

Fishery Management Report No. 10-14

**Dutch Harbor Herring Food and Bait Fisheries
Management Plan, 2010,
and**

**Alaska Peninsula-Aleutian Islands Management Area
Herring Sac Roe and Food and Bait Fisheries
Management Plan, 2010**

by

Alex C. Bernard

April 2010

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

FISHERY MANAGEMENT REPORT NO. 10-14

**DUTCH HARBOR HERRING FOOD AND BAIT FISHERIES
MANAGEMENT PLAN, 2010, AND ALASKA PENINSULA-ALEUTIAN
ISLANDS MANAGEMENT AREA HERRING SAC ROE AND FOOD AND
BAIT FISHERIES MANAGEMENT PLAN, 2010**

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ABSTRACT

The commercial food and bait fishery for Pacific herring *Clupea pallasii* in the Alaska Peninsula-Aleutian Islands Herring Management Area (Area M) occurs within the Unimak, Akutan, Unalaska, Umnak, and Adak districts. The Dutch Harbor herring food and bait fishery takes place from June 24 until February 28 and is allocated 7 percent of the Togiak sac roe herring total allowable harvest (minus the Togiak spawn-on-kelp fishery fixed allocation). The 2010 Dutch Harbor herring food and bait allocation is 1,950 tons, of which 273 (14%) tons is allocated to the gillnet fishery. The purse seine allocation will be 1,577, of which 100 tons is set aside for the experimental pound fishery. The Adak herring food and bait fishery is allocated 500 tons that may be harvested, from June 24 until February 28, with both purse seine and 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.

Key words: Pacific herring, *Clupea pallasii*, commercial food and bait fishery, Alaska Peninsula-Aleutian Islands, Area M, Dutch Harbor herring fishery, Togiak, herring gillnet, herring sac roe, herring seine, herring pound, Adak herring fishery, Fishery Management Plan.

INTRODUCTION

This document is intended to provide commercial herring harvesters and buyers with information and guidelines for participating in the Alaska Peninsula-Aleutian Islands Management Area (Area M) Pacific herring *Clupea pallasii* food and bait fishery. Information on inseason management of the Alaska Peninsula-Aleutian Islands Management Area herring sac roe fisheries can be found in Bernard (2010).

The Alaska Peninsula-Aleutian Islands Herring Management Area consists of Bering Sea waters extending west of Cape Menshikof, and Pacific Ocean state waters extending west of Kupreanof Point, to the International Dateline (Figure 1; 5 AAC 27.600). Fishermen may only harvest herring food and bait in the Unimak, Akutan, Unalaska, Umnak and Adak districts (Figures 1-4).

There are two food and bait fisheries in Area M: the Dutch Harbor and the Adak herring fisheries. 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) establishes that in any district, if any of the southwest herring stocks 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 (b)) establishes a 7% allocation of the Togiak Districts sac roe herring harvest to the Dutch Harbor food and bait fishery; and (3) the Dutch Harbor Food and Bait Herring Fishery Allocation Plan (5 AAC 27.655) which splits the 7% allocation by gear type, 86% for the purse seine and 14% for the gillnet fishery. At the February 2010 Alaska Board of Fisheries (BOF) meeting, the board amended the language to 5 AAC 27.655. It was decided that after July 25, 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 25, then that amount shall be deducted from any remaining quota for that year after July 25. However, if the seine group exceeds the total allocation after July 25, then the seine group overage shall be deducted from the next years' seine allocation as stated in 5 AAC 27.655 (b).

In 2004, the BOF created the Alaska Peninsula-Aleutian Islands Herring Management Plan (5 AAC 27.657), establishing a herring fishery in the Adak District (Figure 3) with a 500-ton allocation independent of the Dutch Harbor food and bait allocation. This plan was amended at the 2010 Board of Fisheries meeting, to allow both purse seine and gillnet gear to harvest the 500 ton Adak allocation. Since the plan's inception in 2004, there has been no harvest in the Adak District.

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

FISHERY REQUIREMENTS

In order for Alaska Department of Fish and Game (ADF&G) to open Unimak, Akutan, Unalaska, or Umnak districts (Figure 2) to herring food and bait fishing, each Western Alaska herring biomass projection must surpass its BOF mandated district threshold (5 AAC 27.060). These biomass projections are fisheries located in the Security Cove, Goodnews Bay, Cape Avinof, Nelson Island, Nunivak Island, Cape Romonzof, Togiak, and Norton Sound districts (Figure 1). The biomass of all the Bering Sea herring stocks are forecasted to be above their threshold levels and the probability of the 2010 Dutch Harbor herring food and bait fishery occurring is favorable. However, the 2010 fishery will be based on the estimated spawning biomass of each Bering Sea herring stock in 2010. ADF&G will update biomass estimates for each stock as herring move into coastal waters during spawning migrations.

