

**Regional Information Report No. 4K19-05**

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# **Kodiak Management Area Herring Sac Roe Fishery Harvest Strategy for the 2019 Season**

by

**Geoff Spalinger**

March 2019

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



## Symbols and Abbreviations

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

***REGIONAL INFORMATION REPORT 4K1905***

**KODIAK MANAGEMENT AREA HERRING SAC ROE FISHERY  
HARVEST STRATEGY FOR THE 2019 SEASON**

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March 2019

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*This document should be cited as follows:*

*Spalinger, G. 2019. Kodiak Management Area herring sac roe fishery harvest strategy for the 2019 season. Alaska Department of Fish and Game, Regional Information Report 4K19-05, Kodiak.*

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## ABSTRACT

This report describes the harvest strategy for the 2019 Kodiak Management Area (KMA) commercial Pacific herring *Clupea pallasii* sac roe fishery and includes the 2019 guideline harvest levels (GHL) by section, management changes from previous years, and reporting and registration requirements. The 2019 KMA areawide GHL is 1,405 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 1,050 tons (74.7% of the areawide GHL), and the gillnet GHL is 355 tons (25.3% 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 effort on large herring with the 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 2019 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 2019 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.

# **2019 HARVEST STRATEGY**

## **GUIDELINE HARVEST LEVELS**

For the 2019 season, GHGs 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 2019. Exploratory areas are open to both gear types and have no set GHG. The remaining sections will remain closed, based on either low abundance or lack of herring sac roe harvests.

The 2019 areawide GHG of 1,405 tons (Table 1) is an increase of 220 tons from the 2018 GHG of 1,185 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 GHG 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 GHG 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) determination of 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 GHG to any gear group if the fishery is not likely to result in overharvest (5 AAC 27.535(e)(1)(C)).

Of the total 1,405 ton GHG, 1,050 tons of herring (74.7%) will be allocated to purse seine permit holders, and 355 tons (25.3%) 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 2019 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;
- Outer Kiliuda and Inner Kiliuda bays; and,
- Outer Deadman and Inner Deadman bays.



The remaining sections will be assigned as follows:

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

<sup>a</sup> 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 are from noon until 9:00 p.m. on odd-numbered days and from 9:00 a.m. until noon on even-numbered days. From May 8 through June 30, fishing periods are from noon until 10:00 p.m. on odd-numbered days and from 9:00 a.m. until noon on even-numbered days (5 AAC 27.510(a)(1)).
- For gillnet permit holders: normal fishing periods are from noon on odd-numbered days until noon on even-numbered days (5 AAC 27.510(a)(2)). However, continuous fishing will be announced by EO due to minimal participation and low overharvest concerns.

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 2019. 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 inseason 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 follow the normal fishing schedule 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 one section with a total GHF of 150 tons (Table 1). The Village Islands/Uganik Bay sections will be open to purse seine only in 2019.

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*. 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 GHF of 150 tons (Table 1). The Danger Bay Section will be open to purse seine only in 2019.

This section will be actively managed for roe quality and size of herring by an ADF&G management biologist aboard either the ADF&G vessel R/V *K-Hi-C* or R/V *Resolution*. 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 a.m., Monday, April 15, aboard the R/V *K-Hi-C* or 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 lb 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**

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 *K-Hi-C* or the R/V *Resolution*, 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, to 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 and 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 a.m. 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. Late or inaccurate 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 2019 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 inseason: 1) announcements of short commercial fishing periods or closures in the Village Islands/Uganik Bay and Danger Bay sections; and 2) announcements of inperiod fishery closures in sections that follow the standard fishing schedule. When a preseason GHF 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, inperiod closures are likely. When inperiod closures are necessary, there may be as little as 5 minutes advance notice prior to the closure time, or less if appropriate. Inperiod 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 inseason. 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 Dispatch #7410.
- 2) Contact ADF&G field personnel on VHF channel 6 or using Dispatch (R/V *K-Hi-C*: #7412, RV *Resolution* #7411).
- 3) Contact any local herring processor for the latest Kodiak herring news release.
- 4) Call the ADF&G 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) News releases may also be searched for and subscribed to on the internet at <http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main>.
- 7) 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 2019 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.



## **TABLES AND FIGURES**

Table 1.–KMA districts and management sections, GHLS, closed sections, and district allocation percentages for the herring sac roe fishery, 2019.

