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**Alaska Peninsula-Aleutian Islands Management Area
Commercial Herring Fishery Management Strategy,
2023**

by

Matthew D. Keyse

and

Tyler D. Lawson

May 2023

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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

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COMMERCIAL HERRING FISHERY MANAGEMENT STRATEGY, 2023**

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Matthew D. Keyse

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Tyler D. Lawson

Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

Alaska Department of Fish and Game

Division of Commercial Fisheries

351 Research Court

Kodiak, AK 99615

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*Matthew D. Keyse and Tyler D. Lawson
Alaska Department of Fish and Game, Division of Commercial Fisheries
351 Research Court, Kodiak, AK 99615, USA*

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TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ii
LIST OF FIGURES.....	ii
LIST OF APPENDICES.....	ii
ABSTRACT.....	1
INTRODUCTION.....	1
Pacific Herring Sac Roe Fishery Overview.....	1
Pacific Herring Food and Bait Fishery Overview.....	2
ALASKA PENINSULA-ALEUTIAN ISLANDS MANAGEMENT AREA HERRING SAC ROE MANAGEMENT STRATEGY.....	3
North and South Alaska Peninsula.....	3
Aleutian Islands.....	4
Registration Requirements.....	4
Fishing Vessels.....	4
Tenders and Processors.....	4
Catch Reporting.....	4
Fish Tickets.....	4
Gillnet and Seine Specifications.....	4
Industry Cooperation.....	5
ALASKA PENINSULA-ALEUTIAN ISLANDS (DUTCH HARBOR) FOOD AND BAIT HERRING FISHERY	5
Fishery Requirements.....	5
Allocation.....	5
Registration Requirements for Permit Holders, Tenders, and Processors.....	5
Fish Tickets.....	6
Fishing Periods.....	6
Herring Seine Pound Fishery.....	6
Gear Testing.....	7
Commercial Harvest Sampling.....	7
ALASKA PENINSULA-ALEUTIAN ISLANDS (ADAK) FOOD AND BAIT HERRING FISHERY.....	7
Commissioner’s Permit.....	7
Fishing Seasons, Area, and Gear Operation.....	7
TABLES AND FIGURES.....	9
APPENDIX A. ADF&G OFFICE CONTACTS.....	19
APPENDIX B. 2023 TOGIAC HERRING FORECAST.....	21

LIST OF TABLES

Table	Page
1. Port Moller District herring sac roe guideline harvest levels.	10
2. Harvest allocation of the 2023 forecasted Pacific herring run biomass, Togiak District, Bristol Bay.	10

LIST OF FIGURES

Figure	Page
1. Map of the <i>Alaska Peninsula-Aleutian Islands Herring Management Plan, Dutch Harbor Food and Bait Herring Fishery Management Plan, and Bering Sea Herring Fishery Management Plan</i> commercial herring districts.	11
2. Map of the North Alaska Peninsula, showing the Port Heiden District with commercial herring fishing statistical areas.	12
3. Map of the North Alaska Peninsula, showing the Port Moller District with commercial herring fishing statistical areas.	13
4. Map of the Alaska Peninsula from Pavlof Bay to Cape Sarichef with commercial herring fishing districts and statistical areas.	14
5. Map of the South Alaska Peninsula from Kupreanof Point to Belkofski Bay with commercial herring fishing districts and statistical areas.	15
6. Map of the Eastern Aleutian Islands from Samalga Pass to Unimak Island illustrating the herring fishing district boundaries.	16
7. Map of the Aleutian Islands from Tigalda Island to Umnak Island with commercial herring fishing districts and statistical areas.	17
8. Map of the Adak Island exploratory fishing area.	18

LIST OF APPENDICES

Appendix	Page
A1. Alaska Peninsula and Aleutian Islands Alaska Department of Fish and Game office information.	20
B1. 2023 Togiak herring forecast.	23

ABSTRACT

A Pacific herring *Clupea pallasii* commercial sac roe fishery may occur in the Alaska Peninsula-Aleutian Islands Management Area (Area M) in 2023. This document is a guide for commercial herring harvesters, buyers, and tender operators and describes the management strategy, guideline harvest levels (GHLs), fishing industry requirements for participation, and provides Alaska Department of Fish and Game (ADF&G) contact information. Dates and times for possible commercial fishing periods will be established by emergency order and can be obtained from ADF&G.

The commercial food and bait fisheries for Pacific herring in the Alaska Peninsula-Aleutian Islands Management Area (Area M) can occur within the Unimak, Akutan, Unalaska, Umnak, and Adak districts. The Dutch Harbor food and bait herring fishery takes place from noon June 24 until February 28 and is allocated 7% of the Togiak sac roe herring total allowable harvest (minus the Togiak spawn-on-kelp fishery fixed allocation). The 2023 Dutch Harbor food and bait herring allocation is 4,322 tons with either purse seine or gillnet gear. The Adak food and bait herring fishery is allocated 500 tons that may be harvested, from June 24 until February 28, with either purse seine or gillnet gear. This document describes how the fisheries will be managed, the industry requirements to participate in the fisheries, and how to contact and relay information to the Alaska Department of Fish and Game.

Keywords: Pacific herring, *Clupea pallasii*, sac roe, Alaska Peninsula, Aleutian Islands, Alaska Peninsula-Aleutian Islands, Area M, North Peninsula, South Peninsula, Port Moller, Sand Point, management plan, Alaska Board of Fisheries, guideline harvest level, commercial food and bait fishery, Dutch Harbor herring fishery

INTRODUCTION

This document provides commercial Pacific herring *Clupea pallasii* harvesters and buyers with guidelines that the Alaska Department of Fish and Game (ADF&G) will use to manage the Alaska Peninsula-Aleutian Islands Management Area (Area M) commercial herring sac roe and food and bait fisheries.

Area M (Figure 1, 5 AAC 27.600¹) is divided into three herring management sub-areas: the North Alaska Peninsula, consisting of Bering Sea waters extending west from Cape Menshikof to Cape Sarichef (Figures 2–4); the South Alaska Peninsula, consisting of Pacific Ocean coastal waters extending west of Kupreanof Point to near Cape Lazaref, on the south side of Unimak Island, 163°30' W long (Figures 4 and 5); and the Aleutian Islands, consisting of Bering Sea waters extending west of Unimak Pass and Pacific Ocean waters extending west from a point near Cape Lazaref, on the south side of Unimak Island, 163°30' W long to the International Date Line (Figure 1 and Figures 6–8). The North Peninsula, South Peninsula, and Aleutian Islands fisheries will be managed independently of each other. Fishermen may only harvest food and bait herring in the Unimak, Akutan, Unalaska, Umnak, and Adak Districts (Figures 6–8).

PACIFIC HERRING SAC ROE FISHERY OVERVIEW

The North Alaska Peninsula sac roe herring fishery occurred annually from 1982 through 1996, and sporadically from 1998 through 2013. In 2014, 2015 and 2019–2022 a commercial herring sac roe fishery did not occur in the waters of the North Alaska Peninsula due to lack of industry interest). A commercial herring sac roe fishery did occur in 2016, 2017 and 2018 in the waters of the North Alaska Peninsula.

The South Alaska Peninsula herring sac roe fishery occurred annually from 1979 through 1996, except in 1983 when the Alaska Board of Fisheries (board) allocated the herring harvest to a food

¹ ADF&G. 2023. 2023-2025 Statewide commercial herring fishing regulations. Alaska Department of Fish and Game, Juneau.

and bait fishery. Since 1997, there has been little industry interest due to poor market conditions, and no harvest has taken place.

In 2004, the board established the *Alaska Peninsula-Aleutian Islands Herring Management Plan* (5 AAC 27.657). This plan sets a 500-ton herring guideline harvest level (GHL) in the Adak District for harvest as either sac roe or food and bait. In 2010, the board amended the plan to allow both purse seine and gillnet gear the ability to harvest the GHL. Season dates for the Adak sac roe fishery are from April 15 through June 24 (5 AAC 27.610(e)(1)). To date, no herring have been harvested in this fishery .

PACIFIC HERRING FOOD AND BAIT FISHERY OVERVIEW

There are two food and bait fisheries in Area M: the Dutch Harbor (Unimak, Akutan, Unalaska, and Umnak Districts) and the Adak (Adak District) herring fisheries (Figure 1). In 2022, a food and bait fishery occurred in the Akutan and Unalaska Districts, with four vessels harvesting 2,170 tons of herring .

