

Fishery Management Report No. 15-12

Kodiak Management Area Herring Sac Roe Fishery Harvest Strategy for the 2015 Season

by

Geoff Spalinger

March 2015

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

FISHERY MANAGEMENT REPORT NO. 15-12

**KODIAK MANAGEMENT AREA HERRING SAC ROE FISHERY
HARVEST STRATEGY FOR THE 2015 SEASON**

by

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ABSTRACT

This report describes the harvest strategy for the 2015 Kodiak Management Area (KMA) commercial Pacific herring *Clupea pallasii* sac roe fishery and includes the 2015 guideline harvest levels (GHLs) by section, management changes from previous years, and reporting and registration requirements. The 2015 KMA areawide GHL is 3,190 tons, and individual GHLs have been established for 37 sections. The areawide GHL is divided between purse seine gear and gillnet gear due to a regulatory allocative management plan (5AAC 27.535). The purse seine GHL is 2,425 tons (76.0% of the areawide GHL), and the gillnet GHL is 765 tons (24.0% of the areawide GHL).

There will be two 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. To prevent gear conflicts and ease management of the fisheries where both gear types have an allocation, fishing will occur by each gear type on alternating days.

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 2015 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 2015 fishery.

The Kodiak herring sac roe fishery begins April 15 and lasts until June 30 (5AAC 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 (5AAC 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.

2015 HARVEST STRATEGY

GUIDELINE HARVEST LEVELS

For the 2015 season, GHLS have been established for 37 of 81 sections (Table 1). Thirteen sections had little or no harvest during the last 10 years and are designated as exploratory in 2015. Exploratory areas are open to both gear types and have no set GHL. The remaining 31 sections will remain closed, based on either low abundance or lack of herring sac roe harvests.

The 2015 area-wide GHL of 3,190 tons (Table 1) is a decrease of 2,640 tons from the 2014 GHL of 5,830 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 GHL 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 GHL for the district allocated to the gillnet permit holders and 70–80% allocated to the purse seine permit holders (5AAC 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.

After April 30, permit holders must be registered with ADF&G before participating in the sac roe herring fishery (5AAC 27.510 (a)(4)). From May 1 through June 30, ADF&G may open any area with remaining GHL to any gear group if the fishery is not likely to result in overharvest (5AAC 27.535 (e)(1)(C)).

Of the total 3,190 ton GHL, 2,425 tons of herring (76.0%) will be allocated to purse seine permit holders, and 765 tons (24.0%) 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 2015 sac roe herring season ((5AAC 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 Deadman and Inner Deadman bays

The following sections will be assigned to both purse seine and gillnet gear in order to achieve the allocative split by gear type within a district, and each will be assigned a portion of the GHL:

- The combined Village Islands/Uganik Bay sections
- The Danger Bay Section

The remaining sections will be assigned as follows:

Purse Seine*	Gillnet*	Exploratory (both gear types)
Izhut/Kitoy/MacDonald	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
Barling Bay	Sulua Bay	Inner Kukak Bay
East Sitkalidak Strait	Lower Olga Bay	Inner Katmai Bay
Outer Kiliuda Bay	Shearwater Bay	Alinchak Bay
Outer Ugak Bay	Inner Kiliuda Bay	Puale Bay
	Inner Ugak Bay	Portage Bay
	Pasagshak Bay	Wide Bay
	Womens Bay	
	Kalsin Bay	
	Anton Larsen Bay	
	Sheratin Bay	

*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 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 (5AAC 27.510 (a)(1)).
- For gillnet permit holders: from April 15 through June 30, fishing periods for gillnet permit holders are from noon on odd-numbered days until noon on even-numbered days (5AAC 27.510 (a)(2)). Continuous fishing, announced by EO, may 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 (5AAC 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 2015. 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 field crew can be stationed 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 GHL of 500 tons (Table 1). In order to properly allocate herring within the Uganik District, both purse seine and gillnet gear will be allowed to fish within these combined sections. For the Village Islands/Uganik Bay sections, the purse seine GHL is 450 tons (Table 1).

These sections 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 these sections are urged to contact the management biologist at 10:00 a.m. Wednesday, April 15, aboard the R/V *K-Hi-C* to volunteer for test fishing and discuss how the fishery will be managed.

To alleviate the potential for gear conflicts, it is expected that the Village Islands/Uganik Bay sections will open by gear type and be separated by time. ADF&G will attempt to prosecute purse seine fisheries on odd-numbered days. In April fishing time will likely begin at noon and will not continue past 9:00 p.m. Once the GHL for one gear type has been met, fishing time for the other gear type may occur on any day until the GHL is met.

