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2017 Southeast Alaska Sac Roe Herring Fishery Management Plan

by

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and

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March 2017

Alaska Department of Fish and Game **Division of Commercial Fisheries**

Symbols and Abbreviations

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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

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by

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This report describes the Southeast Alaska herring sac roe fishery regulations, fishing areas, and Guideline Harvest Levels for 2017. Management plans for the 2017 purse seine and gillnet fisheries are reviewed, including procedures for announcing fishery openings and closures, vessel registration, and catch reporting requirements. A review of herring stock status is presented by spawning area. Alaska Department of Fish and Game management contacts are listed.

Key words: Herring, sac roe, set gillnet, purse seine, management, guideline harvest levels, commercial herring, fishing regulations

INTRODUCTION

Southeast Alaska commercial herring fisheries occur during the winter when herring are harvested for use primarily as bait, and during the spring when herring are harvested for their roe. The roe harvest includes the traditional sac roe fisheries and, in recent years, spawn-on-kelp pound fisheries. This management plan provides an overview of the 2017 sac roe herring fisheries for Southeast Alaska including expected harvest levels and management strategy. A combined management plan for the northern and southern Southeast Alaska spawn-on-kelp pound fisheries is available as a separate publication at local department area offices and on the Alaska Department of Fish and Game (ADF&G) web site.

Southeast Alaska roe herring are commercially harvested by purse seine and set gillnet gear types, both of which are included in the limited entry system. There are currently six sac roe herring fishing areas in Southeast Alaska consisting of two exclusive purse seine areas and four exclusive gillnet areas. During the 2003 Alaska Board of Fisheries (BOF) Southeast and Yakutat Finfish meeting, the board adopted a new sac roe fishery for West Behm Canal (Sections 1-E and 1-F) that was to operate on alternating years for purse seine and gillnet gear. During the 2012 BOF Southeast and Yakutat Finfish meeting, the board changed the West Behm Canal sac roe fishery to be exclusively a set gillnet fishery. Sac roe fishing areas are shown in Figure 1.

Approximately 9,800 tons of herring were harvested in commercial sac roe herring fisheries conducted in Southeast Alaska during 2016. A harvest of approximately 14,600 tons is anticipated for the 2017 fishing season.

REGULATIONS

Commercial herring fishing regulations are included in the ADF&G 2016–2018 Statewide Commercial Herring Fishing Regulations pamphlet. Copies of the pamphlet may be obtained at any department office. Management plans which apply to the herring harvest in the sac roe fisheries include: *Management guidelines for commercial herring sac roe fisheries* (5 AAC 27.059), *Waters closed to herring fishing in Southeastern Alaska Area* (5 AAC 27.150), *Herring Management Plan for Southeastern Alaska Area* (5 AAC 27.190), *Sitka Sound commercial sac roe herring fishery* (5 AAC 27.195), and *Sections 1-E and 1-F commercial sac roe herring fishery* (5 AAC 27.197).

Additionally, in January 2015, the Federal Subsistence Board closed waters to commercial herring fishing in an area known as the Makhnati Island federal waters (Figure 4). This closure went into effect on April 1, 2015.

ADF&G staff members listed at the conclusion of this plan are available to provide further details.

VESSEL CHECK-IN, CHECK-OUT, AND REPORTING PROCEDURE

Buyers or buyers' agents must register all vessels employed in transporting and processing herring with ADF&G prior to commencing those activities, and must make daily reports of herring purchased from fishermen as specified by a local representative of ADF&G [5 AAC 27.162(a)]. ADF&G requires that tenders and fishing vessels not previously registered through buyers or buyer's agents, check in and check out of the fishing areas with department personnel located on the fishing grounds to facilitate timely and complete assessment of herring landings.

Fish tickets must be provided to the Commercial Fisheries Entry Commission (CFEC) permit holder at the time of delivery to the first buyer or buyer's agent [5 AAC 27.162(c)]. This means that there must be a separate fish ticket for each delivery to a tender before the tender leaves the fishing grounds to make a landing. At the request of the CFEC permit holder, on-the-grounds weight and estimated roe content shall both be recorded on the fish ticket. Operators who will transport fish out of Alaska before processing must submit a fish ticket to ADF&G before departing the state [5 AAC 39.130(c)]. Fully completed fish tickets with updated accurate and final weights and roe percentages must be submitted to the department within 10 days after the termination of buying operations, unless otherwise specified by the department [5 AAC 27.162(a)(3)].

REPORTING PROCEDURES FOR FLOATING FISH PROCESSORS

Operators of floating fish processing vessels are required to report in person, by radio, or telephone, to the local ADF&G representative in the management area of intended operation before processing begins [5 AAC 39.130 (g)]. The report must include the location and dates of intended operation.

ANNOUNCEMENT OF OPENINGS AND CLOSURES

Fishery openings and closures will be implemented via ADF&G emergency order (EO). Fishery announcements will be issued through normal news release channels and on the fishing grounds over VHF radio for the set gillnet sac roe fisheries. EOs concerning the Sitka Sound seine sac roe fishery are only announced over the VHF radio. The VHF radio channel for receiving field announcements will be indicated on the fishing grounds. Harvesters should expect short notification of opening and closing times. Short notification is necessary to provide fishing opportunities prior to major spawning and to maintain the harvest at desired levels.

ADF&G will monitor herring in advance of the expected fishery opening dates. Based on discussions at the pre-season meeting, fisheries will be placed on short notice prior to the first opening. The short notice may be 1–2 hours at the discretion of the department. During the Sitka fishery, the department will try to give the industry a 36-hour advance warning of the time that the fishery goes on short notice. Announcement of the time that short notice goes into effect will be made by a department news release. However, if spawning is either earlier or heavier than anticipated and waiting 36 hours could result in loss of fishing opportunity this much advance notice will not be given.

MANAGEMENT STRATEGY

The harvest strategy for Southeast Alaska herring sac roe fisheries is based on the availability and distribution of mature herring containing quality roe (at least 10% mature roe), mature

spawning biomass estimates, population age structure, recruitment, size-at-age, and past spawning success.

Herring populations are assessed annually to determine whether individual spawning stocks are above threshold and to determine the appropriate harvest rate (see Sliding Scale Harvest Rate on next page). As specified in 5 AAC 27.190. *Herring Management Plan for Southeastern Alaska Area*, harvest of a particular spawning stock is not allowed unless an assessment of the abundance and general condition of that spawning stock has been conducted and the estimated biomass is above the minimum spawning biomass threshold level.