In recent years, three management plans have been used to manage the Dutch Harbor herring fishery: (1) the *Bering Sea Herring Fishery Management Plan* (5 AAC 27.060) mandates that if any of the southwest Alaska herring stocks between the Port Clarence and Togiak Districts are below their minimum threshold, the Dutch Harbor food and bait fishery will be closed for the season; (2) the *Bristol Bay Herring Management Plan* (5 AAC 27.865) establishes a 7% allocation of the Togiak District's sac roe herring harvest to the Dutch Harbor food and bait fishery; and (3) the *Dutch Harbor Food and Bait Herring Fishery Management Plan* (5 AAC 27.655) which subtracts excess tonnage from the following year's allocation if the given year's fishery exceeds its current GHL. Additionally, the plan allows up to 100 tons of the allocation to be reserved for an experimental herring seine and pound fishery if a Commissioner's permit is obtained.

At the March 2018 board meeting, the board made changes to the fishing seasons and periods for *Fishing seasons and periods for Alaska Peninsula-Aleutian Island Area* (5 AAC 27.610(e)(2)) and the *Dutch Harbor Food and Bait Herring Fishery Allocation Plan* (5 AAC 27.655). The opening date of June 24 for the food and bait gillnet fishery was unchanged. The date the purse seine fishery may open was changed from July 15 to July 1. The date at which the herring seine fishery may harvest any remaining herring gillnet allocation was changed from after July 20 to after July 5. After July 5, 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 5, then that amount shall be deducted from any remaining quota for that year after July 5. If the seine group exceeds the total allocation after July 5, then the seine group overage shall be deducted from the next year's seine allocation as stated in 5 AAC 27.655(b).

At the February 2019 board meeting, the board amended the *Dutch Harbor Food and Bait Herring Fishery Management Plan* (5 AAC 27.655) so that the season may open for purse seine and gillnet gear beginning on June 24. The board also amended this plan to remove the allocation of harvest between the purse seine and gillnet gear types. Both gear types may participate in harvesting herring until the total GHL is reached.

In 2004, the board created the *Alaska Peninsula-Aleutian Islands Herring Management Plan* (5 AAC 27.657), establishing a herring fishery in the Adak District (Figure 8) with a 500-ton allocation independent of the Dutch Harbor food and bait allocation. This plan was amended at the 2010 board meeting to allow both purse seine and gillnet gear to harvest the 500-ton Adak

allocation. Season dates for the Adak food and bait fishery are June 24 through February 28 (5 AAC 27.610(e)(2)). Since the plan's inception in 2004, there has been no harvest in the Adak District.

ALASKA PENINSULA-ALEUTIAN ISLANDS MANAGEMENT AREA HERRING SAC ROE MANAGEMENT STRATEGY

In the Alaska Peninsula-Aleutian Islands Management Area herring sac roe fishery, the permit holder and buyer will be responsible for determining acceptable herring quality. The herring fishery will not be closed by ADF&G based on roe quality except in cases where excessive herring are expected to be wasted. Permit holders are encouraged to check with their buyer prior to fishing to determine industry standards for product quality and size. All herring harvested during the sac roe season that are sold as bait or discarded due to quality problems will be included as part of the total herring harvest.

GHLs are not established for any management units except for the Port Moller (Table 1) and Adak Districts (5 AAC 27.657). The herring sac roe fisheries may open contingent upon 1) the industry notifying ADF&G of interest in harvesting herring from a specific area, 2) ADF&G documenting herring biomass, and 3) ADF&G establishing a GHL. ADF&G office locations and inseason news release broadcast frequencies are listed in Appendix A.

A global positioning system (GPS; North American Datum 1983) will be used to determine latitude and longitude coordinates throughout all Alaska Peninsula and Aleutian Islands herring fisheries (5 AAC 27.606).

NORTH AND SOUTH ALASKA PENINSULA

In the North Alaska Peninsula Management Area, the Port Heiden, Port Moller, and Amak Districts (Figures 2–4) may be opened for commercial herring sac roe fishing from April 15 through July 15 (5 AAC 27.610(a)). In accordance with the *Bering Sea Herring Fishery Management Plan* (5 AAC 27.060(c)), herring fishing in the Port Moller District will be allowed only if ADF&G has documented a herring biomass threshold of at least 1,000 tons in the area. The GHL will be determined using a sliding scale exploitation rate in which the allowable exploitation rate increases with stock abundance (Table 1). A minimum of a six-hour advance notice will be given prior to any fishing period in the Port Moller area, unless it is an extension of a current fishing period. If effort decreases, the six-hour notice may be reduced or eliminated. Purse seine and gillnet gear will have concurrent openings throughout the North Alaska Peninsula.

In the South Alaska Peninsula Management Area, the Sand Point, Pavlof, and King Cove Districts (Figures 4 and 5) may be opened for commercial sac roe herring fishing from April 15 through July 15 (5 AAC 27.610(a)). Fishing openings will be contingent upon industry interest in harvesting herring from a specific area and ADF&G documentation of sufficient herring biomass. No more than a 25-ton harvest will be allowed from any section in each district unless ADF&G documents a herring biomass that would support a larger harvest. A limited amount of spawning herring biomass has been documented in South Alaska Peninsula waters, in part because of a limited number of aerial surveys. ADF&G plans to conduct aerial surveys and requests that any herring biomass observations be reported to ADF&G personnel in Sand Point.

ALEUTIAN ISLANDS

All districts within the Aleutian Islands, which include the Unimak, Akutan, Unalaska, Umnak and Adak Districts may open to commercial sac roe herring fishing from April 15 through noon June 24 (Figure 6; 5 AAC 27.610(e)(1)). Fishing periods and GHs in the Aleutian Islands will be contingent upon the industry expressing interest in harvesting herring in a specific area and ADF&G documenting sufficient herring biomass.

In the Adak District (Figure 8), up to 500 tons of herring may be taken during the periods established by emergency order from June 24 through February 28 (5 AAC 27.657).

REGISTRATION REQUIREMENTS

Fishing Vessels

All Alaska Peninsula-Aleutian Islands Area seine and gillnet commercial herring permit holders must register by contacting ADF&G in Dutch Harbor, Cold Bay, Sand Point, or Port Moller at least 48 hours before the sac roe season opens (Appendix A).

Tenders and Processors

All herring tenders and processors must register with ADF&G prior to buying or tendering herring (5 AAC 27.662). North Alaska Peninsula buyers, processors, and tender agents may register with ADF&G staff in the Port Moller or Kodiak offices in person or through other means (e.g., radio, email, or phone; Appendix A). For the South Alaska Peninsula and Aleutian Islands districts, registration can be accomplished through the ADF&G offices in Cold Bay, Sand Point, Dutch Harbor, or Kodiak (Appendix A). Catch reporting instructions will be explained during the registration process.

CATCH REPORTING

Processors and tender operators must report daily to ADF&G while involved in the herring sac roe fishery (Appendix A; 5 AAC 27.662). Daily reports must include the statistical area where the herring are caught, the weight of herring harvested by catcher boats and an accurate estimate of herring onboard tenders. Because the allowable harvest could quickly be exceeded, harvesters are encouraged to report harvests after each set, while tenders and processors are asked to report immediately upon completion of each delivery.

FISH TICKETS

Permit holders must provide specific harvest locations (statistical area or a specific landmark) to buyers, so that locations can be recorded on fish tickets. **Fish tickets must be delivered to local ADF&G personnel prior to departure from the area, and no later than 10 days after termination of buying operations in the area, or as otherwise specified by local representatives of ADF&G** (5 AAC 27.662; Appendix A). Fish tickets must include the weight of harvested herring in either units of short tons (2,000 lb.) or total pounds.

GILLNET AND SEINE SPECIFICATIONS

The aggregate length of herring gillnets in use by a herring Commercial Fisheries Entry Commission (CFEC) permit holder may not exceed 150 fathoms and the gillnet mesh may be up to 2.5", except that in the Akutan and Unalaska Districts gillnet mesh may be up to 3.5" (5 AAC

27.631(a)(d)). The permit holder must be present while gillnet gear is being fished (5 AAC 27.631(b)). A purse seine may not exceed 1,000 meshes in depth and 100 fathoms in length (5 AAC 27.632).

