Regional Information Report No. 4K18-06

Alaska Peninsula-Aleutian Islands Herring Sac Roe and Food and Bait Fisheries Annual Management Report, 2017

By

Lucas K. Stumpf

May 2018

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

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	'
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	"
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

REGIONAL INFORMATION REPORT NO. 4K18-06

ALASKA PENINSULA-ALEUTIAN ISLANDS HERRING SAC ROE AND FOOD AND BAIT FISHERIES ANNUAL MANAGEMENT REPORT, 2017

by
Lucas K. Stumpf
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

May 2018

The Regional Information Report Series was established in 1987 and was redefined in 2007 to meet the Division of Commercial Fisheries regional need for publishing and archiving information such as area management plans, budgetary information, staff comments and opinions to Alaska Board of Fisheries proposals, interim or preliminary data and grant agency reports, special meeting or minor workshop results and other regional information not generally reported elsewhere. Reports in this series may contain raw data and preliminary results. Reports in this series receive varying degrees of regional, biometric and editorial review; information in this series may be subsequently finalized and published in a different department reporting series or in the formal literature. Please contact the author or the Division of Commercial Fisheries if in doubt of the level of review or preliminary nature of the data reported. Regional Information Reports are available through the Alaska State Library and on the Internet at: http://www.adfg.alaska.gov/sf/publications/.

Lucas K. Stumpf
Alaska Department of Fish and Game, Division of Commercial Fisheries
351 Research Court, Kodiak, AK 99615, USA

This document should be cited as follows:
Stumpf, L. K., 2018. Alaska Peninsula-Aleutian Islands herring sac roe and food and bait fisheries annual management report, 2017. Alaska Department of Fish and Game, Regional Information Report No. 4K18-06, Kodiak.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ABSTRACT

This report presents information concerning commercial Pacific herring *Clupea pallasii* sac roe and food and bait fisheries that occurred in the Alaska Peninsula-Aleutian Islands Management Area (Area M) in 2017. Area M is split into three sub-areas: North Alaska Peninsula, South Alaska Peninsula, and Aleutian Islands.

A total of 1,050 tons of herring biomass was estimated by aerial survey in the waters of the North Peninsula; 1,492 tons were harvested for the commercial herring sac roe fishery during 2017. In 2017, no aerial surveys were conducted by the Alaska Department of Fish and Game in the waters of the South Peninsula and a commercial herring sac roe fishery did not occur due to lack of industry interest.

In 2017, commercial food and bait herring harvests occurred in the Aleutian Islands during seine gear fishing periods. Aleutian Islands "Dutch Harbor" food and bait herring allocation was set at 1,727 tons, of which 1,485 tons were allocated to the seine fleet and 242 tons to the gillnet fleet. A total of 1,270 tons of herring were harvested in the seine fishery, but there was no participation by the gillnet fleet during the 2017 season. The Adak food and bait herring fishery allocation is set at a fixed 500 tons, no aerial surveys were conducted, and a commercial harvest did not occur due to the lack of industry interest.

Key words: Area M, Alaska Peninsula, Aleutian Islands, *Clupea pallasii*, Adak, herring, harvest, age, length, weight, sac roe, food, bait, combine, Dutch Harbor, AMR.

INTRODUCTION

This report is a summary of commercial Pacific herring *Clupea pallasii* sac roe and food and bait fisheries that occurred in the Alaska Peninsula–Aleutian Islands Management Area (Area M) during the 2017 season. This report is intended as a reference document and provides a description of harvest strategies, includes a summary of the 2017 fishery management activities, as well as age, weight, and length (AWL) data collected from commercial harvests. Harvest information was taken from the Alaska Department of Fish and Game (ADF&G) fish ticket database in November 2017. Data provided in this report supersedes any data previously published by ADF&G.

Area M herring fisheries are divided into three sub-areas: North Alaska Peninsula, South Alaska Peninsula, and Aleutian Islands (Figure 1). The North Alaska Peninsula area consists of Bering Sea waters extending west from Cape Menshikof to Cape Sarichef, encompassing Port Heiden, Port Moller and Amak districts (Figures 1–4). The South Alaska Peninsula area consists of Pacific Ocean waters extending west of Kupreanof Point to a point on the south side of Unimak Island near Cape Lazaref (163°30' W long.) and includes King Cove, Pavlof, and Sand Point districts (Figures 1, 4, and 5). The Aleutian Islands area consists of Bering Sea waters extending west of Cape Sarichef and Pacific Ocean waters west of a point near Cape Lazaref (163°30' W long.) to the International Date Line and includes the Unimak, Akutan, Unalaska, Umnak, and Adak districts (Figure 1 and Figures 6–8; 5 AAC 27.600 and 27.605).

NORTH ALASKA PENINSULA SAC ROE FISHERY

HISTORICAL PERSPECTIVE

The ADF&G has been conducting herring biomass surveys in the Alaska Peninsula-Aleutian Islands waters since 1976. In that time, major concentrations of herring have been documented on the Bering Sea coast from Adak to the Port Heiden District (Figures 1–4 and Figure 8; Table 1; Shaul et al. 1982; Warner and Shafford 1979). However, these surveys have provided limited and variable information on herring abundance and distribution primarily because of limited

aerial survey coverage due to the large area involved, inclement weather conditions, water turbidity, lack of available staff, and suitable aircraft.

Prior to 1982, fishing vessels returning from the Togiak herring sac roe fishery frequently surveyed for herring in North Alaska Peninsula waters, but no harvest occurred (Shaul et al. 1982). Beginning in 1986, fishermen started targeting the earlier (May) herring biomass, effectively harvesting early run stocks. From 1989 through 1992, ADF&G delayed the opening of the fishery in the Port Moller District until May 30 in an attempt to shift fishing pressure to the later and more abundant herring stocks (Witteveen et al. 1999). In some years, the Port Moller District had opened to herring fishing prior to May 30, due to sufficient herring biomass (Tables 1 and 2). There was not a herring fishery in the North Peninsula area from 1999 through 2004 due to either low biomass estimates or the lack of industry interest in purchasing herring. In 2005, ADF&G opened the first sac roe fishery in North Alaska Peninsula waters since 1998. From 2006 to the present the fishery has intermittently opened when there has been sufficient industry interest (Table 3).

HARVEST STRATEGY

Herring may be commercially harvested each spring for their sac roe from April 15 through July 15 in the Amak, Port Moller, and Port Heiden districts (Figures 2–4; 5 AAC 27.610). The guideline harvest level (GHL) for the Port Moller District is determined inseason and is based on observed mature herring biomass from aerial surveys. As established in the *Bering Sea Herring Fishery Management Plan* (5 AAC 27.060(c)), a minimum herring biomass threshold of 1,000 tons is required prior to ADF&G opening the commercial fishery in the Port Moller District. Once assured that a biomass threshold of 1,000 tons has been observed, ADF&G determines an allowable harvest rate based on a sliding scale of the estimated mature biomass. At low biomass levels (1,001–1,999 tons), a conservative exploitation rate of 10 percent is allowed. If the observed biomass is between 2,000 and 2,999 tons, allowable exploitation increases from 10 percent to 15 percent. When the observed biomass reaches 3,000 tons or greater, ADF&G will manage the fishery with an exploitation rate up to but not to exceed 20 percent (5 AAC 27.060(b)).

2017 SEASON SUMMARY

In 2017, a commercial herring sac roe fishery occurred from May 8 through May 9 in the Port Moller District of the North Alaska Peninsula (Table 2). A total biomass estimate of 1,050 tons of herring was observed in the Port Moller District during an aerial survey on the North Alaska Peninsula therefore a 10% exploitation rate was allowed (Table 1). No reported biomass of herring was observed in the Amak or Port Heiden districts in 2017. Total North Alaska Peninsula herring harvest was 1,492 tons which occurred in the Herendeen Bay and Bear River sections (Figure 3, Table 3).

SOUTH ALASKA PENINSULA SAC ROE FISHERY

HISTORICAL PERSPECTIVE

The harvest of herring sac roe has fluctuated in the South Alaska Peninsula waters since it began in 1979 (Shaul et al. 1991; Tables 2). The majority of the fishing effort has occurred around the Shumagin Islands, and Stepovak, Pavlof, and Canoe bays (Figures 4 and 5). Of these, only

Canoe Bay has produced a consistent annual harvest. Beginning in 1992, herring fishing effort and harvests gradually diminished in South Alaska Peninsula waters (Table 2). Many bays may have small harvestable quantities of herring but the cost of having fishing vessels, tenders, and airplanes available to harvest the small guideline harvest level from each section has discouraged both fishermen and processors. There has been no commercial herring sac roe fishery in the South Alaska Peninsula since 1996 (Table 2).

From 1981 to 1995 ADF&G used field crews on the Alaska Peninsula to observe the herring sac roe fisheries (McCullough and Campbell 1996). ADF&G personnel collected herring samples for age, weight, length, and sexual maturity. In addition, ADF&G personnel documented spawning areas and mapped spawning substrate. In 1996, ADF&G discontinued utilizing herring sac roe fishery field crews on the Alaska Peninsula due to budget constraints.

HARVEST STRATEGY

Herring may be commercially harvested each spring for their sac roe from April 15 through July 15 in the Sand Point, Pavlof, and King Cove districts (Figures 4 and 5; 5 AAC 27.610). The South Alaska Peninsula herring sac roe fishery is opened by emergency order with individual sections assigned GHLs of no more than 25 tons with the potential of additional harvest opportunity if warranted by ADF&G surveys (Jackson 2007).

2017 SEASON SUMMARY

In 2017, no commercial herring fishery occurred in South Alaska Peninsula waters due to a lack of industry participation. No aerial surveys were conducted in South Alaska Peninsula waters due to minimal industry interest and budget constraints.

ALEUTIAN ISLANDS "DUTCH HARBOR" HERRING FOOD AND BAIT FISHERIES

HISTORICAL EFFORT

From 1929 through 1938 and in 1945, herring food and bait fisheries occurred in the vicinity of Unalaska Bay (Table 5; Figures 6 and 7). During that time, a mixture of gillnet, seine gear, and holding pounds were used and there were numerous, small, shore-based hand packing operations. A large portion of the catch was brined for either food or bait purposes. In those early years, seine gear provided the bulk of the herring harvest (Schwarz 1988). From 1946 through 1980, there was no commercial herring harvest.

When the fishery resumed in 1981, herring were harvested from Tigalda Island to Umnak Island (Figure 7). However, the majority of harvest occurred within several miles of shore-based processing facilities in Unalaska and Akutan bays. From 1981 through 1986, 1990 through 1996, and 1998 through 2000, only purse seine gear was used to harvest herring in the Dutch Harbor food and bait fishery (Table 6). Additionally, in 1987, 1989, and 1997, gillnet permit holders recorded landings.

REGULATORY HISTORY

During the 1981 and 1982 seasons, there were no harvest restrictions (Schwarz 1988). From 1983 through 1985, the board of fisheries (BOF) implemented a harvest ceiling of 3,527 tons. In 1986, ADF&G was directed by the BOF to reduce the established harvest ceiling of 3,527 tons to 2,453 tons over concern for depressed western Alaska herring stocks.

In 1988, the BOF implemented the *Bering Sea Herring Fishery Management Plan* (5 AAC 27.060(c) and (d)) that established the criteria for calculating the Dutch Harbor food and bait herring allocation. The plan directs ADF&G to manage the fishery so that the overall exploitation of a herring stock should not exceed 20% of the spawning biomass (Appendix A). The dominant stock harvested in the Dutch Harbor food and bait fishery is from the Togiak spawning stock (Rowell et al. 1991). An allocation plan between the Togiak sac roe and spawn on kelp fisheries, and the Dutch Harbor food and bait fishery, was established to prevent harvest from exceeding 20% of observed spawning biomass (Appendix B). The Dutch Harbor food and bait fishery was allocated 7% of the Togiak District harvestable biomass after deducting 1,500 tons for the Togiak District spawn-on-kelp fishery (5 AAC 27.865 (b)(7)).