The threshold level is the herring biomass needed to meet minimum spawning and/or allocation requirements. The established threshold levels for the herring sac roe fishing areas are:

Fishing Area	**Threshold Level**
Seymour Canal	3,000 tons
Revilla Channel	6,000 tons
Lynn Canal	5,000 tons
Sitka Sound	25,000 tons
Hobart/Houghton	2,000 tons
West Behm Canal	6,000 tons

A variety of methods have been used to assess the status of herring populations in Southeast Alaska. Before 1970, herring abundance was assessed through visual estimates made from vessels using depth sounders and sonar immediately prior to spawning or on wintering aggregations. In addition, miles of spawn were documented by aerial or skiff surveys. A computer-assisted hydro acoustic survey method was developed in the early 1970s and used extensively during the late 1970s to the mid-1980s. Spawn deposition surveys were first used in 1976 and continue to be a key component of current assessment methods. The spawn deposition method combines diver estimates of herring egg deposition on the spawning grounds along with estimates of total area receiving spawn, average fecundity, average weight-at-age, and age composition to yield an estimate of spawning biomass. In past years, estimates of spawning biomass from one year were used as the forecast to set harvest quotas for individual spawning stocks for the following year.

Beginning in 1993, ADF&G began using age-structured analysis (ASA) to forecast abundance for selected spawning stocks with sufficient historic stock information. The ASA method relies on time series of estimated total egg deposition, spawner-age composition, catch-age composition, weight-at-age, and harvest. Estimates of fecundity are also included in the model. The method applies estimates of recruitment, growth, maturation, and natural mortality to an estimate of spawning biomass from one year to forecast biomass for the next year. The ASA model was an important development because gains in herring biomass due to recruitment, growth, and maturity are often not equal to the loss of biomass due to natural mortality, as was assumed when using the spawn deposition method for forecasting abundance. The ASA method is currently used to forecast herring abundance for the Sitka and Seymour Canal sac roe fisheries.

Beginning in 1995, ADF&G began using a biomass accounting (BA) method to forecast abundance for stocks without sufficient historic stock information for ASA modeling. Spawn

deposition estimates were obtained for these areas as an initial indication of the likelihood that the spawning biomass would be above the respective thresholds for each area. For those areas likely to be above their thresholds, biomass accounting was then used to forecast biomass. The BA method uses the most recent year's spawn deposition estimate of eggs, the age composition of the spawning biomass, weight-at-age, and fecundity to project the following year's return of mature herring. It also uses survival and maturity-at-age estimated from ASA modeling of other stocks in the region. The median historical proportion of mature age-3 herring for each stock is used to forecast age-3 recruitment to the spawning biomass. The sac roe fishery areas for which the BA method is currently used to forecast herring abundance include West Behm Canal and Hobart/Houghton.

SLIDING SCALE HARVEST RATE

The allowable harvest is based on a graduated scale that allows for higher harvest rates as a herring population increases relative to the threshold level. This approach maintains annual harvest rates between 10% and 20% of the forecast spawning stock if the forecasted biomass is greater than established threshold levels. When the spawning stock biomass is at the threshold level, a 10% harvest is allowed. The allowable harvest increases an additional 2% for every spawning stock biomass increase of an amount equal to the threshold level and reaches a maximum of 20% when the population is six-times the threshold level.

The percent harvest rate for any multiple of the threshold level from one to six can be estimated from Figure 2, or by performing the following calculation:

$$Percent\ Harvest Rate = 8 + 2\left[\frac{Forecast\ Spawning\ Population\ Size}{Threshold\ Level}\right] \qquad (1)$$

An exception to the harvest rate formula now applies to the Sitka Sound sac roe herring fishery based on BOF actions taken at the 1997 and 2009 Southeast and Yakutat Finfish meetings. For the Sitka fishery, the harvest rate is calculated using the following formula (Figure 3):

$$Percent\ Harvest Rate = 2 + 8\left[\frac{Forecast\ Spawning\ Population\ Size}{20{,}000}\right] \qquad (2)$$

Based on BOF action during the 2009 Southeast and Yakutat Finfish meeting, the minimum harvest rate is 12%, the maximum harvest rate remains at 20%, and the minimum biomass threshold necessary to provide a commercial fishery was increased from 20,000 to 25,000 tons.

ROE QUALITY

Sac roe herring fisheries are managed in compliance with regulation 5 AAC 27.059 *Management guidelines for commercial herring sac roe fisheries*. This regulation outlines ways ADF&G can manage sac roe fisheries to enhance value. To determine the best time to fish, the department samples pre-spawning herring populations in cooperation with harvesters and trained industry technicians. All test-fishing activities must be authorized by department biologists on the fishing grounds.

GILLNET FISHERIES

There are four set gillnet sac roe fishing areas in Southeast Alaska: the Revilla Channel fishery in regulatory Section 1-F, the West Behm Canal fishery in Sections 1-E and 1-F, the Seymour

Canal fishery in Section 11-D, and the Hobart-Houghton fishery in District 10. A summary of historical harvest and fishing time information for each fishery is shown in Tables 1 and 2.

REVILLA CHANNEL

Set gillnet sac roe fisheries have occurred in the Revilla Channel area (Section 1-F) in state managed waters from 1976 to 1998 (Table 1). Seasonal landings have ranged from a low of 171 tons in 1978 to a high of 3,113 tons in 1983. In 1999, a Guideline Harvest Level (GHL) of 870 tons was established. However, due to on-grounds concern over the lack of herring located in state managed waters, the fishery was not opened and no herring were harvested. From 2000 through 2016, the minimum threshold level was not reached in state managed waters and no fishery was permitted.

In 2016, there was approximately 11.9 nmi of herring spawn observed in state waters in the Revilla Channel area. No spawn deposition dive survey was conducted due to the lack of funding. Therefore, the department did not produce a 2017 forecast and no sac roe herring fishery will take place in 2017.

Due to budget constraints, the department will be conducting limited surveys of Revilla Channel herring during the upcoming spawning event.

WEST BEHM CANAL

A sac roe fishery was established in West Behm Canal (Sections 1-E and 1-F) in 2003 by the BOF that was to operate on alternating years for purse seine and gillnet gear.

In 2004, a fishery was announced but due to inseason concerns over the lack of herring in West Behm Canal, the fishery was not opened and no herring were harvested.

From 2005 to 2010 the threshold was not met and no fishery occurred. A gillnet fishery occurred in 2011 but was unsuccessful because the majority of herring spawning activity took place in closed waters.

A fishery was announced in 2012, but due to inseason concern over lack of herring in West Behm Canal, no fishery was prosecuted and no herring were harvested. The actual spawning biomass observed in 2012 was 2,134 tons. During the 2012 BOF Southeast and Yakutat Finfish meeting, the board changed the West Behm Canal sac roe fishery to be exclusively a set gillnet fishery.

