23	West Sitkalidak	100	Purse Seine	429	-	4/17/2009	-
EA24	Barling Bay	100	Purse Seine	109	-	4/29/2009	-
EA30	East Sitkalidak	125	Purse Seine	228	-	4/15/2009	-
EA31	Tanginak Anchorage	Exploratory	Both	12	0	5/6/2009	5/6/2009
EA40	Outer Sitkalidak	Closed	-	-	-	-	-
EA41	Boulder Bay	Closed	-	-	-	-	-
EA42	Shearwater Bay	40	Gillnet	43	0	5/5/2009	5/5/2009
EA43	Outer Kiliuda Bay	50	Purse Seine	50	0	4/18/2009	-
EA44	Inner Kiliuda Bay	40	Gillnet	26	0	5/4/2009	5/4/2009
EA50	Outer Ugak Bay	250	Purse Seine	292	-	4/21/2009	-
EA51	Inner Ugak Bay	150	Gillnet	195	0	5/11/2009	5/11/2009
EA52	Pasagshak Bay	Closed	-	-	-	-	-
DISTRICT TOTAL		855		1,440	0		
NORTHEAST DISTRICT							
NE10	Women's Bay	30	Gillnet	45	0	5/15/2009	5/15/2009
NE20	Kalsin Bay	Closed	-	-	-	-	-
NE30	Middle Bay	Closed	-	-	-	-	-
NE40	Inshore Chiniak	Closed	-	-	-	-	-
NE50	Offshore Chiniak	Closed	-	-	-	-	-
DISTRICT TOTAL		30		45	0		
INNER MARMOT DISTRICT							
IM10	Monashka Bay	Closed	-	-	-	-	-
IM20	Anton Larsen Bay	15	Gillnet	-	0	-	6/30/2009
IM30	Sharatin Bay	15	Gillnet	-	0	-	6/30/2009
IM40	Kizhuyak Bay	100	Purse Seine	183	-	4/27/2009	-
IM50	Spruce Island	Closed	-	-	-	-	-
DISTRICT TOTAL		130		183	0		
NORTH MAINLAND DISTRICT							
NM10	Hallo Bay	Closed	-	-	-	-	-
NM20	Inner Kukak	Exploratory	Both	0	0	6/30/2009	6/30/2009
NM30	Outer Kukak	Closed	-	-	-	-	-
NM40	Missak Bay	Closed	-	-	-	-	-
MID MAINLAND DISTRICT							
MM10	Inner Katmai	Exploratory	Both	0	0	6/30/2009	6/30/2009
MM20	Outer Katmai	Closed	-	-	-	-	-
MM30	Alinchak	Exploratory	Both	0	0	6/30/2009	6/30/2009
MM40	Puale Bay	Exploratory	Both	0	0	6/30/2009	6/30/2009
MM50	Portage Bay	Exploratory	Both	0	0	6/30/2009	6/30/2009
MM60	Outer Portage	Closed	-	-	-	-	-
SOUTH MAINLAND DISTRICT							
SM10	Wide Bay	Exploratory	Both	0	0	6/30/2009	6/30/2009
SM20	Lower Shelikof	Closed	-	-	-	-	-
MAINLAND DISTRICTS TOTAL				0	0		
GRAND TOTAL		3,865		4,549	210		
				% of Harvest	% of Harvest	Total Harvest	
				96%	4%	4,759	

[a] Beginning May 1, ADF&G may open any area to any gear group.
[b] SA10, SA20, and SA30 were combined and managed as one section.
[c] UG30, UG32, UG33, and UG 34 were combined and managed as one section.
[d] On 5/13 AL20, AL21, AL22, and AL30 were combined and managed as one section open to both gear types, the GHL was raised to 900 tons.
[e] AL20 was initially established as a purse seine section with a 100 ton GHL.
[f] The AL21 and AL22 were initially combined and managed as a purse seine section with a 300 ton GHL.
[g] The Sulua Bay Section was initially established as a gillnet section with a 75 ton GHL.

Table 3.–Summary of season length, guideline harvest level (GHL), harvest by gear type, percentage of harvest by gear type, number of landings, and estimated exvessel earnings for the herring sac roe fishery in the KMA, from 1979 through 2009.

Year	Season Length (Days)	GHL (Tons)	Total Harvest (Tons)	Harvest by Gear Type		Percent Harvest by Gear Type		Number of Landings by Gear Type		Units of Gear Fished		Average Catch by Gear		Estimated Average Earnings [a]		Price per Ton [a]	Estimated Exvessel Total Value [a]
				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	$34,758	$7,537	$850	$1,911,650
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	$20,539	$5,136	$500	$1,617,500
1998	50	2,030	2,057	1,954	103	95%	5%	110	26	35	7	56	15	$27,914	$7,357	$500	$1,028,500
1999	38	1,495	1,651	1,589	62	96%	4%	94	16	31	5	51	12	$33,984	$8,221	$663	$1,094,613
2000 [b]	37	1,735	1,370	1,290	80	94%	6%	57	23	31	10	42	8	$29,129	$5,600	$700	$959,000
2001	47	1,540	1,694	1,412	282	83%	17%	67	37	33	9	43	31	$21,394	$15,667	$500	$847,000
2002	46	1,860	1,677	1,274	403	76%	24%	37	50	30	14	42	29	$21,233	$14,393	$500	$838,500
2003	42	2,600	1,992	1,738	254	87%	13%	59	45	31	11	56	23	$28,032	$11,545	$500	$996,000
2004	42	2,850	3,167	2,894	273	91%	9%	95	36	27	11	107	25	$53,593	$12,409	$500	$1,583,500
2005	31	3,475	3,463	2,932	531	85%	15%	134	61	32	12	92	44	$45,813	$22,125	$500	$1,731,500
2006	34	3,705	2,643	2,617	26	99%	1%	86	*	21	*	125	*	$34,270	*	$275	$726,825
2007	28	4,000	2,546	2,510	36	99%	1%	105	8	21	3	120	12	$47,810	$4,800	$400	$1,018,400
2008	38	4,290	3,099	3,086	13	>99%	<1%	108	*	22	*	140	*	$73,643	*	$525	$1,626,975
2009	54	4,765	4,759	4,549	210	96%	4%	218	19	31	6	147	35	$77,040	$18,375	$525	$2,498,475
Average 1979 to 2009	54	2,785	2,702	2,231	470	81%	19%	146	296	41	52	62	13	$41,304	$8,898	$757	$2,040,609
10 Year 2000 to 2009	40	3,082	2,641	2,430	211	91%	9%	97	28	28	8	91	23	$43,196	$11,531	$493	$1,282,618
5 Year 2005 to 2009	37	4,047	3,302	3,139	163	95%	5%	130	18	25	5	125	23	$55,715	$11,140	$445	$1,520,435

[a] Exvessel values are based on dock delivered herring and inseason data.
[b] Beginning in 2000, an allocative harvest strategy was in effect.
[c] Total GHL was initially 4,340 tons, but raised by 425 tons during the fishery in the Alitak District.
* Confidential data.

Table 4.–Age composition of herring samples from the commercial sac roe fishery, by section in the KMA, 2009.