In 1990, the BOF changed the opening date of the food and bait fishery from July 16 to August 15 to reduce the chance of catching non-Togiak and North Alaska Peninsula herring stocks (Rowell et al. 1991). In 1998, the BOF changed the opening date of the food and bait fishery for purse seine gear to noon on July 15 because of safety concerns with the fishery being conducted in the dark (5 AAC 27.610(e)(2)(B); Witteveen et al. 1999). The food and bait fishery for gillnet gear may open as early as noon on June 24.

Due to participation by gillnet permit holders, in 2001 the BOF adopted a regulation that allocated 7% of the total Dutch Harbor GHL to the gillnet fleet. From 2001 through 2003, the number of gillnet fishermen increased from 6 to 13 vessels (Tables 5 and 6) leading to a further increase in allocation by the BOF to 14% for the gillnet fleet in 2004 (5 AAC 27.655).

Additionally, in 2004 the BOF established a herring seine and pound fishery in Alaska Peninsula-Aleutian Islands Management Area with an allocation of 100 tons (5 AAC 27.655(c)). In a pound fishery, seine-caught herring are transferred to a holding pound and retained for several days for gut clearance. The rationale for this was to minimize belly burn and achieve a high-quality product suitable for food markets. However, no significant amounts of herring were placed into the pounds.

HARVEST STRATEGY

In recent years, three management plans, (1) the *Bering Sea Herring Fishery Management Plan* (5AAC 27.060); (2) the *Bristol Bay Herring Management Plan* (5 AAC 27.865 (b)(7)); and (3) the *Dutch Harbor Food and Bait Herring Allocation Plan* (5 AAC 27.655), have been used to manage the Aleutian Islands "Dutch Harbor" food and bait herring fishery. Fishing time is established by emergency order and is based on a 7% allocation of allowable Togiak biomass harvest (5 AAC 27.060 (d)), the inseason evaluation of the observed biomass, effort levels, and harvest.

In order for the Unimak, Akutan, Unalaska, or Umnak districts (Figures 1 and 7) to open to herring food and bait fishing, certain western Alaska herring stocks (Togiak, Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, Nunivak Island, Cape Romanzof, and Norton

Sound) must surpass their respective BOF mandated spawning biomass thresholds (5 AAC 27.060 (c) and (h); Appendix A and B). The biomass estimates are updated by ADF&G for each stock as herring move into coastal waters during spawning migrations.

The *Dutch Harbor Food and Bait Herring Allocation Plan* (5 AAC 27.655) allocates between gear groups with 86% allocated to the seine fishery and 14% to the gillnet fishery. These allocations are considered independent of each other so that one gear group may not harvest herring allocated to the other gear group until July 20. After July 20, if the gillnet fishery has not harvested its allocation, the remaining allocation may be taken by either group. Additionally, if the seine group exceeds its allocation before July 20, then that overage shall be deducted from any remaining gillnet quota for that year after July 20. However, if the seine group exceeds the total allocation after July 20, then the seine group overage shall be deducted from the next year's seine allocation. Furthermore, 100 tons may be reserved from the purse seine allocation for a herring pound fishery.

2017 SEASON SUMMARY

The Dutch Harbor food and bait herring fishery was allocated 1,727 tons of herring for the 2017 season (Table 6 and 7; Appendix B). The purse seine fishery was allocated 1,485 tons and the gillnet fishery was allocated 242 tons of herring (Table 6). ADF&G did not conduct aerial surveys in 2017 to assess herring biomass in the Dutch Harbor area because of budget constraints and limited staff availability. Exploratory surveys were conducted by commercial spotter pilots and that information was relayed to ADF&G management staff.

Gillnet Fishery

In 2017, the Dutch Harbor food and bait herring commercial gillnet fishery occurred from July 13 through February 28 (Table 7; Appendix C; Figures 6 and 7). In 2017, there was no participation by the gillnet fleet (Table 6).

Purse Seine Fishery

In 2017, the Dutch Harbor food and bait herring seine fishery occurred from July 13 through February 28 (Table 7; Appendix C; Figure 6 and 7). By regulation the purse seine fishery can open beginning on July 15, however the fishery was opened on July 13 by a special emergency order issued by ADF&G (5 AAC 27.610 (B)). The harvest of herring only occurred between July 13 and July 22, with three vessels participating in the Unalaska and Akutan districts (Figures 6 and 7). The seine fishery was allocated 1,485 tons of herring for the 2017 season and were eligible to harvest the remaining gillnet allocation (242 tons) after July 20 (Table 6). A total of 1,270 tons of herring were harvested, which is 215 tons less than the purse seine fleet was originally allocated. Exvessel prices ranged from $300 to $550 per ton, which has stayed consistent with the exvessel price range over that past ten years. The total exvessel value of the 2017 purse seine fishery was an estimated $481,000 (Table 5).

2017 CATCH SAMPLING

Commercial harvest samples were collected in the Aleutian Islands "Dutch Harbor" food and bait fishery. These samples provided age composition, sex, maturity status, weight-at-age, and length-at-age data from the commercial harvest. Age is determined by examining scales (Warner and Shafford 1979) taken from the preferred area located on the left side of the herring, three

scales posterior to the center of the operculum. One scale is taken from each herring and the ages are recorded and entered into a database.

Fish length (lower jaw to the hypural plate) and weight measurements are collected and entered into the ADF&G herring database. Mean lengths (mm) and weights (g) are calculated for each year class and tabulated.

A total of 206 herring were sampled from the Dutch Harbor food and bait purse seine fishery (Table 8). The most abundant age classes were age-5 (28.1%) and 6 (25.2%), followed by ages 7 and 4 which represented 13.1% and 12.6%, respectively (Tables 8 and 9; Figure 9). Average length of sampled herring was 454 mm and average weight was 302 g (Table 8). The sex composition of the sample was 52% male and 48% female.

ALEUTIAN ISLANDS "ADAK" HERRING FOOD AND BAIT FISHERIES

HISTORICAL PERSPECTIVE

In 2004 the BOF enacted the *Alaska Peninsula-Aleutian Islands Herring Management Plan* (5 AAC 27.657). This plan established an exploratory herring gillnet fishery in the Adak Island area (Figure 8) with a 500-ton allocation independent of the Dutch Harbor food and bait herring allocation. In 2010 the BOF amended the plan to allow both purse seine and gillnet gear to harvest the 500-ton herring allocation in the Adak Island area. Herring can be harvested as food and bait and the fishery occurs annually from June 24 until February 28. This fishery is managed in compliance with the terms of a commissioner's permit or commissioner's designee.

No effort has occurred in this fishery since it was established in 2004.

2017 SEASON SUMMARY

Due to lack of industry interest, there was no herring fishery in the Adak area in 2017.

REFERENCES CITED

Jackson, J. V. 2007. Alaska Peninsula-Aleutian Islands Management Area herring sac roe fishery management plan, 2007. Alaska Department of Fish and Game, Fishery Management Report No. 07-26, Anchorage.

McCullough, J. N. and R. D. Campbell. 1996. Alaska Peninsula - Aleutian Islands Management Areas sac roe herring report and the Aleutian Islands Management Area food and bait herring report. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 4K96-12, Kodiak.

Rowell, K. A., H. J. Geiger, and B. G. Bue. 1991. Stock identification of Pacific herring in the eastern Bering Sea trawl bycatch and the Dutch Harbor directed food and bait fishery. Proceedings of the International Herring Symposium. Alaska Sea Grant Report, AK-SG-91-01, Fairbanks.

Schwarz, L. 1988. Peninsula/Aleutians herring sac-roe fishery report to the Board of Fisheries. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report 4K88-3, Kodiak.

Shaul, A. R., T. R. Gilmer, J. N. McCullough, and L. M. Malloy. 1982. 1982 fin fisheries annual report Alaska Peninsula-Aleutian Islands Areas. Alaska Department of Fish and Game, Division of Commercial Fisheries, Area Management Report, Kodiak

Shaul, A. R., J. N. McCullough, A. J. Quimby, R. S. Berceli, and M. E. Stopha. 1991. 1990 Alaska Peninsula–Aleutian Islands Areas salmon and herring annual management report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K91-12, Kodiak.

Warner, I. M., and P. Shafford. 1979. Forage fish spawning surveys-southern Bering Sea. Alaska Marine Environmental Assessment Project. Completion Report (revised November 1979), Alaska Department of Fish and Game, Kodiak.

Witteveen, M. J., R. D. Campbell, R. L. Murphy. 1999. Alaska Peninsula and Aleutian Islands Management Areas sac roe report and the Aleutian Islands Management Area food and bait herring report. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K99-23, Kodiak.

TABLES AND FIGURES

Table 1.–Herring biomass estimates (tons) for the North Alaska Peninsula, by area, 1984–2017.

	Port Moller District					Port Heiden District			
Date	Herendeen Bay		Port Moller Bay		Bear River to Strogonof Point	Port Heiden Bay Section	Total Biomass Estimate	Aerial Survey Date First	Aerial Survey Date Last
1984[a]	2,000		1,500–1,900		0	0	3,500–3,900	May 9	Jul 31
1985	260		1,305		5,240	0	6,805	May 1	Jun 13
1986	1		28		0	0	29	May 16	Jun 7
1987	0		5,125		0	0	5,125	May 6	Jun 3
1988	1,737		442		8	0	2,187	May 17	Jun 15
1989	1,163		1,471		0	0	2,634	May 19	Jun 16
1990	155		387		0	0	542	May 21	Jun 14
1991	2,278	(250)[b]	4,651		1,471	0	8,400	May 17	Jun 26
1992	755		8,269		5,798	10,021	24,843	May 19	Jun 18
1993	775		2,878		33	0	3,686	May 4	Jun 9
1994	381		274		0	0	655	May 22	May 28
1995	60		477		0	0	537	May 13	Jun 2
1996	390	(390)[b]	986	(755)[b]	309	65	1,750	May 9	Jun 18
1997	160		45		0	0	205	May 22	Jun 12
1998	930		135		360 (200)[b]	0	1,425	May 11	Jun 3
1999	10		220		0	0	230	May 16	Jun 14
2000	115		350		0	0	465	May 15	May 28
2001	335		1,980		0	0	2,315	May 14	May 22
2002	85		255		0	0	340	May 15	May 28
2003	400		100		500	0	1,000	May 17	May 29
2004	0		0		0	0	0	Jun 2	Jun 10
2005	1,500[c]		3,300		50	0	4,850	May 8	May 24
2006	4,500		1,150		585	0	6,235	May 26	May 28
2007	290		1,515		0	0	1,805	May 19	May 20
2008	75		975		0	0	1,050	May 25	May 26

-continued-

Table 1.–Page 2 of 2.

	Port Moller District			Port Heiden District			
						Aerial Survey Date	
Date	Herendeen Bay	Port Moller Bay	Bear River to Strogonof Point	Port Heiden Bay Section	Total Biomass Estimate	First	Last
2009	1,692	36,610	365	0	38,667	May 16	Jun 2
2010	720	1,725	30,000	0	32,445	May 21	May 22
2011	70	662	4,110	0	4,842	May 18	May 19
2012	3,930	990	0	0	4,920	May 21	May 29
2013	0	0	2,500	0	2,500	May 15	Jun 5
2014	200	200	2,300	0	2,700	May 22	May 22
2015[d]	-	-	-	-	-	-	-
2016	100	500	800	0	1,400	May 1	May 26
2017	0	450	600	0	1,050	May 8	Jun 7
2007–2016 Average	786	4,797	4,453	0	10,037		

[a] Surveys were conducted 1976–1983; however, biomass estimates were not calculated.

[b] Biomass estimates (tons) conducted by commercial spotter pilots are enclosed in parentheses ( ); these estimates are not included in the total biomass estimates. They may not be comparable to the department estimates.

[c] Biomass estimates (tons) conducted by both commercial spotter pilots and department biologists.