INDUSTRY COOPERATION

Cooperation of harvesters, tender operators, spotter pilots, and processors is necessary when ADF&G personnel request herring samples from the commercial catch. Samples will be collected for monitoring age composition, which assists in determining the stock's health and forecasting the following year's run strength. ADF&G will also be monitoring spawning activities and will be soliciting information regarding herring sightings to supplement information gathered by ADF&G personnel. ADF&G's ability to monitor herring biomass is limited by aircraft availability and funding constraints. Industry cooperation in locating herring will enable ADF&G to monitor Alaska Peninsula-Aleutian Islands Area herring stocks more efficiently. Harvesters and spotter pilots are encouraged to provide herring biomass estimates and spawning information to ADF&G. Past cooperation has proven valuable when evaluating stock status and managing the fishery.

ALASKA PENINSULA-ALEUTIAN ISLANDS (DUTCH HARBOR) FOOD AND BAIT HERRING FISHERY

FISHERY REQUIREMENTS

In order for ADF&G to open Unimak, Akutan, Unalaska, or Umnak Districts (Figure 6) to food and bait herring fishing, each southwest Alaska herring biomass projection must surpass its board mandated district threshold (5 AAC 27.060). These biomass projections are for fisheries located in the Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, Nunivak Island, Cape Romonzof, Togiak, and Norton Sound Districts (Figure 1). Traditionally, ADF&G 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. The Pacific herring spawning biomass in the Togiak District is estimated to be 316,203 tons for 2023 (Appendix B).

ALLOCATION

ADF&G will attempt to manage the Dutch Harbor food and bait herring fishery so that the harvest remains within the allocation (Table 2; Appendix B). A "rollover" provision was adopted during the 2001 board meeting (5 AAC 27.655(b)); during years when herring harvest exceeds the allocation, the amount of harvest over the allocation shall be deducted from the next year's allocation.

The 2023 GHF for the Dutch Harbor food and bait herring harvest is 4,322 tons. Furthermore, 100 tons may be reserved from the allocation for an experimental herring pound fishery (5 AAC 27.655(c)).

REGISTRATION REQUIREMENTS FOR PERMIT HOLDERS, TENDERS, AND PROCESSORS

Prior to harvesting, buying, or processing any herring, permit holders must register at the ADF&G office in Sand Point or Cold Bay. Even if no herring are harvested or vessels are not actively fishing, each permit holder, tender, and processor must still report daily by 10:00 AM or until registration

from the fishery is withdrawn. If conditions arise that require additional time for permit holders to report herring harvests, ADF&G must be informed of the situation prior to fishing operations. Catch reporting instructions will be explained in detail during registration.

All processors must make daily reports of all herring purchased from fishermen and other processing records as specified by ADF&G (5 AAC 27.662(2)). These daily reports can be provided to ADF&G by phone, fax, or e-mail (Appendix A). Contact information for the region is in Appendix A.

FISH TICKETS

Permit holders must provide specific harvest locations (statistical area and specific landmark) to buyers so that they can be recorded on fish tickets. **Fish tickets must be delivered, by mail or in person, to the Sand Point or Kodiak ADF&G offices within ten days after the closure of the fishery** (5 AAC 27.662(3)). If 10 days are insufficient time to submit fish tickets, other arrangements must be made by contacting ADF&G in Sand Point (Appendix A).

FISHING PERIODS

The food and bait herring fishery can open by emergency order as early as noon June 24 and may be extended until the allocation is reached, or until ADF&G decides that an additional fishing period might exceed the allocation, or the season reaches its end on February 28 (5 AAC 27.610(e)(2)(A)). It is the intention of ADF&G to begin the fishery no later than July 1. Effort levels and harvest rates will be considered when establishing fishery openings. If possible, the fishery will be conducted in the waters of Unalaska Bay (Figure 6).

Due to the harvest capabilities and competitive nature of the fleet, ADF&G anticipates that fishing periods will be short in duration, unless the harvesters form a combine. Short openings over several days may be required to prevent exceeding the allocation. Generally, there will be a 12-hour closure between fishing periods to allow permit holders an opportunity to deliver their catch and ADF&G to assess the harvest and processing capacity. The fishery may be extended until the allocation is reached if the harvesters form a combine and ADF&G receives harvest reports promptly from all permit holders. ADF&G may cancel or extend a fishing period with little notice.

In the past, widespread overharvesting has occurred in the Dutch Harbor food and bait fishery. To avoid potential overharvest issues, ADF&G instituted the policy that if the average allocation per vessel fished (total allocation/number of vessels registered) is less than 150 tons per registered vessel, ADF&G will drastically limit both the length of the fishing periods and the size of the area open to commercial herring fishing.

Harvesters and spotter pilots are encouraged to relay biomass information to ADF&G prior to the opening. Past cooperation between ADF&G and the fishing industry has proven valuable in gaining information critical to management of the fishery. ADF&G will make every attempt to assess herring biomass in the area prior to opening the fishery.

HERRING SEINE POUND FISHERY

One hundred tons of herring may be allocated to the herring seine pound fishery, which will be deducted from the allocation (5 AAC 27.655(c)). A person planning to operate a pound must check in with ADF&G and include detailed plans describing the design and operation of the pound, including exact location and timing of pound operation. These plans must be received by ADF&G

in a timely manner to allow preparation of a Commissioner's permit for pound operation. A permit holder intending to operate a pound is encouraged to register with ADF&G in Sand Point or Cold Bay no later than 5:00 PM June 22, 2020.

If the herring pound allocation is not harvested, it will then be rolled over into the remaining allocation. If more than one permit holder registers for the pound fishery, the pound allocation is divided equally among them.

GEAR TESTING

Prior to opening the fishery, purse seine and gillnet gear may be tested during daylight hours until 5:00 PM June 23. Permit holders must contact ADF&G in Sand Point, Cold Bay or Dutch Harbor prior to setting gear to establish a designated time and place for gear testing. In addition, any fish caught during gear testing must immediately be released unharmed. After the fishery has been closed and all herring on the vessel have been offloaded, participants may, after notifying ADF&G, set their net to straighten, clean, and organize their gear at a time and place designated by ADF&G.

COMMERCIAL HARVEST SAMPLING

Cooperation from harvesters, tender operators, and processors will be appreciated when ADF&G personnel request herring samples from the commercial catch. These samples will be used to determine the age, sex, and size composition of the stock.

ALASKA PENINSULA-ALEUTIAN ISLANDS (ADAK) FOOD AND BAIT HERRING FISHERY

Beginning in 2004, the board authorized a herring set gillnet fishery in the Adak District with a 500-ton allocation (5 AAC 27.657; Figure 8). However, in 2010, the board amended the regulations to include both seine and gillnet gear in the harvest of up to 500 tons within the waters around Adak Island (175° 30' W. long. to 177° W. long.). This allocation is independent of the Dutch Harbor food and bait allocation. Herring can be harvested in this fishery as either sac roe or food and bait (5 AAC 27.657). ADF&G has no information about the size, timing, or condition of herring stocks in the Adak area.

COMMISSIONER'S PERMIT

Each permit holder, tender operator, and buyer must register and obtain a Commissioner's permit for the Adak herring fishery at the ADF&G office in Sand Point or Cold Bay prior to catching, tendering, buying, or processing herring. The buyer and tender reporting requirements are described in 5 AAC 27.662. Permit holders are encouraged to check with their markets prior to fishing to determine which products are acceptable.

FISHING SEASONS, AREA, AND GEAR OPERATION

In that portion of the Adak District from 175°30' W long to 177° W long, herring may be taken in the food and bait fishery using purse seine or gillnet gear from June 24 through February 28 (5 AAC 27.657(b); Figure 8).

The permit holder must be physically present while the gillnet gear is being fished. Each drift gillnet in operation must have a buoy at one end, and the opposite end must be attached to the

fishing vessel. Each set gillnet in operation must be anchored and buoyed at both ends. Buoy must be plainly and legibly marked with the permanent vessel license plate number (ADF&G number) of the vessel operating the gear. The buoy may bear only a single number, and this number must be that of the vessel used in operating the gear. The numbers must be painted on the top one-third of the buoy in numerals at least four inches in height, one-half inch in width, and in a color contrasting to that of the buoy. The buoy markings must be visible above the water surface. (5 AAC 27.631(b)(c)). A purse seine may not be more than 1,000 meshes in depth and 250 fathoms in length. (5 AAC 27.632).