		Percent at Age													
Section	n	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10	Age-11	Age-12	Age-13	Age-14	Harvest (tons)
Barling Bay	266	0.0	0.8	89.0	6.8	0.4	0.8	1.9	0.0	0.0	0.4	0.0	0.0	0.0	109
Browns Lagoon	333	0.0	3.0	63.0	23.7	7.2	0.9	1.5	0.3	0.0	0.3	0.0	0.0	0.0	61
Danger Bay	478	0.0	0.6	32.8	39.1	11.7	5.6	4.2	3.1	2.1	0.6	0.0	0.0	0.0	392
MacDonalds/Izhut/Kitoi	345	0.0	1.2	60.0	27.8	6.4	1.2	2.9	0.6	0.0	0.0	0.0	0.0	0.0	154
East Sitkalidak	286	0.0	0.0	51.3	12.5	3.1	2.1	27.9	1.7	1.0	0.0	0.0	0.0	0.0	228
East Upper Olga Bay	173	0.0	0.0	20.2	22.5	2.3	8.7	40.4	2.9	0.0	1.7	1.2	0.0	0.0	60
Inner Kiliuda	104	0.0	0.0	61.5	11.5	1.0	0.0	25.0	0.0	0.0	0.0	1.0	0.0	0.0	26
Inner Kukak	196	0.0	21.9	42.3	28.5	6.1	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0
Inner Ugak	222	0.0	0.0	60.8	2.3	0.0	10.8	11.2	5.0	2.3	4.1	3.2	0.5	0.0	195
Inner/Outer Deadman/Sulua/Inner Alitak	464	0.0	0.4	25.2	16.8	5.8	9.3	40.9	0.6	0.6	0.0	0.2	0.0	0.0	825
Kizhuyak	129	0.0	1.6	69.7	10.0	3.9	5.4	6.2	2.3	0.8	0.0	0.0	0.0	0.0	183
Lower Olga Bay	169	0.0	0.0	21.3	17.1	0.6	10.6	39.0	3.0	4.7	1.2	2.4	0.0	0.0	28
Outer Kiliuda	61	0.0	1.6	52.4	13.1	4.9	3.3	24.5	0.0	0.0	0.0	0.0	0.0	0.0	50
Outer Ugak	340	0.0	0.0	88.8	6.8	2.1	0.6	1.2	0.3	0.0	0.3	0.0	0.0	0.0	292
Paramanof	412	0.0	6.8	69.6	22.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
Perenosa	119	0.0	0.0	37.8	42.0	12.6	5.0	1.7	0.8	0.0	0.0	0.0	0.0	0.0	9
Shearwater	331	0.0	3.6	63.4	11.7	1.8	2.7	15.4	0.3	0.0	0.0	0.9	0.0	0.0	43
Three Saints Bay	376	0.0	1.1	68.0	14.8	2.7	1.9	8.0	0.8	0.8	1.3	0.3	0.3	0.0	56
Tonki Bay	268	0.0	3.7	51.8	29.4	11.9	1.5	1.1	0.0	0.4	0.0	0.0	0.0	0.0	22
Village Islands/Uganik Bays	692	0.0	1.3	30.9	27.6	15.0	5.5	7.1	6.6	2.9	2.3	0.6	0.0	0.1	1,352
West Sitkalidak	370	0.0	0.3	21.0	15.6	2.4	4.6	51.6	2.2	1.1	0.5	0.5	0.0	0.0	429
West Upper Olga Bay	513	0.0	0.0	24.1	26.7	2.9	6.8	36.0	2.1	0.2	0.4	0.6	0.0	0.0	75
Women's Bay	160	0.0	1.3	51.8	3.8	11.2	10.6	21.2	0.0	0.0	0.0	0.0	0.0	0.0	45
Zachar Bay	335	0.0	1.5	57.0	30.4	7.5	2.7	0.0	0.0	0.6	0.3	0.0	0.0	0.0	112
All samples combined[a]	7,142	0.0	0.8	40.9	20.5	7.7	5.5	18.6	3.0	1.4	1.1	0.4	0.0	0.0	4,746

[a] For ‘All samples combined’ the percent of the harvest by section is weighted to the age class data to estimate overall age composition of the harvest.

Table 5.–Average weight of herring samples from the commercial sac roe fishery, by age and section in the KMA, 2009.

		Weight at Age (g)												
Section	n	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7	Age-8	Age-9	Age-10	Age-11	Age-12	Age-13	Age-14
Barling Bay	266	-	81	133	157	211	224	275	-	-	297	-	-	-
Browns Lagoon	333	-	97	116	144	176	202	200	283	-	253	-	-	-
Danger Bay	478	-	120	138	183	219	254	279	303	302	320	-	-	-
MacDonalds/Izhut/Kitoi	345	-	89	122	158	196	246	261	266	-	-	-	-	-
East Sitkalidak	286	-	-	134	184	214	225	275	324	308	-	-	-	-
East Upper Olga Bay	173	-	-	154	198	240	262	299	302	-	375	376	-	-
Inner Kiliuda	104	-	-	130	155	212	-	259	-	-	-	356	-	-
Inner Kukak	196	-	65	95	132	153	143	165	-	-	-	-	-	-
Inner Ugak	222	-	-	121	143	-	210	243	269	321	296	307	334	-
Inner/Outer Deadman/Sulua/Inner Alitak	464	-	114	155	206	242	267	300	354	340	-	332	-	-
Kizhuyak	129	-	70	118	154	224	241	284	276	267	-	-	-	-
Lower Olga Bay	169	-	-	156	213	274	285	305	317	357	334	400	-	-
Outer Kiliuda	61	-	110	125	166	196	255	262	-	-	-	-	-	-
Outer Ugak	340	-	-	119	158	185	256	245	282	-	306	-	-	-
Paramanof	412	-	80	102	127	163	-	-	-	-	-	-	-	-
Perenosa	119	-	-	124	161	183	215	210	224	-	-	-	-	-
Shearwater	331	-	66	117	141	178	216	246	256	-	-	306	-	-
Three Saints Bay	376	-	82	138	177	204	262	294	303	329	316	332	337	-
Tonki Bay	268	-	89	122	163	194	242	233	-	296	-	-	-	-
Village Islands/Uganik Bays	692	-	91	114	153	185	216	231	242	257	253	268	-	303
West Sitkalidak	370	-	114	143	186	237	251	281	310	338	316	350	-	-
West Upper Olga Bay	513	-	-	152	198	233	260	297	330	354	332	409	-	-
Womens Bay	160	-	96	123	165	195	214	232	-	-	-	-	-	-
Zachar Bay	335	-	101	123	158	188	214	-	-	239	388	-	-	-

Table 6.–Herring food and bait commercial fishery GHLs by district, KMA, 2009.

Management District	GHL (tons)
F/B 3 - South Afognak	44
F/B 4 - Uganik	179
F/B 7 - Alitak	112
F/B 8 - Eastside	85
Total	420

Table 7.–Herring food and bait commercial fishery GHLs and harvest, KMA, 2001 through 2009.

Year	GHL (tons)	Harvest (tons)
2001	107	114
2002	134	135
2003	197	199
2004	225	190
2005	302	168
2006	342	169
2007	370	154
2008	351	202
2009	420	263
Average	272	177

Table 8.–Subsistence herring harvest summary for the KMA, 1991 through 2009.

Year	Permits Issued	Permits Returned	Estimated Harvest in Pounds by District								
			Afognak	Northeast	Inner Marmot	Uganik	Uyak	Eastside	Alitak	Other	Total
1991	50	9	2,110	1,745	1,745	1,000	0	0	0	0	6,600
1992	45	10	120	250	250	1,000	0	0	320	0	1,940
1993	50	16	90	3,000	3,910	550	50	0	0	0	7,600
1994	47	14	90	740	1,350	2,000	200	0	0	0	4,380
1995	20	6	75	0	500	0	340	0	175	0	1,090
1996	23	10	550	180	140	0	590	0	0	0	1,460
1997	16	7	0	200	350	50	1,325	0	0	0	1,925
1998	18	10	1,240	0	0	50	0	0	0	0	1,290
1999	15	9	0	200	350	0	425	0	0	0	975
2000	39	21	575	21,150	0	1,825	0	0	700	0	24,250
2001	48	19	3,000	0	875	0	1,015	10,500	0	0	15,390
2002	[a]	23	1,170	1,150	420	0	200	903	0	0	3,843
2003	[a]	16	0	220	300	0	420	1,210	30	0	2,180
2004	[a]	24	200	580	465	206	1,580	1,142	0	0	4,173
2005	[a]	37	300	850	1,070	160	550	2,300	155	0	5,385
2006	[a]	33	600	1,109	1,175	250	415	1,650	0	0	5,199
2007	[a]	37	200	912	1,430	5	1,470	850	300	0	5,167
2008	[a]	21	100	1,134	1,110	50	1,020	610	0	0	4,024
2009	[a]	36	625	660	520	400	451	980	0	330	3,966

[a] Beginning in 2002 herring was added to the Kodiak subsistence salmon and crab permit; no separate permit was required.