ALLOCATION AND HARVEST PROJECTIONS

ADF&G will attempt to manage the Dutch Harbor herring food and bait fishery so that the harvest remains within the allocated 7% of the remaining allowable Togiak District herring sac roe harvest (Appendix A1). A “rollover” provision was adopted during the 2001 board meeting (5 AAC 27.655 (b)), as an incentive to conduct a fishery that stays within the allocation. During years when herring harvest exceeds the allocation, the amount of harvest over the allocation shall be deducted from the next year’s allocation, by gear group. During the 2009 season neither gear group exceeded their respective allocations.

The Dutch Harbor food and bait allocation is divided between gear groups: 86% is allocated to the seine fishery and 14% to the gillnet fishery (5 AAC 27.655 (a)). These allocations are considered independent of each other so that one gear group may not harvest herring allocated to the other gear group. Furthermore, 100 tons may be reserved from the purse seine allocation for an experimental herring pound fishery (5 AAC 27.655(c)). After July 25, 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 25, then that amount shall be deducted from any remaining quota for that year after July 25. However, if the seine group exceeds the total allocation after July 25, then the seine group overage shall be deducted from the next year’s seine allocation as stated in 5 AAC 27.655 (b). The 2010 harvest allocations are 1,577 tons for the purse seine fishery, 100 tons for the seine pound fishery, and 273 tons for the gillnet fishery (Table 4).

Inseason news releases will be broadcasted on VHF channel 12 in Dutch Harbor, which will serve as the designated ADF&G channel for communications during the herring fishery. Fishermen, tenders, and processors should monitor this channel.

REGISTRATION REQUIREMENTS FOR PERMIT HOLDERS, TENDERS, AND PROCESSORS

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 (a)(2)). These daily reports can be provided to the ADF&G by VHF, SSB, phone, fax, or e-mail. The following ADF&G offices can

be contacted for information concerning the Dutch Harbor and Adak herring food and bait fisheries:

Sand Point:

Alaska Department of Fish and Game
P.O. Box 129
Sand Point, AK 99661

Phone: (907) 383-2066
Fax: (907) 383-2606
VHF channels 6 & 72
Single Side Band 3.230 MHz
KWB 362 (call sign)

Dutch Harbor:

Alaska Department of Fish and Game
P.O. Box 920587
Dutch Harbor, AK 99692

Phone: (907) 581-1239
Fax: (907) 581-1572
VHF 12
Single Side Band 4.125 MHz
WIM 76 (call sign)

Prior to catching, tendering, buying, or processing any herring, permit holders must register at the ADF&G office in Dutch Harbor. 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 which 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.

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 Dutch Harbor ADF&G office 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 the ADF&G in Sand Point.

FISHING PERIODS

The herring gillnet fishery can open by emergency order beginning noon June 24 and may be extended until the allocation is reached, ADF&G decides that an additional fishing period might exceed the allocation, or until the season ends on February 28 (5AAC 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 4).

The initial purse seine herring fishing period may occur as early as noon on July 15 (5 AAC 27.610 (e)(2)(B)). Unless harvesters form a combine, the department anticipates that purse seine fishing periods will be short in duration and the fishery will be conducted within portions of Unalaska Bay. 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 the department to assess the harvest and processing capacity. A shorter closed period may be allowed if 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 following policy; 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 try to assess herring biomass in the area prior to opening the fishery.

HERRING SEINE POUND FISHERY

One hundred tons of herring will be allocated to the herring seine pound fishery, which is deducted from the purse seine allocation. 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 Dutch Harbor or Sand Point no later than 4:30 PM June 30, 2010.

Herring for pounding may be harvested during purse seine fishery openings. If the herring pound allocation is not harvested, it will then be rolled over into the seine allocation. If the seine fishery exceeds the allocation, the penalty provision (5 AAC 27.655(b)) will be applied to the next year's total allocation. If two or more permit holders register for the pound fishery, the pound allocation is divided equally among them.

GEAR TESTING

Prior to opening the fishery, purse seine gear may be tested during daylight hours until 5:00 PM July 14. Gear testing will only be allowed at a time and place designated by ADF&G. Permit holders must contact the department in Dutch Harbor on VHF channel 12 or in person prior to setting gear. 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) HERRING FISHERY

Beginning in 2004, the BOF authorized a herring set gillnet fishery in the Adak District (Figure 3) with a 500-ton allocation. However in 2010, the BOF amended the regulations to include both seine and gillnet gear in the harvest of up to 500 tons within the waters around Adak. 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 (Poetter 2009). ADF&G has no information about the size, timing, or condition of herring stocks in the Adak area. ADF&G may station a representative in Adak to manage this fishery and collect herring samples.