TABLES AND FIGURES

Table 1.–Port Moller District herring sac roe guideline harvest levels.

Stock size (tons)	Sliding scale exploitation rate ^a	Allowable harvest (tons) ^b
< 1,000	0%	0
1,001–1,500	10%	100–150
1,501–2,000	10%	150–200
2,001–2,500	15%	300–375
2,501–3,000	15%	375–450
> 3,001	20%	> 600

^a The guideline harvest level (GHL) increases proportionally to spawning biomass observed by ADF&G. A sliding scale exploitation rate will be used to determine the GHL.

^b Herring harvested along the Bering Sea coast (southwest of Cape Seniavin) will be allocated to the Port Moller and Herendeen Bays guideline harvest level if it is determined that these herring were traveling into Port Moller or Herendeen bays.

Table 2.–Harvest allocation of the 2023 forecasted Pacific herring run biomass, Togiak District, Bristol Bay.

	Biomass (short Tons)
2023 Togiak District forecasted biomass	316,203
Total allowable harvest (20% exploitation rate)	63,241
Togiak spawn on kelp fishery (fixed allocation)	1,500
Remaining allowable harvest	61,741
Dutch Harbor food and bait allocation ^a	4,322
Overharvest penalty from previous year	0
2023 purse seine and gillnet allocation	4,322

^a The Dutch Harbor food and bait allocation is 7% of the remaining allowable harvest from the Togiak District.

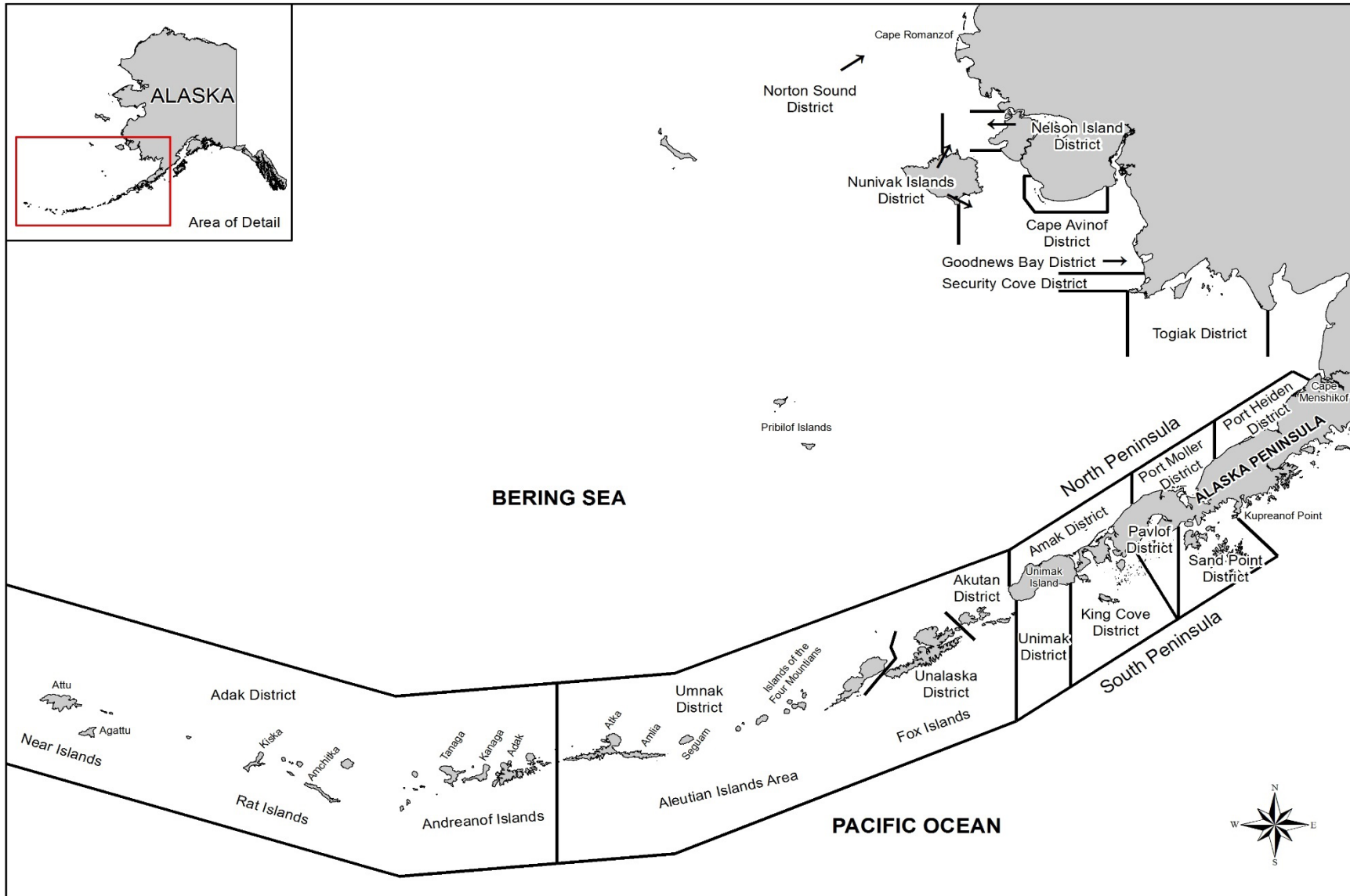


Figure 1.—Map of the Alaska Peninsula-Aleutian Islands Herring Management Plan, Dutch Harbor Food and Bait Herring Fishery Management Plan, and Bering Sea Herring Fishery Management Plan commercial herring districts.