Danger Bay Section

The Danger Bay Section will be managed with a total GHL of 800 tons (Table 1). In order to properly allocate herring within the Afognak districts, both purse seine and gillnet gear will be allowed to fish within this section. For the Danger Bay Section, the purse seine GHL is 625 tons (Table 1).

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 *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. Wednesday, April 15, aboard the R/V *Resolution* to volunteer for test fishing and discuss how the fishery will be managed.

To alleviate the potential for gear conflicts, it is expected that the Danger Bay Section will open by gear type and be separated by time. ADF&G will attempt to prosecute purse seine fisheries on odd-numbered days. In April fishing time will likely begin at noon and will not continue past 9:00 p.m. Once the GHL for one gear type has been met, fishing time for the other gear type may occur on any day until the GHL is met.

Permit holders wishing to fish in these sections are urged to meet with the management biologist aboard the R/V *Resolution* or R/V *K-Hi-C* to volunteer for test fishing and to discuss how the fishery will be managed.

GILLNET FISHERY MANAGEMENT

Gillnet fishing periods for most sections will be modified by EO to allow continuous fishing. However, the Village Islands/Uganik Bay and Danger Bay sections will not follow this schedule.

Village Islands/Uganik Bay sections

In order to properly allocate herring within the Uganik District, both purse seine and gillnet gear will be allowed to fish within these combined sections. For the Village Islands/Uganik Bay sections, the gillnet permit holders GHL is 50 tons (Table 1).

Gillnet fishing periods will begin after at least 1 successful purse seine fishing period has occurred. This should ensure that high quality herring are present on the grounds. For gillnet gear, fishing periods will be established by EO and likely begin shortly after the last purse seine fishing period for that day. Gillnet fishing periods are likely to be at least 24 hours in length.

If no gillnetters are on the grounds the day following a purse seine opening, ADF&G may allow another day of purse seine fishing. Gillnetters are encouraged to contact the ADF&G biologist onboard the R/V *K-Hi-C* if they intend to fish this section. Once the GHL for one gear group has been met, the fishing time for the other gear type that has not met its allocation could occur on any day.

Danger Bay Section

In order to properly allocate herring within the Afognak districts, both purse seine and gillnet gear will be allowed to fish the Danger Bay Section. The GHL for gillnet permit holders is 125 tons (Table 1).

Gillnet fishing periods will begin after at least 1 successful purse seine fishing period has occurred. This should ensure that high quality herring are present on the grounds. For gillnet gear, fishing periods will be established by EO and likely begin shortly after the last purse seine fishing period for that day. Gillnet fishing periods are likely to be at least 24 hours in length.

If no gillnetters are on the grounds the day following a purse seine opening, ADF&G may allow another day of purse seine fishing. Gillnetters are encouraged to contact the ADF&G biologist onboard the R/V *Resolution* if they intend to fish this section. Once the GHL for one gear group has been met, the fishing time for the other gear type that has not met its allocation could occur on any day.

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 GHL 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

Management of the herring sac roe fishery relies primarily on analysis of harvest data collected by ADF&G field crews. Timely harvest reporting is essential to managing the Kodiak herring fishery. In addition to the management biologists aboard the R/V *Resolution* and the R/V *K-Hi-C*, field crews will be stationed in mobile camps in sections where the highest fishing activity is expected (Table 3). Field crews will initially be stationed in Amee Bay and Kiliuda Bay. On-the-grounds monitoring of fisheries is limited or unavailable in many sections and may occur incidentally to monitoring efforts in adjacent sections. 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.

Permit holders and tender operators are encouraged to keep ADF&G field crews aware of herring harvests. In exploratory sections and sections where a field crew is not present, fishermen, tenders, or buyers should immediately contact area management biologists in Kodiak, or onboard the R/V *Resolution* or the R/V *K-Hi-C*, when a harvest occurs. 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 field crews or 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 field crews and 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 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. 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.

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 (5AAC 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.

PERMIT HOLDER REGISTRATION

After April 30, CFEC permit holders must be registered with ADF&G before participating in the sac roe herring fishery (5 AAC 27.510 (a)(4)). Permit holders may register either in the Kodiak office or with an ADF&G field crew. 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)).

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 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, 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 GHF.