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 Dutch Harbor prior to catching, tendering, buying, or processing herring. The buyer and tender reporting requirements are described in 5AAC 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 from June 24 through February 28 (5 AAC 27.657; Figure 3).

The permit holder must be physically present while the set gillnet is being fished. Each set gillnet in operation must be anchored and buoyed at both ends. Each buoy must be plainly and legibly marked with the permanent vessel license plate number (ADF&G number) of the vessel 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.

REFERENCES CITED

- Bernard, A. C. 2010. Alaska Peninsula-Aleutian Islands Management Area herring sac roe fishery management plan, 2010. Alaska Department of Fish and Game, Fishery Management Report No. 10-12, Anchorage.
- Poetter, A. D., A. C. Bernard, and M. D. Keyse. 2009. Alaska Peninsula-Aleutian Islands Management Area herring sac roe and food and bait fisheries annual management report, 2008 and 2009. Alaska Department of Fish and Game, Fishery Management Report No. 09-56, Anchorage.

TABLES AND FIGURES

Table 1.–Harvest allocation of the 2010 forecasted Pacific herring run biomass, Togiak District, Bristol Bay.

	Biomass (Tons)	Harvest (Tons)
2010 Togiak District Forecasted Biomass Exploitation at maximum 20%	146,775	
Total Allowable Harvest		29,355
Togiak Spawn on Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		27,855
Dutch Harbor Food/Bait Allocation ^a		1,950
Purse Seine Allocation (86%) ^b		1,577
Overharvest penalty from previous year.		0
2010 Seine Allocation		1,577
Pound Fishery Allocation		100
Overharvest penalty from previous year.		0
Gillnet Allocation (14%) ^c		273
Overharvest penalty from previous year.		0
2010 Gillnet Allocation		273

^a The Dutch Harbor Food/Bait allocation is 7% of the remaining allowable harvest from the Togiak District.

^b The purse seine allocation for 2010 is 86% of the Dutch Harbor allocation minus the pound fishery allocation of 100 tons.

^c The gillnet allocation for 2010 is 14% of the Dutch Harbor allocation.