From 2013 to 2016 the threshold was not met and no fishery occurred.

Surveys conducted in 2016 documented 4.3 nmi of spawn in West Behm Canal. No spawn deposition dive survey was conducted in 2016 due to lack of funding. Due to budget constraints, the department will be conducting very limited surveys of the West Behm Canal area in 2017.

SEYMOUR CANAL

Set gillnet fisheries have occurred intermittently in Seymour Canal (Section 11-D) since the fishery was changed from seine to gillnet in 1980. Annual landings during years fished by gillnets have ranged from a low of 302 tons in 1987 to a high of 1,519 tons in 2003 (Table 1).

It was not possible to determine a 2017 forecast for Seymour Canal herring. The current model structure was unable to reproduce the extremely low egg depositions observed in 2014 and 2016 while also matching the observed cast net age composition data. A number of alternative model

structures were examined in an attempt to resolve this issue and none produced a forecast near the 3,000 ton threshold that would allow a commercial fishery. The Seymour Canal set gillnet herring fishery will not be opened in 2017.

ADF&G will monitor and document the spawning biomass to attempt to develop forecasts for the 2017–2018 season.

HOBART/HOUGHTON

In January 1997, the BOF adopted regulations that allocate unharvested GHL from the District 10 (Hobart/Houghton) winter food and bait fishery to the sac roe gillnet fishery [5 AAC 27.160 (f)]. Since the inception of the sac roe fishery, harvests have occurred in 1997–1999, 2005, 2008, 2009, and 2010. In 2000, the entire GHL was harvested during the winter bait fishery and no surplus GHL was available for the sac roe fishery (Table 2). Herring biomass estimates were not large enough to allow fisheries in 2001–2004, 2006, 2007, and 2011–2016.

Aerial and spawn deposition surveys of Hobart Bay/Port Houghton were not conducted in 2016. Therefore, no biomass forecast was developed for 2017. Currently the department is not planning on conducting surveys in 2017.

PURSE SEINE FISHERIES

There are two exclusive purse seine herring sac roe areas in Southeast Alaska: Lynn Canal and Sitka Sound. Commercial fishing will be allowed only in Sitka Sound during the 2017 season. Summaries of harvest and fishing time information for each fishery are shown in Tables 1 and 2.

LYNN CANAL

The Lynn Canal herring sac roe fishing area encompasses regulatory Sections 15-B, 15-C, and that portion of Section 11-A north of the Shrine of St. Therese.

Although the Lynn Canal fishery has not been open since 1982, ADF&G monitored this stock closely through aerial, skiff, and dive surveys. Aerial and on-the-grounds surveys conducted in Lynn Canal during the spring of 2016 documented 4.3 nmi of spawn. The spawning biomass estimate of 351 tons is a record low and well below the 5,000 ton threshold for a commercial fishery. The long time series of observed production has been consistently below threshold and observed spawn deposition estimates have fluctuated widely in the last ten years with a new low of 351 tons documented in 2016 to a high of 8,000 tons estimated in 2013.

SITKA SOUND

The Sitka Sound sac roe fishing area encompasses the waters of Section 13-B north of the latitude of Aspid Cape and in Section 13-A south of the latitude of Point Kakul in Salisbury Sound.

In the spring of 2016, the biomass of mature herring returning to Sitka Sound to spawn was estimated by the ASA model to be 84,509, above the 74,707 tons forecasted to return. The final guideline harvest level (GHL) for the 2017 Sitka Sound herring fishery will be 14,649 tons. This is based on a 20% harvest rate of a forecast mature biomass of 73,245 tons. It is expected that 111 tons will be harvested in the winter bait test fishery which will be subtracted from the GHL resulting in a target harvest of 14,538 tons for the Sitka Sound herring sac roe fishery. The forecast indicates that the spawning stock will consist of 6% age-3, 6% age-4, 73% age-5, 2% age-6, 6% age-7, and 7% age-8+ fish.

Herring distribution and roe quality will be monitored prior to and during the fishing periods. Monitoring methods for 2017 will include aerial surveys, vessel sonar surveys, and test fishing. In 2017, ADF&G will coordinate with industry vessels to conduct test fishing as necessary to determine roe quality. Prior to making test sets, the identified test boats will contact department biologists on the grounds to monitor set locations and to plan for transport of herring samples to a central location for analysis by industry technicians. The areas open to fishing will depend on the distribution of herring, the need to provide for a fishery that will harvest good quality herring, and the need to provide a reasonable opportunity for subsistence.

In 2012, the BOF adopted a regulation [5 AAC 27.150(a)(4)] closing an area in Sitka Sound to the commercial sac roe fishery (Figure 4). This closure is intended to reduce perceived conflict of commercial harvests with subsistence harvest of herring roe-on-branches by closing waters adjacent to the high use subsistence areas. ADF&G will continue to manage the commercial sac roe fishery in consideration of the subsistence fishery by dispersing the commercial harvest consistent with 5 AAC 27.195. *Sitka Sound commercial sac roe herring fishery*.

Beginning with the 2002 season, in lieu of using a permit system to estimate the subsistence herring roe harvest, the Sitka Tribe of Alaska and ADF&G Subsistence Division have worked collaboratively to develop a methodology using a household survey to estimate harvest. Following each season, the Sitka Tribe of Alaska conducts a "census" survey whereby all known participants in the subsistence fishery are contacted to determine the results of the subsistence harvest. The list of participants is changed each season to reflect newly identified participants and to remove past participants who have either moved or passed away. The survey information is used to determine the amount and quality of the subsistence harvest and would indicate whether the amount reasonably necessary for subsistence had been successfully harvested. For the period 2002–2015, the subsistence roe harvest estimate has ranged from 71,936 to 381,226 pounds and averaged 155,456 pounds. The results of harvest monitoring for the 2015 season will not be available until later this year. The amount necessary for subsistence is a range of 136,000–227,000 pounds.

Limitations on processing capacity will require multiple openings to harvest this season's GHL and depending on the amount of harvest on any given day, it will be necessary to provide one or more days between harvesting opportunities to ensure processing capacity is available. The total daily processing capacities for the 2017 season will not be determined until immediately prior to the fishery though it is expected to be around 2,000 tons per day.