Statistical area	Management section	GHLS 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	65	65	Closed
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	150	150	Closed
SA50	Litnik	Closed	-	-
SA60	Duck Bay	Closed	-	-
Total All Afognak Districts		275	215	60
District Allocation Percentage			78.2%	21.2%
Uganik District				
UG10	Kupreanof	Closed	-	-
UG20	Viekoda Bay	15	Closed	15
UG21	Terror Bay	15	Closed	15
UG30	Village Islands	150	150	Closed
UG31	West Uganik Passage	30	Closed	30
UG32	NE Arm Uganik Bay	UG30, UG32, UG33, and UG34 will be managed as one section.		
UG33	East Arm Uganik Bay	UG30, UG32, UG33, and UG34 will be managed as one section.		
UG34	South Arm Uganik Bay	UG30, UG32, UG33, and UG34 will be managed as one section.		
UG40	Offshore Uganik	Closed	-	-
District Total		210	150	60
District Allocation Percentage			71.4%	28.6%
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	50	50	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		175	125	50
District Allocation Percentage			71.4%	28.6%
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	30	30	Closed
EA22	Newman Bay	Exploratory	Exploratory	Exploratory
EA23	W. Sitkalidak Strait	75	75	Closed
EA24	Barling Bay	40	Closed	40
EA30	E. Sitkalidak Strait	125	125	Closed
EA31	Tanginak Anchorage	Exploratory	Exploratory	Exploratory
EA40	Outer Sitkalidak	Closed	-	-
EA41	Boulder Bay	Closed	-	-
EA42	Shearwater Bay	75	Closed	75
EA43	Outer Kiliuda Bay	150	150	Closed
EA44	Inner Kiliuda Bay	EA43 and EA44 will be managed as one section.		
EA50	Outer Ugak Bay	150	150	Closed
EA51	Inner Ugak Bay	50	Closed	50
EA52	Pasagshak Bay	Closed	-	-
District Total		695	530	165
District Allocation Percentage			76.3%	23.7%

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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	-	-
District Total		20	0	20
District Allocation Percentage			0%	100%
Inner Marmot District				
IM10	Monashka Bay	Closed	-	-
IM20	Anton Larsen Bay	Closed	-	-
IM30	Sharatin Bay	Closed	-	-
IM40	Kizhuyak Bay	30	30	Closed
IM50	Spruce Island	Closed	-	-
District Total		30	30	0
District Allocation Percentage			100%	0%
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		1,405	1,050	355
Allocation Percentage All Districts			74.7%	25.3%

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 2018.