[d] No surveys completed due to lack of industry interest

Table 2.–Alaska Peninsula Management Area commercial sac roe herring harvest by time 1980–2017.

	North Peninsula		South Peninsula		
Year	Harvest (Tons)	Harvest Time Period	Harvest (Tons)	Harvest Time Period	Total
1980	-	-	454	May 18–July 14	454
1981	-	-	798	May 9–June 23	798
1982	[b]	May 31–June 12	176	May 31–June 14	[b]
1983	627	May 9–May 29	-	-	627
1984	431	May 24–June 8	210	May 13–June 1	642
1985	710	May 24–June 4	288	June 1–June 11	998
1986	894	May 18–May 30	282	June 7–June 14	1,176
1987	514	May 9–June 5	319	June 8–June 19	833
1988	294	May 17–June 15	377	May 31–June 20	671
1989	729	May 28–June 23	310	May 13–June 19	1,039
1990	273	June 4–June 19	312	May 14–June 14	585
1991	1,313	May 17–July 4	157	May 16–June 11	1,470
1992	3,969	May 23–June 17	180	June 4–June 7	4,149
1993	536	May 8–June 9	[b]	May 27–June 9	[b]
1994	90	May 21–June 7	[b]	June 2–June 3	[b]
1995	337	May 29–June 20	[b]	June 6–June 17	[b]
1996	[b]	June 12–June 18	117	May 10–June 27	[b]
1997[a]	-	-	-	-	-
1998	[b]	May 21–June 3	-	-	[b]
1999[a]	-	-	-	-	-
2000[a]	-	-	-	-	-
2001[a]	-	-	-	-	-
2002[a]	-	-	-	-	-
2003[a]	-	-	-	-	-
2004[a]	-	-	-	-	-
2005	351	May 11–May 12	-	-	351
2006[a]	-	-	-	-	
2007[a]	-	-	-	-	-
2008[a]	-	-	-	-	-
2009	3,027	May 27–June 2	-	-	3,027
2010	[b]	May 24–May 26	-	-	[b]
2011[a]	-	-	-	-	-
2012	[b]	May 27–May 29	-	-	[b]
2013	230	May 23–May 34	-	-	230
2014[a]	-	-	-	-	-
2015	-	-	-	-	-
2016	[b]	May 1–May 2	-	-	[b]
2017	1,492	May 8–May 9	-	-	1,492

[a] No Fishery
[b] This information cannot be released due to confidentiality requirements.

Table 3.–North Peninsula commercial sac roe herring fishery harvest by section, 1982–2017.

	Port Moller District				Port Heiden District	
Year	Deer Island Mud Bay Section	Herendeen Bay Section	Port Moller Bay Section	Bear River Bering Sea Coast	Port Heiden Bay Section	Total
1982	0	[a]	[a]	[a]	0	[a]
1983	0	509	37	81	0	627
1984	0	181	250	0	0	431
1985	0	173	256	281	0	710
1986	0	156	255	484	0	894
1987	0	157[b]	350	7	0	514
1988	0	8	286	0	0	294
1989	0	67	247	416	0	729
1990	0	156	117	0	0	273
1991	156	167	690	300	0	1,313
1992	18	0	2,351	0	1,600	3,969
1993	0	107	371	58	0	536
1994	7	0	83	0	0	90
1995	3	146	188	0	0	337
1996	0	[a]	[a]	0	0	[a]
1997[c]	-	-	-	-	-	-
1998	0	0	[a]	[a]	0	37
1999[c]	-	-	-	-	-	-
2000[c]	-	-	-	-	-	-
2001[c]	-	-	-	-	-	-
2002[c]	-	-	-	-	-	-
2003[c]	-	-	-	-	-	-
2004[c]	-	-	-	-	-	-
2005	0	0	351	0	0	351
2006[c]	-	-	-	-	-	-
2007[c]	-	-	-	-	-	-
2008[c]	-	-	-	-	-	-
2009	0	0	2,297	730	0	3,027
2010	0	0	[a]	0	0	103
2011[c]	-	-	-	-	-	-
2012	[a]	[a]	[a]	[a]	[a]	[a]
2013	0	142	88	0	0	230
2014[c]	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	[a]	[a]	[a]	[a]	[a]	[a]
2017	0	63	0	1,429	0	1,492

[a] This information cannot be released due to confidentiality requirements.
[b] At least 11 tons were caught in the Deer Island-Mud Bay Section.
[c] No fishery.

Table 4.–Aleutian Islands Area (Dutch Harbor) commercial herring food and bait gillnet fishery historical summary, 2001–2017.

Year	Harvest in Tons	No. Vessels Making Landings	Number Landings	Tons Per Boat	Tons Per Landing	Price Per Ton	Exvessel Value (Thousands)	Exvessel Value Per Vessel (Thousands)
2001	105	6	25	18	4	$300–500	$53	$9
2002	134	13	37	10	4	$400	$54	$4
2003	108	13	23	8	5	$400	$35[a]	$11
2004	216	7	37	31	6	$300	$65	$9
2005[b]	0	0	0	0	0	$300	$0	$0
2006	[c]	[c]	[c]	[c]	[c]	$300	$0	[c]
2007	[c]	[c]	[c]	[c]	[c]	$300	$1	[c]
2008	[c]	[c]	[c]	[c]	[c]	$300	$11	[c]
2009	[c]	[c]	[c]	[c]	[c]	$500	$12	[c]
2010–2017[d]	-	-	-	-	-	-	-	-
2012–2016 Average	-	-	-	-	-	-	-	-

[a] 20 of the 108 tons were not purchased due to spoilage.

[b] Participation, but no harvest.

[c] This information cannot be released due to state confidentiality requirements.

[d] No participation by gillnet fleet.

Table 5.–Aleutian Islands Area (Dutch Harbor) herring food and bait seine fishery historical summary, 1929–2017.

Year	Harvest in Tons	No. Vessels Making Landings	Number Landings	Tons Per Vessel	Tons Per Landing	Price Per Ton	Exvessel Value (Thousands)	Exvessel Value Per Vessel (Thousands)
1929	1,259	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1930	1,916	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1931	1,056	26	[a]	[a]	[a]	[a]	[a]	[a]
1932	2,510	30	[a]	[a]	[a]	[a]	[a]	[a]
1933	1,585	38	[a]	[a]	[a]	[a]	[a]	[a]
1934	1,533	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1935	2,412	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1936	1,379	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1937	579	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1938	513	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1939–1944[b]								
1945	75	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1946–1980[b]								
1981	704	[c]	16	[c]	44	$300	[c]	[c]
1982	3,565	7	95	509	38	$300	$1,020	$146
1983	3,567	8	96	446	37	$232	$828	$104
1984	3,578	9	61	398	59	$210	$751	$83
1985	3,554	6	68	592	52	$162	$564	$94
1986	2,394	7	54	342	44	$254	$600	$86
1987	2,485	8	44	311	56	$300	$751	$94
1988	1,983	8	50	248	40	$252	$505	$63
1989	3,079	9	67	342	46	$283	$873	$97
1990	820	7	15	117	55	$350	$287	$41
1991	1,325	8	18	166	74	$300	$398	$50
1992	1,982	11	27	180	73	$300	$573	$52
1993	2,824	13	33	217	86	$300	$837	$64
1994	3,349	14	65	239	52	$300	$1,005	$72
1995	1,705	14	23	122	74	$300	$524	$37
1996	2,279	24	30	95	76	$300	$684	$28

-continued-

Table 5.–Page 2 of 2.

Year	Harvest in Tons	No. Vessels Making Landings	Number Landings	Tons Per Vessel	Tons Per Landing	Price Per Ton	Exvessel Value (Thousands)	Exvessel Value Per Vessel (Thousands)
1997	1,950	26	63	75	31	$300	$585	$23
1998	1,994	22	22	91	91	$300	$598	$27
1999	2,437	21	72	116	34	$400–600	$1,038	$49
2000	2,014	20	22	101	92	$300–500	$671	$34
2001	1,332	14	29	95	46	$300–500	$406	$29
2002	2,664	12	15	222	178	$300–450	$909	$76
2003[d]	1,379	6	16	230	86	$50–400	$342	$57
2004[d]	1,038	3	16	346	65	$100–500	$309	$103
2005[d]	1,159	3	7	386	166	$100–500	$370	$123
2006[d]	952	2	18	476	53	$100–500	$384	$192
2007[d]	1,248	2	12	624	104	$100–500	$437	$219
2008[d]	1,536	2	14	768	110	$300–490	$592	$296
2009[d]	1,310	2	12	655	109	$300–500	$519	$260
2010[d]	1,941	2	18	971	108	$100–500	$724	$362
2011[d]	1,795	2	15	898	120	$500	$898	$449
2012[d]	1,807	2	16	904	113	$100–500	$542	$271
2013[d]	1,764	3	12	588	147	$300–550	$750	$250
2014[d]	1,645	3	11	548	150	$300–549	$699	$233
2015[d]	1,972	3	15	657	131	$300–550	$838	$279
2016[d]	208	[c]	[c]	[c]	[c]	$300–500	$108	[c]
2017[d]	1,270	3	14	423	91	$300–550	$481	$160
1929–1938 Average	1,474	[a]	[a]	[a]	[a]	[a]	[a]	[a]
2007–2016 Average	1,523	2	14	735	121	$260-514	$611	$291

[a] Information not available.
[b] No fishery.
[c] This information cannot be released due to state confidentiality requirements.
[d] Several permit holders formed a combine and used one vessel.

Table 6.–Aleutian Islands Area (Dutch Harbor) herring food and bait fishery allocations (tons), commercial harvest (tons), and effort by gear type, 1992–2017.

	All Gear Types		Gillnet Fishery					Seine Fishery				
Year	Allocation	Harvest	Allocation	Harvest	Permits	Landings	Days Fished	Allocation	Harvest	Permits	Landings	Days Fished
1992	1,940	1,982	[a]	-	-	-	0	1,940	1,982	12	26	5
1993	2,193	2,824	[a]	-	-	-	0	2,193	2,824	14	33	2
1994	2,215	3,349	[a]	[b]	[b]	[b]	1	2,215	3,349	14	65	4
1995	1,982	1,705	[a]	[b]	[b]	[b]	1	1,982	1,705	15	23	1
1996	1,793	2,279	[a]	-	-	-	0	1,793	2,279	27	30	1
1997	1,645	1,950	[a]	[b]	[b]	[b]	1	1,645	1,950	26	63	5
1998	1,590	1,994	[a]	[b]	[b]	[b]	1	1,590	1,994	22	22	1
1999	2,082	2,437	[a]	-	-	-	0	2,082	2,437	22	72	4
2000	1,728	2,014	[a]	-	-	-	0	1,728	2,014	20	22	1
2001	1,572	1,437	110	105	8	25	9	1,462	1,332	14	29	2
2002	1,578	2,799	110	134	15	37	16	1,468	2,664	13	15	1
2003	1,662	1,487	116	88	18	23	5	1,546	1,379	6[c]	16	4
2004	1,899	1,255	266	216	12	37	13	1,633	1,038	3[c]	16	13
2005	1,365	1,159	191	0	9	0	11	1,174	1,154	3[c]	7	9
2006	1,715	954	240	[b]	[b]	[b]	2	1,375	952	2[c]	18	15
2007	1,779	1,254	249	[b]	[b]	[b]	2	1,530	1,248	2[c]	12	12
2008	1,722	1,575	241	[b]	[b]	[b]	7	1,481	1,536	2[c]	14	10
2009	1,600	1,334	224	[b]	[b]	[b]	28	1,321	1,310	2[c]	12	5
2010	1,950	1,941	273	-	-	-	0	1,677	1,941	2[c]	18	15
2011	1,867	1,795	261	-	-	-	0	1,606	1,795	2[c]	15	7
2012	1,627	1,807	227	-	-	-	0	1,400	1,807	2[c]	16	6
2013	2,082	1,764	317	-	-	-	0	1,765	1,764	3	12	5
2014	2,099	1,645	294	-	-	-	0	1,805	1,645	3	11	5
2015	2,184	1,972	306	-	-	-	0	1,878	1,972	3	15	9
2016	2,166	208	303	-	-	-	0	1,863	208	[b]	[b]	13
2017	1,727	1,270	242	-	-	-	0	1,485	1,270	3	14	6
Average 2007–2016	1,908	1,530	270	-	-	-	4	1,633	1,523	3	14	9

[a] No allocation.