ADF&G has been in contact with processors to discuss strategies for harvesting this season's GHL. There is a general agreement to set daily harvest levels that provide thresholds for setting the amount of days off that may be required before additional harvesting can occur. If less than 3,000 tons are harvested, then harvesting may resume the following day depending on input from processors and available tendering and processing capacities. Harvests above 3,000 tons would require at least one day off before further harvesting would occur. Under this harvesting guideline, it can be expected that it will take at least 5 days to harvest the GHL. It will be necessary to remain flexible and adapt specific opening target harvest levels in consideration of inseason assessment of herring distribution and quality, progress of the spawn, changes in available processing and tendering capacity, and input from industry representatives. A general pre-fishery meeting will be held in Sitka immediately prior to the fishery for the purpose of reviewing stock assessment, enforcement issues, and harvesting plans for the fishery.

In recent years, the United States Coast Guard (USCG) has been closely monitoring fishery openings for violations of “Rules of the Road” during the conduct of the fishery. For further information regarding the application of “Rules of the Road” during the conduct of the fishery, contact the USCG Marine Safety Detachment at 966-5454.

The Magnuson-Stevens Fishery Conservation and Management Act restricts the use of foreign vessels outside of internal waters and the port of Sitka. Fishery openings outside of internal waters and the port of Sitka are possible. Operators of foreign vessels wanting to participate in the Sitka Sound herring sac roe fishery are encouraged to contact the National Marine Fisheries Service at (907) 747-6940 for more details.

LIST OF MANAGEMENT CONTACTS

The following ADF&G, Division of Commercial Fisheries personnel may be contacted regarding this management plan:

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Dan Gray Region I Management Coordinator Sitka Area Office	304 Lake St. Rm. 103 Sitka, Alaska 99835 (907) 747-6688
Dave Harris and Scott Forbes Area Management Biologists Douglas Regional Office	P.O. Box 110024 Douglas, Alaska 99811 (907) 465-4250
Kyle Hebert Herring Research Biologist Douglas Regional Office	P.O. Box 110024 Douglas, Alaska 99811 (907) 465-4250
Scott Walker, Justin Breese, and Bo Meredith Area Management Biologists Ketchikan Area Office	2030 Sea Level Dr., Suite 205 Ketchikan, Alaska 99901 (907) 255-5195
Troy Thynes and Kevin Clark Area Management Biologists Petersburg Area Office	P.O. Box 667 Petersburg, Alaska 99833 (907) 772-3801
Eric Coonradt and Aaron Dupuis Area Management Biologists Sitka Area Office	304 Lake St. Rm. 103 Sitka, Alaska 99835 (907) 747-6688
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TABLES AND FIGURES

Table 1.–Southeast Alaska gillnet sac roe herring fisheries information summary for Seymour Canal and Revilla Channel, 1976–2016.

Year	Seymour Canal[a]				Revilla Channel			
	Guideline Harvest Level (Tons)	Harvest (Tons)[b]	Date 2-Hour Notice Effective	Opening Dates	Guideline Harvest Level (Tons)[c]	Harvest (Tons)[d]	Date 2-Hour Notice Effective	Opening Dates
1976	200	194	–	May 9	300	494	March 23	April 2
1977	500	485	May 4	May 9	800	776	March 29	April 1
1978	500	729	May 2	May 8	680	171	March 26	April 4
1979	250	269	May 3	May 3	585	524	March 28	March 29
1980	–	–	No Fishery	–	1,100	1,149	March 25	March 25
1981	600	615	April 28	April 28	1,550	1,871	March 20	March 20
1982	–	–	No Fishery	–	1,700	2,319	March 20	March 26
1983	–	–	No Fishery	–	2,500	3,113	March 23	March 24
1984	375	499	April 20	April 26	2,100	2,177	March 20	March 29
1985	–	–	No Fishery	–	2,300	2,159	March 28	March 29
1986	300	392	May 5	May 10	1,100	1,530	March 29	March 31
1987	419	302	May 1	May 5, 6	1,200	1,452	March 24	March 26, 27
1988	530	586	April 20	April 26–May 1	953	1,145	March 24	March 25
1989	332	541	April 21	April 28	647	595	March 20	March 20, 21
1990	312	359	April 21	April 28–29	–	–	–	–
1991	–	–	No Fishery	–	680	660	March 28	April 8–11
1992	–	–	No Fishery	–	1,200	1,246	April 1	April 3
1993	–	–	No Fishery	–	717	737	March 31	April 10
1994	368	374	April 28	April 29	880	730	April 9	April 9,11
1995	316	319	April 30	May 14	630	610	April 11	April 12
1996	–	–	No Fishery	–	871	601	April 8	April 10
1997	–	–	No Fishery	–	912	1,159	April 6	April 6
1998	633	585	April 30	May 1–4	620	616	April 1	April 1, 2
1999	595	706	April 30	April 30	870	0	No Fishery	Fishery Not Opened
2000	346	389	May 3	May 5	0	0	No Fishery	Fishery Not Opened
2001	474	620	May 6	May 11–12	0	0	No Fishery	Fishery Not Opened
2002	1,096	1,066	May 12	May 16–17	0	0	No Fishery	Fishery Not Opened
2003	1,712	1,519	Apr 28	Apr 29–May 2	0	0	No Fishery	Fishery Not Opened
2004	838	804	May 1	May 3	0	0	No Fishery	Fishery Not Opened
2005	894	945	April 26	May 1	0	0	No Fishery	Fishery Not Opened
2006	1,508	1,187	April 28	May 4–7	0	0	No Fishery	Fishery Not Opened
2007	1,292	1,219	May 8	May 13–14	0	0	No Fishery	Fishery Not Opened

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Table1.–Page 2 of 2.

Year	Seymour Canal[a]				Revilla Channel			
	Guideline Harvest Level (Tons)	Harvest (Tons)[b]	Date 2-Hour Notice Effective	Opening Dates	Guideline Harvest Level (Tons)[c]	Harvest (Tons)[d]	Date 2-Hour Notice Effective	Opening Dates
2008	1,205	1,208	May 6	May 10–11	0	0	No Fishery	Fishery Not Opened
2009	1,471	866	April 29	April 30–May 2	0	0	No Fishery	Fishery Not Opened
2010	657	710	April 24	April 24–25	0	0	No Fishery	Fishery Not Opened
2011	835	Confidential	April 25	April 26	0	0	No Fishery	Fishery Not Opened
2012	1,287	0	April 23	Fishery Not Opened	0	0	No Fishery	Fishery Not Opened
2013	1,014	649	May 6	May 8–11	0	0	No Fishery	Fishery Not Opened
2014	772	Confidential	April 30	April 30-May 9	0	0	No Fishery	Fishery Not Opened
2015	–	–	No Fishery	–	0	0	No Fishery	Fishery Not Opened
2016	5,113	–	No Fishery	–	0	0	No Fishery	Fishery Not Opened

[a] Seymour Canal was a purse seine fishing area prior to 1980.
[b] Seymour Canal harvest includes all herring for sac roe including confiscated and test fishery catch based on IFDB query February, 2015.
[c] Revilla Channel GHL reduced by 150 tons as an allocation for the Annette Island sac roe harvest in 1993 and 1994.
[d] Revilla Channel harvest includes all herring for sac roe based on IFDB query March, 2007.

