

Fishery Management Report No. 16-12

**Kodiak Management Area Herring Sac Roe Fishery
Harvest Strategy for the 2016 Season**

by

Geoff Spalinger

March 2016

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

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Weights and measures (metric)		General		Mathematics, statistics	
centimeter	cm	Alaska Administrative		<i>all standard mathematical</i>	
deciliter	dL	Code	AAC	<i>signs, symbols and</i>	
gram	g	all commonly accepted		<i>abbreviations</i>	
hectare	ha	abbreviations	e.g., Mr., Mrs.,	alternate hypothesis	H _A
kilogram	kg		AM, PM, etc.	base of natural logarithm	<i>e</i>
kilometer	km	all commonly accepted		catch per unit effort	CPUE
liter	L	professional titles	e.g., Dr., Ph.D.,	coefficient of variation	CV
meter	m		R.N., etc.	common test statistics	(F, t, χ^2 , etc.)
milliliter	mL	at	@	confidence interval	CI
millimeter	mm	compass directions:		correlation coefficient	
		east	E	(multiple)	R
		north	N	correlation coefficient	
		south	S	(simple)	r
		west	W	covariance	cov
Weights and measures (English)		copyright	©	degree (angular)	°
cubic feet per second	ft ³ /s	corporate suffixes:		degrees of freedom	df
foot	ft	Company	Co.	expected value	<i>E</i>
gallon	gal	Corporation	Corp.	greater than	>
inch	in	Incorporated	Inc.	greater than or equal to	≥
mile	mi	Limited	Ltd.	harvest per unit effort	HPUE
nautical mile	nmi	District of Columbia	D.C.	less than	<
ounce	oz	et alii (and others)	et al.	less than or equal to	≤
pound	lb	et cetera (and so forth)	etc.	logarithm (natural)	ln
quart	qt	exempli gratia		logarithm (base 10)	log
yard	yd	(for example)	e.g.	logarithm (specify base)	log ₂ , etc.
		Federal Information		minute (angular)	'
Time and temperature		Code	FIC	not significant	NS
day	d	id est (that is)	i.e.	null hypothesis	H ₀
degrees Celsius	°C	latitude or longitude	lat. or long.	percent	%
degrees Fahrenheit	°F	monetary symbols		probability	P
degrees kelvin	K	(U.S.)	\$, ¢	probability of a type I error	
hour	h	months (tables and		(rejection of the null	
minute	min	figures): first three		hypothesis when true)	α
second	s	letters	Jan, ..., Dec	probability of a type II error	
		registered trademark	®	(acceptance of the null	
Physics and chemistry		trademark	™	hypothesis when false)	β
all atomic symbols		United States		second (angular)	"
alternating current	AC	(adjective)	U.S.	standard deviation	SD
ampere	A	United States of		standard error	SE
calorie	cal	America (noun)	USA	variance	
direct current	DC	U.S.C.	United States	population	Var
hertz	Hz		Code	sample	var
horsepower	hp	U.S. state	use two-letter		
hydrogen ion activity	pH		abbreviations		
(negative log of)			(e.g., AK, WA)		
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

FISHERY MANAGEMENT REPORT NO. 16-12

**KODIAK MANAGEMENT AREA HERRING SAC ROE FISHERY
HARVEST STRATEGY FOR THE 2016 SEASON**

by

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ABSTRACT

This report describes the harvest strategy for the 2016 Kodiak Management Area (KMA) commercial Pacific herring *Clupea pallasii* sac roe fishery and includes the 2016 guideline harvest levels (GHL) by section, management changes from previous years, and reporting and registration requirements. The 2016 KMA areawide GHL is 1,670 tons, and individual GHLs have been established for 34 sections. The areawide GHL is divided between purse seine gear and gillnet gear due to a regulatory allocative management plan (5 AAC 27.535(e)). The purse seine GHL is 1,305 tons (78.1% of the areawide GHL), and the gillnet GHL is 365 tons (21.9% of the areawide GHL).

There will be 2 types of fishing periods in the KMA: those that fall under the “standard” fishing schedule established in regulation (5 AAC 27.510), and those that occur in sections managed by emergency order (EO). In order to maximize roe quality and control harvest rates, fishing periods for the Village Islands/Uganik Bay and Danger Bay sections will be established by EO. Herring will be sampled for age, sex, weight, length, and maturity from purse seine test sets. Time and area restrictions may be used to target the effort on large herring with highest roe content.