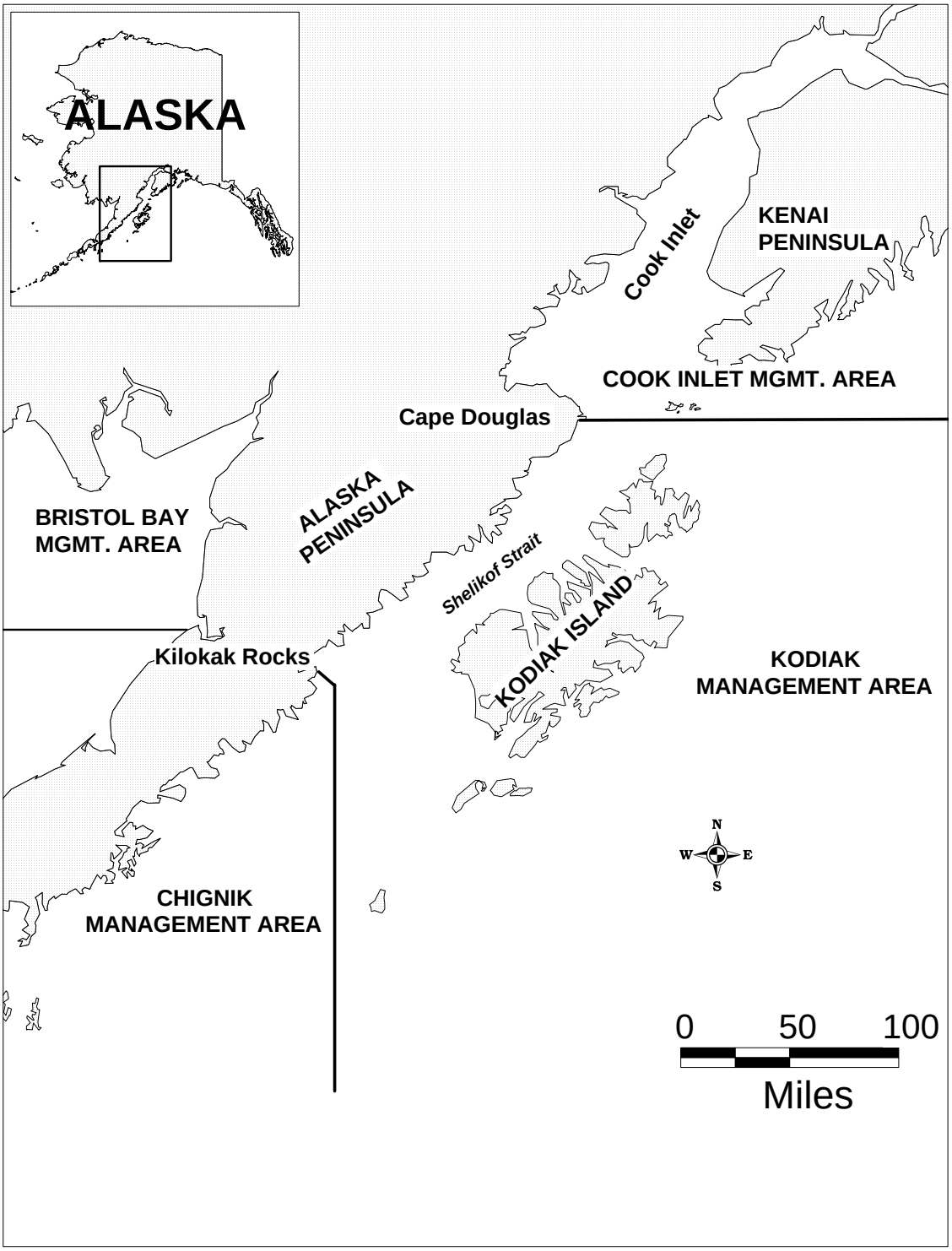


Figure 1.–Map of southwestern Alaska showing the KMA and surrounding management areas.

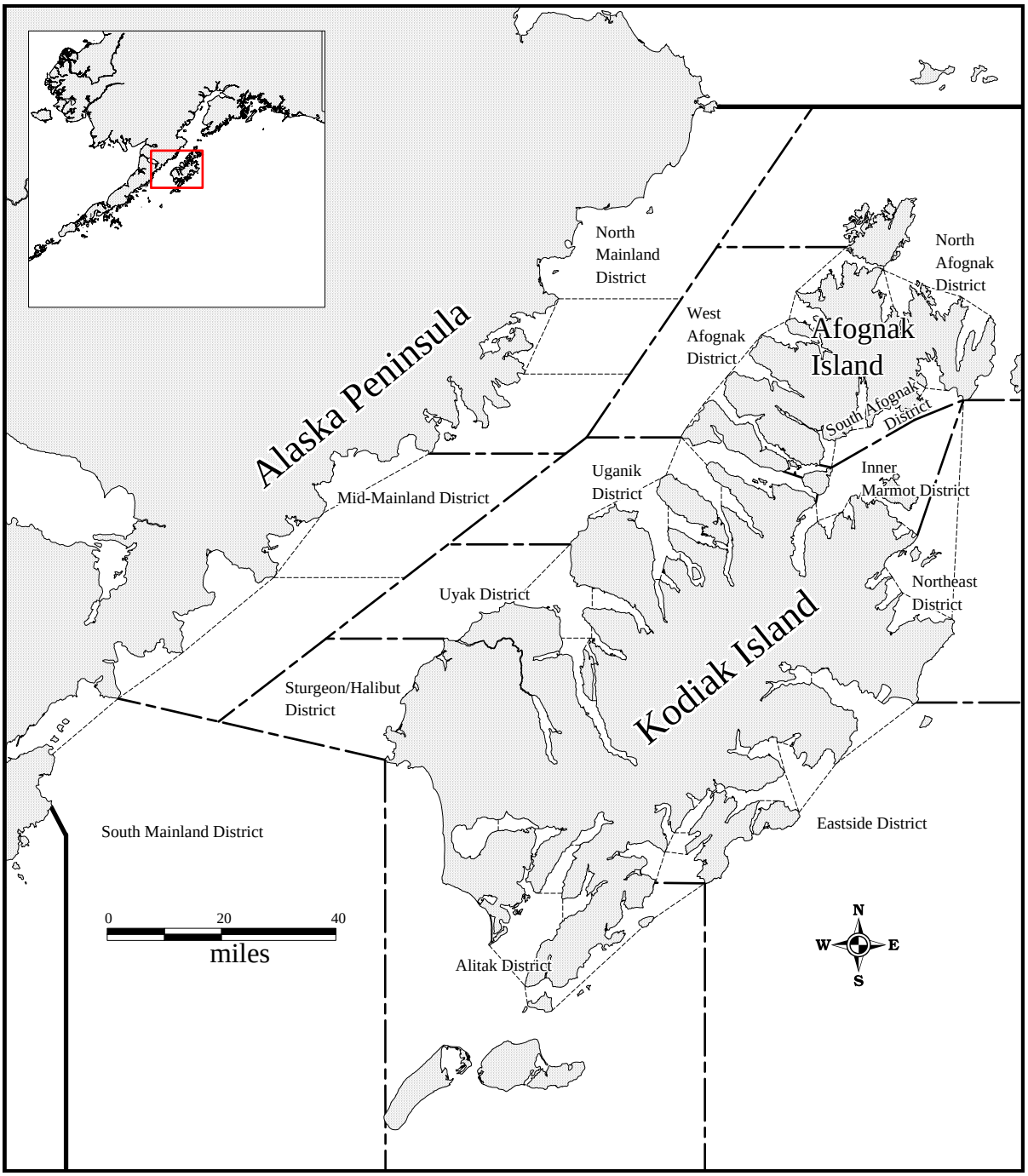


Figure 2.–Map of the KMA illustrating the herring commercial fishery districts.

