

2020 Southeast Alaska Herring Spawn-On-Kelp Pound Fishery Management Plan

by

Eric Coonradt

Dave Harris

Bo Meredith

and

Paul Salomone

February 2020

Alaska Department of Fish and Game

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

REGIONAL INFORMATION REPORT NO. 1J20-03

**2020 SOUTHEAST ALASKA HERRING SPAWN-ON-KELP POUND
FISHERY MANAGEMENT PLAN**

by

Eric Coonradt

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

Dave Harris

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

Bo Meredith

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

and

Paul Salomone

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

Alaska Department of Fish and Game
Division of Commercial Fisheries, Publications Section
802 3rd, Douglas, Alaska, 99824-0020

February 2020

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

*Eric Coonradt,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
304 Lake St. Rm. 103
Sitka, AK 99835 USA*

*Dave Harris,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
802 3rd Street
Douglas, AK 99824 USA*

*Bo Meredith,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
2030 Sea level Drive Suite 205,
Ketchikan, AK 99901, USA*

and

*Paul Salomone,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
16 Sing Lee Alley
Petersburg, AK 99833 USA*

This document should be cited as follows:

Coonradt, E., D. Harris, B. Meredith, and P. Salomone. 2020. 2020 Southeast Alaska herring spawn-on-kelp pound fishery management plan. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report IJ20-03, Douglas.

The Alaska Department of Fish and Game (ADF&G) administers all programs and activities free from discrimination based on race, color, national origin, age, sex, religion, marital status, pregnancy, parenthood, or disability. The department administers all programs and activities in compliance with Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act (ADA) of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972.

If you believe you have been discriminated against in any program, activity, or facility please write:

ADF&G ADA Coordinator, P.O. Box 115526, Juneau, AK 99811-5526

U.S. Fish and Wildlife Service, 4401 N. Fairfax Drive, MS 2042, Arlington, VA 22203

Office of Equal Opportunity, U.S. Department of the Interior, 1849 C Street NW MS 5230, Washington DC 20240

The department's ADA Coordinator can be reached via phone at the following numbers:

(VOICE) 907-465-6077, (Statewide Telecommunication Device for the Deaf) 1-800-478-3648,

(Juneau TDD) 907-465-3646, or (FAX) 907-465-6078

For information on alternative formats and questions on this publication, please contact:

ADF&G, Division of Sport Fish, Research and Technical Services, 333 Raspberry Rd, Anchorage AK 99518 (907) 267-2375

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ii
LIST OF FIGURES	ii
ABSTRACT	1
INTRODUCTION.....	1
HERRING STOCK STATUS AND HISTORICAL FISHERY PERFORMANCE	1
Methods of Forecasting Herring Biomass.....	1
Craig-Klawock (Section 3-B).....	2
Ernest Sound (District 7)	3
Tenakee Inlet (Section 12-A).....	3
Hoonah Sound (Section 13-C).....	4
CALENDAR OF EVENTS	5
REGULATIONS	5
General Spawn-On-Kelp Regulations	5
Expanded Open Pounding Area.....	5
Closure of some pound types.....	5
Other Regulations	6
HARVEST AND ALLOCATION OF KELP FOR 2020.....	6
FISHERY CONDUCT AND MANAGEMENT	6
Open Waters	7
Closed Waters	7
OTHER AGENCY REQUIREMENTS.....	8
Alaska Department of Natural Resources.....	8
U.S. Forest Service	8
U.S. Coast Guard	8
LIST OF MANAGEMENT CONTACTS	9
TABLES AND FIGURES	10

LIST OF TABLES

Table	Page
1. Craig/Klawock herring stock size and fishery summary, 1987–2019.....	11
2. Craig/Klawock herring SOK detailed fishery summary, 2002–2019.....	12
3. Craig and Ernest Sound herring spawning dates comparison, 1997–2019.....	13
4. Ernest Sound herring stock and fishery summary, 1969–2019.....	15
5. Ernest Sound SOK detailed fishery summary, 2004, 2008–2009, 2011, and 2013–2014.....	17
6. Tenakee Inlet herring stock and fishery summary, 1978–2019.....	18
7. Tenakee Inlet herring SOK detailed fishery summary, 2003–2005, 2009, and 2014.....	19
8. Hoonah Sound and Tenakee Inlet herring spawn dates comparison, 2000–2019.	20
9. Hoonah Sound herring spawning stock and fishery summary, 1971–2019.....	21
10. Hoonah Sound herring SOK detailed fishery summary, 2003–2017.	22