Key Words: sac roe, herring, *Clupea pallasii*, guideline harvest levels (GHL), Kodiak Management Area (KMA), harvest strategy, Fisheries Management Report (FMR)

INTRODUCTION

The Alaska Department of Fish and Game (ADF&G) Commercial Fisheries Division staff in Kodiak will manage the 2016 Kodiak commercial Pacific herring *Clupea pallasii* sac roe fishery. This report presents the harvest strategy for the Kodiak Management Area (KMA) herring sac roe fishery, including the guideline harvest levels (GHL) by section, section gear assignments, changes in management, and reporting and registration requirements for the 2016 fishery.

The Kodiak herring sac roe fishery begins April 15 and lasts until June 30 (5 AAC 27.510 (a)). The fishery is intended to occur in an orderly fashion, with minimal waste of resource and within conservation limits as determined by ADF&G, while striving for the highest quality product (5 AAC 27.535 (e)(6)). The fishery will be managed in accordance with general statewide herring guideline harvest policies, which provide for catches in traditional inshore areas, management for the greatest value, and exploitation (harvest) not to exceed 20% of the available spawning biomass. Conservative GHLs are established due to the uncertainty in estimating individual section populations.

The KMA is divided into 13 districts that define areas used to manage the herring sac roe fishery (Figure 1; Table 1). Each district is further divided into smaller areas called sections. There are 81 sections in the KMA that define spawning areas or historical harvest locations. Current statistical charts, which illustrate districts and sections, are available at the ADF&G office in Kodiak (Figure 1).

GHLs are preseason harvest projections that are established for individual sections by Kodiak ADF&G fishery management biologists (Table 1). After a review of stock status trends for the entire KMA, ADF&G determines which sections will be open to commercial fishing and what level of harvest will be targeted. Each section’s GHL is based on the following: 1) fishery performance during the preceding season or seasons (using total harvest, timing, duration of fishery, or average school size); 2) trends in age composition; 3) spawn and juvenile herring observations; 4) aerial surveys; and 5) hydroacoustic surveys. Information from commercial fishermen and spotter pilots are also considered in setting a GHL.

2016 HARVEST STRATEGY

GUIDELINE HARVEST LEVELS

For the 2016 season, GHLS have been established for 34 of 81 sections (Table 1). Thirteen sections had little or no harvest during the last 10 years and are designated as exploratory in 2016. Exploratory areas are open to both gear types and have no set GHLS. The remaining sections will remain closed, based on either low abundance or lack of herring sac roe harvests.

The 2016 area-wide GHLS of 1,670 tons (Table 1) is a decrease of 1,520 tons from the 2015 GHLS of 3,190 tons (Table 2).

HARVEST ALLOCATION

ADF&G shall manage the herring sac roe fishery to provide opportunities for gillnet permit holders to harvest approximately 25% of the total preseason GHLS and purse seine permit holders to harvest approximately 75% (Table 1; 5 AAC 27.535 (e)). With few exceptions, this is accomplished by assigning sections to only purse seine gear or only gillnet gear. Each district having more than 1 section that is open for fishing will have approximately 20–30% of the GHLS for the district allocated to the gillnet permit holders and 70–80% allocated to the purse seine permit holders (5 AAC 27.535 (e)(2)(D)). Determining which gear type will be assigned to a section is based on the following: 1) estimated biomass and age composition of the stock(s) within a section; 2) historical harvest by gear from that section; 3) historical harvest timing; 4) management concerns; 5) determining allocative percentages; and 6) input from fishery participants as solicited during a preseason meeting.

From May 1 through June 30, ADF&G may open any area with remaining GHLS to any gear group if the fishery is not likely to result in overharvest (5 AAC 27.535 (e)(1)(C)).

Of the total 1,670 ton GHLS, 1,305 tons of herring (78.1%) will be allocated to purse seine permit holders, and 365 tons (21.9%) will be allocated to gillnet permit holders (Table 1) in accordance with regulatory management plan (5 AAC 27.535 (e)).

SECTION ASSIGNMENTS

The following adjacent sections will be combined and managed as a single section for the 2016 sac roe herring season ((5 AAC 27.535 (e)(1)(A)); Table 1):

- Izhut Bay, Kitoi Bay, and MacDonald Lagoon;
- Village Islands, Northeast Arm Uganik, East Arm Uganik, and South Arm Uganik bays; and
- Outer Deadman and Inner Deadman bays.