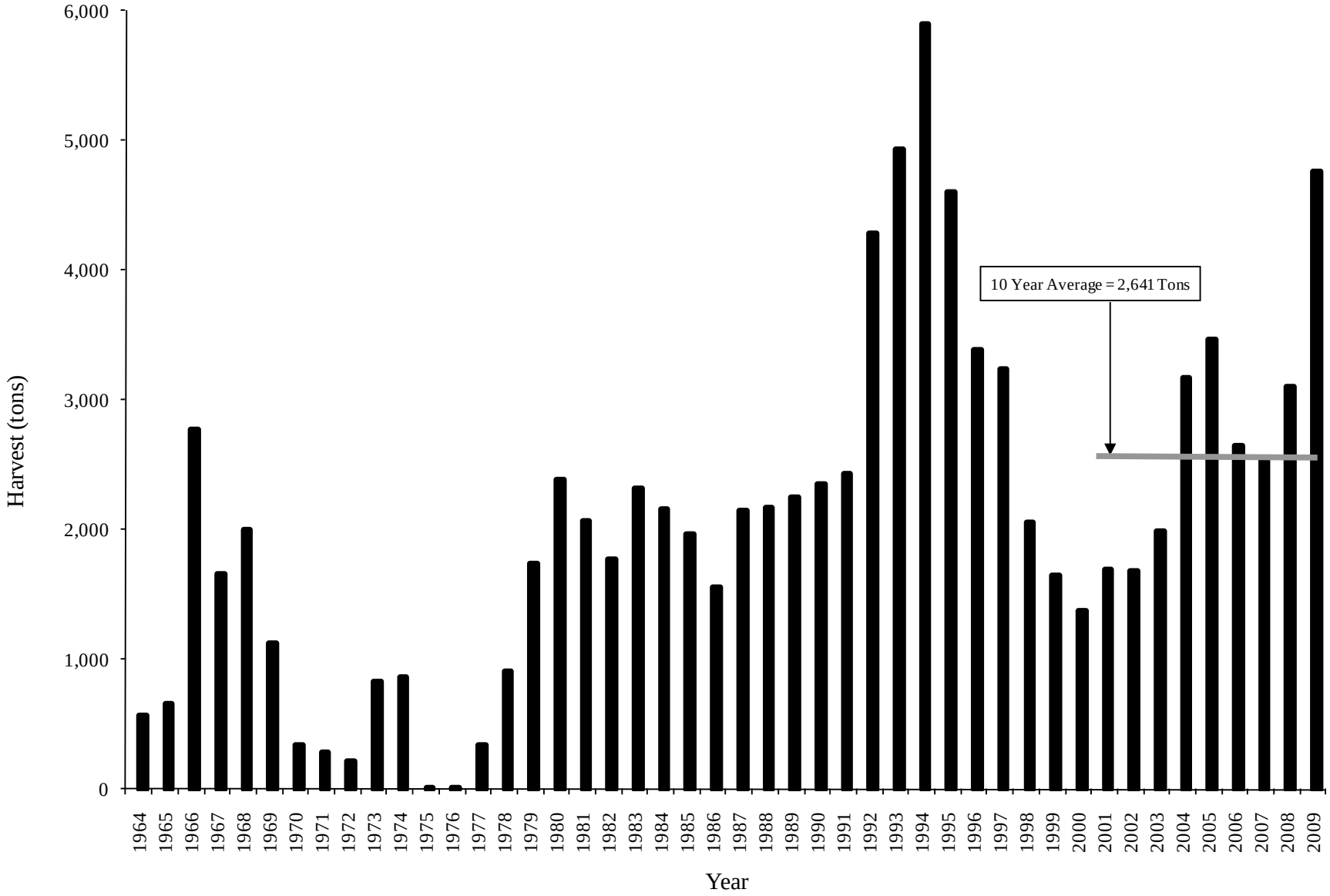


Figure 3.–Herring sac roe commercial fishery harvest in the KMA, 1964 through 2009.

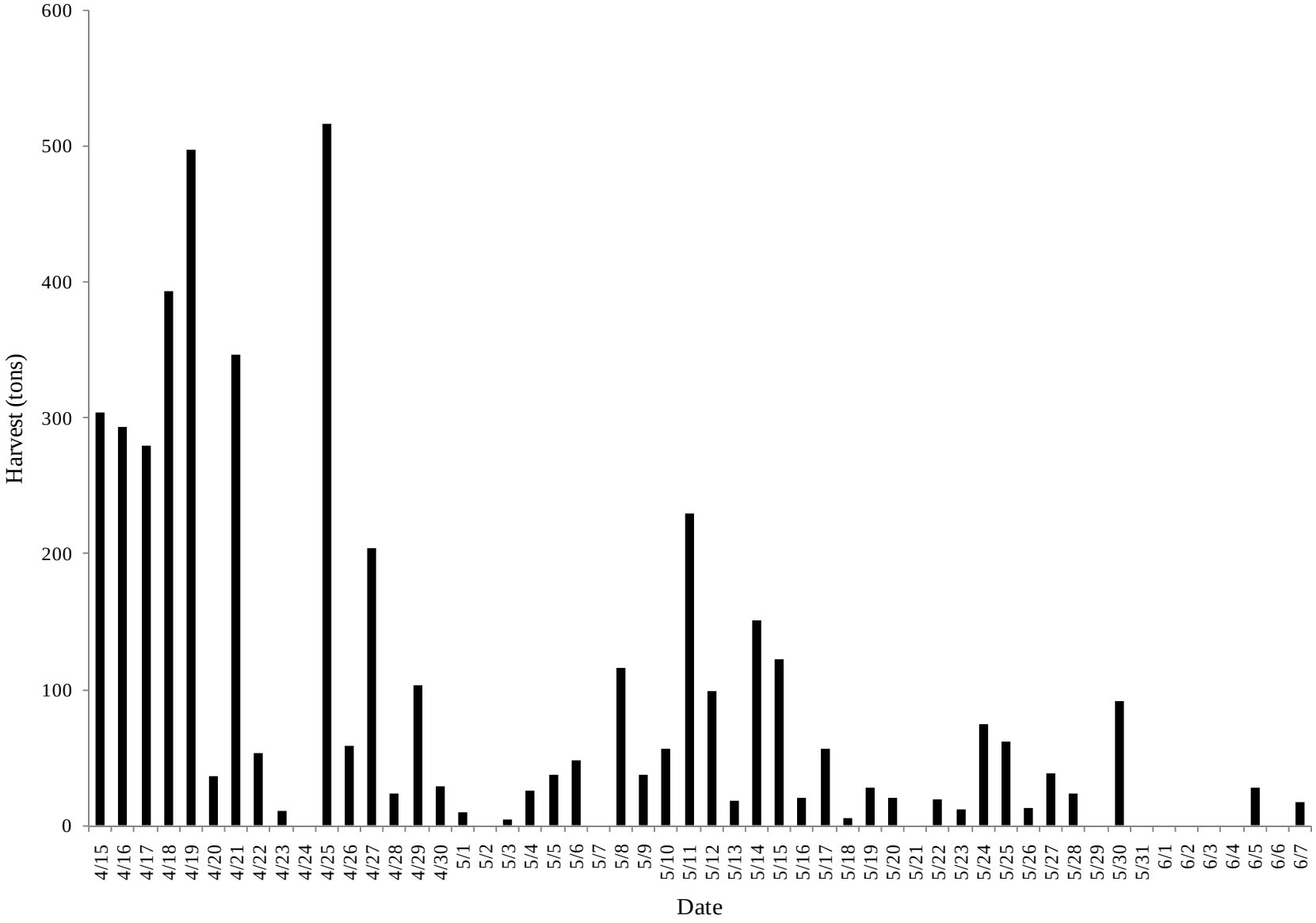


Figure 4.–Herring sac roe fishery harvest by day in the KMA, 2009.