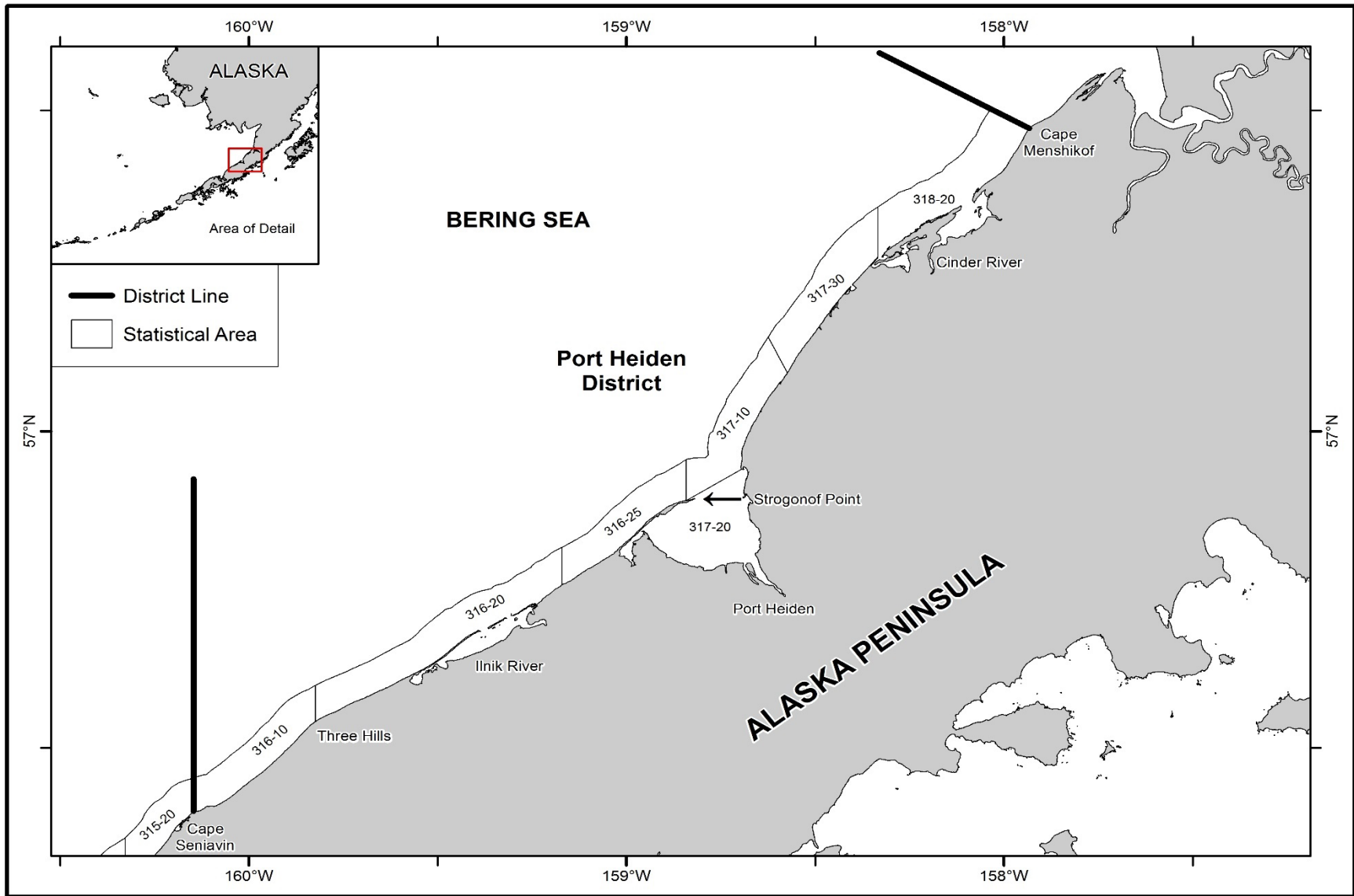


Figure 2.—Map of the North Alaska Peninsula, showing the Port Heiden District with commercial herring fishing statistical areas.

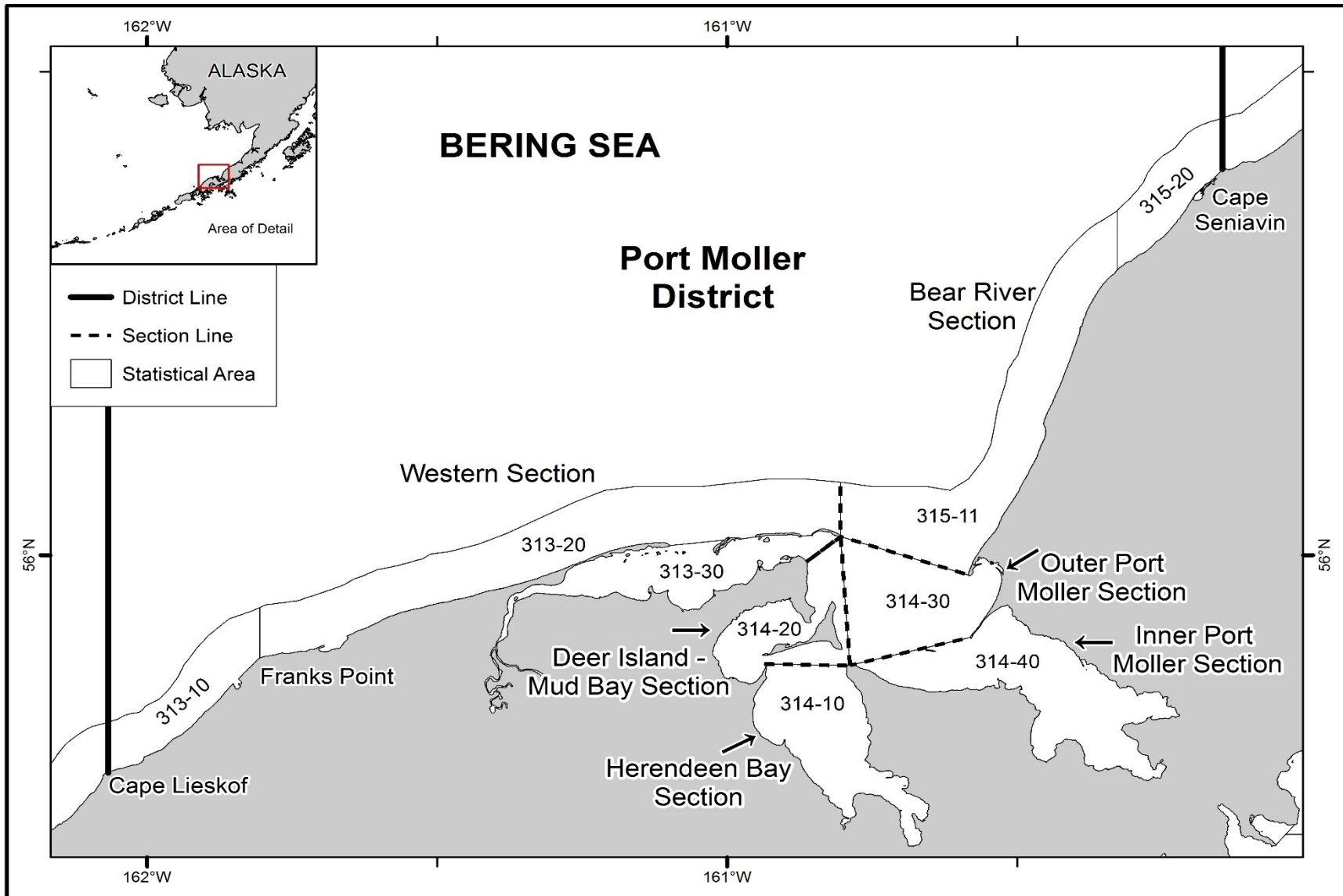


Figure 3.—Map of the North Alaska Peninsula, showing the Port Moller District with commercial herring fishing statistical areas.