The remaining sections will be assigned as follows:

Purse Seine ^a	Gillnet ^a	Exploratory (both gear types)
Village Islands/Uganik Bays	Izhut/Kitoi/MacDonald	Delphin Bay
Inner Alitak	Perenosa Bay	Bluefox Bay
Inner/Outer Deadman	Tonki Bay	Geese-Twoheaded
E. Upper Olga Bay	Malina Bay	Kaiugnak
W. Upper Olga Bay	Raspberry Strait	SW Sitkalidak
Three Saints Bay	Viekoda Bay	Newman Bay
West Sitkalidak Strait	Terror Bay	Tanginak Anchorage
Barling Bay	West Uganik Passage	Inner Kukak Bay
East Sitkalidak Strait	Sulua Bay	Inner Katmai Bay
Outer Kiliuda Bay	Lower Olga Bay	Alinchak Bay
Outer Ugak Bay	Shearwater Bay	Puale Bay
Danger Bay	Inner Kiliuda Bay	Portage Bay
	Inner Ugak Bay	Wide Bay
	Womens Bay	
	Kalsin Bay	

^a Beginning May 1, sections may be opened to either gear type.

FISHING PERIODS

Daily Fishing Periods for Most Purse Seine and Gillnet Sections

Unless otherwise specified by emergency order (EO), herring may be taken during the sac roe season from April 15 through June 30 as follows:

- For purse seine permit holders: from April 15 through May 7, fishing periods for purse seine permit holders are from noon until 9:00 PM on odd-numbered days and from 9:00 AM until noon on even-numbered days. From May 8 through June 30, fishing periods are from noon until 10:00 PM on odd-numbered days and from 9:00 AM until noon on even-numbered days (5 AAC 27.510 (a)(1)).
- For gillnet permit holders: fishing periods for gillnet permit holders are from noon on odd-numbered days until noon on even-numbered days (5 AAC 27.510 (a)(2)). Continuous fishing, announced by EO, will occur if participation and overharvest concerns are low.

Regulations stipulate a 24-hour closed period for both gear types from noon on even-numbered days until noon on odd-numbered days (5 AAC 27.510). The “day-on, day-off” schedule applies to most sections allocated to seine gear, except for those to be managed under EO authority.

It is anticipated that gillnet effort will be low in 2016. As a result, fishing periods in gillnet only sections will be announced by EO and remain open until further notice. If effort is higher than anticipated, fishing periods in gillnet only sections will revert to the schedule in regulation

ADF&G may use EO authority to restrict fishing time and close areas in any section if overharvest concerns exist during the season. ADF&G may also use EO authority to close sections if resources are not available to monitor the fishery and there are overharvest concerns.

PURSE SEINE FISHERY MANAGEMENT

ADF&G will manage the Outer Ugak Bay, Village Islands/Uganik Bay, and Danger Bay sections differently than other purse seine sections within the KMA. Openings of these sections may be delayed, and some of these sections will be managed in season by EO to maximize roe percentage of the landed product and to control harvest rates.

Outer Ugak Bay Section

The initial opening in the Outer Ugak Bay Section will be delayed until an ADF&G vessel is available to monitor the fishery. A news release will be issued 24 hours in advance of any opening in this section. Once open, fishing periods will be as stated in 5 AAC 27.510 (a)(1). Fishermen are strongly encouraged to sample catches for roe quality and size of herring prior to landing to ensure the highest value of product.

Village Islands/Uganik Bay sections

The Village Islands, Northeast Arm Uganik, East Arm Uganik, and South Arm Uganik sections will be managed as 1 section with a total GHLL of 250 tons (Table 1). The Village Islands/Uganik Bay sections will be open to purse seine only in 2016.

These sections will be actively managed for roe quality and size of herring by the ADF&G management biologist aboard the R/V *K-Hi-C* or the R/V *Resolution* depending on the availability of either vessel. There will be at least 24-hour notice prior to any potential fishing period. ADF&G will attempt to target herring with approximately 11% roe recovery on the grounds. Permit holders wishing to fish in these sections are urged to contact the management biologist to volunteer for test fishing and discuss how the fishery will be managed.

Danger Bay Section

The Danger Bay Section will be managed with a total GHLL of 400 tons (Table 1). The Danger Bay Section will be open to purse seine only in 2016.