Table 2.–Southeast Alaska gillnet sac roe herring fisheries information summary for Hobart-Houghton and West Behm Canal, 1977–2016.

	Hobart-Houghton					West Behm Canal			
		Harvest (Tons)[b]							
Year	Guideline Harvest Level (Tons)[a]	Bait	Sac Roe	Date 2-Hour Notice Effective	Opening Dates Bait/Sac Roe	Guideline Harvest Level (Tons)	Harvest (Tons)	Date 2-Hour Notice Effective	Opening Dates
1977	0	40	0	–	October 1	–	–	–	–
1978	0	0	0	–	Fishery Not Open	–	–	–	–
1979	0	0	0	–	Fishery Not Open	–	–	–	–
1980	0	0	0	–	Fishery Not Open	–	–	–	–
1981	0	0	0	–	Fishery Not Open	–	–	–	–
1982	0	0	0	–	Fishery Not Open	–	–	–	–
1983	0	0	0	–	Fishery Not Open	–	–	–	–
1984	0	0	0	–	Fishery Not Open	–	–	–	–
1985	0	0	0	–	Fishery Not Open	–	–	–	–
1986	0	0	0	–	Fishery Not Open	–	–	–	–
1987	0	0	0	–	Fishery Not Open	–	–	–	–
1988	0	0	0	–	Fishery Not Open	–	–	–	–
1989	0	0	0	–	Fishery Not Open	–	–	–	–
1990	0	0	0	–	Fishery Not Open	–	–	–	–
1991	0	0	0	–	Fishery Not Open	–	–	–	–
1992	200	0	0	–	January 13, 1992	–	–	–	–
1993	500	0	0	–	January 12, 1993	–	–	–	–
1994	230	140	0	–	October 17, 1993	–	–	–	–
1995	250	229	0	–	October 1, 1994	–	–	–	–
1996	700	230	0	–	October 15, 1995	–	–	–	–
1997	550	104	442	April 19	October 1, 1996–April 28	–	–	–	–
1998	260	0	351	April 19	October 1,1997–April 20	–	–	–	–
1999	436	0	506	April 25	October 14, 1998–April 26	–	–	–	–
2000	418	432	0	No Fishery	December 19–February 28	–	–	–	–
2001	0	0	0	No Fishery	Fishery Not Opened	–	–	–	–
2002	0	0	0	No Fishery	Fishery Not Opened	–	–	–	–
2003	0	0	0	No Fishery	Fishery Not Opened	First fishery set for 2004 by Board of Fisheries			
2004	0	0	0	No Fishery	Fishery Not Opened	940	0	No Fishery	Fishery Not Opened

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Table 2.–Page 2 of 2.

	Hobart-Houghton					West Behm Canal			
Year	Guideline Harvest Level (Tons)[a]	Harvest (Tons)[b] Bait	Harvest (Tons)[b] Sac Roe	Date 2-Hour Notice Effective	Opening Dates Bait/Sac Roe	Guideline Harvest Level (Tons)	Harvest (Tons)	Date 2-Hour Notice Effective	Opening Dates
2005	223	0	204	April 24	April 24	0	0	No Fishery	Fishery Not Opened
2006	0	0	0	No Fishery	Fishery Not Opened	0	0	No Fishery	Fishery Not Opened
2007	0	0	0	No Fishery	Fishery Not Opened	0	0	No Fishery	Fishery Not Opened
2008	462	0	302	May 2	May 8–May 9	0	0	No Fishery	Fishery Not Opened
2009	376	0	341	April 29	May 2–May 3	0	0	No Fishery	Fishery Not Opened
2010	345	0	302	April 22	April 23–April 24	0	0	No Fishery	Fishery Not Opened
2011	0	0	0	No Fishery	Fishery Not Opened	1,276	confidential	April 11	April 11–April 14
2012	0	0	0	No Fishery	Fishery Not Opened	758	0	April 5	Fishery Canceled
2013	0	0	0	No Fishery	Fishery Not Opened	0	0	0	Fishery Not Opened
2014	0	0	0	No Fishery	Fishery Not Opened	0	0	0	Fishery Not Opened
2015	0	0	0	No Fishery	Fishery Not Opened	0	0	0	Fishery Not Opened
2016	0	0	0	No Fishery	Fishery Not Opened	0	0	0	Fishery Not Opened

[a] Hobart Bay was opened to Gillnet Sac Roe Fishing in 1997.

[b] Hobart-Houghton gillnet quota is the portion of GHL left after the winter bait fishery is completed.

Table 3.–Southeast Alaska purse seine sac roe herring fisheries information summary, 1976–2016.

Year	Juneau-Lynn Canal[a]						Sitka Sound			
	Guideline Harvest Level (Tons)[b]	Harvest (Tons) by Gear Type[c]		Date 2-Hour Notice Was Effective	Opening Dates by Gear Type		Guideline Harvest Level (Tons)	Harvest (Tons)[d]	Date 2-Hour Notice Was Effective	Opening Dates
		Seine	Gillnet		Seine	Gillnet				
1976	650	432	124	–	April 26	April 29	780	800	April 10	April 16
1977	875	709	211	–	April 19	April 20	–	–	Fishery Not Open	–
1978	820	602	363	April 19	April 20	April 21	250	175	April 4	April 5
1979	120	0	0	Fishery Not Open	–	–	2,000	2,559	April 7	April 12
1980	600	975	0	April 13	April 26	–	4,000	4,385	April 4	April 4, 5
1981	725	775	0	April 17	April 23	–	2,700	3,506	March 23	March 24, 26
1982	400	551	0	April 30	April 30	–	3,000	4,445	March 26	March 30
1983	0	0	0	Fishery Not Open	–	–	5,500	5,449	March 23	March 26, 29
1984	0	0	0	Fishery Not Open	–	–	5,000	5,771	March 22	March 26, 27, 28
1985	0	0	0	Fishery Not Open	–	–	7,700	7,475	March 24	March 29, April 1, 5
1986	0	0	0	Fishery Not Open	–	–	5,029	5,443	March 28	April 2, 8
1987	0	0	0	Fishery Not Open	–	–	3,600	4,216	March 23	March 31
1988	0	0	0	Fishery Not Open	–	–	9,200	9,390	March 25	April 4–14
1989	0	0	0	Fishery Not Open	–	–	11,700	11,714	March 23	March 31–April 8
1990	0	0	0	Fishery Not Open	–	–	4,146	3,804	April 4	April 5, 6
1991	0	0	0	Fishery Not Open	–	–	3,200	1,838	March 29	April 10–April 13
1992	0	0	0	Fishery Not Open	–	–	3,356	5,368	March 30	April 6
1993	0	0	0	Fishery Not Open	–	–	9,691	10,186	March 26	March 27–April 3
1994	0	0	0	Fishery Not Open	–	–	4,432	4,758	March 28	March 29, 31
1995	0	0	0	Fishery Not Open	–	–	2,609	2,908	March 23	March 25, 27
1996	0	0	0	Fishery Not Open	–	–	8,144	8,144	March 23	March 23, March 31–Apr. 9

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Table 3.–Page 2 of 2.