LIST OF FIGURES

Figure	Page
1. Craig/Klawock (Section 3-B) herring SOK fishery open area.	23
2. Diagram of a herring pound showing two alternatives methods of marking herring pounds.	24
3. Coast Guard requirements for marking pounds.....	25

ABSTRACT

This management plan provides an overview of the management approach, permit requirements, and regulations for the 2020 herring spawn-on-kelp pound fisheries in Southeast Alaska. A spawn-on-kelp pound fishery will only occur in Craig-Klawock. Staff biologists listed at the end of this document are available to answer questions regarding this plan. Pound operators are also advised to review the section of this plan that describes requirements of other agencies.

Key words: Pacific herring, *Clupea pallasii*, herring pound, *Macrocystis* kelp, allocation, management plan, spawn on kelp

INTRODUCTION

This plan provides an overview of the 2020 management approach, permit requirements, and regulations for the Southeast Alaska herring (*Clupea pallasii*) spawn-on-kelp fisheries. 5 AAC 27.185 *Management Plan for Herring Spawn on Kelp in Southeastern Alaska* establishes the regulatory framework for the Southeast Alaska spawn-on-kelp (SOK) fisheries and provides for fisheries in Sections 3-B (Craig/Klawock), 12-A (Tenakee Inlet), 13-C (Hoonah Sound), and in District 7 (Ernest Sound).

A *closed-pound fishery* involves capturing sexually mature herring and releasing them into a net impoundment in which kelp is suspended. The herring are released from the pound after they spawn on the kelp and the kelp with eggs is then sold. An *open-pound fishery* involves suspending kelp from a floating frame structure in an area where herring are spawning. The herring are not impounded but instead are allowed to naturally spawn on the suspended kelp. The kelp blades with eggs are removed from the water then sold.

In the Southeast Alaska herring SOK fisheries, a closed or an open pound may be operated by one or more Commercial Fisheries Entry Commission (CFEC) permit holders.

The 2019–2020 herring guideline harvest level (GHL) for the Craig/Klawock area stock is 11,014 tons of herring. Forty percent (40%) or 4,406 tons is allocated to the SOK fishery plus any unharvested portion of the winter food and bait quota. The current GHL for the Craig/Klawock spawn-on-kelp fishery will put the fishery in the 1,500 or more ton kelp allocation range.

No fishery will occur in Ernest Sound during the 2019–2020 season. In 2019, a forecast was not generated due to the low mileage of herring spawn observed. In 2020, Ernest Sound will be monitored throughout the duration of historical spawn timing. If enough herring spawn is observed, a spawn deposition survey may be conducted.

No fishery will occur in Hoonah Sound during the 2019–2020 season. In 2019, no herring or herring spawn was observed therefore no forecast was generated for the 2019–2020 season. Future assessment and fisheries are dependent on available funding.

No fishery will occur in Tenakee Inlet during the 2019–2020 season. Approximately 0.5 nautical miles (nmi) of spawn was observed in 2019, but no samples were taken, and no forecast was generated. Future assessment and fisheries are dependent on available funding.

HERRING STOCK STATUS AND HISTORICAL FISHERY PERFORMANCE

Methods of Forecasting Herring Biomass

The Biomass Accounting (BA) method of forecasting is used to determine the expected prefishery mature spawning biomass and to establish the fishery GHL in Hoonah Sound and Ernest Sound.

The BA method uses the most recent year's spawn deposition estimate of eggs, the age composition of the spawning biomass, and weights-at-age to project the following year's return of mature herring. The Hoonah Sound projection uses the estimated survival and maturity estimates from the age-structured-analyses (ASA) for the nearby Sitka Sound herring stock. A median historical level of recruitment of age-3 herring specific to Hoonah Sound is also applied to forecast biomass. The Ernest Sound projection uses the estimated survival and maturity estimates from the ASA for the Craig herring stock and a median historical recruitment of age-3 herring specific to Ernest Sound is applied to forecast biomass.