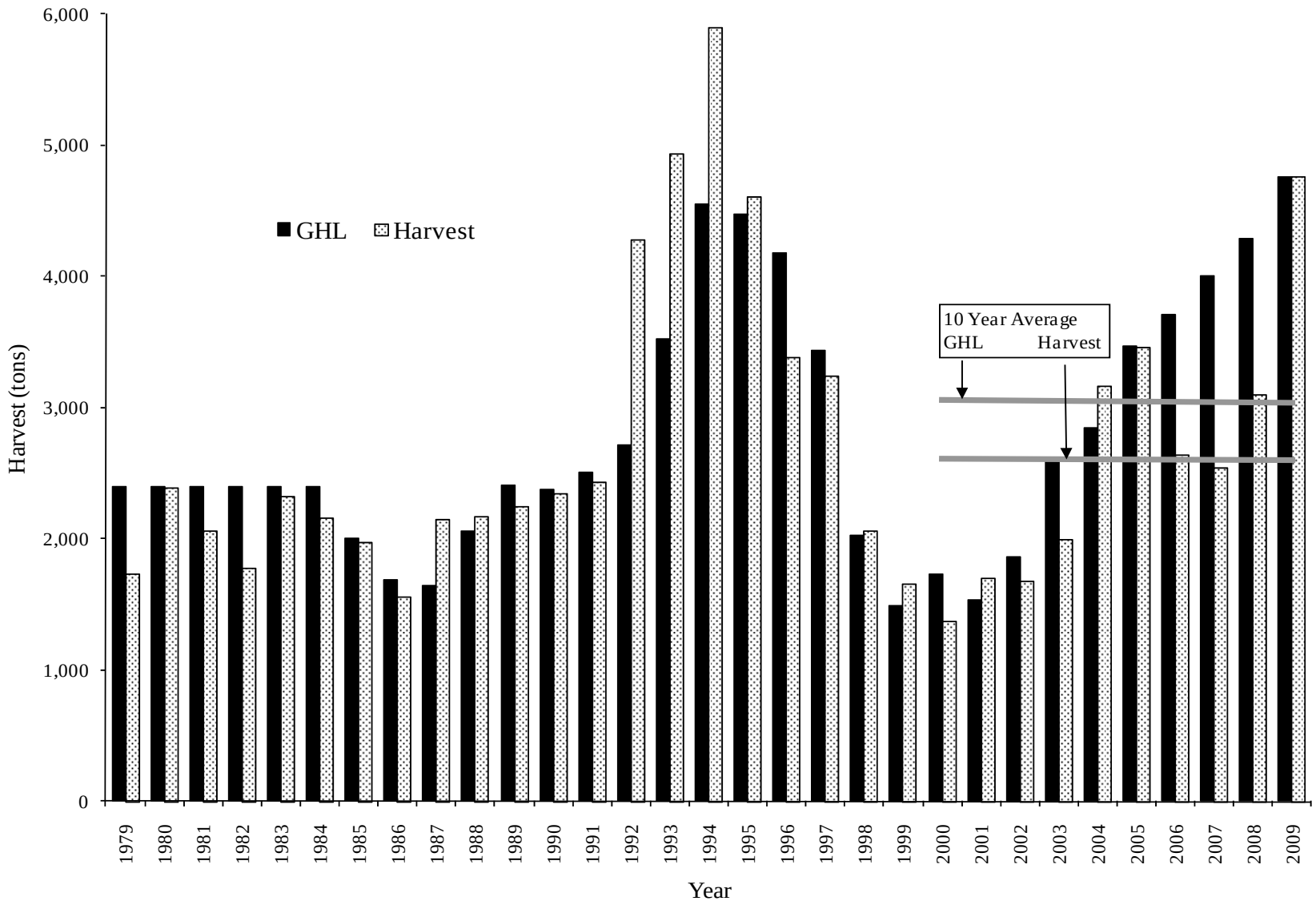
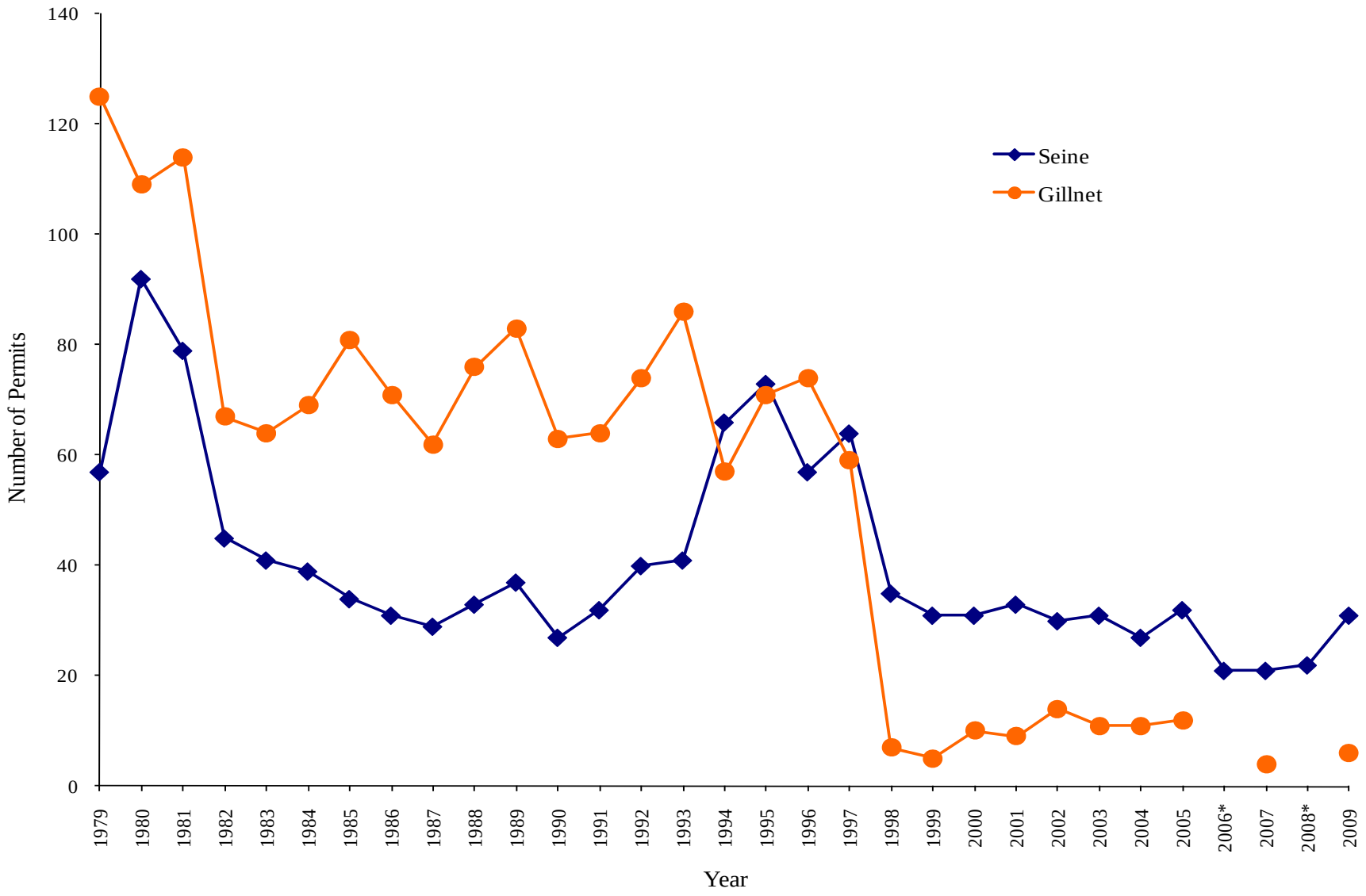


Figure 5.–Comparison of guideline harvest levels (GHLs) to the herring sac roe commercial harvest, KMA, 1979 through 2009.



*2006 and 2008 gillnet data is confidential

Figure 6.–Herring sac roe commercial fishery participation, by gear type in the KMA, 1979 through 2009.