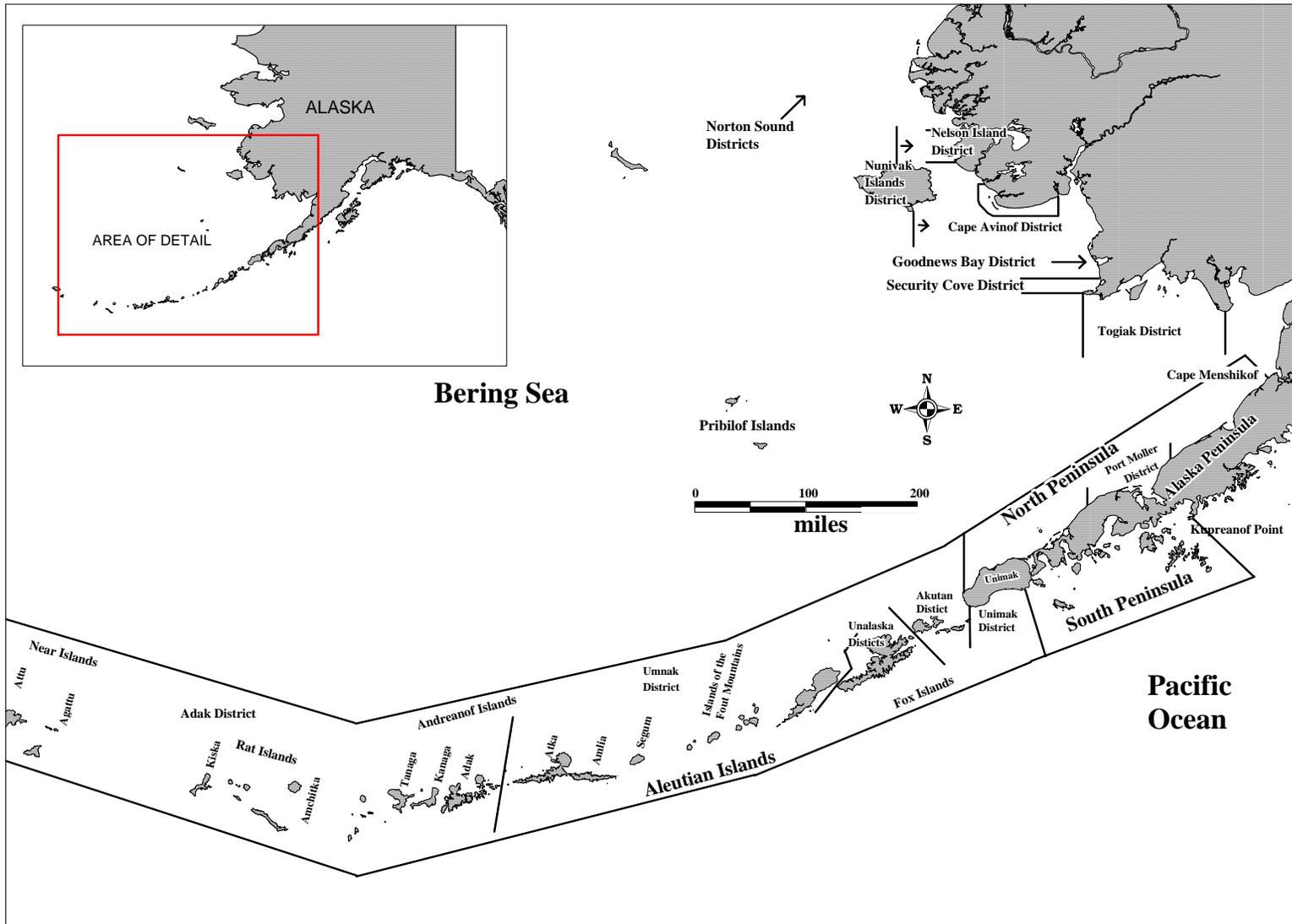


Figure 1.—Map of the Bering Sea Management Plan (5 AAC 27.060) commercial herring districts.

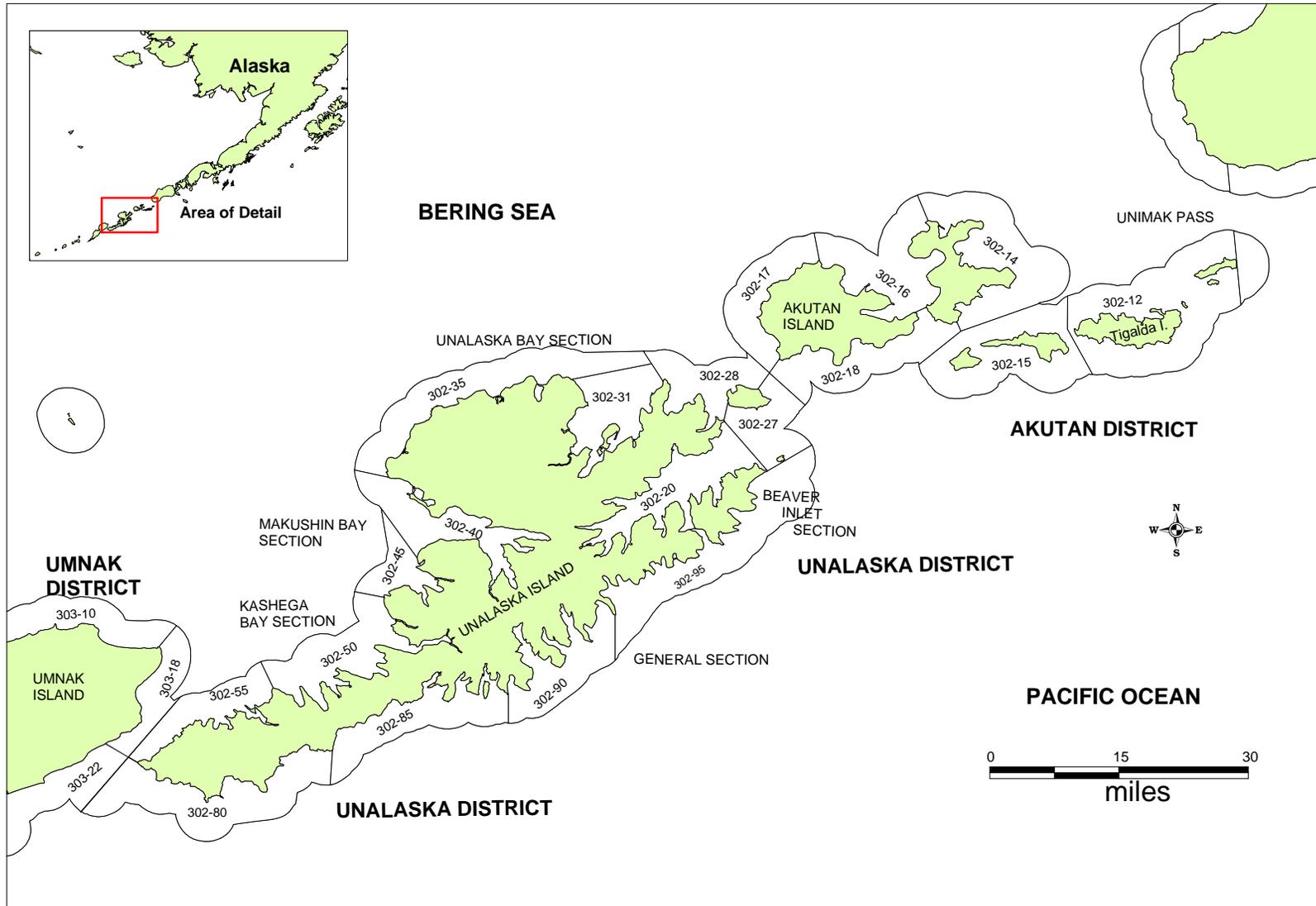


Figure 2.—Map of the Aleutian Islands from Tigalda Island to Umnak Island illustrating the herring fishing statistical areas.