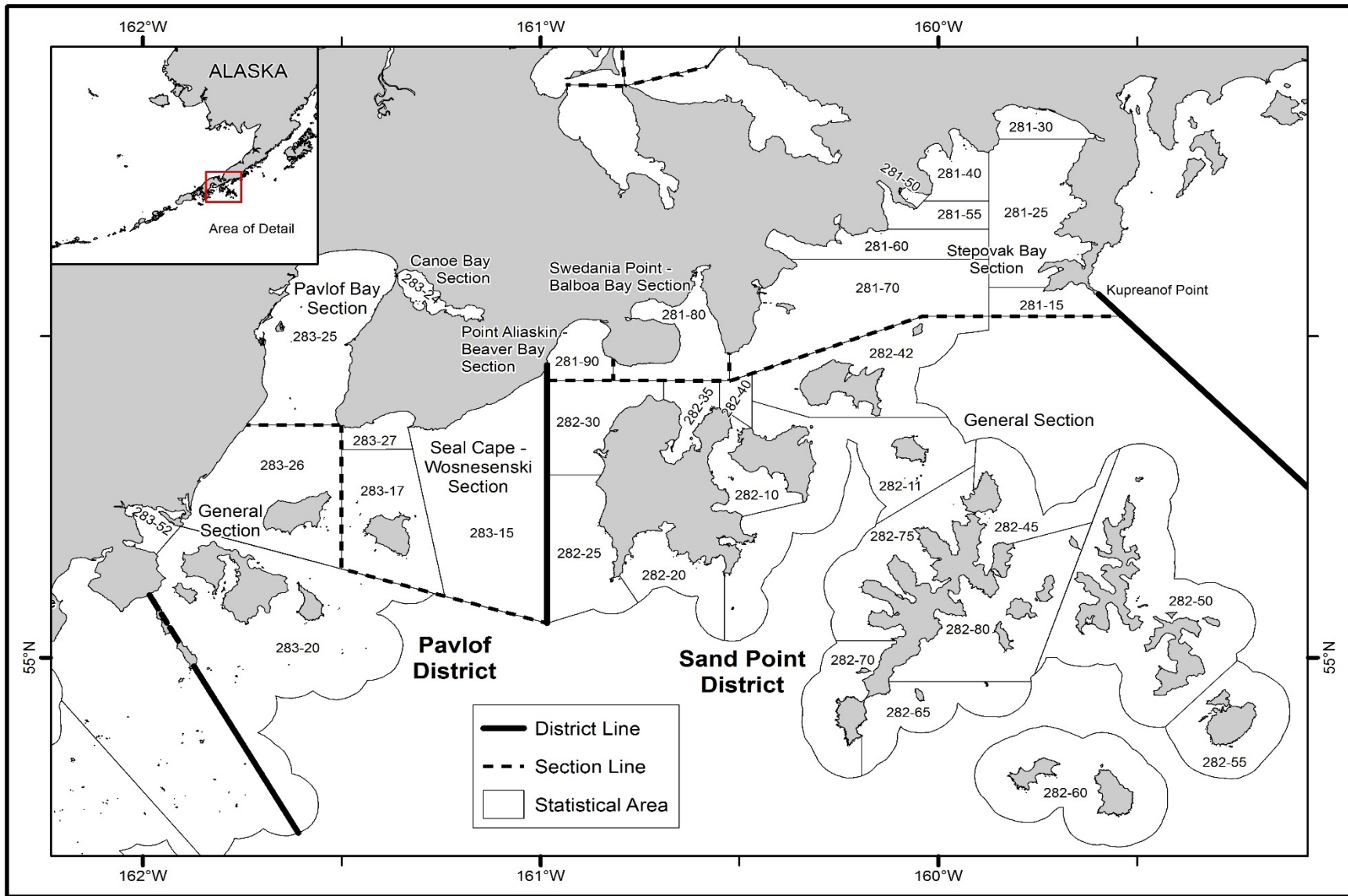


Figure 5.—Map of the South Alaska Peninsula from Kupreanof Point to Belkofski Bay with commercial herring fishing districts and statistical areas.

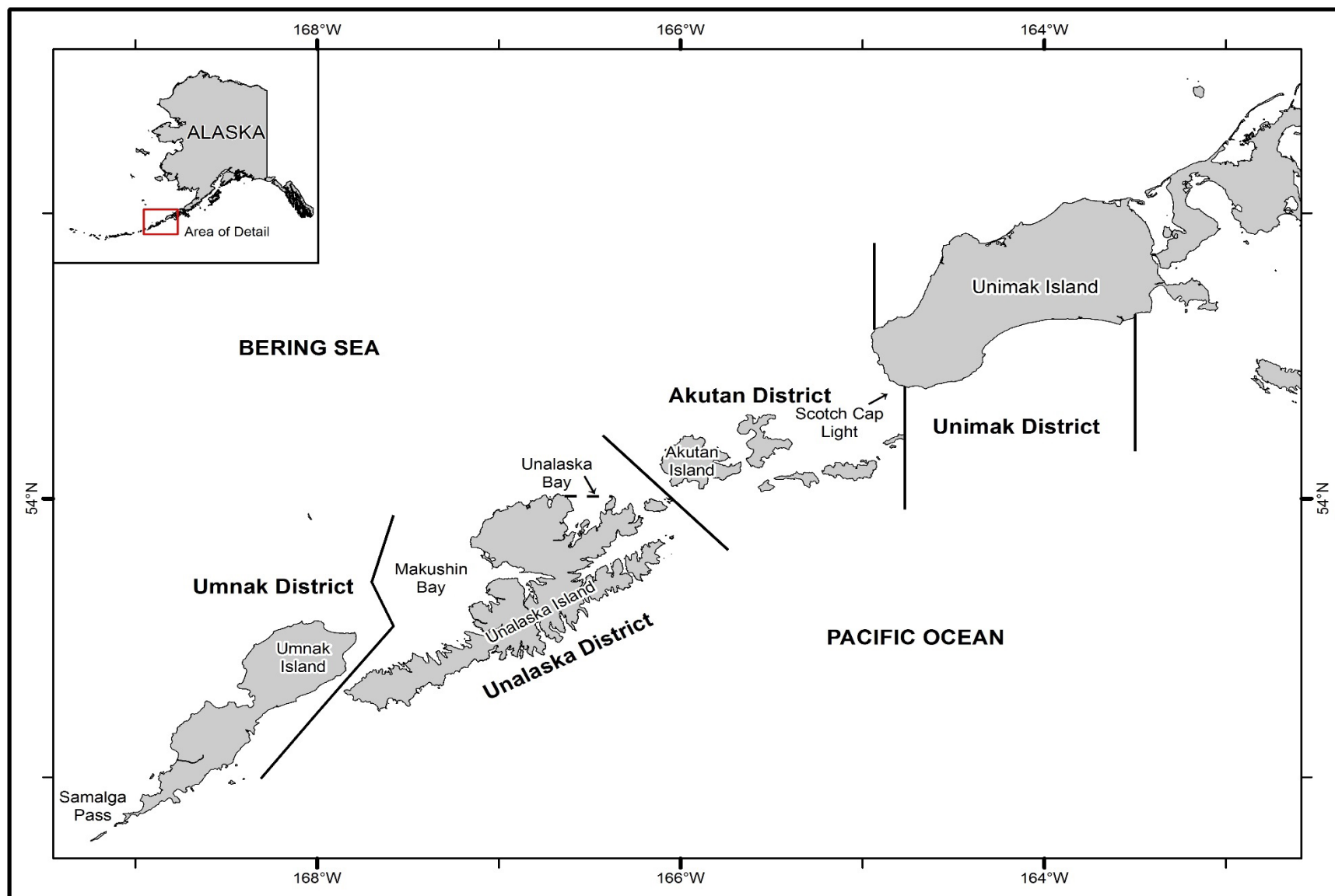


Figure 6.—Map of the Eastern Aleutian Islands from Samalga Pass to Unimak Island illustrating the herring fishing district boundaries.

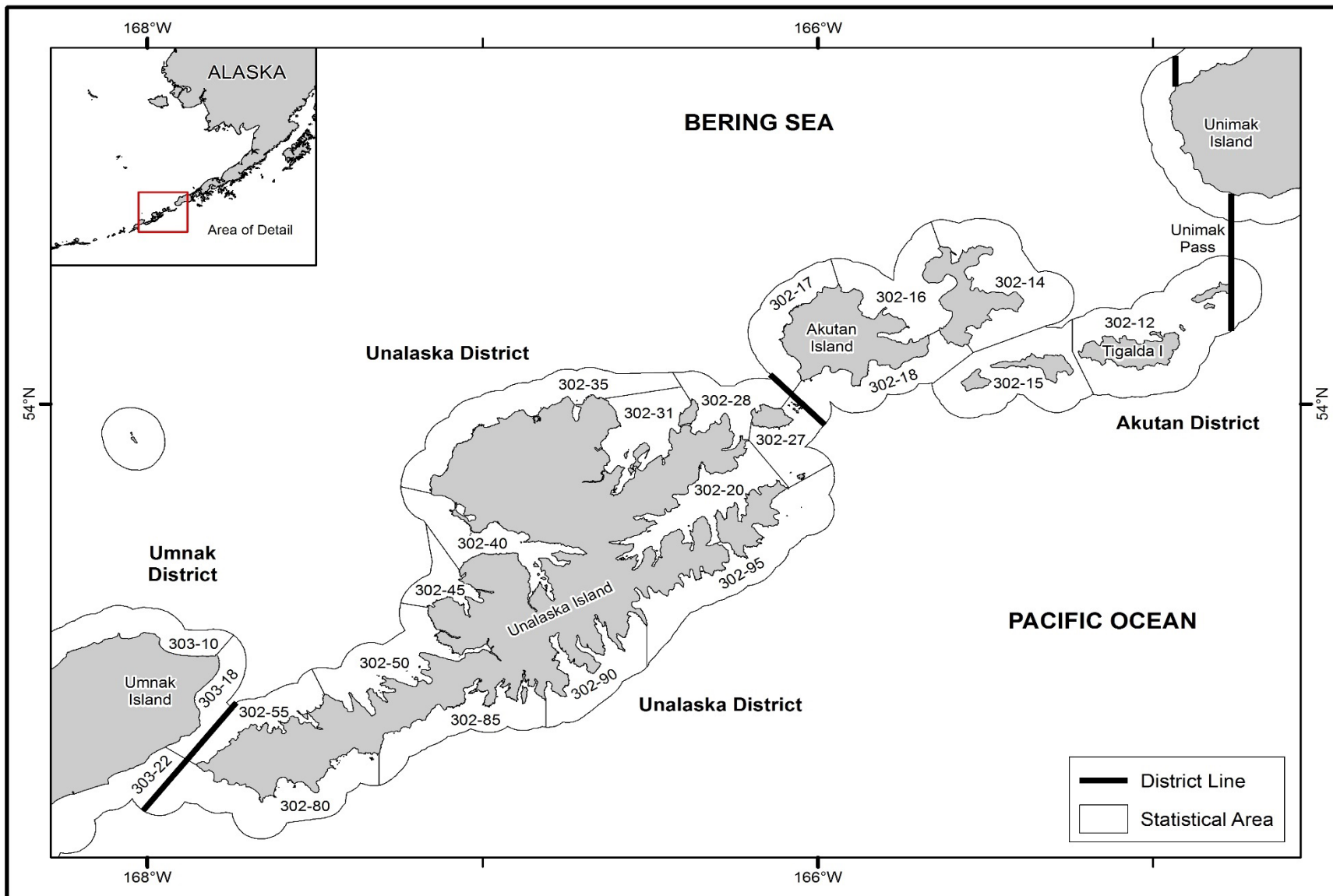


Figure 7.—Map of the Aleutian Islands from Tigalda Island to Umnak Island with commercial herring fishing districts and statistical areas.