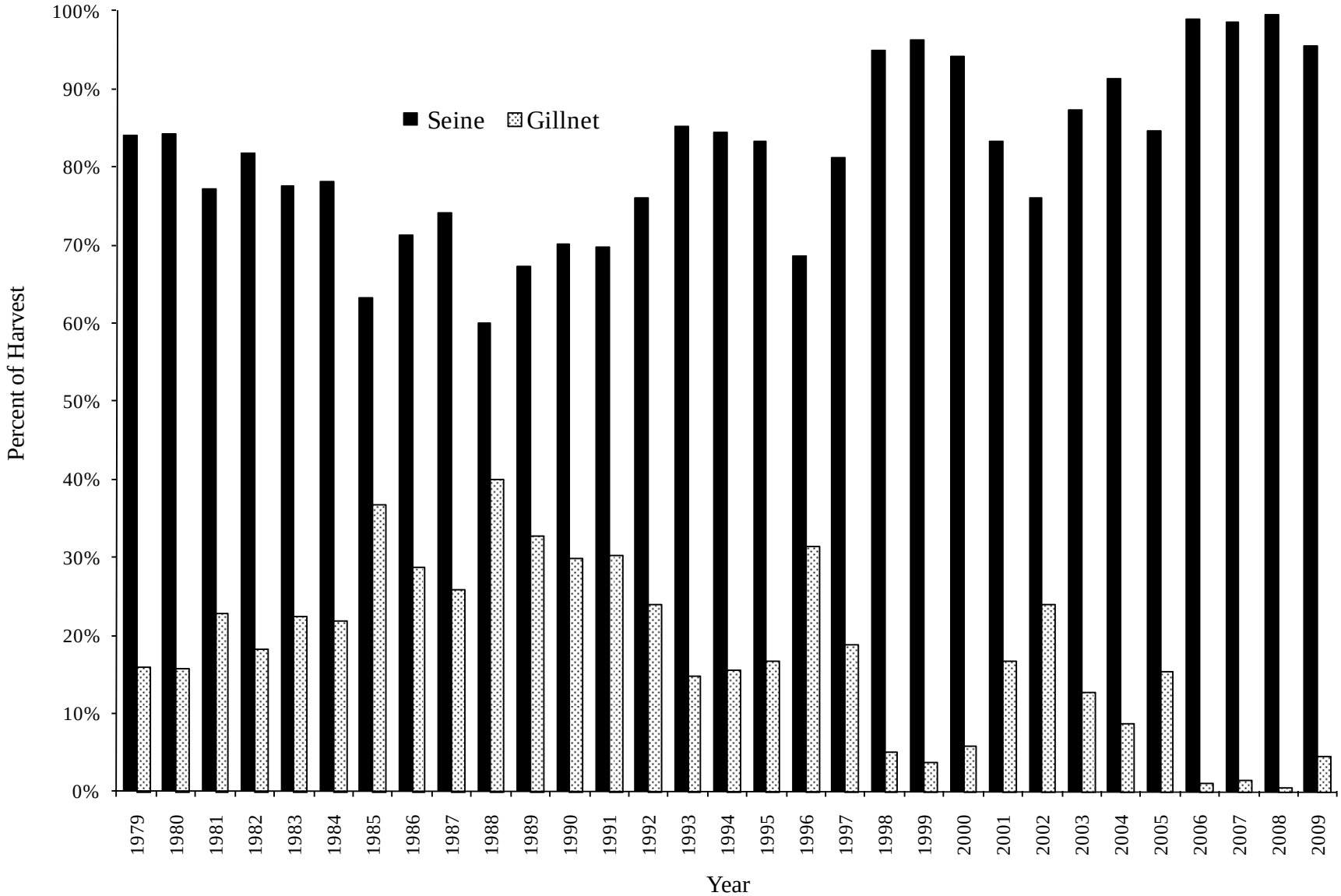


Figure 7.–Percent of the total harvest taken by gear type in herring sac roe commercial fishery, KMA, 1979 through 2009.

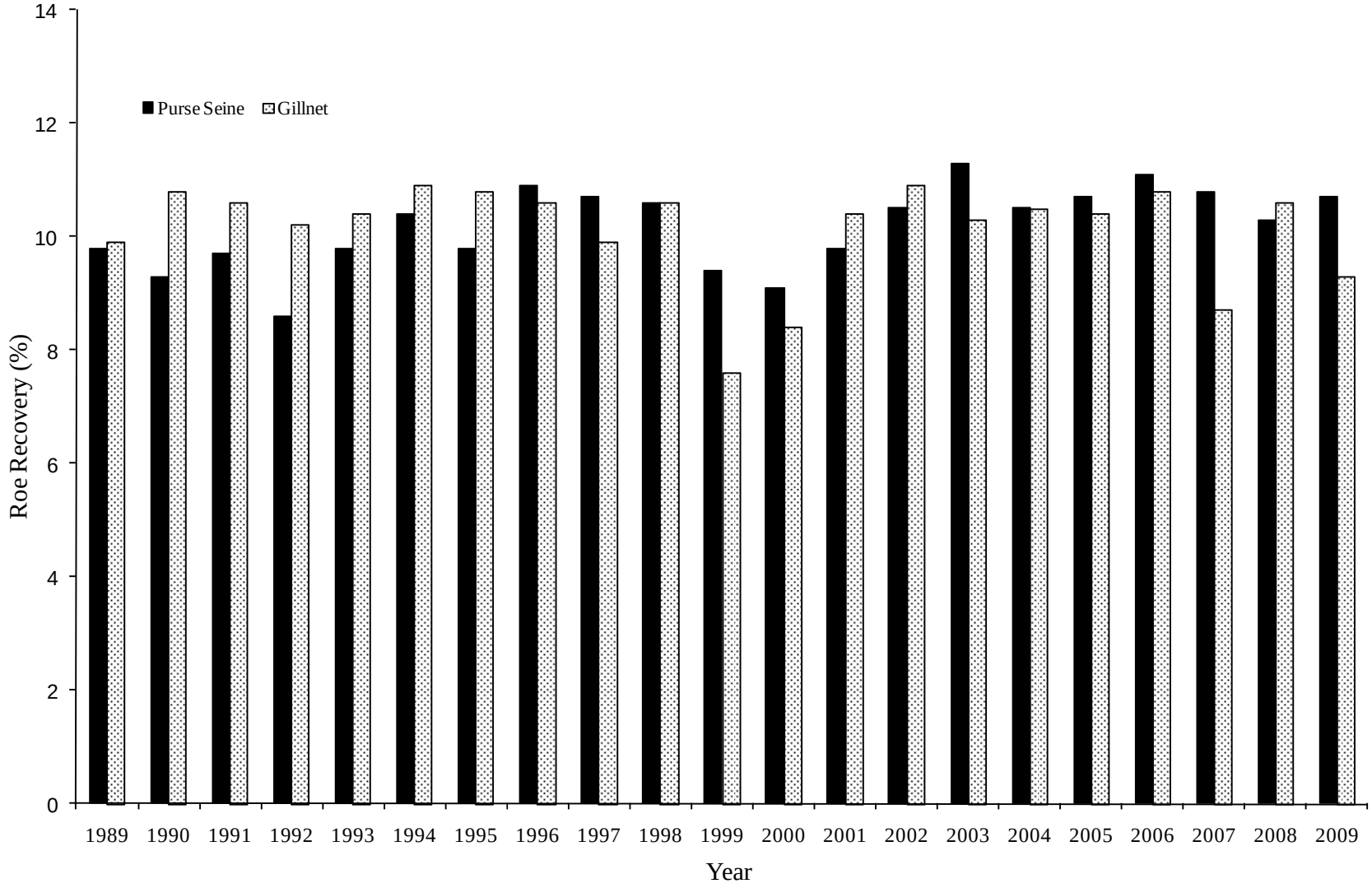
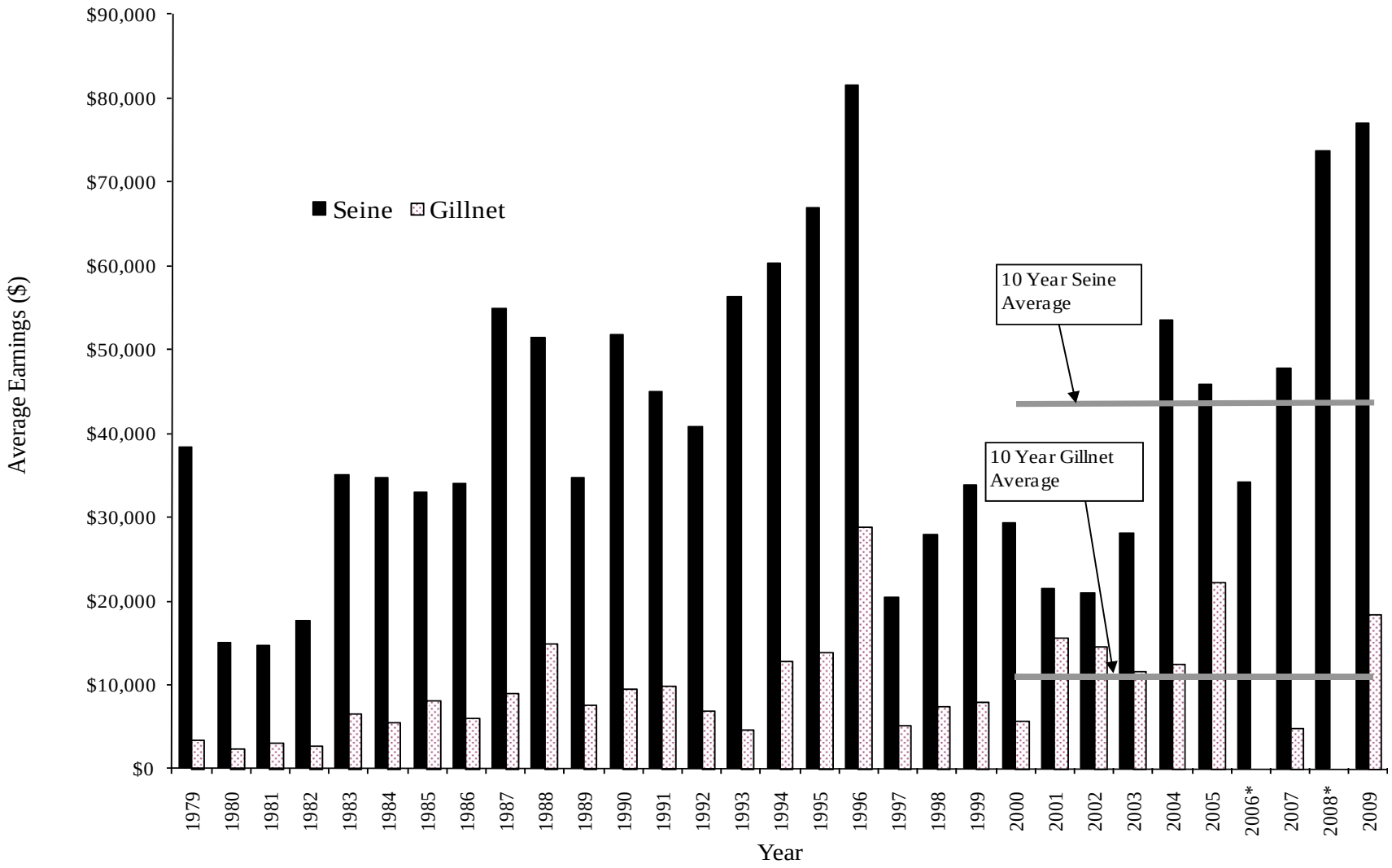