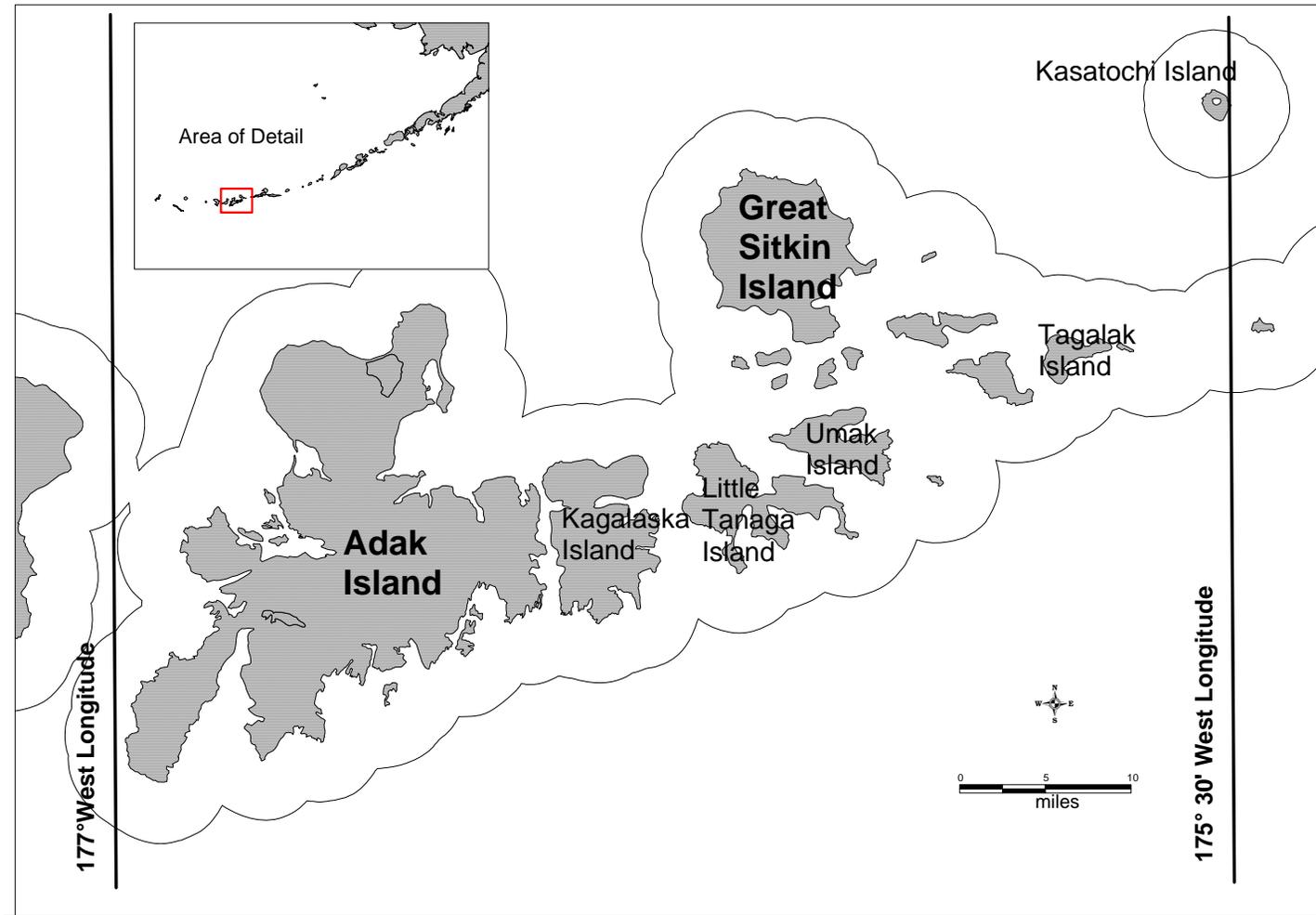


Figure 3.—Map of the Adak District illustrating the herring fishery boundaries.