This BA method is unlike the ASA method used for forecasting herring biomass for several of the larger stocks in Southeast Alaska, including Craig/Klawock and Tenakee Inlet. The ASA method also uses the spawn deposition estimate of the eggs and the age composition to project the following year's return of mature herring. However, the ASA model calculates survival and maturation rates specific to the spawning stock. The ASA model utilizes a long time series of spawn deposition and age composition information to provide an estimate of the most recent biomass from which the forecast biomass for the next year is determined. The Alaska Department of Fish and Game (ADF&G) will continue to consider converting to use of the preferred ASA method for forecasting once there is an adequate time series of data to do so.

Once a forecast of the season's biomass is calculated, a variable harvest rate formula allows for a harvest rate of 10–20% of the forecast of mature spawning biomass. When the spawning biomass forecast for an area equals the threshold, the exploitation rate is 10% of the estimated spawning biomass. For each incremental increase in the spawning biomass equal to the threshold, the exploitation rate increases by 2%.

CRAIG-KLAWOCK (SECTION 3-B)

Winter food and bait herring fisheries have occurred in Section 3-B (in the Mears Passage and Bocas de Finas areas) since the 1960s. Seasonal landings from the 1960s through 1985 were small, averaging approximately 210 tons. From the start of the herring SOK fishery in 1992, the Craig/Klawock herring GHs have averaged 1,981 tons, ranging from a low of 626 tons in 2000 to a high of 11,014 tons in 2020 (Table 1). Spawn-on-kelp fishing effort, harvest, spawning dates, fishery dates, and product values are summarized in Table 2.

The GH for the Section 3-B stock is allocated between both the winter food and bait fishery and the herring SOK fishery. When the fishery was created, the GH allocation was 85% for the winter food and bait fishery and 15% for the SOK fishery. In 1998, the allocation was modified so that the winter food and bait fishery is allocated 60% of the GH with the remaining 40% and any unharvested portion of the food and bait fishery going to the herring SOK fishery.

Annual harvest levels are based on a formula that allows for higher harvest rates as the herring population increases relative to the threshold level. No harvest is allowed if the biomass estimate for the stock is less than the threshold level. The established threshold level for the Craig/Klawock stock is 5,000 tons.

Herring biomass information collected in 2019 indicate a pronounced shift in the population dynamics of herring, not just in Craig, but throughout southeast Alaska. Specifically, samples from both cast net and the commercial catch during the 2019 spawning event in Craig indicate that the mature biomass was dominated by age-3 fish, 81% of cast net and 85% of the commercial catch respectively. This large proportion of age-3 fish was observed throughout Southeast Alaska herring

stocks, including Ernest Sound, Revilla Channel, Seymour Canal and Sitka Sound. Due to the very large uncertainty associated with the 2019 age-3 abundance, the department based the 2019–20 Craig/Klawock guideline harvest level (GHL) on the 2019 spawn deposition estimate of 55,072 tons. This biomass estimate allows for a 20% harvest rate and a combined GHL of 11,014 tons for the winter food and bait and the SOK fisheries. Therefore, the GHL is 6,608 tons to the winter food and bait fishery and 4,406 tons to the SOK fishery. The department anticipates a strong return of age-4 herring based on the age structure of the 2019 spawning biomass.

The 2019–2020 winter food and bait fishery closes on February 28, 2020. All unharvested winter food and bait quota will be added to the GHL for the SOK fishery. The original GHL of 4,406 tons along with the remainder of the food and bait fishery will allow for the kelp allocation in the Section 3-B SOK fishery to fall above the maximum allocation of 1,500 or more tons.

Herring spawning normally occurs in the Craig/Klawock area between mid-March and early April. The earliest spawning observed since the mid-1970s was March 9 and the latest date of initial spawning was April 9. Figure 1 shows the new open area adopted by the BOF in Sitka in January 2018 for the Craig/Klawock SOK fishery.