Year	GHL (tons)	Total harvest (tons)	Harvest (tons) by gear type		Percent harvest by gear type		Number of landings by gear type		Units of gear fished		Average catch (tons) by gear		Estimated average earnings <sup>a</sup>		Price per ton <sup>a</sup>	Estimated exvessel total value <sup>a</sup>
			Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet		
1979	2,400	1,735	1,457	278	84%	16%	-	-	57	125	26	2	\$38,342	\$3,336	\$1,500	\$2,602,500
1980	2,400	2,383	2,009	374	84%	16%	-	-	92	109	22	3	\$15,068	\$2,368	\$690	\$1,644,270
1981	2,400	2,065	1,596	469	77%	23%	207	406	79	114	20	4	\$14,647	\$2,983	\$725	\$1,497,125
1982	2,400	1,771	1,447	324	82%	18%	138	191	45	67	32	5	\$17,686	\$2,660	\$550	\$974,050
1983	2,400	2,319	1,797	522	77%	23%	164	284	41	64	44	8	\$35,063	\$6,525	\$800	\$1,855,200
1984	2,400	2,163	1,691	472	78%	22%	138	212	39	69	43	7	\$34,687	\$5,472	\$800	\$1,730,400
1985	2,000	1,968	1,244	724	63%	37%	118	348	34	81	37	9	\$32,929	\$8,044	\$900	\$1,771,200
1986	1,690	1,558	1,110	448	71%	29%	132	385	31	71	36	6	\$34,016	\$5,994	\$950	\$1,480,100
1987	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	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	2,415	2,249	1,513	736	67%	33%	171	627	37	83	41	9	\$34,758	\$7,537	\$850	\$1,911,650
1990	2,375	2,347	1,644	703	70%	30%	156	544	27	63	61	11	\$51,756	\$9,485	\$850	\$1,994,950
1991	2,510	2,432	1,697	735	70%	30%	169	587	32	64	53	11	\$45,077	\$9,762	\$850	\$2,067,200
1992	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	3,525	4,929	4,203	726	85%	15%	237	294	41	86	103	8	\$56,382	\$4,643	\$550	\$2,710,950
1994	4,550	5,893	4,976	917	84%	16%	285	485	66	57	75	16	\$60,315	\$12,870	\$800	\$4,714,400
1995	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	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	3,435	3,235	2,629	606	81%	19%	183	418	64	59	41	10	\$20,539	\$5,136	\$500	\$1,617,500
1998	2,030	2,057	1,954	103	95%	5%	110	26	35	7	56	15	\$27,914	\$7,357	\$500	\$1,028,500
1999	1,495	1,651	1,589	62	96%	4%	94	16	31	5	51	12	\$33,984	\$8,221	\$663	\$1,094,613
2000 <sup>b</sup>	1,735	1,370	1,290	80	94%	6%	57	23	31	10	42	8	\$29,129	\$5,600	\$700	\$959,000
2001	1,540	1,694	1,412	282	83%	17%	67	37	33	9	43	31	\$21,394	\$15,667	\$500	\$847,000
2002	1,860	1,677	1,274	403	76%	24%	37	50	30	14	42	29	\$21,233	\$14,393	\$500	\$838,500
2003	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	Total		Harvest		Percent		Number of		Units of gear		Average catch		Estimated		Price	Estimated
	GHLL harvest		(tons)		harvest by		landings by		fished		(tons) by gear		average			
	(tons)	(tons)	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	earnings <sup>a</sup>	per
2004	2,850	3,167	2,894	273	91%	9%	95	36	27	11	107	25	\$53,593	\$12,409	\$500	\$1,583,500
2005	3,475	3,463	2,932	531	85%	15%	134	61	32	12	92	44	\$45,813	\$22,125	\$500	\$1,731,500
2006	3,705	2,643	2,617	26	99%	1%	86	<sup>c</sup>	21	<sup>c</sup>	125	<sup>c</sup>	\$34,270	<sup>c</sup>	\$275	\$726,825
2007	4,000	2,546	2,510	36	99%	1%	105	8	21	3	120	12	\$47,810	\$4,800	\$400	\$1,018,400
2008	4,290	3,099	3,086	13	99.6%	0.4%	108	<sup>c</sup>	22	<sup>c</sup>	140	<sup>c</sup>	\$73,643	<sup>c</sup>	\$525	\$1,626,975
2009	4,765	4,759	4,549	210	96%	4%	218	19	31	6	147	35	\$77,040	\$18,375	\$525	\$2,498,475
2010	6,075	5,701	5,538	163	97%	3%	277	14	36	7	154	23	\$61,533	\$9,314	\$400	\$2,280,400
2011	6,135	2,957	2,937	20	99%	1%	95	6	14	3	210	7	\$41,957	\$1,333	\$200	\$591,400
2012	5,355	4,260	4,253	7	99.8%	0.2%	164	<sup>c</sup>	23	<sup>c</sup>	185	<sup>c</sup>	\$55,474	<sup>c</sup>	\$300	\$1,278,000
2013	5,410	4,447	4,298	149	97%	3%	189	18	33	5	130	30	\$29,956	\$6,854	\$230	\$1,022,810
2014	5,830	2,463	2,463	0	100%	0%	99	0	21	0	117	0	\$11,729	\$0	\$100	\$246,300
2015	3,190	357	357	0	100%	0%	19	0	9	0	40	0	\$4,363	\$0	\$110	\$39,270
2016	1,670	365	365	0	100%	0%	15	0	3	0	122	0	\$15,817	\$0	\$130	\$47,450
2017	1,645	125	124	1	99%	1%	6	<sup>c</sup>	3	<sup>c</sup>	41	<sup>c</sup>	\$6,613	<sup>c</sup>	\$160	\$20,000
2018	1,185	226	226	0	100%	0%	8	0	3	0	75	0	\$15,067	\$0	\$200	\$45,200
Average																
1979 to 2017	3,119	2,678	2,295	383	85%	15%	138	253	36	45	75	13	\$38,663	\$8,514	\$644	\$1,763,705
10 year avg.																
2008 to 2017	4,437	2,853	2,797	56	99%	1%	119	8	20	3	129	14	\$37,812	\$5,125	\$268	\$965,108
5 year avg.																
2013 to 2017	3,549	1,551	1,521	30	99%	1%	66	5	14	1	90	7	\$13,696	\$1,714	\$146	\$275,166

<sup>a</sup> Exvessel values are based on dock delivered herring and inseason data.

<sup>b</sup> Beginning in 2000, an allocative harvest strategy was in effect.

<sup>c</sup> Confidentiality requirements prohibit the release of this information.