[b] This information cannot be released due to state confidentiality requirements.

[c] Several permit holders formed a combine and used one vessel.

Table 7.–Aleutian Islands Area (Dutch Harbor) herring food and bait fishery summary, including landing date, days fished, preseason Togiak spawning biomass, guideline harvest level, harvest, and number of vessels fishing, 1981–2017.

Year	Landing Date First	Landing Date Last	Days Fished	Togiak Forecast Tons	Dutch Harbor Allocation Tons	Dutch Harbor Harvest Tons	Number Vessels Fishing
1981	Aug 3	Aug 23	21	159,000	[a]	[b]	[b]
1982	Aug 5	Sep 12	39	98,000	[a]	3,565	7
1983	Jul 23	Sep 6	46	142,000	3,525[c]	3,567	8
1984	Jul 17	Jul 27	11	115,000	3,525[c]	3,578	9
1985	Jul 17	Aug 11	26	132,000	3,525[c]	3,554	6
1986	Jul 16	Jul 28	13	96,000	2,453	2,394	7
1987	Jul 16	Jul 23	4	88,000	2,332	2,485	9
1988	Jul 16	Sep 18	21	132,000	3,100	1,999	9
1989	Jul 16	Aug 5	19	100,108	3,100	3,081	9
1990	Aug 15	Aug 15	<1	72,000	903	820	7
1991	Jul 17	Jul 17	<1	83,229	931	1,325	8
1992	Jul 16	Jul 28	5	60,214	1,940	1,982	12
1993	Jul 16	Jul 16	<1	164,135	2,193	2,824	14
1994	Jul 16	Jul 19	4	165,747	2,215	3,349	14
1995	Jul 16	Jul 16	<1	149,093	1,982	1,705	15
1996	Jul 16	Jul 16	<1	135,585	1,793	2,279	27
1997	Jul 15	Jul 19	5	125,000	1,645	1,950	27
1998	Jul 16	Jul 16	<1	121,054	1,590	1,994	22
1999	Jul 16	Jul 20	4	156,200	2,082	2,437	22
2000	Jul 15	Jul 15	<1	130,904	1,728	2,014	20
2001[d]	Jun 25	Jul 16	10	119,818	1,572	1,437[e]	22
2002	Jun 25	Jul 16	17	120,196	1,578	2,799[e]	28
2003	Jun 24	Jul 19	7	126,213	1,662	1,487[e]	24[f]
2004	Jul 15	Jul 29	26	143,124	1,899	1,038[e]	15[f]
2005	Jul 15	Aug 20	11	105,029	1,365	1,159[e]	4[f]
2006	Jul 16	Jul 27	12	129,976	1,715	954[e]	4[f]
2007	Jul 16	Jul 27	12	134,566	1,779	1,254[e]	4[f]
2008	Jul 12	Jul 27	10	130,516	1,722	1,575[e]	3[f]
2009	Jun 24	Jul 25	28	121,800	1,600	1,334[e]	4[f]
2010[g]	Jul 15	Jul 29	15	146,775	1,950	1,941	2[f]
2011	Jul 15	Jul 22	7	140,860	1,867	1,795	2[f]
2012	Jul 15	Jul 27	6	123,745	1,627	1,807	2[f]
2013	Jul 15	Jul 21	5	169,094	2,082	1,764	3
2014	Jul 15	Jul 20	5	157,448	2,099	1,645	3
2015	Jul 15	Jul 21	6	163,480	2,184	1,972	3
2016	Jul 31	Aug 12	13	162,244	2,166	208	2[f]
2017	Jul 13	Jul 22	6	160,852	1,727	1,270	3
2007–2016 Average			11	145,053	1,908	1,590	3

-continued-

[a] No allocation
[b] This information cannot be released due to state confidentiality requirements.
[c] Harvest ceiling of 3,525 established by Alaska Board of Fisheries.
[d] In 2001, a gillnet fishery was established.
[e] Includes both gillnet and seine harvest.
[f] Several permit holders formed a combine and used one vessel.
[g] Starting in 2010, any remaining gillnet allocation after July 25 may be harvested by either purse seine or gillnet gear (5 AAC 27.655 (b)).

Table 8.–Age, sex, weight and length of herring harvested in the Aleutian Islands Area (Dutch Harbor) herring food and bait fisheries, 2017.

	Sex				Percent	Standard Length			Weight		
Age (Years)	Male	Female	Unknown	Total	of Total	Mean (mm)	Standard Dev.	Number Measured	Mean (g)	Standard Dev.	Number Weighed
4	15	11	0	26	12.62%	389	73.1	26	286	19.8	26
5	36	22	0	58	28.16%	441	63.9	58	303	23.6	58
6	25	27	0	52	25.24%	477	72.8	52	305	20.5	52
7	12	14	1	27	13.11%	493	69.9	27	309	13.6	27
8	3	4	0	7	3.40%	487	47.7	7	311	13.5	7
9	2	1	0	3	1.46%	508	79.4	3	310	18	3
Error	13	20	0	33	16.02%	300	19.1	33	439	60.1	33
Total	106	99	1	206	100%	454		206	302		206

Table 9.–Estimated age composition of Aleutian Islands Area (Dutch Harbor) herring food and bait harvests, in percent, 1991–2017.

	Percent at Age (Years)														
Year	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1991	0.2	0.2	0.2	8.7	11.0	5.7	13.4	11.2	22.1	17.2	8.9	1.0	0.0	0.2	0.0
1992	0.0	0.3	0.2	0.3	23.3	25.0	4.8	15.2	8.9	10.0	9.4	2.5	0.2	0.0	0.0
1993	0.3	9.5	51.8	5.1	5.9	13.2	6.2	2.5	1.6	1.7	1.3	0.8	0.0	0.0	0.0
1994	0.2	1.7	24.3	36.7	3.8	4.0	13.3	6.5	3.6	3.3	1.0	0.9	0.9	0.0	0.0
1995	0.2	3.2	5.6	30.4	27.5	4.5	4.3	10.4	5.0	1.9	4.8	1.4	0.6	0.2	0.0
1996	0.0	0.7	8.2	16.1	35.8	25.8	3.3	2.9	2.7	1.6	1.5	0.8	0.4	0.2	0.0
1997	0.0	3.2	15.2	31.3	9.3	21.2	9.5	1.8	4.5	1.6	1.2	0.5	0.1	0.0	0.0
1998	0.0	6.5	7.9	25.3	26.0	8.5	14.6	8.4	0.5	1.4	0.3	0.0	0.1	0.1	0.0
1999	0.2	0.2	12.2	8.2	21.8	21.1	10.2	15.6	5.6	2.2	0.9	1.3	0.4	0.0	0.0
2000	0.0	0.0	0.7	19.8	16.6	12.4	14.5	10.8	12.4	8.2	2.3	1.3	0.5	0.0	0.0
2001	0.0	3.5	2.1	6.4	31.4	12.8	11.9	9.7	5.7	10.7	4.0	0.9	0.4	0.0	0.0
2002	0.0	0.0	3.0	6.3	4.3	25.3	11.6	9.3	12.3	9.0	12.0	5.0	0.0	3.0	2.0
2003	0.0	0.0	3.0	27.4	16.8	7.5	15.6	9.9	5.4	6.6	3.3	2.7	0.9	0.6	0.0
2004	0.0	0.0	0.0	18.8	39.3	8.4	3.9	14.6	3.4	5.9	1.9	0.7	1.4	1.2	0.0
2005	1.1	2.5	1.4	4.3	40.0	27.2	5.6	5.1	6.4	1.9	1.2	1.4	0.8	0.3	0.0
2006	0.4	5.9	6.2	3.5	5.2	32.0	23.9	3.4	4.7	5.3	2.9	3.1	1.3	1.0	0.4
2007	0.5	5.2	12.2	7.8	12.8	21.6	20.7	9.3	4.6	2.3	0.8	0.8	0.2	0.2	0.0
2008	0.7	6.9	17.6	17.6	17.1	18.3	13.1	5.0	2.6	0.7	0.2	0.2	0.0	0.0	0.0
2009	5.6	15.9	23.4	23.4	15.9	5.6	3.7	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2010	2.2	11.1	25.9	27.8	16.2	8.4	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2011	0.7	10.5	28.7	34.3	18.2	2.8	0.7	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2012	0.4	2.4	16.3	28.6	22.2	16.7	7.1	2.4	2.0	2.0	0.0	0.0	0.0	0.0	0.0
2013	0.4	1.8	8.8	17.5	25.3	15.8	11.6	10.9	4.9	2.1	0.4	0.4	0.0	0.0	0.0
2014	0.0	9.0	20.1	19.8	24.3	13.8	6.0	2.6	1.1	0.4	0.4	0.0	0.0	0.0	0.0
2015	0.0	4.0	19.7	30.9	19.3	10.0	6.0	3.6	0.8	1.2	0.0	0.0	0.0	0.0	0.0
2016	13.8	23.3	16.4	12.9	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2017	12.6	28.2	25.2	13.1	3.4	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

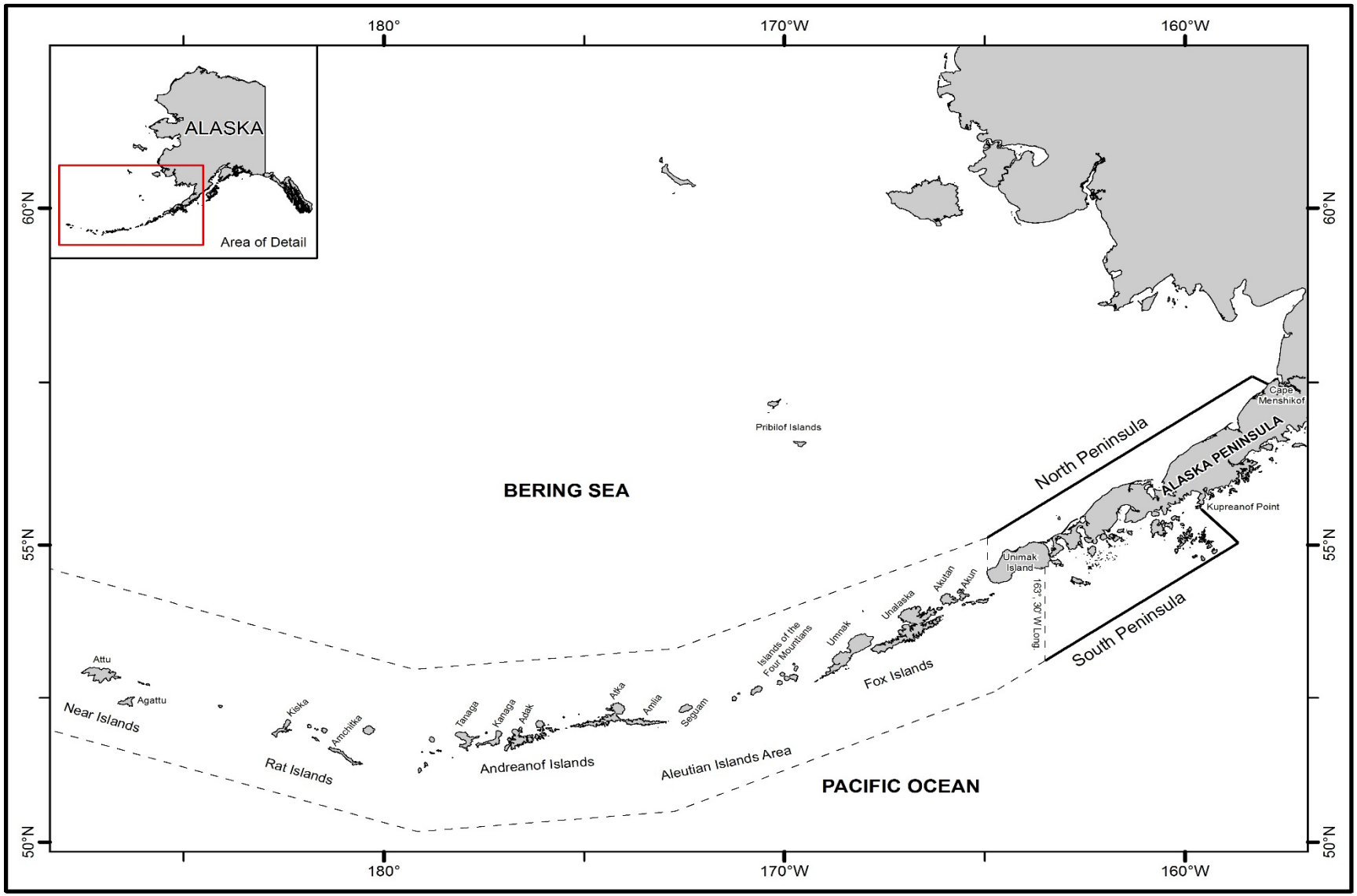

Figure 1.–Map of Bering Sea Herring Fishery Management Plan (5 AAC 27.060) commercial districts.