This section will be actively managed for roe quality and size of herring by the ADF&G management biologist aboard the ADF&G vessel R/V *K-Hi-C*. ADF&G will attempt to target herring with approximately 11% roe recovery on the grounds. Permit holders wishing to fish in this section are urged to contact the management biologist at 10:00 AM Friday, April 15, aboard the R/V *Resolution* to volunteer for test fishing and discuss how the fishery will be managed.

GILLNET FISHERY MANAGEMENT

Gillnet fishing periods will be modified by EO to allow continuous fishing.

TEST FISHING

ADF&G staff will not conduct roe recovery testing; industry personnel (processor technicians, fishermen, or tendermen) are expected to determine roe quality. Instructions on how to determine roe quality and recovery percentages may be available from buyers and processors. Additionally, processors establish minimum size requirements (average weights) for the herring that they will

purchase. All fishermen are urged to check with their buyer to determine what roe recovery and size limits will be marketable.

Prior to any fishing period in the Village Islands/Uganik Bay and Danger Bay sections, the management biologist on the grounds will seek volunteer fishermen to conduct test sets to sample fish size and roe quality. The management biologist will choose the boats to make test fishing sets. In some circumstances, more than 1 boat may be needed. All test fishing will be coordinated and directed by the ADF&G management biologist on the grounds. No test set will be allowed without first consulting the management biologist, either in person or via VHF radio channel 6.

Small amounts of herring from each test set will be kept to determine marketability. Approximately 75–150 lbs. of herring will be randomly selected from each set to be tested for mature roe and average weight (grams). Herring will be sampled onboard the fishing vessel or may be transported to a central fishing boat or tender for later testing. ADF&G biologists will attempt to manage fisheries so that industry roe recovery and size requirements are met or exceeded. ADF&G will broadcast test fishery results on VHF channel 6.

MANAGEMENT FROM MAY 1 TO JUNE 30

ADF&G may open any section with unharvested GHM to both gear groups beginning May 1 unless overharvest concerns exist (5 AAC 27.535(e)(1)(c)). Some areas will not open to both gear groups until an ADF&G field crew is stationed on the grounds to monitor the fishery. At least 24 hours of advance notice will be given prior to opening an area to both groups.

ADF&G AND INDUSTRY COOPERATION

Due to funding cuts, ADF&G will not have a field crew that is normally stationed on the Eastside of Kodiak. As a result, there will be a preseason registration requirement that will require permit holders to report harvest location and tonnage immediately after landing herring. Fishermen should immediately contact the area management biologists in Kodiak, or onboard the R/V *Resolution* or the R/V *K-Hi-C*, when a harvest occurs. Timely harvest reporting is essential to managing the Kodiak herring fishery. ADF&G staff will make frequent contact with permit holders to collect harvest data, fleet movement information, spawn observations, and observations of juvenile and adult herring concentrations.

Past cooperation between the ADF&G, the fishing fleet, and buyers has been excellent, and it is hoped that this will continue. If cooperation is lacking, **closure of sections may be necessary**, and future openings will be closely evaluated. Fishermen are strongly encouraged to sample catches prior to landing in order to harvest the highest value product possible.

Permit holders and spotter pilots are encouraged to provide biomass estimates, juvenile herring observations, and spawn observations to management staff. Past cooperation has helped staff evaluate stock status and gain critical management information. All information from fishermen and spotter pilots will remain confidential. Of particular interest are any observations of herring in closed management sections. Timely information will be used by management staff to conduct aerial or hydroacoustic surveys to assess herring abundance.

Samples from commercial herring harvests will be collected by management biologists. These are primarily used to monitor age composition and, when used with other stock performance indicators, assist in determining stock status. Support and assistance from the industry is

necessary for this style of fishery management to be successful. This support will result in a more manageable fishery, greater economic benefit to the permit holders, and will help ensure the long-term health of the KMA herring stocks.

CATCH REPORTING FOR BUYERS AND TENDERS

Processors and independent tender operators are required to provide daily catch reports by section to the Kodiak ADF&G office by 9:00 AM Herring onboard tenders that have not yet been delivered to a processing facility must also be reported. Timely and accurate harvest reports received from field crews, permit holders, tender operators, spotters, and processors are critical in the assessment of herring harvests and guide the management of the fishery. Inaccurate or late information could result in premature area closures or overharvest. Catch reporting procedures and ADF&G contact information is listed on the registration permit.