Figure 8.–Herring sac roe fishery, roe recovery in the KMA, 1989 through 2009



* 2006 and 2008 gillnet data is confidential

Figure 9.–Average earnings by gear type for herring sac roe commercial fisheries, KMA, 1979 through 2009.

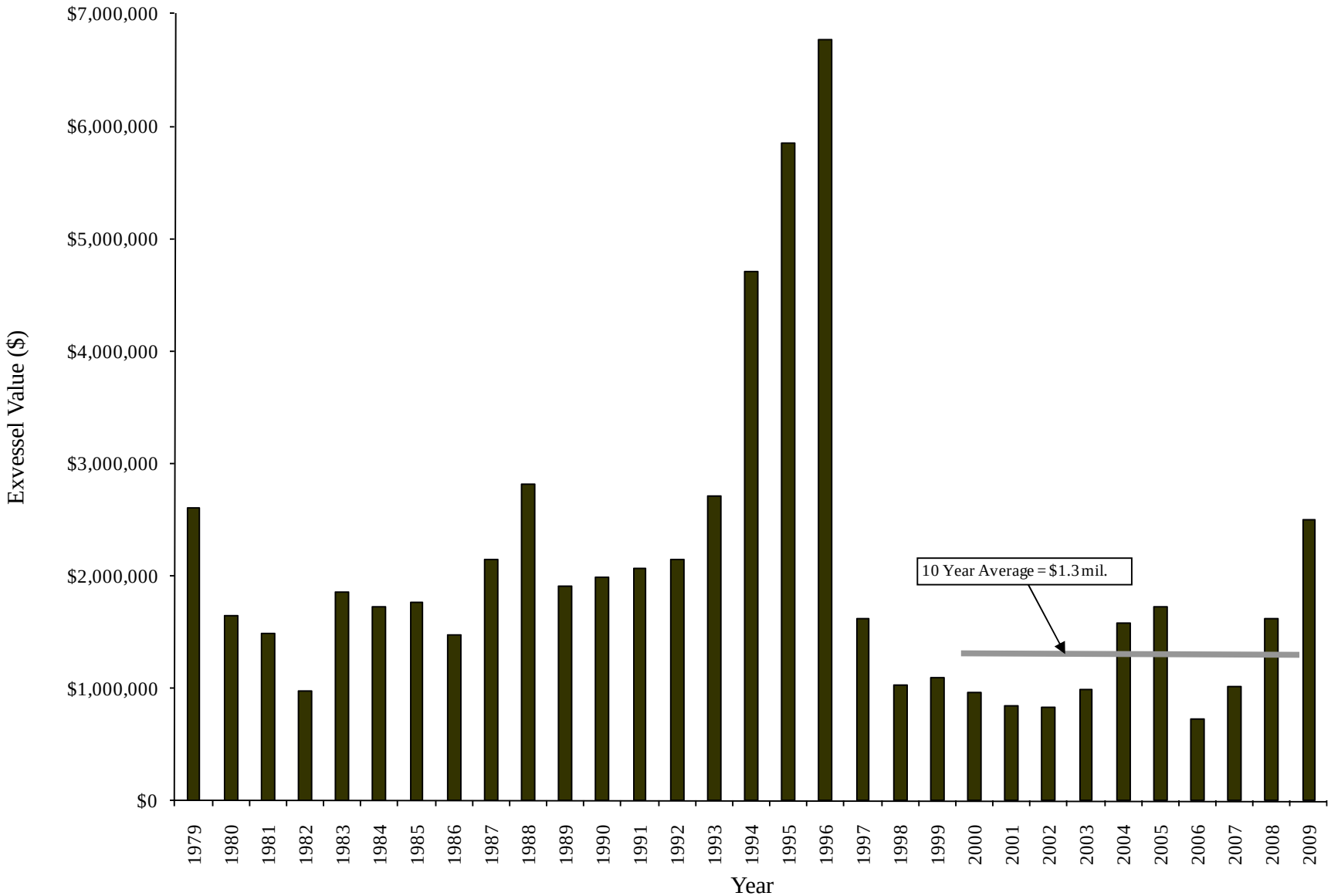


Figure 10.–Total exvessel value for herring sac roe commercial fisheries, Kodiak Management Area, 1979 to 2009.

APPENDIX A: SUMMARY OF EMERGENCY ORDERS ISSUED FOR THE HERRING COMMERCIAL FISHERIES IN THE KODIAK MANAGEMENT AREA, 2009

Appendix A.–Summary of emergency orders issued for the herring commercial fisheries in the Kodiak Management Area, 2009.

Emergency Order #	Issued	Effective:	Action Taken:
1	11:00 AM April 10	noon April 15	Open Sac Roe Fishery: initial opening times and fishing periods by gear and section for sac roe herring fishery announced.
2	5:25 PM April 15	5:25 PM April 15	Closure: The East Sitkalidak Section (EA30) at 5:25 PM April 15.
3	11:00 AM April 16	11:00 AM April 16	Closure: The Danger Bay Section (SA40) at 11:00 AM April 16 for purse seine gear.
4	9:00 AM April 17	noon April 17	Extension: commercial herring fishing was extended for gillnet gear in the Danger Bay Section (SA40) until further notice.
5	12:35 PM April 17	12:35 PM April 17	Closure: The West Sitkalidak Section (EA23) at 12:35 PM April 17.
6	4:50 PM April 17	4:50 PM April 17	Closure: The Three Saints Bay Section (EA21) at 4:50 PM April 17.
7	3:00 PM April 18	3:00 PM April 18	Closure: The Outer Kiliuda Bay Section (EA43) and the combined Izhut Bay (SA10), Kitoi Bay (SA20), and McDonalds Lagoon (SA30) sections at 3:00 PM April 18.
8	2:30 PM April 19	2:45 PM April 19	Fishing Period: Commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 2:45 PM to 3:45 PM April 19 in that portion south of 57°40.00’ N. lat.
9	2:40 PM April 19	2:45 PM April 19	Increase open waters: Open waters for the Commercial herring fishing period in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 2:45 PM to 3:45 PM April 19 in that portion south of 57°40.00’ N. lat. will be increased and include that portion south of 57°40.50’ N. lat.