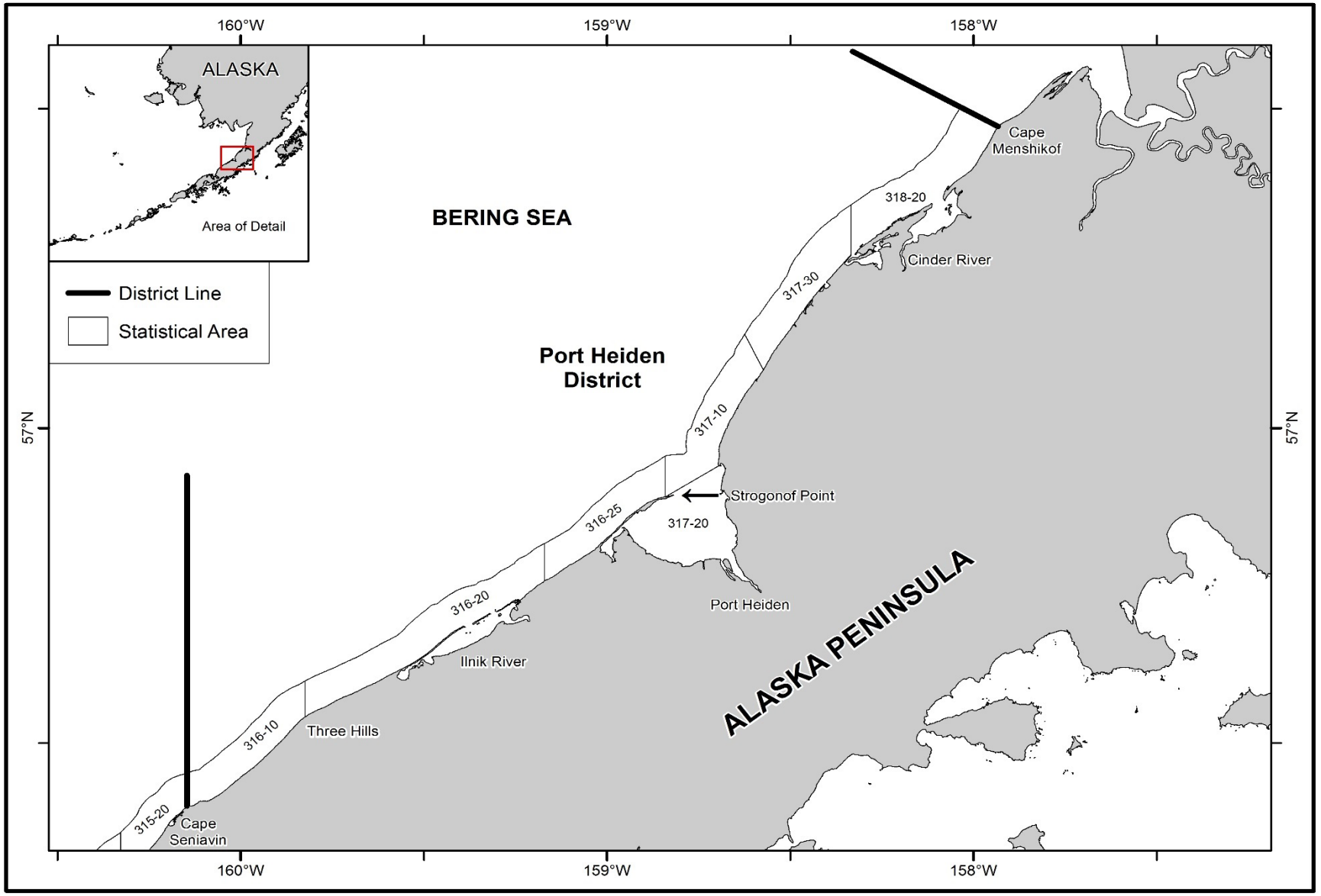

Figure 2.–Map of Port Heiden District with commercial herring fishing statistical areas shown.

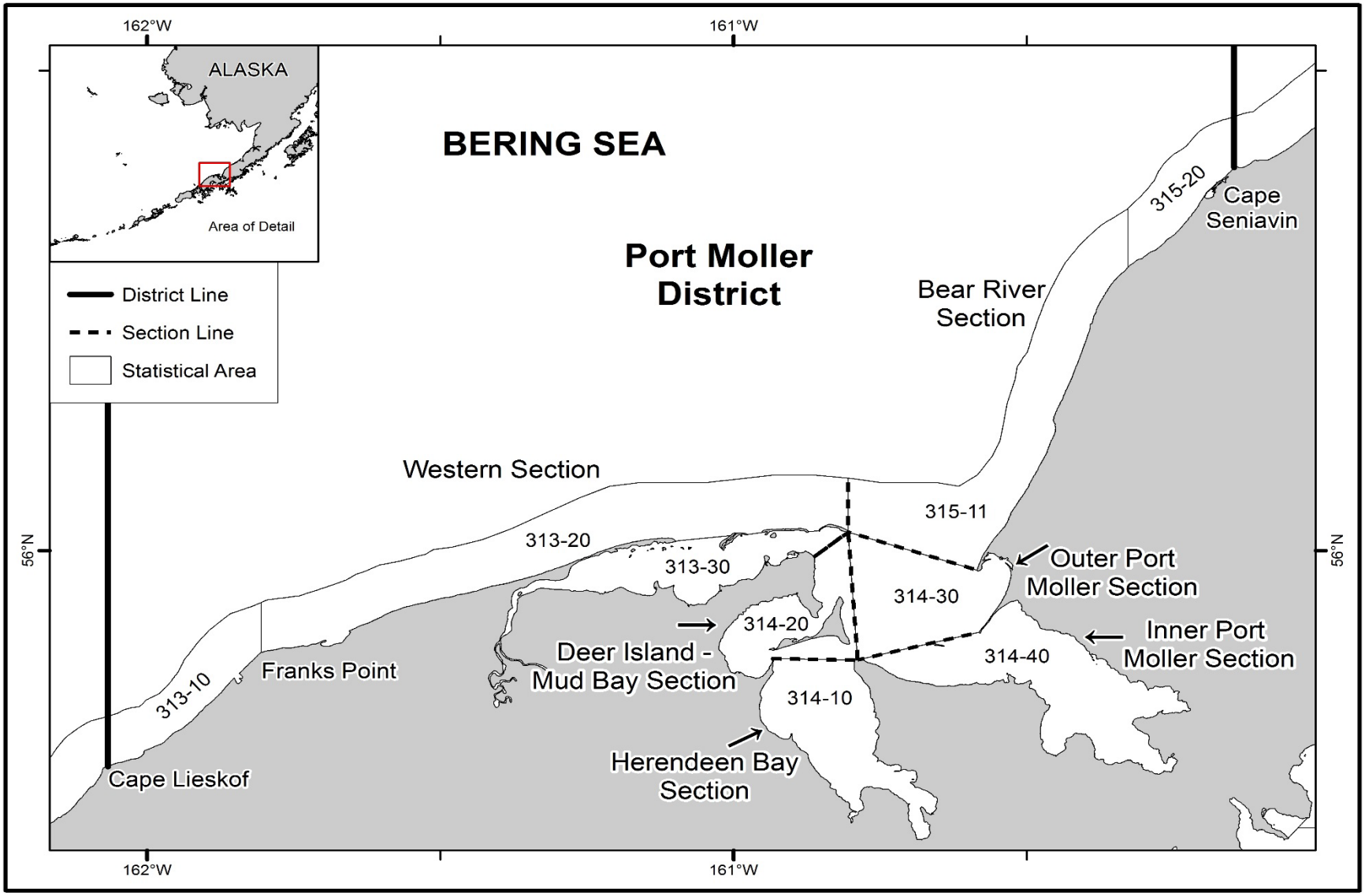

Figure 3.–Map of Port Moller District with commercial herring fishing statistical areas shown.

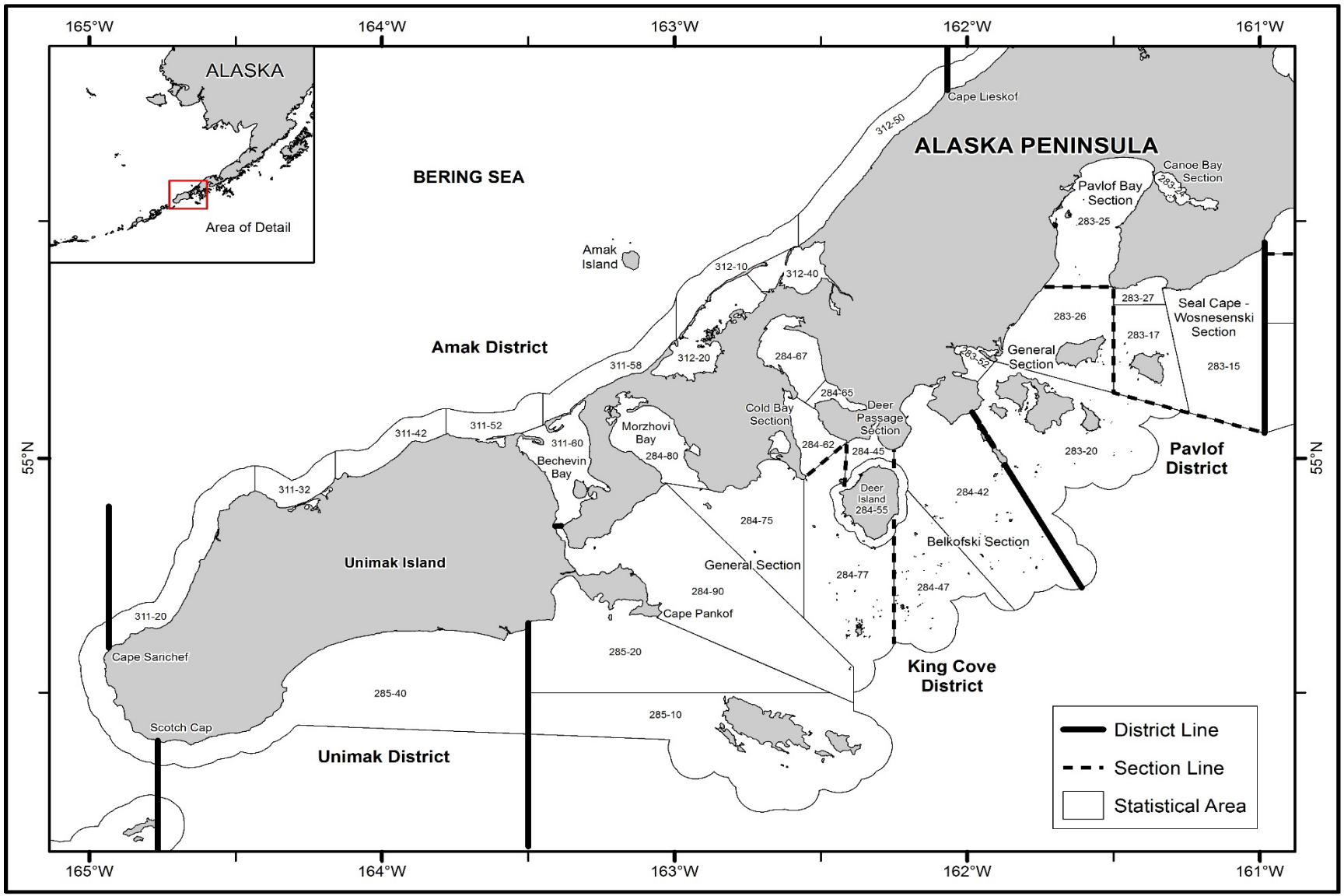

Figure 4.–Map of Amak, Unimak, King Cove, and Pavlof districts with commercial herring fishing statistical areas shown.