PRESEASON PERMIT HOLDER REGISTRATION

ADF&G will require permit holders to register prior to participating in the 2016 fishery. It is the responsibility of the permit holders to keep ADF&G informed of fishing activity and report herring harvests daily. The registration permit will outline reporting requirements by gear type. Failure to maintain contact with ADF&G will result in closures.

Purse seine permit holders are reminded that they may use only 1 purse seine vessel to harvest herring; this may be either the vessel identified on the permit card or a replacement vessel. If a Kodiak sac roe seine permit holder intends to fish with a different vessel than is listed on their permit card, they must register the replacement vessel with Kodiak management staff (5 AAC 27.525 (d)).

REGISTRATION PERMIT

Each KMA tender operator and buyer must obtain a registration permit from ADF&G in the Kodiak office, either in person or through an authorized agent (5 AAC 27.540). A registration permit is required prior to taking fish onboard the tender or taking fish at the processing plant. Tenders are required to complete ADF&G fish tickets for each delivery. The fish ticket must have the fisherman's permit information legibly recorded and must show how many pounds or tons of fish were harvested (the on-the-grounds weight), date of harvest, and section from which the fish were harvested.

TRANSPORTER PERMITS

All KMA herring sac roe permit holders that intend to transport herring, other than their own commercially harvested herring, are required to have in their possession a fish transporter permit (AS 16.05.671). Permit applications are available at the Kodiak ADF&G office.

EMERGENCY ORDER ANNOUNCEMENTS

Two types of EOs will be issued in season: 1) announcements of short commercial fishing periods or closures in the Village Islands/Uganik Bay and Danger Bay sections; and 2) announcements of in-period fishery closures in sections that follow the standard fishing schedule. When a preseason GHL for a section is approached or achieved, that section will be closed for the remainder of the season. Due to the rapid pace of the harvest in certain locations, in-period closures are likely. When in-period closures are necessary, there may be as little as 5

minutes advance notice prior to the closure time, or less if appropriate. In-period closures will be announced on VHF channel 6. Fishermen and tender operators should monitor VHF channel 6 to remain aware of section closures.

At any time during the season, if ADF&G determines that herring stock abundance is below preseason expectations, sections may be closed prior to reaching their GHL.

A news release will be issued to announce fishery decisions such as openings, closures, and area restrictions. News releases are posted on the ADF&G website and distributed to processors, local radio stations, newspapers, and other interested parties.

All permit holders, tender operators, and processors are responsible for staying updated on section closures as they occur in season. Fishery information can be obtained in the following ways:

- 1) Contact the herring management staff in the Kodiak office in person, by telephone at 486-1830, or by using Matrix Alaska Net Satellite Dispatch at #7410.
- 2) Contact ADF&G field personnel on VHF channel 6 or using Matrix Alaska Net Satellite Dispatch (R/V *Resolution*: #7411 and R/V *K-Hi-C*: #7412).
- 3) Contact any local herring processor for the latest Kodiak herring news release.
- 4) Call the ADF&G 24-hour recorded message phone at 486-4559.
- 5) Obtain a copy of the most recent news release from the Kodiak ADF&G office at 351 Research Ct. (copies are available 24 hours a day in a bin located outside the main entrance to the building).
- 6) Listen to the ADF&G reports broadcast over the local AM and FM radio stations (consult stations for broadcast times):
 - 560 AM KVOK
 - 101.1 FM KRXX
 - 100.1 FM KMXT
- 7) News releases may also be searched for and subscribed to on the internet at: <http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main>.
- 8) Contact ADF&G biologists after hours at the following numbers:
 - James Jackson – 907-942-2097
 - Todd Anderson – 701-214-7667
 - Geoff Spalinger – 952-567-1420

HERRING TEST FISHERY PROGRAM

A herring test fishery program is proposed for the 2016 season to generate funds to be used for Kodiak herring fishery management and research projects. However, if herring prices are low and the test fishery would impact processor capacity, then the test fishery could be cancelled. ADF&G is requesting bids from processors and/or fishermen for the harvest and purchase of herring. Interested permit holders should contact a Kodiak herring management biologist at the ADF&G office for more details (Table 3).

TABLES AND FIGURES

Table 1.–KMA districts and management sections, GHLS, closed sections, and district allocation percentages for the herring sac roe fishery, 2016.