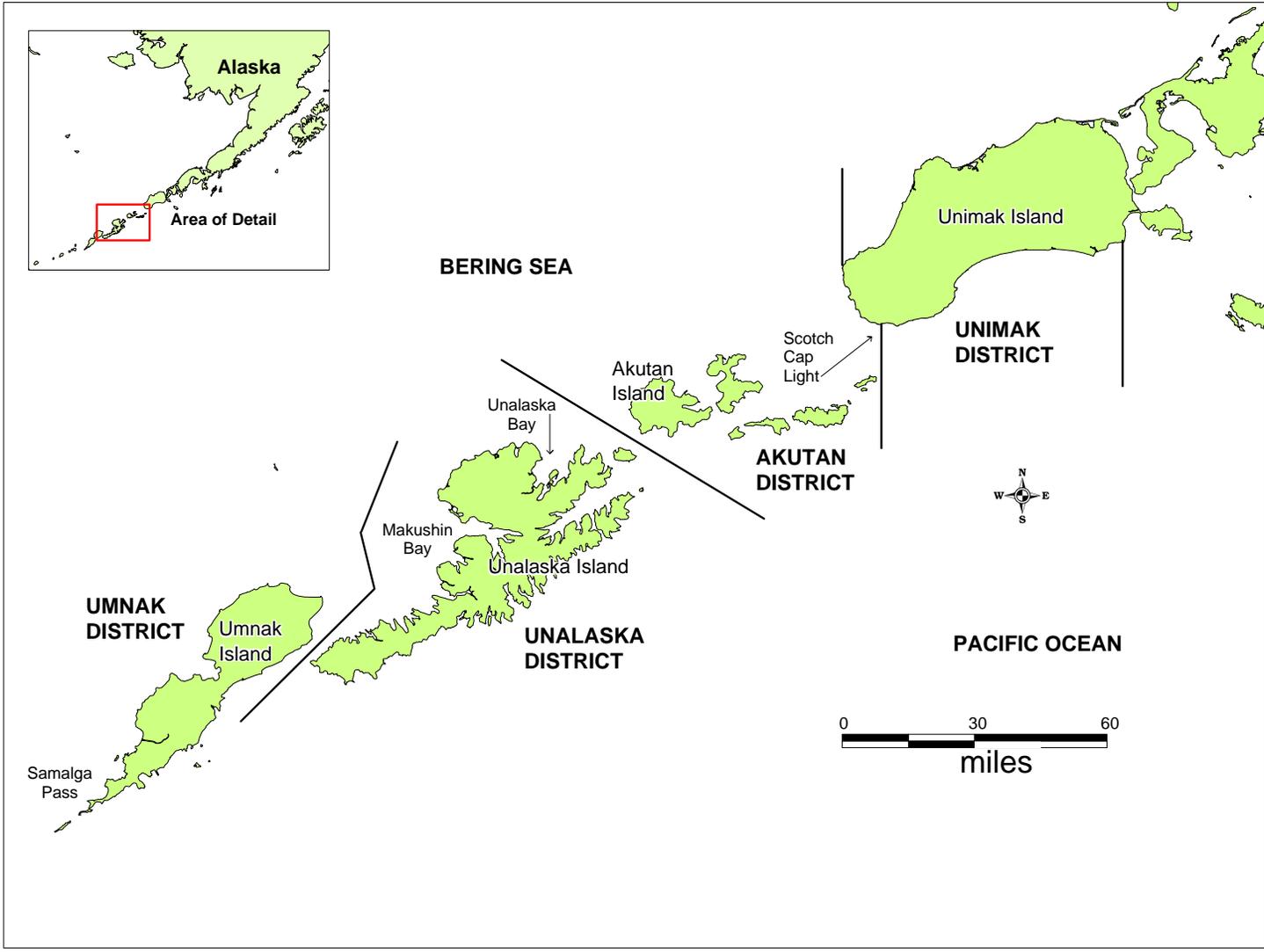


Figure 4.—Map of the eastern Aleutian Islands from Samalga Pass to Unimak Island illustrating the herring fishing district boundaries.

**APPENDIX A: FORECASTED HARVEST ALLOCATION
FOR TOGIAK SAC ROE AND DUTCH HARBOR HERRING
FOOD AND BAIT FISHERIES, 2010**

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



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Date Issued: November 13,
Time: 1:00 p.m.

2010 TOGIAK HERRING FORECAST

The 2010 Togiak herring forecast and harvest allocation is listed below for the Togiak District sac roe fishery and the Dutch Harbor food and bait fishery, given a maximum 20% exploitation rate of the projected run biomass:

*Harvest Allocation of the 2010 Forecasted Pacific
Herring Run Biomass, Togiak District, Bristol Bay*

	Biomass (Short Tons)	Harvest (Short Tons)
Forecasted Biomass for 2010	146,775	
Total Allowable Harvest (20% exploitation rate)		29,355
Togiak Spawn-on-Kelp Fishery (Fixed Allocation)		1,500
Remaining Allowable Harvest		27,855
Dutch Harbor Food/Bait Allocation (7.0% of the remaining allocation)		1,950
Remaining Allowable Harvest for Togiak District Sac Roe Fishery:		25,905
Purse Seine Allocation 70.0%		18,134
Gill Net Allocation 30.0%		7,772

2010 TOGIK HERRING FORECAST SUMMARY

The Pacific herring population is forecasted to be 146,775 tons in Togiak District during 2010 (Figure 1). Herring returning from 2004 through 2006-year classes (ages 4–6) are expected to comprise 45.1% of the biomass (Figure 2) in 2010. Ages 7-8 are expected to comprise 24.5% of the population while ages 9–11 and 12+ are forecasted to comprise 16.8% and 13.6% of the population by weight, respectively. The forecasted individual average weight of herring in the harvest biomass is 330 g.