Year	Juneau-Lynn Canal[a]				Sitka Sound			
	Guideline Harvest Level (Tons)[b]	Harvest (Tons)[c]	Date 2-Hour Notice Was Effective	Opening Dates	Guideline Harvest Level (Tons)	Harvest (Tons)[d]	Date 2-Hour Notice Was Effective	Opening Dates
1997	–	–	Fishery Not Open	–	10,900	11,147	March 18	March 18–23
1998	–	–	Fishery Not Open	–	6,900	6,638	March 16	March 16, 18, 19
1999	–	–	Fishery Not Open	–	8,476	9,218	March 19	March 22, 24, 26–27
2000	–	–	Fishery Not Open	–	5,120	4,675	March 13	March 19, 22
2001	–	–	Fishery Not Open	–	10,597	12,034	March 15	March 22, 26, 27
2002	–	–	Fishery Not Open	–	11,042	9,885	March 25	March 27,29,31,April 2,12–15
2003	–	–	Fishery Not Open	–	6,969	7,069	March 20	March 22, 23, 26
2004	–	–	Fishery Not Open	–	10,618	10, 569	March 19	March 21, 25, 27
2005	–	–	Fishery Not Open	–	11,192	11, 425	March 20	March 23, 25, 27–29
2006	–	–	Fishery Not Open	–	10,412	9,967	March 23	March 24, 26, 27, 29
2007	–	–	Fishery Not Open	–	11,904	11,571	March 24	March 26, 30, April 1, 3
2008	–	–	Fishery Not Open	–	14,723	14,412	March 24	March 25, 26, 31
2009	–	–	Fishery Not Open	–	14,508	14,776	March 22	March 22, 24, 28, 31, April 1
2010	–	–	Fishery Not Open	–	18,293	17,602	March 19	March 24, 27, 30, April 2
2011	–	–	Fishery Not Open	–	19,490	19,419	March 28	March 31, April 1,4,7,9
2012	–	–	Fishery Not Open	–	28,829	13,231	March 27	March 31, April 2, 7
2013	–	–	Fishery Not Open	–	11,549	5,688	March 25	March 27, 28, 30, April 3
2014	–	–	Fishery Not Open	–	16,333	16,957	March 20	March 20, 23, 26, 29
2015	–	–	Fishery Not Open	–	8,712	8,756	March 18	March 18–25
2016	–	–	Fishery Not Open	–	14,941	9,769	March 17	March 17–23

[a] The Juneau-Lynn Canal fishery was seine, gillnet and bait pound area prior to 1980.

[b] The Lynn Canal GHL includes combined seine, gillnet, and bait pound from 1976 to 1978, bait pound for 1979, and seine and bait pound for 1980–1982. The GHL for 1977 was estimated.

[c] The Lynn Canal harvest includes all herring for sac roe, by gear based on IFDB query March, 2007. Bait pound harvests are confidential, so are not included.

[d] The Sitka harvest includes all herring for sac roe including confiscated catch and test fishery harvest based on IFDB query March, 2013.