Statistical area	Management section	GHL tons	Purse seine tons	Gillnet tons
North Afognak District				
NA10	Shuyak Island	Closed	-	-
NA20	Delphin Bay	Exploratory	Exploratory	Exploratory
NA30	Perenosa Bay	10	Closed	10
NA40	Seal Bay	Closed	-	-
NA50	Tonki Bay	30	Closed	30
West Afognak District				
WA10	Raspberry Strait	10	Closed	10
WA20	Malina Bay	10	Closed	10
WA31	Paramanof Bay	Closed	-	-
WA32	Foul Bay	Closed	-	-
WA40	Blue Fox/Devil's Inlet	Exploratory	Exploratory	Exploratory
WA50	Offshore W. Afognak	Closed	-	-
South Afognak District				
SA10	Izhut Bay	40	Closed	40
SA20	Kitoy Bay	* SA10, SA20, and SA30 will be managed as one section.		
SA30	MacDonalds Lagoon	* SA10, SA20, and SA30 will be managed as one section.		
SA40	Danger Bay	400	400	Closed
SA50	Litnik	Closed	-	-
SA60	Duck Bay	Closed	-	-
Total All Afognak Districts		500	400	100
District Allocation Percentage			80.0%	20.0%
Uganik District				
UG10	Kupreanof	Closed	-	-
UG20	Viekoda Bay	15	Closed	15
UG21	Terror Bay	15	Closed	15
UG30	Village Islands	250	250	Closed
UG31	West Uganik Passage	35	Closed	35
UG32	NE Arm Uganik Bay	* Note: UG30, UG32, UG33, and UG34 will be managed as one section with 450 ton GHL for purse seine gear and 50 ton GHL for gillnet gear.		
UG33	East Arm Uganik Bay			
UG34	South Arm Uganik Bay			
UG40	Offshore Uganik	Closed	-	-
District Total		315	250	65
District Allocation Percentage			79.4%	20.6%
Uyak District				
UY10	Offshore Uyak	Closed	-	-
UY20	Harvester Island	Closed	-	-
UY30	Inner Uyak	Closed	-	-
UY32	Browns Lagoon	Closed	-	-
UY31	Larsen Bay	Closed	-	-
UY40	Zachar Bay	Closed	-	-
UY50	Spiridon Bay	Closed	-	-
District Total			-	-

-continued-

Table 1.–Page 2 of 3.

Statistical area	Management section	GHL tons	Purse seine tons	Gillnet tons
Alitak District				
AL10	Outer Alitak	Closed	-	-
AL20	Inner Alitak	25	25	Closed
AL21	Inner Deadman Bay	90	90	Closed
AL22	Outer Deadman Bay	*AL21 and AL22 will be managed as one section.		
AL30	Sulua Bay	25	Closed	25
AL40	Lower Olga	25	Closed	25
AL41	East Upper Olga Bay	25	25	Closed
AL50	West Upper Olga Bay	25	25	Closed
AL60	Geese/Twoheaded	Exploratory	Exploratory	Exploratory
District Total		215	165	50
District Allocation Percentage			76.7%	23.3%
Sturgeon/Halibut District				
SH10	Sturgeon/Halibut	Closed	Closed	Closed
Eastside District				
EA10	Kaiugnak	Exploratory	Exploratory	Exploratory
EA20	SW. Sitkalidak	Exploratory	Exploratory	Exploratory
EA21	Three Saints Bay	25	25	Closed
EA22	Newman Bay	Exploratory	Exploratory	Exploratory
EA23	W. Sitkalidak Strait	75	75	Closed
EA24	Barling Bay	40	40	Closed
EA30	E. Sitkalidak Strait	100	100	Closed
EA31	Tanginak Anchorage	Exploratory	Exploratory	Exploratory
EA40	Outer Sitkalidak	Closed	-	-
EA41	Boulder Bay	Closed	-	-
EA42	Shearwater Bay	40	Closed	40
EA43	Outer Kiliuda Bay	75	75	Closed
EA44	Inner Kiliuda Bay	40	Closed	40
EA50	Outer Ugak Bay	125	125	Closed
EA51	Inner Ugak Bay	50	Closed	50
EA52	Pasagshak Bay	Closed	-	-
District Total		570	440	130
District Allocation Percentage			77.2%	22.8%

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Table 1.–Page 3 of 3.