A run biomass of 146,775 tons would be ~5% more than the recent 10-year average observed biomass of 139,635 tons. A biomass of this size would potentially produce an overall harvest of 29,355 tons in all fisheries and 25,905 tons in the Togiak sac roe fisheries (purse seine and gillnet). A harvest of this size in the Togiak sac roe fisheries would be ~28% more than the recent 10-year average harvest of 20,212 tons.

We used an age-structured analysis (ASA) model to forecast the Togiak herring population using catch and age composition data and total run biomass estimates. The ASA model integrates data from purse seine fishery age compositions (1978-2009), total run age compositions (1978-1995, 1997, 1999, 2001, and 2005-2009), and aerial survey biomass estimates (1981, 1983, 1992-1994, 1997, 1999-2001, and 2005-2009). The model estimates were generated by comparing them to observed data. Samples from non-selective gear (commercial purse seine) were used to assess age composition of the total run biomass. Commercial purse seine catch samples ranged from age-3 to age-17. Age-4 herring average weight for 2010 was predicted using the recent four-year average while simple linear regression models were used to forecast average weight of age-5 through age-15 herring based on their weight the previous year.

A temporal change in age composition from older to younger herring typically occurs during this fishery. A cohort of young herring (< age-7) and a cohort of older (ages 11-13) herring predominated in 2009, comprising 48.1% and 23.7% of the total commercial purse seine harvest by weight respectively. These two major age cohorts made up a significant portion of the observed biomass through 22 May, after which the older cohort had migrated through and the biomass came to be dominated by age-7 and younger herring after 22 May. The high abundance (15.4% by number of fish) of age-4 and age-3 herring (age classes that are typically not caught in significant numbers) in the purse seine harvest suggests very strong future year classes in years ahead. However, it should be noted that measuring contributions of younger age classes to the spawning biomass is difficult as they typically do not show up until late in the fishery and the department no longer conducts post-fishery sampling as was typical during the 1980s.

The biomass of the Togiak herring spawning population has been estimated with aerial surveys since the late 1970s, concurrent with development of the sac-roë fishery. Total run biomass for 2009 was estimated to be 142,133 tons. This was the sum of the peak aerial survey on 24 May (93,894 tons) and a survey on 16 May (48,239 tons). The time between these surveys leads us to believe that a near complete turnover of herring on the spawning grounds had occurred between these surveys. Herring were first observed in district on 13 May, when approximately 462 tons were documented in Togiak Bay. The biomass steadily increased through 16 May, with herring concentrated in areas east of Togiak Bay (Figure 3). Spawning biomass had extended westward by the time of the peak survey on 24 May and was most heavily concentrated in Togiak Bay. Large recruitments in this population are typical every eight to ten years.

The last such event occurred off the 1996 and 1997-year classes and another currently appears to be underway with strong returns from 2005 and 2006-year classes.

There is always uncertainty in forecasting the Togiak District herring biomass and predicting the 2010 run is no different. The performance of the ASA model has had a tendency to forecast low since its inception in 1993, under-forecasting the run in 2009 (121,800 tons forecast and

142,133 tons observed). The mean percent error (MPE) was -22.2% for years with reliable total run biomass estimates (Figure 1). The accuracy or mean absolute percent error (MAPE) of the ASA model has been 20%. The forecast range for 2010 is from 117,460 tons to 176,090 tons based on a MAPE of 20%. We consider this population to be healthy and sustainable.