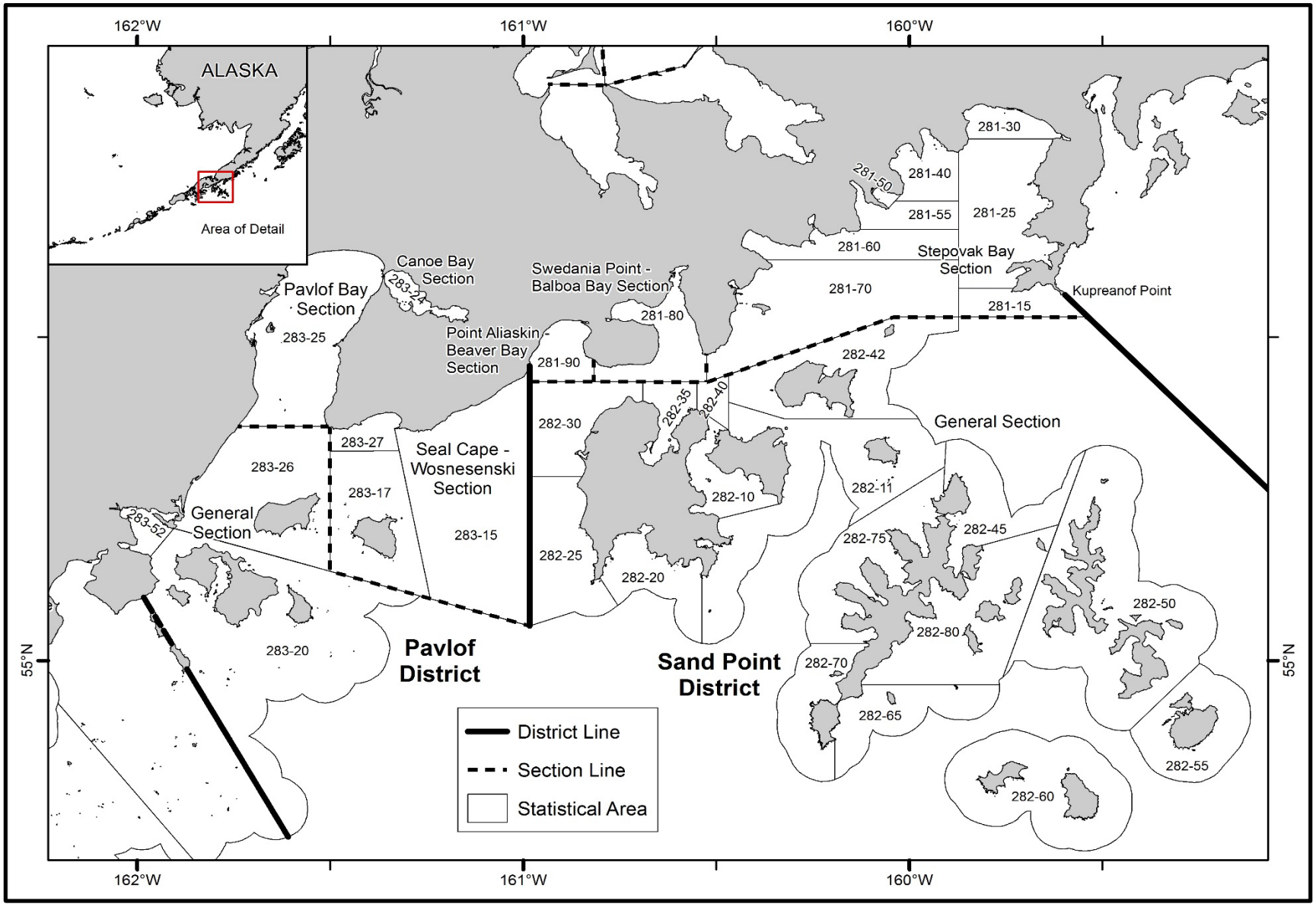

Figure 5.–Map of Pavlof and Sand Point districts with commercial herring fishing statistical areas shown.

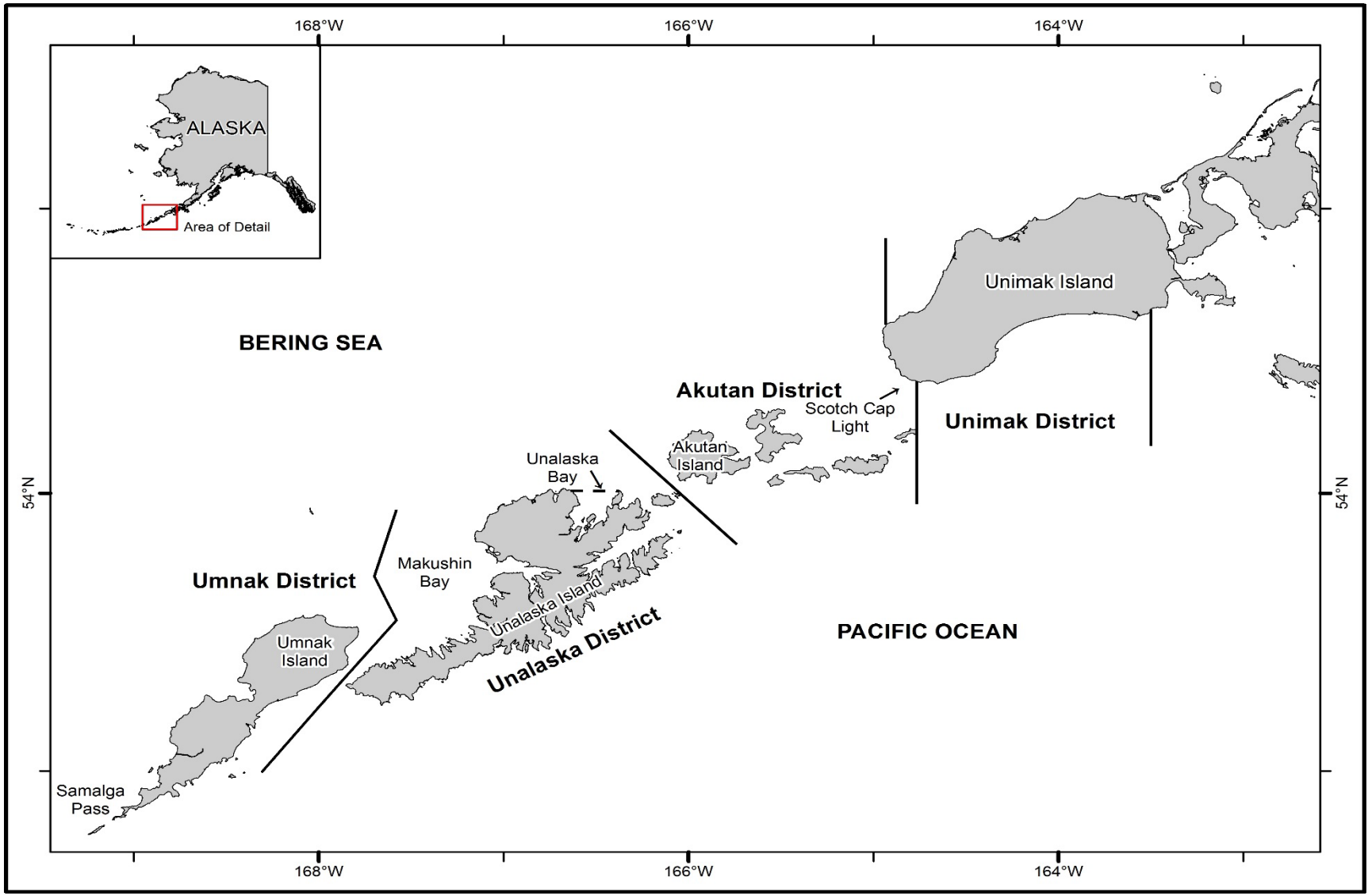

Figure 6.–Map of Aleutian Islands from Samalga Pass to Unimak Island with commercial herring fishing districts shown.

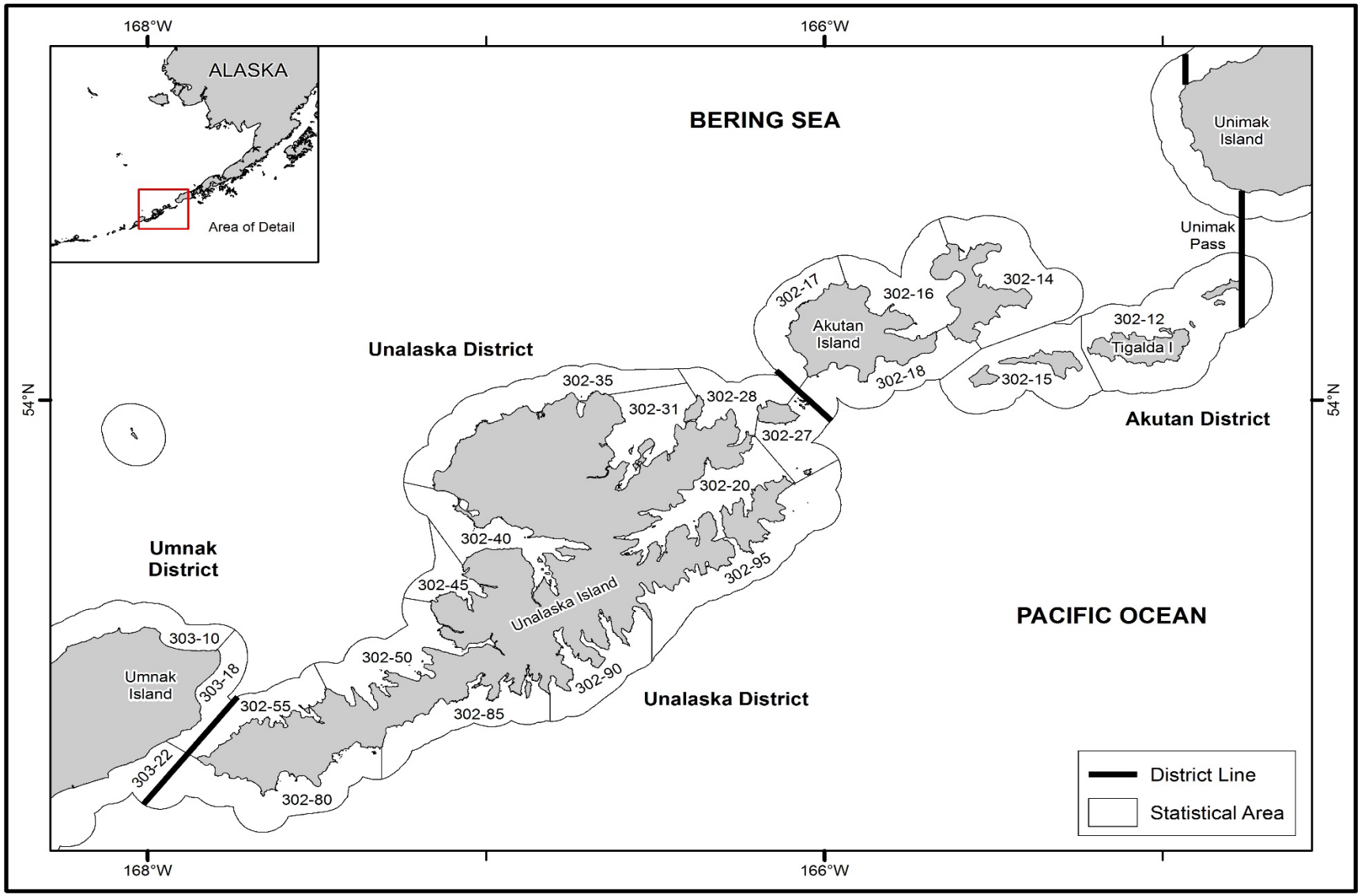

Figure 7.–Map of Aleutian Islands from Unimak Island to Umnak Island with commercial herring fishing statistical areas shown.