Statistical area	Management section	GHL tons	Purse seine tons	Gillnet tons
Northeast District				
NE10	Womens Bay	10	Closed	10
NE20	Kalsin Bay	10	Closed	10
NE30	Middle Bay	Closed	-	-
NE40	Inshore Chiniak	Closed	-	-
NE50	Offshore Chiniak	Closed	-	-
Inner Marmot District				
IM10	Monashka Bay	Closed	-	-
IM20	Anton Larsen Bay	Closed	-	-
IM30	Sharatin Bay	Closed	-	-
IM40	Kizhuyak Bay	50	50	Closed
IM50	Spruce Island	Closed	-	-
Total Ne/Im Districts		70	50	20
District Allocation Percentage			71.4%	28.6%
North Mainland District				
NM10	Hallo Bay	Closed	-	-
NM20	Inner Kukak	Exploratory	Exploratory	Exploratory
NM30	Outer Kukak	Closed	-	-
NM40	Missak Bay	Closed	-	-
Mid Mainland District				
MM10	Inner Katmai	Exploratory	Exploratory	Exploratory
MM20	Outer Katmai	Closed	-	-
MM30	Alinchak	Exploratory	Exploratory	Exploratory
MM40	Puale Bay	Exploratory	Exploratory	Exploratory
MM50	Portage Bay	Exploratory	Exploratory	Exploratory
MM60	Outer Portage	Closed	-	-
South Mainland District				
SM10	Wide Bay	Exploratory	Exploratory	Exploratory
SM20	Lower Shelikof	Closed	-	-
Mainland Districts Total		0	0	0
District Allocation Percentage			0.0%	0.0%
Grand Total		1,670	1,305	365
Allocation Percentage All Districts			78.1%	21.9%

Table 2.—Summary of season length, guideline harvest levels (GHL), harvest data by gear type, percentage of harvest by gear type, number of landings, and estimated exvessel earnings for the herring fishery in the KMA from 1979 to 2015.

Year	Season length (days)	GHL (tons)	Total harvest (tons)	Harvest (tons)		Percent harvest by gear type		Number of landings by gear type		Units of gear fished		Average catch (tons) by gear		Estimated average earnings ^a		Price per ton ^a	Estimated exvessel total value ^a
				Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	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

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Table 2.–Page 2 of 2.

Year	Season length (days)	GHL (tons)	Harvest (tons)		Percent harvest by gear type		Number of landings by gear type		Units of gear fished		Average catch (tons) by gear		Estimated average earnings ^a		Price per ton ^a	Estimated exvessel total value ^a	
			Total harvest	by gear type	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet			Seine
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	37	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	^c	21	^c	125	^c	\$34,270	^c	\$275	\$726,825
2007	37	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	99.6%	0.4%	108	^c	22	^c	140	^c	\$73,643	^c	\$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
2010	48	6,075	5,701	5,538	163	97%	3%	277	14	36	7	154	23	\$61,533	\$9,314	\$400	\$2,280,400
2011	48	6,135	2,957	2,937	20	99%	1%	95	6	14	3	210	7	\$41,957	\$1,333	\$200	\$591,400
2012	72	5,355	4,260	4,253	7	99.8%	0.2%	164	^c	23	^c	185	^c	\$55,474	^c	\$300	\$1,278,000
2013	65	5,410	4,447	4,298	149	97%	3%	189	18	33	5	130	30	\$29,956	\$6,854	\$230	\$1,022,810
2014	28	5,830	2,463	2,463	0	100%	0%	99	0	21	0	117	0	\$11,729	\$0	\$100	\$246,300
2015	15	3,190	357	357	0	100%	0%	19	0	9	0	40	0	\$4,363	\$0	\$110	\$39,270
Average																	
1979 to 2014	54	3,198	2,877	2,463	415	84%	16%	149	269	39	48	76	14	\$41,141	\$8,625	\$686	\$1,907,716
10-year avg.																	
2005 to 2014	46	4,904	3,634	3,518	116	97%	3%	148	18	25	5	142	22	\$47,922	\$7,530	\$346	\$1,302,109
5-year avg.																	
2010 to 2014	52	5,761	3,966	3,898	68	99%	1%	165	10	25	4	159	15	\$40,130	\$3,429	\$246	\$1,083,782

^a Exvessel values are based on dock delivered herring and inseason data.

^b Beginning in 2000, an allocative harvest strategy was in effect.

^c Confidentiality requirements prohibit the release of this information.

Table 3.—Alaska Department of Fish and Game, Division of Commercial Fisheries management staff, KMA, 2016.