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Emergency Order #	Issued:	Effective:	Action Taken:
10	3:35 PM April 19	3:35 PM April 19	Closure: The Village Islands/Uganik Bay sections (UG30, 32-34) south of 57°40.50' N. lat. to purse seine gear at 3:35 PM April 19.
11	7:30 PM April 19	9:00 PM April 19	Fishing Period: Commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for gillnet gear from 9:00 PM April 19 to 9:00 PM April 20.
12	10:30 AM April 20	9:00 PM April 20	Extension: commercial herring fishing was extended in the Village Islands/Uganik Bay sections (UG30, 32-34) for gillnet gear from 9:00 PM April 20 to 9:00 AM April 21. Fishing Period: The Outer Ugak Bay Section (EA50) to purse seine gear at noon April 21.
13	noon April 21	1:30 PM April 21	Fishing Period: commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 1:30 PM to 4:30 PM April 21 in that portion south of 57°42.00' N. lat.
14	4:15 PM April 21	9:00 PM April 21	Extension: commercial herring fishing was extended in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 4:30 PM to 9:00 PM April 21 in that portion south of 57°42.00' N. lat.
15	8:25 PM April 21	8:25 PM April 21	Closure: The Outer Ugak Bay Section (EA50) at 8:25 PM April 21.
16	5:30 PM April 21	9:00 PM April 21	Fishing period: commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for gillnet gear from 9:00 PM April 21 to 9:00 AM April 23.
17	10:15 AM April 25	10:35 AM April 25	Fishing Period: commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 10:35 AM to 10:45 AM April 25 in that portion north of 57° 46.91' N. lat., south of 57° 47.57' N. lat. and west of 153° 31.80 W. long.

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Emergency Order #	Issued:	Effective:	Action Taken:
18	12:30 PM April 25	12:45 PM April 25	Fishing Period: commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 12:45 PM to 12:55 PM April 25 in that portion north of 57° 46.00' N. lat., south of 57° 47.57' N. lat. and west of 153° 31.20 W. long.
19	3:10 PM April 25	3:40 PM April 25	Fishing Period: commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for purse seine gear from 3:10 PM to 3:40 PM April 25 in that portion north of 57° 46.00' N. lat., south of 57° 47.57' N. lat. and west of 153° 31.20 W. long.
20	5:00 PM April 25	6:00 PM April 25	Fishing Period: commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for gillnet gear from 6:00 PM April 25 until further notice.
21	7:00 PM April 27	7:00 PM April 27	Closure: The Kizhuyak Bay Section (IM40) at 7:00 PM April 27.
22	11:00 AM April 29	noon May 1	Gear Change Announcement: establishes the sections that will be open to both gear types beginning noon May 1. Closure: The Village Islands/Uganik Bay sections (UG30, 32-34) to gillnet gear at noon May 1.
23	9:45 PM April 29	9:00 PM April 29	Closure: The Barling Bay Section (EA24) and the Tonki Bay Section (NA50) at 9:00 PM April 29.
24	11:40 AM May 4	11:40 AM May 4	Closure: The Inner Kiliuda Bay Section (EA44) to purse seine gear at 11:40 AM May 4.

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Emergency Order #	Issued:	Effective:	Action Taken:
25	10:00 AM May 5	10:00 AM May 5	Fishing Period: Commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) to both gear types from 10:00 AM to 9:00 PM May 5 in that portion south of 57° 47.60' N. lat., north of 57° 46.40' N. lat., and west of 153° 32.30' W. long.
26	7:21 PM May 5	7:21 PM May 5	Closure: The Shearwater Bay Section (EA42) at 7:21 PM May 5.
27	9:00 AM May 6	9:00 AM May 6	Fishing Period: Commercial herring fishing opened in the Village Islands/Uganik Bay sections (UG30, 32-34) for both gear types from 9:00 AM to 9:00 PM May 6 in that portion south of 57° 47.60' N. lat., north of 57° 46.40' N. lat., and west of 153° 32.30' W. long. Beginning noon May 7, purse seine fishing periods were from noon to 9:00 PM on odd-numbered days and 9:00 AM to noon on even-numbered days. Gillnet fishing will remain open until further notice.
28	12:22 PM May 6	12:22 PM May 6	Closure: The Tanginak Anchorage Section (EA31) at 12:22 PM May 6.
29	8:45 AM May 7	9:00 AM May 8	Fishing Period: Commercial herring fishing opened in the Zachar Bay Section (UY40) to purse seine gear at 9:00 AM May 8.
30	9:25 AM May 8	9:25 AM May 8	Closure: The Zachar Bay Section (UY40) at 9:25 AM May 8.
31	noon May 8	noon May 8	Closure: The Perenosa Bay (UY40), Terror Bay (UG21), and Viekoda Bay (UG20) sections at noon May 8.
32	9:00 AM May 11	9:00 AM May 11	Closure: The Browns Lagoon Section (UY32) at 9:00 AM May 11.

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Emergency Order #	Issued:	Effective:	Action Taken:
33	8:35 PM May 11	8:35 PM May 11	Closure: The Inner Ugak Bay Section (EA51) at 8:35 PM May 11.
34	9:00 AM May 13	9:00 AM May 14	Section combine: The Sulua Bay (AL30), Inner Alitak (AL20), Inner Deadman Bay (AL21), and Outer Deadman Bay (AL22) sections were combined and managed as one unit. The GHL for this area was increased to 900 tons.
35	11:45 AM May 13	noon May 13	Opening Delay: The scheduled opening for the combined Inner Deadman Bay (AL21) and Outer Deadman Bay (AL22) sections at noon May 13 is delayed until 1:00 PM. Closed waters include all waters of Deadman Bay north of 57° 00.58' N. lat.
36	9:00 AM May 14	noon May 15	Fishing Period: Commercial herring fishing opened in the Womens Bay Section (NE10) to purse seine gear at noon May 15.
37	11:40 AM May 14	noon May 14	Extension: The fishing period in the combined Sulua Bay (AL30), Inner Alitak (AL20), Inner Deadman Bay (AL21), and Outer Deadman Bay (AL22) sections is extended until 10:00 PM May 14.
38	5:30 PM May 15	5:30 PM May 15	Closure: The Womens Bay Section (NE10) at 5:30 PM May 15.
39	9:00 AM May 26	10:00 PM May 25	Closure: The West Upper Olga Bay Section (AL50) at 10:00 PM May 25.
40	2:00 PM May 28	noon May 28	Closure: The East Upper Olga Bay Section (AL41) at noon May 28.
41	3:45 PM May 31	3:45 PM May 31	Closure: The combined Sulua Bay (AL30), Inner Alitak (AL20), Inner Deadman Bay (AL21), and Outer Deadman Bay (AL22) at 3:45 PM May 31.

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Emergency Order #	Issued:	Effective:	Action Taken:
42	9:00 AM September 23	9:00 AM September 24	F/B Fishing Period: Established the initial fishing period for the food and bait fishery in that portion of the Uganik District south of the latitude of Miners point at 9:00 AM September 24 until further notice. The Uganik District has a 179 ton GHL.
43	10:00 AM October 20	noon October 20	F/B Fishing Period: Established a fishing period for the Eastside District and the South Afognak District at noon October 20 until further notice. The Eastside District has a GHL of 85 tons and the South Afognak District has a GHL of 44 tons.
44	4:00 PM November 9	4:00 PM November 9	F/B Closure: That portion of the Uganik District south of the latitude of Miners Point at 4:00 PM November 9.
45	3:00 PM November 16	3:00 PM November 16	F/B Closure: The South Afognak District at 3:00 PM November 16.

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