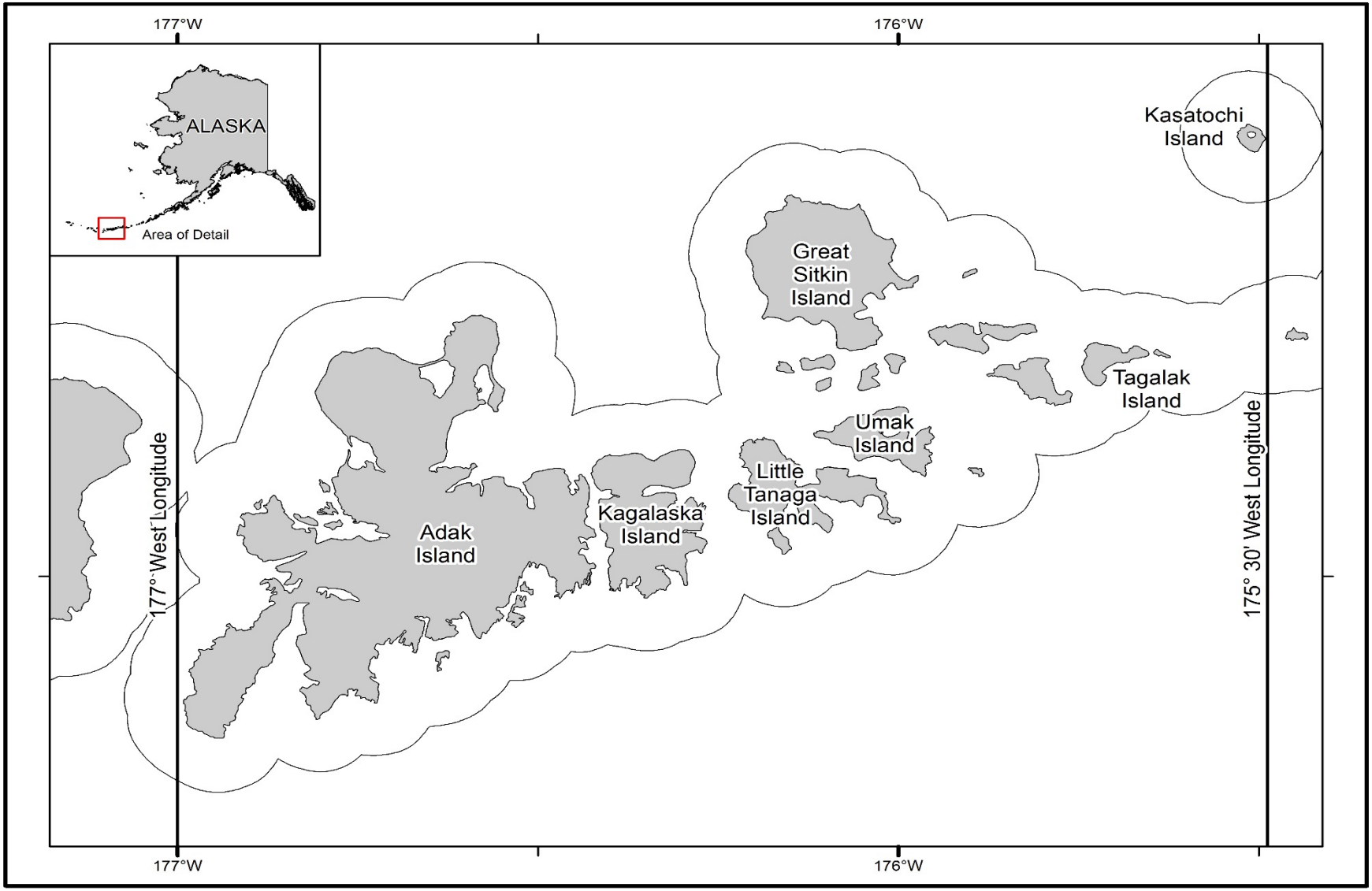

Figure 8.–Map of Adak Island area with boundaries of exploratory herring fishery defined.

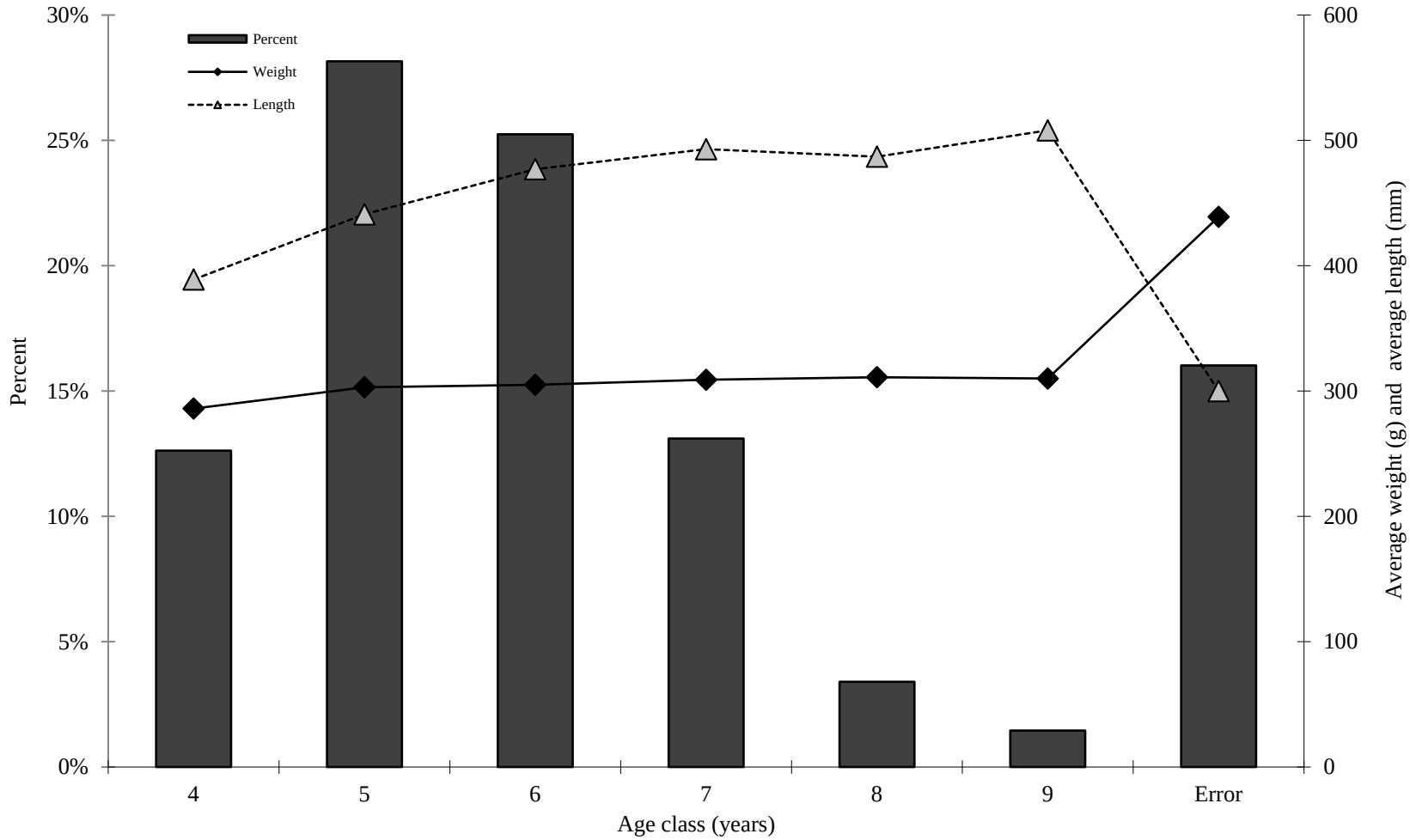

Figure 9.–Estimated average length-at-age (mm), average weight-at-age (g), and age composition of herring harvested in the Aleutian Islands Area (Dutch Harbor) herring food and bait fisheries, 2017 (n = 206).

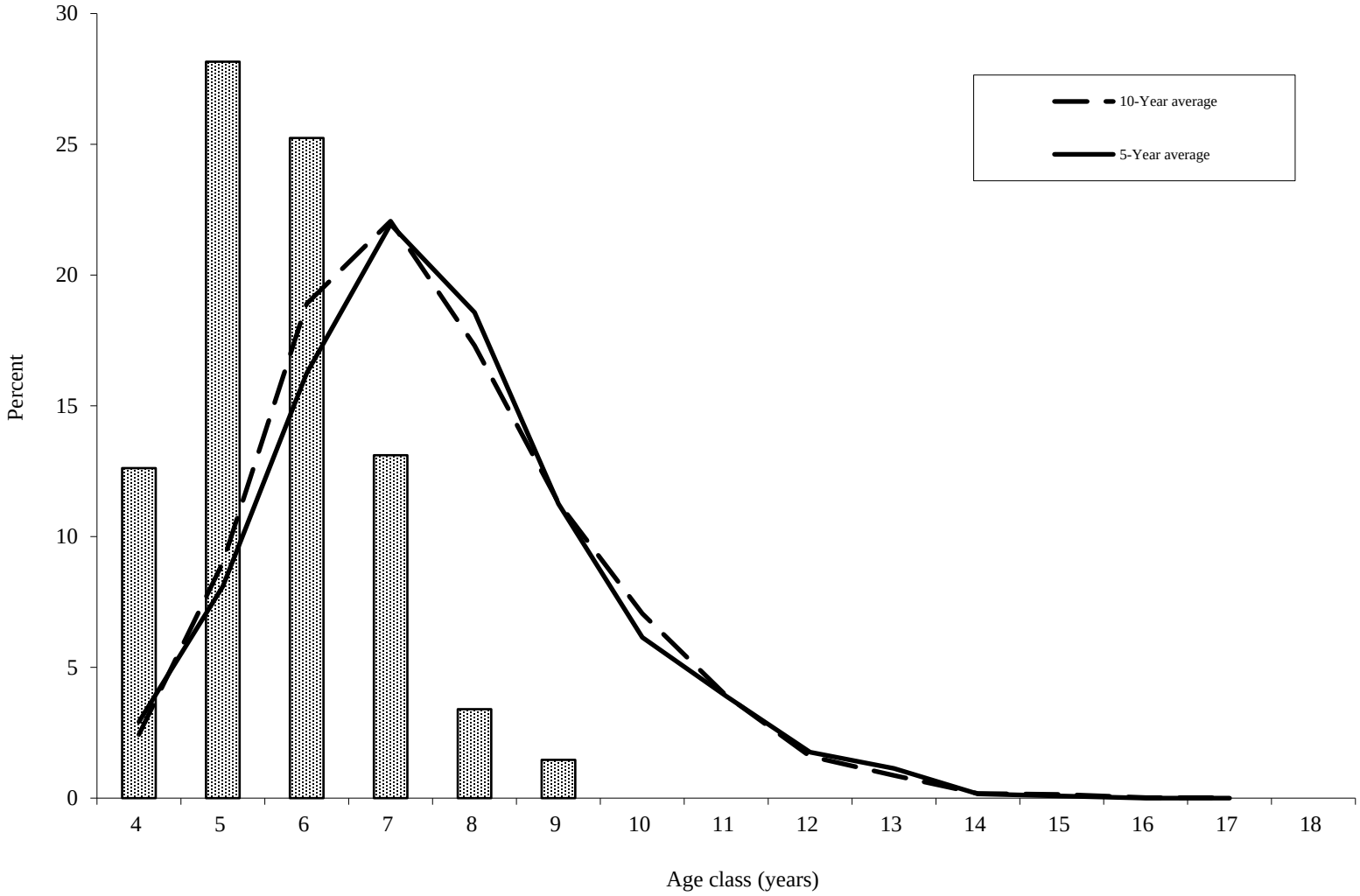

Figure 10.–Estimated 2017 percentage age composition of the Aleutian Islands Area (Dutch Harbor) commercial herring food and bait fisheries, with five and ten-year averages.