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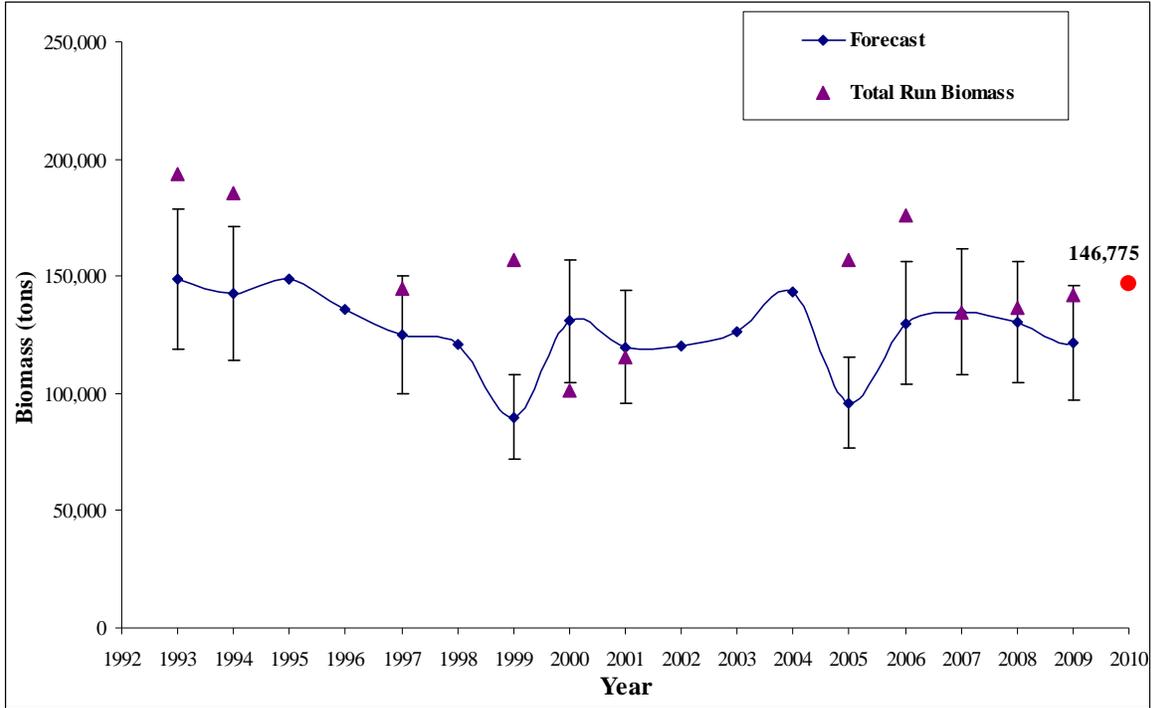


Figure 1.–Annual observed Togiak herring total run biomass estimates and preseason forecasts based on the ASA model. Mean absolute percent error (MAPE) of 25% around the forecast is also shown for years with a reliable total run biomass estimate.

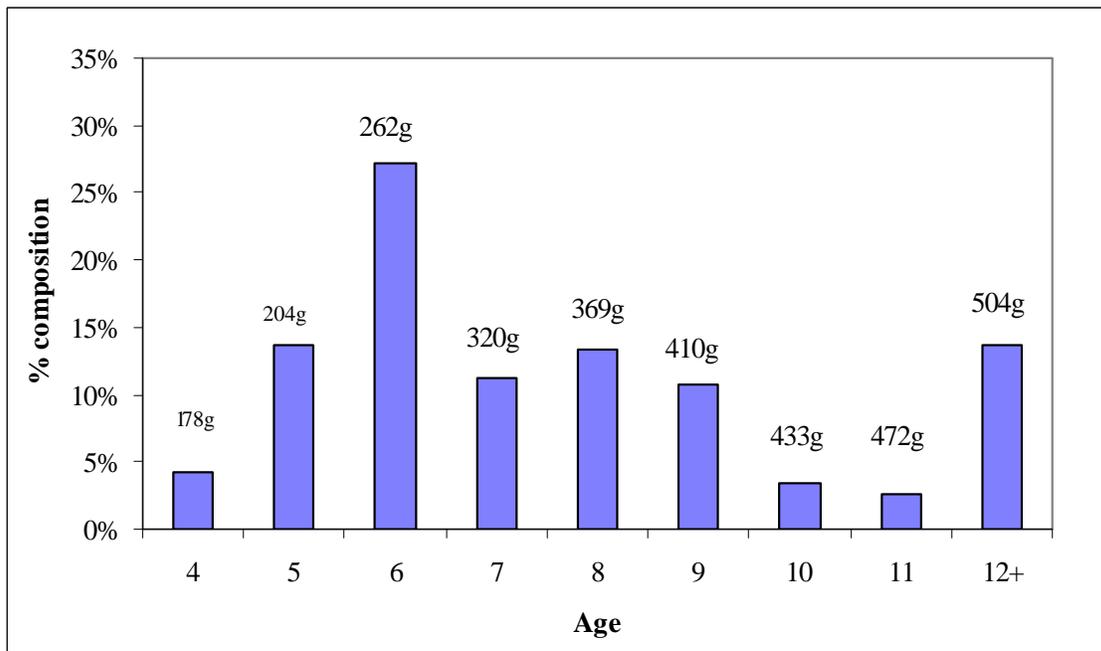


Figure 2.–Forecasted age composition by weight for the 2010 Togiak herring return. Forecasted average weight (grams) shown for each age category.