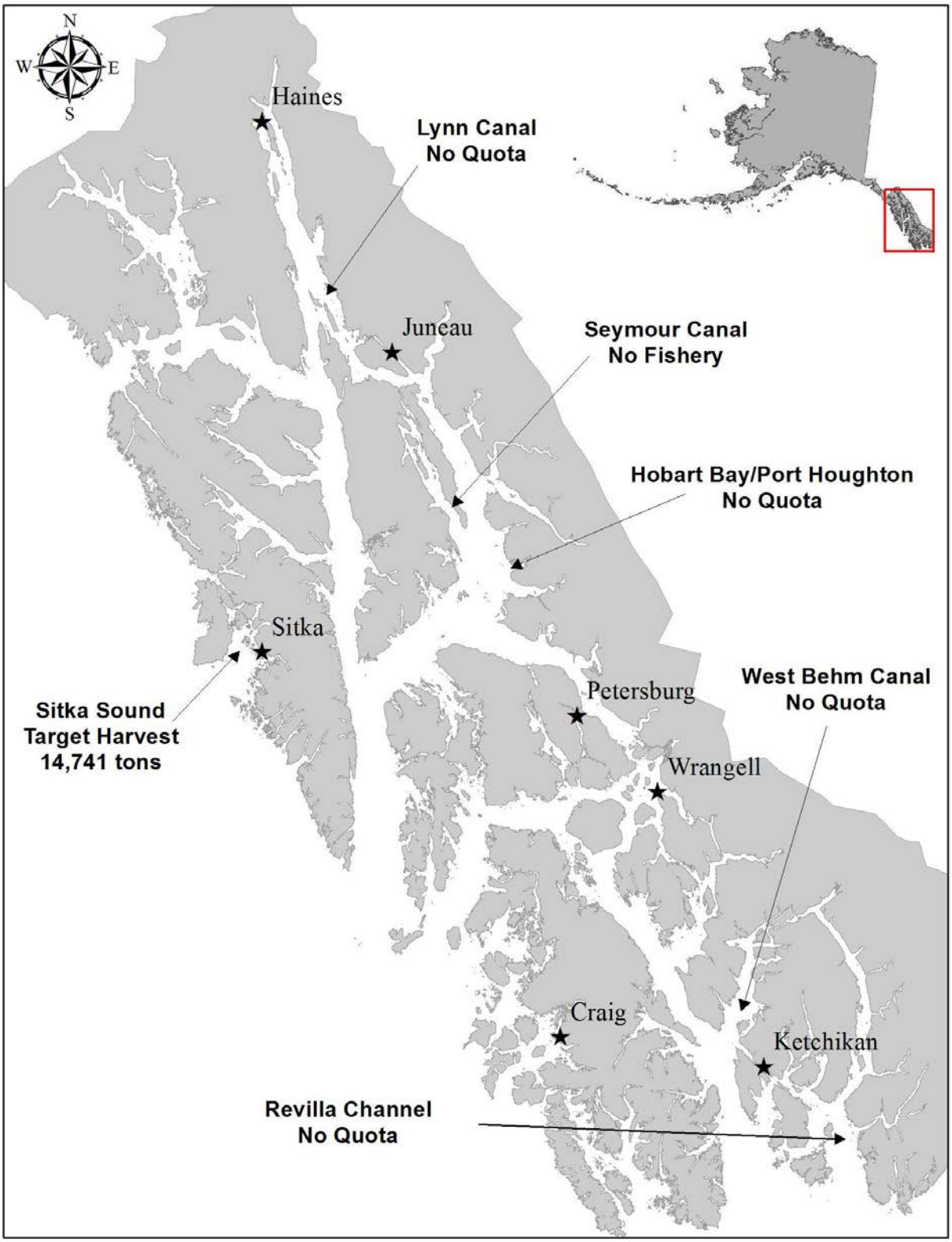

Figure 1.–Southeast Alaska sac roe herring areas and Guideline Harvest Levels for 2016.

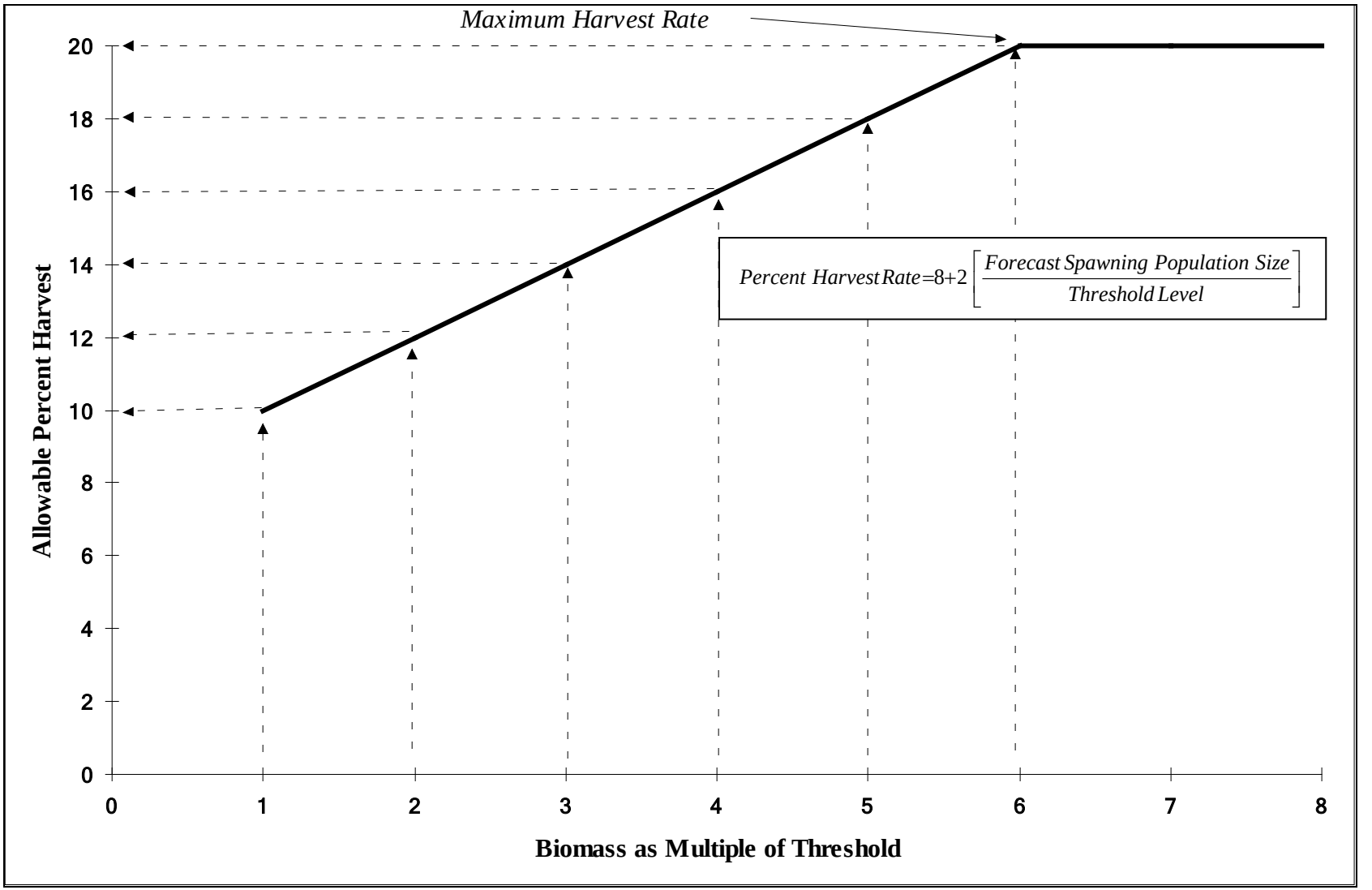

Figure 2.–Generalized harvest strategy for Southeast Alaska herring (excluding Sitka Sound). The allowable percent annual harvest is plotted against the estimated biomass of mature herring expressed as a multiple of the established harvest threshold level.