APPENDIX A. ARCTIC-YUKON-KUSKOKWIM HERRING OUTLOOK, 2017

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

Sam Cotten, Commissioner
Scott Kelley, Director

Contact:
Jim Menard, Nome Area Manager (907) 443-5167
Jeff Estensen, Yukon Area Manager (907) 459-7274
Aaron Poetter, Kuskokwim Area Manager (907) 267-2303
Fax: (907) 267-2442

Anchorage Area Office
333 Raspberry Road
Anchorage, AK, 99518

Date issued: April 7, 2017

2017 Arctic-Yukon-Kuskokwim Herring Outlook

This news release is to inform fishermen of projected herring biomass and GHLs in the Arctic-Yukon-Kuskokwim (AYK) Region in 2017. At this time, a small commercial bait fishery is anticipated to occur in the Norton Sound District. There has been minimal commercial fishing in the AYK Region since 2006 given limited market interest. Under the *Bering Sea Herring Fishery Management Plan* 5 AAC 27.060, commercial fishing will not open in a district unless the minimum threshold biomass is observed in that district. Since all preseason projected biomass thresholds are expected to be exceeded, commercial fishing may occur in any of the AYK districts unless inseason biomass assessments show that the thresholds will not be met.

The 2017 AYK herring forecast and guideline harvest levels (GHLs), given a maximum 20% exploitation rate of the projected biomass, are listed below for the northeastern Bering Sea herring stocks (Table 1). The 2017 estimated spawning biomass for northeastern Bering Sea herring stocks (Security Cove to Norton Sound districts) is 60,386 short tons and the total allowable harvest is 11,776 short tons. Based on previous years, only a small portion of the total allowable harvest is anticipated to be taken in 2017.

In previous years, the AYK region herring biomass projection was based on an age-structured assessment (ASA) model. The ASA model requires age composition information, harvest data, and good aerial survey biomass estimates from each of the northeastern Bering Sea stocks. Test fishing projects and aerial surveys were not conducted in any of the AYK herring districts in 2016, and these data have been severely limited since 2006. Data deficiencies make it impossible to continue using the ASA model to project herring biomass. The 2017 projected biomass is the median of the long-term (1981–2014, no aerial surveys from 2015–2017) biomass estimates from "good" aerial surveys (rating 3 or higher) in AYK districts. A "good" rating refers to the quality of the aerial survey; "good" aerial surveys are those that occurred during peak herring spawning in good weather conditions and are therefore considered reliable abundance estimates. The actual biomass observed in 2017 may fall above or below the preseason projections given that herring experience annual fluctuations in survival and recruitment rates.

2017 Management Strategies

The department will monitor catch statistics inseason if commercial fishing occurs. Given current resources available, it is unlikely the department will be able to conduct aerial surveys or test fishing projects for herring. Commercial fishery openings may be adjusted according to inseason assessments of herring biomass. In accordance with the AYK Region harvest strategy, any operational commercial fishery will not target newly recruited age classes (age-2 through age-5 herring). The duration of fishing periods will vary in each district depending on inseason biomass estimates, roe quality, spawning activity, weather conditions, fishing effort, and processor input.

Kuskokwim and Cape Romanzof Districts

A commercial fishery is not anticipated in 2017 given the lack of a buyer.

Norton Sound District

The 2017 projected biomass for the Norton Sound District is 33,924 short tons which surpasses the minimum biomass threshold of 7,000 tons. A 20% exploitation rate results in a guideline harvest of 6,785 short tons. The allocation for the herring pound spawn-on-kelp fishery may not be more than 320 tons leaving 6,465 short tons of the guideline harvest remaining (5 AAC 27.965 (d)). Additionally, the spawn-on-kelp guideline harvest is no more than 90 tons of product (combined weight of herring roe and kelp; 5 AAC 27.965 (e)). The beach seine harvest is allocated 10% of the sac roe projected harvest, or 647 tons (5 AAC 27.960 (a)). The 2017 herring fishery will be opened by emergency order and the fishery will close by emergency order when up to 20% of the available herring biomass has been harvested. Varied harvest rates may be applied to individual subdistricts based on biomass distribution, roe quality, weather, and sea ice conditions.

Table 1. Projections of Pacific herring spawning biomass and GHLs for commercial fishing districts in the northeastern Bering Sea, Alaska, 2017.

District	Threshold (short tons)	2017 Projected Biomass (short tons)	Exploitation Rate (%)	2017 Harvest Guideline (short tons)
Security Cove	1,200	5,270	20	1,054
Goodnews Bay	1,200	5,258	20	1,052
Cape Avinof [a]	500	2,042	15	306
Nelson Island [b]	3,000	5,275	20	855
Nunivak Island	1,500	4,980	20	996
Cape Romanzof	1,500	3,638	20	728
Norton Sound [c]	7,000	33,924	20	6,785
Totals		60,386		11,776

[a] Cape Avinof commercial harvest is 15% of projected biomass (5 AAC 27.895(a)).

[b] Nelson Island commercial harvest is 20% of projected biomass minus 200 tons for subsistence harvest (5 AAC 27.895 (d)).

[c] See Norton Sound District management strategies for more details on GHL allocations (5 AAC 27.960).

APPENDIX B. TOGIAK SAC ROE AND SPAWN-ON-KELP HERRING FORECASTS, 2017

Appendix B.–Forecasted harvest allocation for Togiak sac roe and Dutch Harbor herring food and bait fisheries, 2017.

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
NEWS RELEASE

Sam Cotten, Commissioner
Scott Kelley, Director

Contact:
Greg Buck, Area Research Biologist
Phone: (907) 267-2355
Fax: (907) 267-2442

Anchorage Regional Office
333 Raspberry Road
Anchorage, AK 99518

Date Issued: October 3, 2016

2017 TOGIAK HERRING FORECAST

The 2017 Togiak herring forecast and harvest allocations are listed below for the Togiak District sac roe and spawn-on-kelp fishery, and the Dutch Harbor food and bait fishery. This forecast is based on a maximum 20% exploitation rate of the projected biomass as defined in regulation 5 AAC 27.865 Bristol Bay Herring Management Plan.

Table 1. 2017 Togiak District Pacific herring biomass and harvest forecast and allocation by fishery and gear.

	Biomass (Short Tons)	Harvest (Sort Tons)
Forecasted Biomass	130,852	
Total Allowable Harvest (20% exploitation rate)		26,170
Togiak Spawn-on-Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		24,670
Dutch Harbor Food/Bait Allocation (7% of remaining allowable harvest)		1,727
Remaining Allowable Harvest for Togiak District Sac Roe Fishery:		22,943
Purse Seine Allocation (70%)		16,060
Gill Net Allocation (30%)		6,883

2017 TOGIAK HERRING FORECAST
SUMMARY

The Pacific herring spawning biomass in the Togiak District was not estimated in 2016 nor was any estimation made of the age composition of the 2016 harvest due to budget cuts. Traditionally, the department has used an age structured assessment (ASA) model to forecast the spawning biomass of Togiak herring. The ASA model requires estimates of the spawning biomass as well as estimates of the age composition of the spawning biomass and the harvest. Because that data is no longer available to us, we forecast the 2017 biomass as the average

-continued-

spawning biomass for all years for which we have data (1978-2015) less 10% in order to be conservative. This method produces an estimate of 130,852 tons (Table 1). Because we are not using the ASA model for the 2017 forecast we have no predictions regarding age composition or individual size of herring for 2017. As the department ceased estimating the spawning biomass of Togiak herring in 2015, the historical average used here is a static number and unless the budget situation changes we will not be able to estimate spawning biomass or age composition in the future. The current management plan calls for a forecast based on an estimated biomass but we no longer have the budget to estimate the biomass of this stock. This forecast strategy therefore, should be viewed as a temporary measure until a more long term strategy for this fishery can be developed.

APPENDIX C. NORTH ALASKA PENINSULA SAC ROE AND DUTCH HARBOR FOOD AND BAIT HERRING FISHERY EMERGENCY ORDER SUMMARY

Appendix C.–Emergency order summary, 2017.

EMERGENCY ORDER NO. 4-FH-M-PM-17-01

DATE ISSUED: 12:30 p.m. May 8, 2017

EXPLANATION: This emergency order establishes a commercial herring fishing period in the Port Moller District for 24 hours from 4:00 p.m. Monday, May 8 until 4:00 p.m. Tuesday, May 9, 2017.

EMERGENCY ORDER NO. 4-FH-M-PM-17-02

DATE ISSUED: 3:00 p.m. May 9, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Port Moller District for 6 hours from 4:00 p.m. Tuesday, May 9 until 10:00 p.m. Tuesday, May 9, 2017.

EMERGENCY ORDER NO. 4-FH-M-PM-17-03

DATE ISSUED: 1:00 p.m. May 10, 2017

EXPLANATION: This emergency order closes the commercial herring fishing period in the Port Moller District until further notice.

EMERGENCY ORDER NO. 4-FH-M-SP-01-17

DATE ISSUED: 9:00 a.m. July 8, 2017

EXPLANATION: This emergency order establishes a commercial herring fishing period in the Unalaska and Akutan districts for 24 hours from noon Thursday, July 13 until noon Friday, July 14, 2017.

EMERGENCY ORDER NO. 4-FH-M-SP-02-17

DATE ISSUED: 9:00 a.m. July 14, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Unalaska and Akutan districts for 48 hours from noon Friday, July 14 until noon Sunday, July 16, 2017.

EMERGENCY ORDER NO. 4-FH-M-SP-03-17

DATE ISSUED: 9:00 a.m. July 16, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Unalaska and Akutan districts for 24 hours from noon Sunday, July 16 until noon Monday, July 17, 2017.

EMERGENCY ORDER NO. 4-FH-M-SP-04-17

DATE ISSUED: 10:00 a.m. July 17, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Unalaska and Akutan districts for 24 hours from noon Monday, July 17 until noon Tuesday, July 18, 2017.

EMERGENCY ORDER NO. 4-FH-M-SP-05-17

DATE ISSUED: 10:30 a.m. July 18, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Unalaska and Akutan districts for 24 hours from noon Tuesday, July 18 until noon Wednesday, July 19, 2017.

-continued-

EMERGENCY ORDER NO. 4-FH-M-SP-06-17

DATE ISSUED: 9:00 a.m. July 19, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Unalaska and Akutan districts for 24 hours from noon Wednesday, July 19 until noon Thursday, July 20, 2017.

EMERGENCY ORDER NO. 4-FH-M-SP-07-17

DATE ISSUED: 11:00 a.m. July 20, 2017

EXPLANATION: This emergency order extends the commercial herring fishing period in the Unalaska and Akutan districts from noon Thursday, July 20 until further notice.