ERNEST SOUND (DISTRICT 7)

The Ernest Sound SOK pound fishery was created in January 2003 by the BOF. Additionally, the BOF created a herring bait pound fishery that is allocated 10% of the area's GHL and is similar to other herring fisheries in that its allocation is based upon the GHL remaining after the herring food and bait fisheries occur. Any remaining GHL from the winter food and bait fishery, or the bait pound fishery after March 15, is allocated to the SOK fishery. SOK fisheries in Ernest Sound have occurred intermittently and at various levels of effort and harvest since the first fishery occurred in 2004. From 2004 through 2017, there have been SOK GHLs in 6 years. Effort has varied from 0 participants in 2011 to 129 in 2014 (Table 5).

The Ernest Sound herring stock has a threshold level of 2,500 tons. A forecast was not developed for 2020 because no spawn deposition survey was conducted. Historical spawning biomass, forecast, GHLs, spawning dates, harvest, and fishery dates are summarized in Tables 3, 4, and 5.

No commercial herring fisheries will occur in Ernest Sound during the 2019-2020 season. Monitoring herring spawn, collecting samples of spawning herring, and spawn deposition survey are planned for 2020.

TENAKEE INLET (SECTION 12-A)

The Tenakee Inlet stock has been utilized for the winter food and bait fishery since the 1978–1979 season. During seasons that the estimated spawning biomass was above the 3,000 ton threshold, the GHL has ranged from a low of 200 tons in the initial season to a peak of 1,700 tons in 1985–1986 (Table 5). Regulations adopted by the BOF in January 2003, provide for a SOK fishery in Tenakee Inlet if sufficient GHL remains at the close of the winter food and bait fishery. The SOK fishery occurred for the first time in April 2003. Summaries of the Tenakee Inlet SOK fisheries are presented in Table 6.

ADF&G has conducted aerial surveys in Tenakee Inlet since the early 1970s; documenting the total miles of spawn each season to provide an indication of herring stock size or biomass. Aerial surveys were supplemented with hydroacoustic surveys from 1979 through 1986. Spawn-deposition surveys began in 1987 as the most reliable and accurate means to assess the spawning biomass and have not been conducted in Tenakee Inlet since 2015.

The Tenakee Inlet spawning stock has historically exhibited cycles of abundance. After a decade of fisheries, the stock declined below threshold in the early 1990s and no fisheries took place until 1996. Good recruitment led to nearly a decade of harvestable surplus until the forecasted biomass again declined below threshold in 2006. Aerial spawn surveys and spawn deposition dive surveys conducted in 2008 indicated a significant increase in spawning biomass to the levels seen in 1997–1999. However, recent surveys conducted since 2009 once again indicated a decreasing trend in mature spawning biomass. The herring spawn mileage observed in 2014, 2015, and 2017 was approximately 2.0 nmi each year. No herring spawn was documented within the inlet in 2016. Although 1.4 nmi of spawn was observed in 2018 and 0.5 nmi of spawn was observed in the spring of 2019.

Spawning in Tenakee Inlet has generally occurred between the last week in April and the first week in May (Tables 5 and 7). Traditionally, herring spawn primarily along the southern shoreline of Tenakee Inlet between Saltery Bay and South Passage Point, with the core areas centered east and west of the Kadashan River flats. Spawn has also been documented intermittently along the Chatham Strait shoreline from South Passage Point to Basket Bay. The 2019 spawn occurred in the traditional core area on the west side of the Kadashan River flats over the course of three days and was characterized as very light.

No commercial herring fisheries will occur in Tenakee Inlet during the 2019–2020 season. Aerial surveys will begin in mid-April of 2020.

HOONAH SOUND (SECTION 13-C)

ADF&G began monitoring the Hoonah Sound herring population in 1971. Since that time, the herring spawning stock has averaged 7.0 nmi of spawn and an estimated average spawning biomass of 3,774 tons. Since 1990, the year the SOK fishery started, the stock has averaged 8.9 nmi of spawn and 5,339 tons of estimated spawning biomass (Table 9). The highest recorded spawning biomass occurred in 2008 with an estimated 14.5 nmi of spawn and a spawning biomass of 19,975 tons based on the spawn deposition survey.

In 1990, when Hoonah Sound became an SOK fishery, the minimum threshold at which a fishery could occur was reduced from 2,000 tons to 1,000 tons. In 2015, to be more consistent with similar sized stocks around the region, the threshold in Hoonah Sound was increased to 2,000 tons. A summary of historic herring spawn timing and herring SOK harvest in Hoonah Sound is available in Tables 8 and 10, respectively.