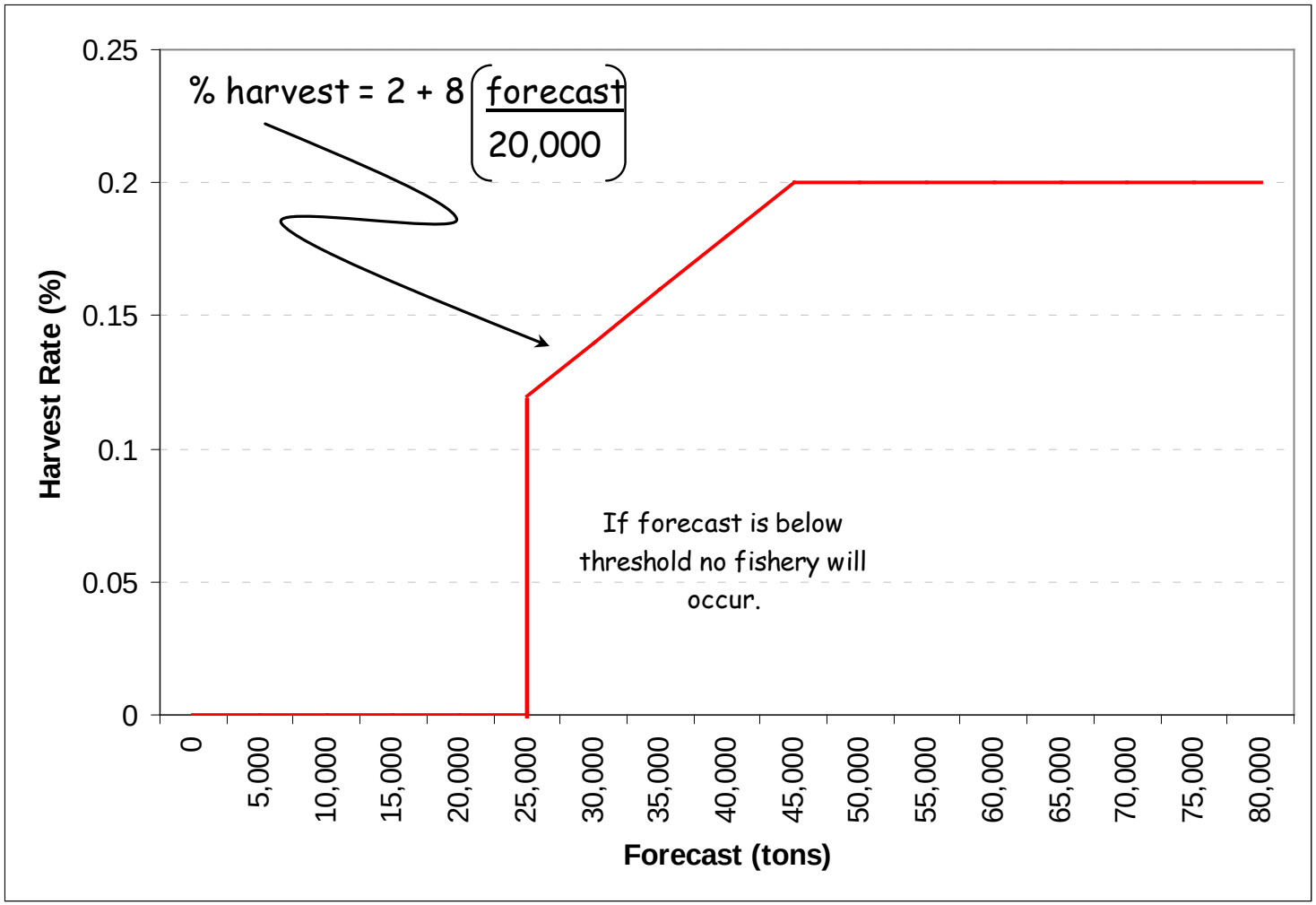

Figure 3.–Harvest rate and formula for Sitka Sound under 25,000 ton minimum threshold level [5 AAC 27.160 (g)].

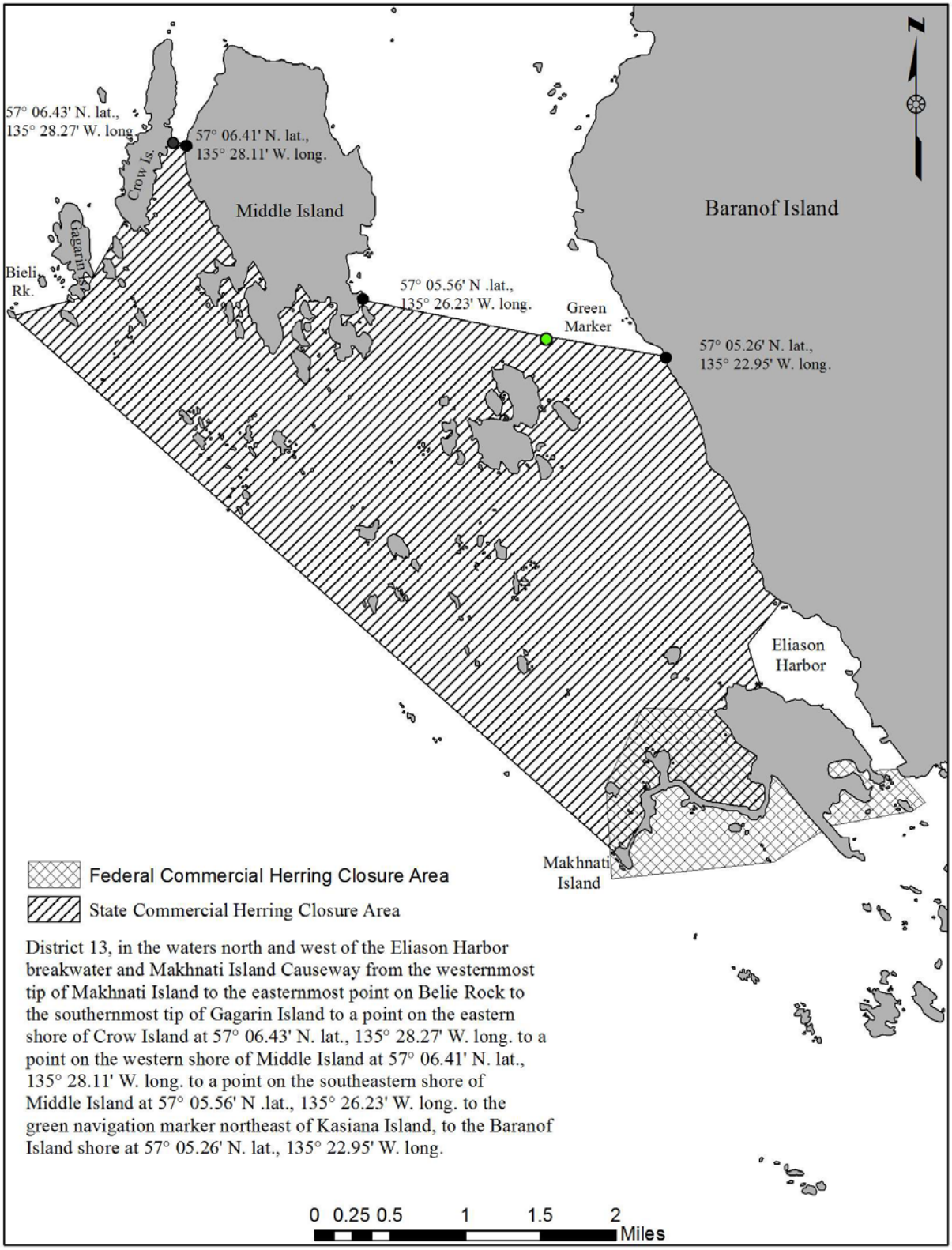

Figure 4.–Map showing area in Sitka Sound closed to commercial herring harvest.