Table 3.—Alaska Department of Fish and Game, Division of Commercial Fisheries management staff, KMA, 2019.

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<b>Office Staff</b>	
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

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<b>Field Staff</b>	
<i>R/V K-Hi-C:</i>	
Boat Officer	Danny Wilson
Management Biologists	Geoff Spalinger/James Jackson
 <i>R/V Resolution:</i>	
Boat Officer	Denis Cox
Management Biologist	Todd Anderson
 <i>Eastside Crew:</i>	
Fishery Biologist	Brad Fuerst
Fishery Technician	Judy Young

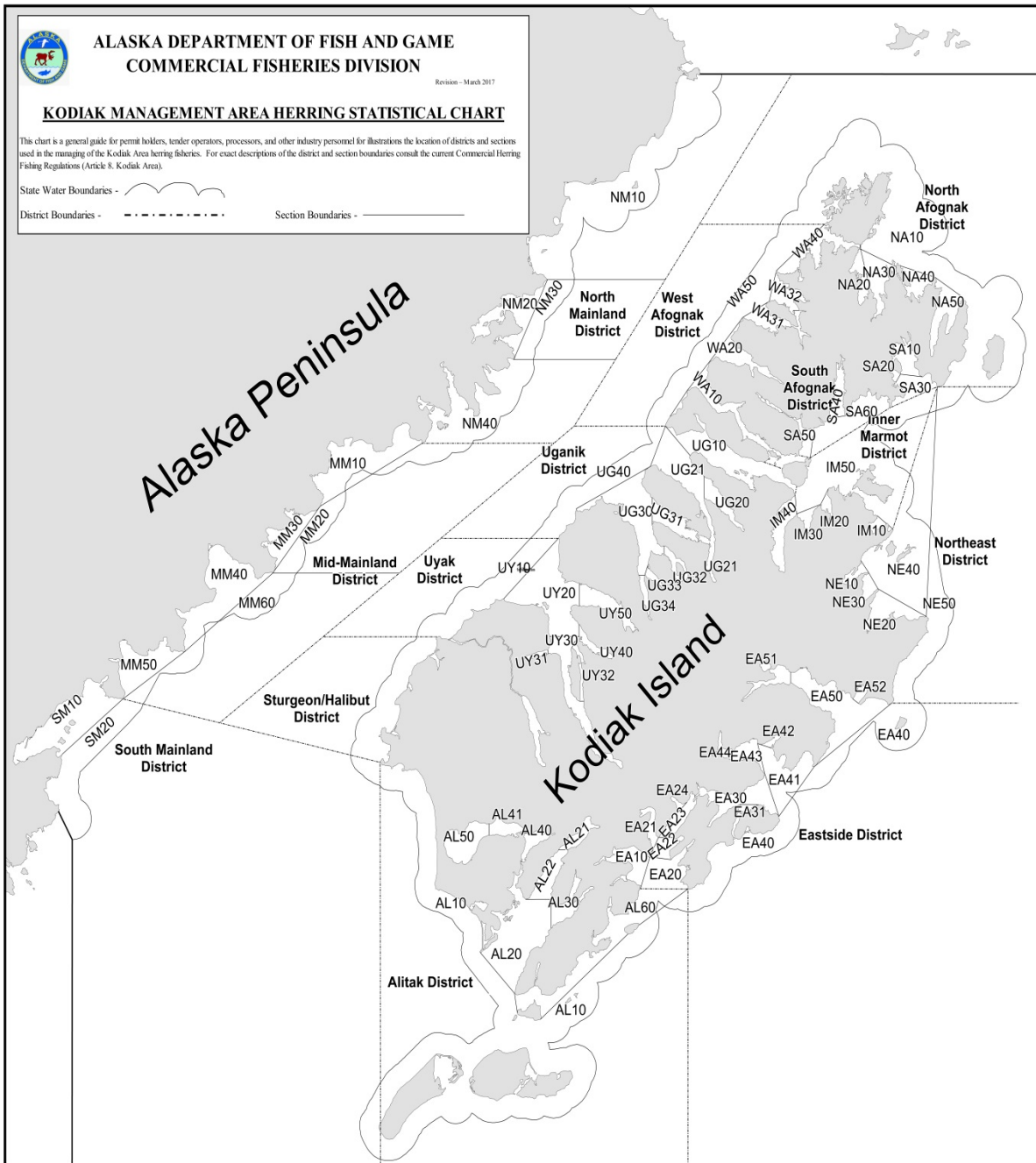


Figure 1.-Map of the Kodiak herring sac roe fishery harvest areas.