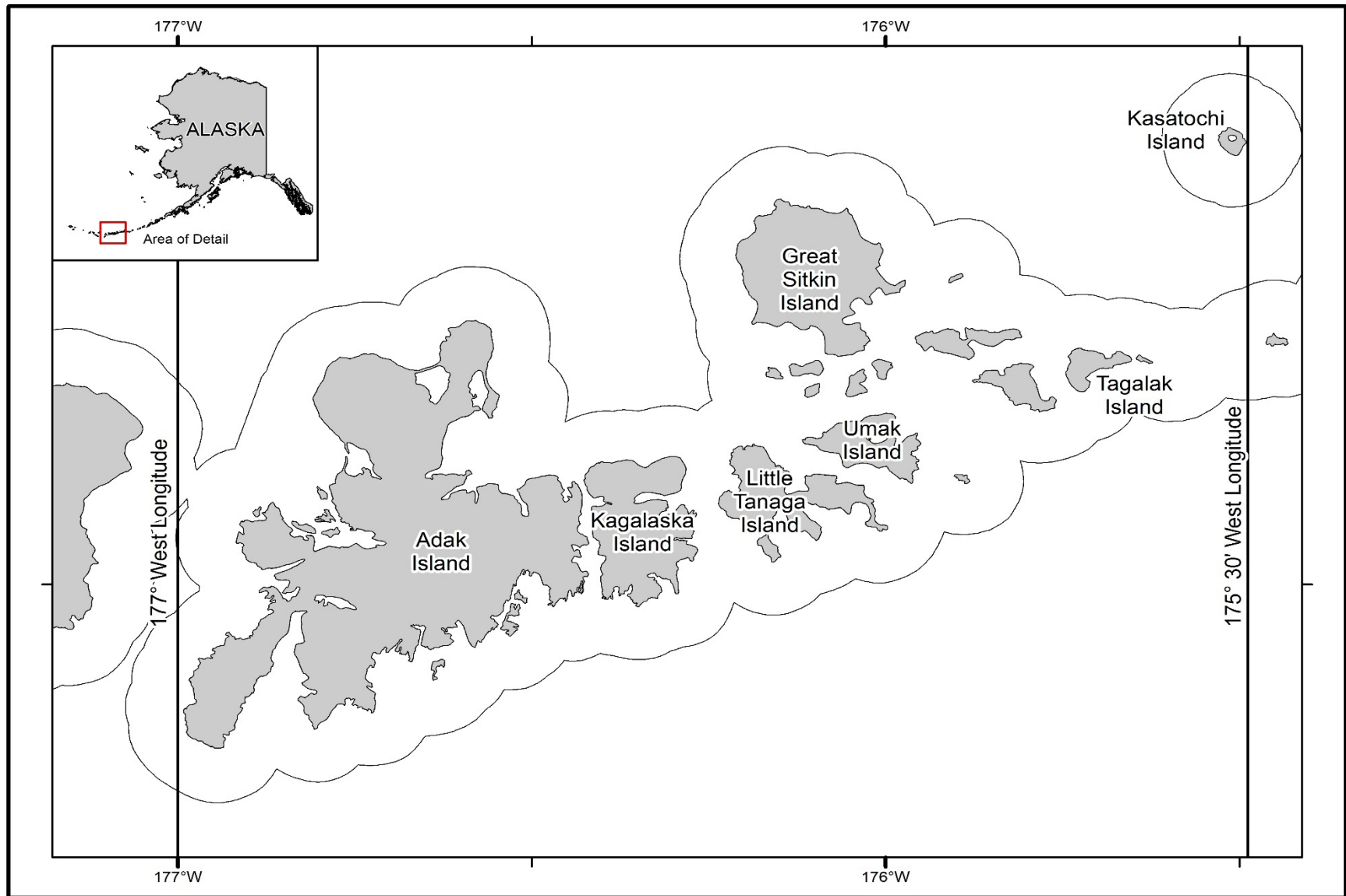


Figure 8.—Map of the Adak Island exploratory fishing area.

APPENDIX A. ADF&G OFFICE CONTACTS

Appendix A1.–Alaska Peninsula and Aleutian Islands Alaska Department of Fish and Game office information.

Sand Point

Alaska Department of Fish and Game
P.O. Box 129
Sand Point, AK 99661
Phone: (907) 383-2066
Fax: (907) 383-2606
Recorded message: (907) 383-2334
VHF: Channels 6 and 73
Email: matthew.keyse@alaska.gov
Email: geoff.spalinger@alaska.gov

Dutch Harbor

Alaska Department of Fish and Game
P.O. Box 920587
Dutch Harbor, AK 99692
Phone: (907) 581-1239
Fax: (907) 581-1572

Cold Bay

Alaska Department of Fish and Game
P.O. Box 50
Cold Bay, AK 99571
Phone: (907) 532-2419

Email: tyler.lawson@alaska.gov

Port Moller

Alaska Department of Fish and Game
P.O. Box 163
Port Moller, AK 99571
Phone: (907) 375-2716
VHF: Channel 72
Single Side Band: 3.230 MHz, call sign WNGV 537
Email: charlie.russell@alaska.gov
Email: william.middleton@alaska.gov

Kodiak

Alaska Department of Fish and Game
351 Research Court
Kodiak, AK 99615
Phone: (907) 486-1830
Fax: (907) 486-1841
Dispatch #7410
amanda.dorner@alaska.gov
todd.anderson@alaska.gov

APPENDIX B. 2023 TOGIAK HERRING FORECAST

Division of Commercial Fisheries
Sam Rabung, Director

Anchorage Office
 333 Raspberry Road
 Anchorage, AK 99518



Alaska Department of Fish and Game
Doug Vincent-Lang, Commissioner
 Headquarters Office
 P.O. Box 115526
 Juneau, AK 99811-5526
 www.adfg.alaska.gov

Advisory Announcement

Date Issued: December 21, 2022

Time Issued: 12:00 p.m.

Contact Information

Jordan Head, Area Research Biologist

Sara Miller, Biometrician

Phil Joy, Biometrician

Stacy Vega, Area Research Biologist

Phone: (907) 267-2166

2023 TOGIAK HERRING FORECAST

The 2023 Togiak herring biomass forecast is 316,203 short tons, which yields a total allowable harvest of 63,241 short tons per the 20% exploitation rate in regulation. This harvest is further split among fisheries in series, per the *Bristol Bay Herring Management Plan 5 AAC 27.865(b)*: 1,500 tons to the Togiak spawn-on kelp fishery, then 7% of the remaining harvest to the Dutch Harbor food and bait fishery, and then the remainder to the Togiak sac roe fishery. The sac roe fishery is then allocated 80% to purse seines and 20% to gillnets (Table 1).

Table 1.–The 2023 Togiak District herring biomass, with resulting harvest forecasts and allocations per 5 AAC 27.865.