Office Staff	
Regional Supervisor	Nick Sagalkin
Regional Finfish Management Supervisor	Jeff Wadle
Area Management Biologist	James Jackson
Assistant Area Management Biologist	Geoff Spalinger
Assistant Area Management Biologist	Todd Anderson
Fishery Biologist	Brad Fuerst

Field Staff	
<i>R/V K-Hi-C:</i>	
Boat Officer	Danny Wilson
Management Biologists	Todd Anderson/James Jackson
 <i>R/V Resolution:</i>	
Boat Officer	Denis Cox
Management Biologists	Geoff Spalinger/James Jackson

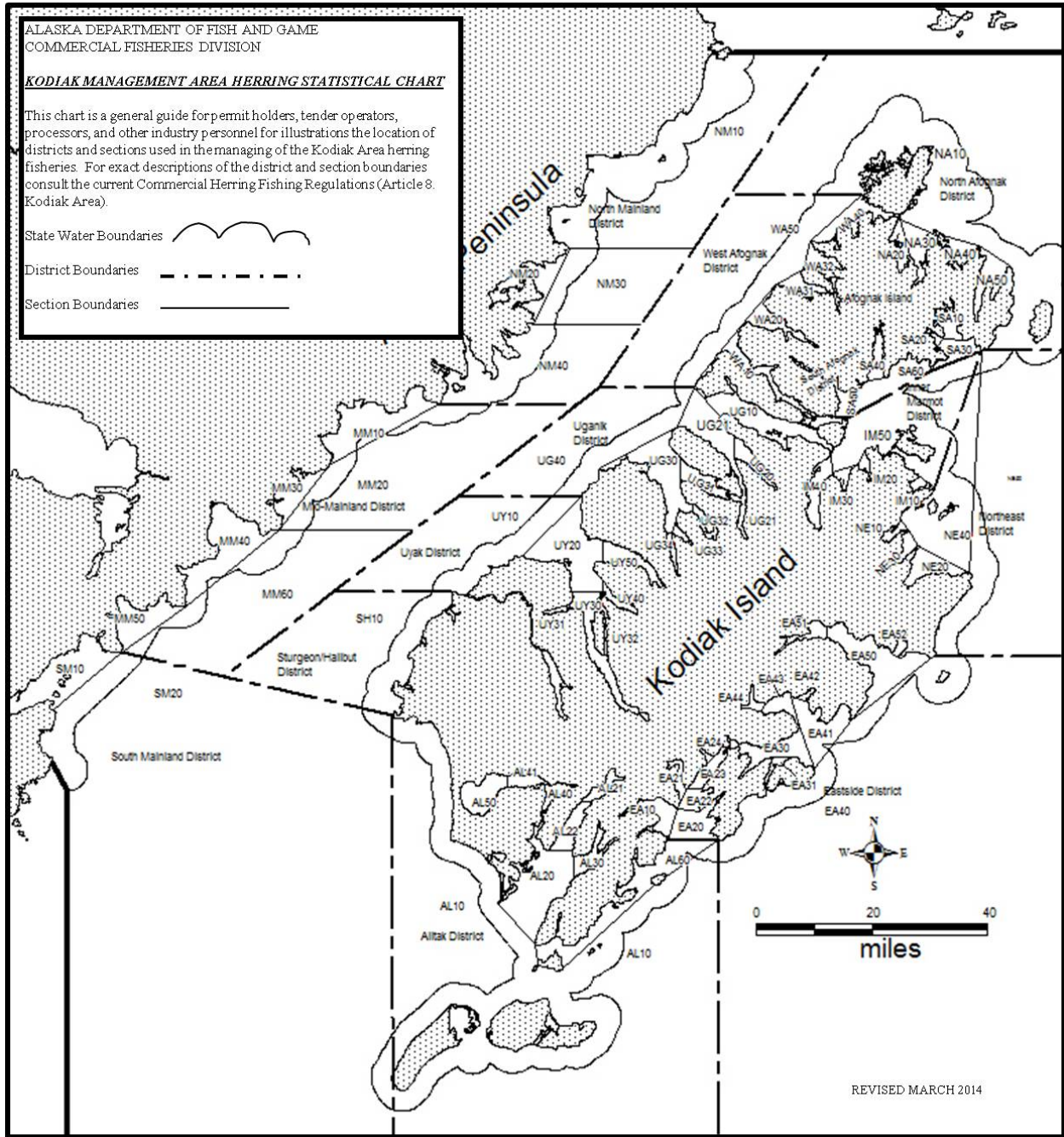


Figure 1.—Map of the Kodiak herring sac roe fishery harvest areas.