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

Geoff Spalinger – 952-567-1420

Todd Anderson – 701-214-7667

HERRING TEST FISHERY PROGRAM

A herring test fishery program is proposed for the 2015 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, 2015.

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	Closed	Closed
WA32	Foul Bay	Closed	Closed	Closed
WA40	Blue Fox/Devil's Inlet	Exploratory	Exploratory	Exploratory
WA50	Offshore W. Afognak	Closed	-	-
South Afognak District				
SA10	Izhut Bay	50	50	CLOSED
SA20	Kitoi 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	800	625	175
SA50	Litnik	Closed	-	-
SA60	Duck Bay	Closed	-	-
Total All Afognak Districts		910	675	235
District Allocation Percentage			74.2%	25.8%
Uganik District				
UG10	Kupreanof	Closed	-	-
UG20	Viekoda Bay	20	Closed	20
UG21	Terror Bay	20	Closed	20
UG30	Village Islands	500	450	50
UG31	West Uganik Passage	40	Closed	40
UG32	NE Arm Uganik Bay	* Note: UG30, UG32, UG33, and UG34 will be managed as one section with 450 ton GHLS for purse seine gear and 50 ton GHLS for gillnet gear.		
UG33	East Arm Uganik Bay			
UG34	South Arm Uganik Bay			
UG40	Offshore Uganik	Closed	-	-
District Total		580	450	130
District Allocation Percentage			77.6%	22.4%
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			-	-

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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	50	50	Closed
AL21	Inner Deadman Bay	175	175	Closed
AL22	Outer Deadman Bay	*AL21 and AL22 will be managed as one section.		
AL30	Sulua Bay	50	Closed	50
AL40	Lower Olga	50	Closed	50
AL41	East Upper Olga Bay	50	50	Closed
AL50	West Upper Olga Bay	50	50	Closed
AL60	Geese/Twoheaded	Exploratory	Exploratory	Exploratory
District Total		425	325	100
District Allocation Percentage			76.5%	23.5%
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	50	50	Closed
EA22	Newman Bay	Exploratory	Exploratory	Exploratory
EA23	W. Sitkalidak Strait	150	150	Closed
EA24	Barling Bay	75	75	Closed
EA30	E. Sitkalidak Strait	200	200	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	75	Closed	75
EA50	Outer Ugak Bay	250	250	Closed
EA51	Inner Ugak Bay	100	Closed	100
EA52	Pasagshak Bay	10	Closed	10
District Total		1,135	875	260
District Allocation Percentage			77.1%	22.9%

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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	10	Closed	10
IM30	Sharatin Bay	10	Closed	10
IM40	Kizhuyak Bay	100	100	Closed
IM50	Spruce Island	Closed	-	-
Total Ne/Im Districts		140	100	40
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				
		3,190	2,425	765
Allocation Percentage All Districts			76.0%	24.0%

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 2014.

	Season		Harvest		Percent		Number of		Units of Gear		Average catch		Estimated		Price	Estimated	
	length	GHL	Total harvest	(tons)		harvest by		landings by		Fished		(tons) by gear		average earnings ^a			
				by gear type	gear type	gear type	gear type	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet				Seine
Year	(Days)	(Tons)	(Tons)	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Ton ^a	total value ^a
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.

	Season		Harvest			Percent		Number of		Units of Gear		Average catch		Estimated		Price	Estimated
	length	GHL	Total harvest	(tons)	by gear type	harvest by gear type	gear type	landings by gear type	gear type	Fished		(tons) by gear		average earnings ^a		per	exvessel
Year	(Days)	(Tons)	(Tons)	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Seine	Gillnet	Ton ^a	total value ^a
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
Average																	
1979 to 2013	55	3,123	2,889	2,463	426	84%	16%	150	278	39	49	74	15	\$41,982	\$9,313	\$703	\$1,955,185
10 Year																	
2004 to 2013	48	4,606	3,704	3,561	143	96%	4%	147	23	26	7	141	25	\$52,109	\$10,744	\$386	\$1,435,829
5 Year																	
2009 to 2013	57	5,548	4,425	4,315	110	98%	2%	189	14	27	5	165	24	\$53,192	\$8,969	\$331	\$1,534,217

^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, 2015.

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	Geoff Spalinger/James Jackson
<i>R/V Resolution:</i>	
Boat Officer	Denis Cox
Management Biologists	Todd Anderson/James Jackson
<i>Field Crew #1:</i>	
Fishery Technician	Aaron Johnson
Fishery Technician	Jayna Phillips
Fishery Biologist	Brad Fuerst