	Biomass (Short Tons)	Harvest (Short Tons)
Biomass Estimate	316,203	
Total Allowable Harvest (20% exploitation rate)		63,241
Togiak Spawn on Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		61,741
Dutch Harbor Food/Bait Allocation (7% of remaining allocation)		4,322
Togiak District Sac Roe Fishery		57,419
Purse Seine Allocation (80%)		45,935
Gillnet Allocation (20%)		11,484

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2023 TOGIAC HERRING FORECAST SUMMARY

The 2023 mature herring biomass forecast is 316,203 tons and is the second highest forecast (after the 2022 forecast) since 1993 (Figure 1). This continues an increasing trajectory of Togiak mature herring biomass and is due primarily to the large recruitment of age-4 fish in 2020 and 2021 as well as the bodily growth of those strong year classes. Recruitment since 2017 has also been above the long-term median of 128 million fish since (1980-2022), with the 2020 and 2021 recruitments being 3.1 and 4.7 times larger, respectively, than the median recruitment. The 2020 and 2021 cohorts are projected to make up an even larger portion of the population in 2023 due to increasing maturity and growth (Figure 2). The majority of the mature population in 2023 is expected to be age-6 and age-7 fish, both by number (39% and 22% respectively) and by biomass (36% and 24% respectively; Figure 2). The forecast average weight of a fish in the 2023 mature population is 321 g (Figure 2), whereas the forecast average weight of a fish that is vulnerable to the commercial purse seine fishery is 332 g.

The assessment model used to forecast the Togiak herring population utilizes time series of harvest, age composition of the purse seine and gillnet harvest, age composition of the mature population, and aerial survey biomass estimates from 1980 forward. The age composition of the seine harvest is estimated from samples taken from the entire commercial purse seine harvest. The age composition of mature population biomass is estimated from samples taken from the seine fishery near in time to the peak survey and the post-peak surveys. Mature biomass is estimated by combining aerial survey biomass estimates (peak- and post-peak) with presurvey harvest (purse seine and gillnet). The assessment model uses between-dataset weighting and variable weighting within the aerial survey dataset to reflect the confidence staff has in the respective datasets and the confidence staff has in the individual aerial survey estimates. Confidence in the individual aerial survey estimates is based on the number of surveys, timing of surveys, weather, and water conditions. The forecasted average weight-at-age of herring for 2023 was calculated using the average weight from recent commercial purse seine fishery samples (2021 and 2022).

Uncertainty is not yet quantified for Togiak herring forecasts but is considered to be relatively high for the 2023 forecast due to the widely varying estimates of biomass from aerial surveys in 2021 and 2022 (Figure 1). Aerial survey conditions were good in 2022, but mechanical issues prevented surveys at the peak of the run. As a result, the 2022 aerial survey peak biomass estimate had a relatively low overall confidence ranking of 0.25 out of 1.0. In addition, the model estimates a single survival rate across all ages and years and if the survival of exceptionally large year classes differs from others, this will not be captured in the forecast. All these factors reduce certainty in the 2023 forecast.

Herring are detected in our sampling when they recruit into the fishery; this process begins around age-4 and may not be fully complete until approximately age-9. Large recruitments into this population generally occur every eight to ten years, typically last one or two years, and biological sampling suggests the most recent recruitments occurred in 2020 and 2021. It is difficult to measure contributions of young age classes because these fish are not fully recruited (available) in the harvest and often arrive on the spawning grounds near the end of, or after, the fishery. Improved estimation of herring year class size is expected as cohorts are observed in the fishery in subsequent years.

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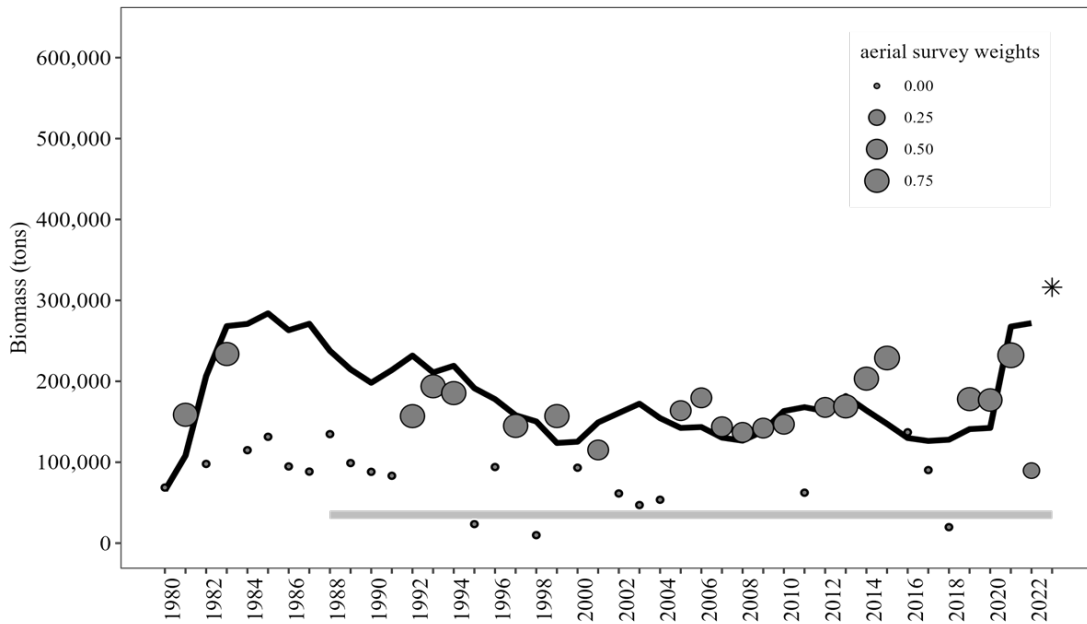


Figure 1. –Aerial survey-estimated biomass plus pre-peak catch that were included in the model (grey circles), model-estimated mature biomass (black solid line), and model-estimated mature biomass forecast (black asterisk). The size of the grey circles reflects the confidence weighting of each aerial survey estimate in the model based on weather, number of surveys, quality of surveys, and timing of surveys relative to the spawn (ranging from 0 = no confidence to 1 = perfect confidence). The confidence ranking in 2022 was 0.25. The grey line denotes the threshold biomass of 35,000 tons.

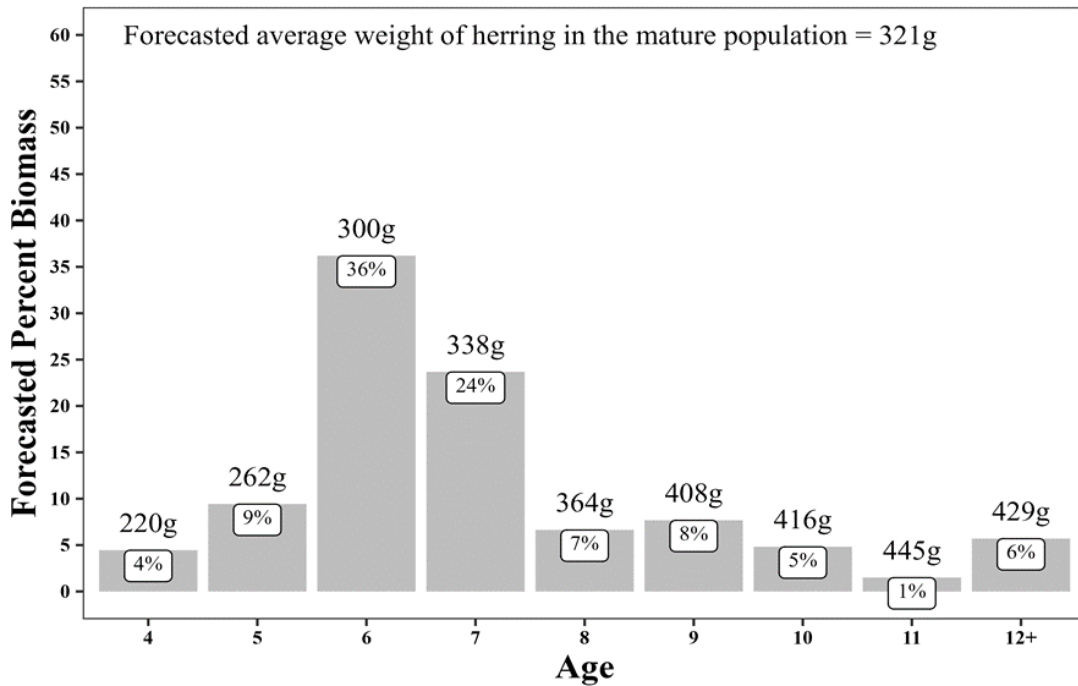


Figure 2. –Forecasted percent mature biomass of Togiak herring by age in 2023, showing average weight (grams) for each age class and for all age classes combined (321 g).