In 2019, no herring spawn was observed; because of this, no estimate of spawning biomass was generated. The biomass has been decreasing in this area since 2008. The reason for this decrease is not known, however, there are many oceanographic and biological influences on herring populations that are not well understood. There will be no formal forecast of herring biomass for the 2019–2020 season; therefore, no commercial fishery will occur in Hoonah Sound in 2020.

CALENDAR OF EVENTS

The following is a calendar of events to be considered by pound operators for the 2020 herring season.

- | | |
|----------------|---|
| By February 28 | 2020 Southeast Alaska Herring Spawn-On-Kelp Pound Fishery Management Plan will be available at all Southeast Alaska area offices. |
| March 3 | News Release announcing the 2020 Ernest Sound, Hoonah Sound, and Tenakee Inlet closures, and the 2020 Craig/Klawock GHL. |
| March 17 | The Craig/Klawock fishery will be open to seining of herring for placement in pounds effective 12:00 noon. |
| May 31 | Pounds and all associated equipment in support of the fishery must be completely removed from the waters of the herring pound fishing area in Section 3-B. This includes the area covered by extreme high tide. |

REGULATIONS

GENERAL SPAWN-ON-KELP REGULATIONS

The BOF met in Sitka from January 11 to 23, 2018, and adopted two regulatory changes to the SOK management plan. These changes include: an expansion to the open pounding area 5 AAC 27.185 (f)(1) and adoption of a regulation that allows the department to close fishing for some pound types listed in 5 AAC 27.185 (c) and 5 AAC 27.185 (dd)(2) if necessary to stay within the GHL.

The regulatory framework for the SOK fishery is found in 5 AAC 27.185. *Management Plan for Herring Spawn on Kelp in Pounds in Sections 3-B, 12-A, 13-C, and District 7.*

Expanded Open Pounding Area

Pounds for the taking of herring spawn on kelp and seines for the taking of herring for placement in pounds may be operated in the following locations, in Section 3-B, in the waters of the Gulf of Esquibel, San Alberto Bay, Shinaku Inlet, and San Christoval Channel south of the latitude of the northernmost tip of Saint Philips Island at 55°39.31' N. lat., east of a line from the northernmost tip of Saint Phillips Island at 55°39.31' N. lat., to the northernmost tip of Point Garcia at 55°33.65' N. lat., 133°26.47' W. long., and north of a line from Entrance Point at 55°31.10' N. lat., 133°09.00' W. long., to the southernmost tip of Clam Island at 55°30.96' N. lat., 133°09.43' W. long., to the southernmost tip of Fern Point 55°30.05' N. lat., 133°16.97' W. long., and east of 133°20.00' W. long. (Figure 1). The closed waters under 5 AAC 27.185 (f)(1) remain in effect.

Closure of some pound types

The department may close fishing for some pound types if necessary to avoid exceeding the GHL. In years when the GHL is low, the department, instead of closing the fishery, may instead close the fishery to certain pound types, such as single closed and double closed.

Other Regulations

Additional regulations pertaining to the pound fisheries can be found in the 2019–2021 Statewide Commercial Herring Fishing Regulations booklet under CHAPTER 27, ARTICLE 4, SOUTHEAST ALASKA AREA under the following sections: 5 AAC 27.110 *Fishing Seasons for Southeastern Alaska Area* (f), 5 AAC 27.130 *Lawful Gear for Southeastern Alaska Area* (d), and (e); 5 AAC 27.185 *Management Plan for Herring Spawn on Kelp in Pounds* (a) through (dd); 5 AAC 27.187 *Buyer and Processors Reporting Requirements for Spawn on Kelp in Pounds for the Southeastern Alaska Area*; harvesting requirements for *Macrocystis* kelp in 5 AAC 37.100 *Permits*; and 5 AAC 37.300 *Harvesting Requirements for Macrocystis*.

Under 5 AAC 27.185 (w) all pounds and associated equipment used in these fisheries must be removed from the water by a specific date for a specific period of time. ADF&G and Alaska Wildlife Troopers (AWT) are advising permit holders that any pounds, nets, buoys, lines, and anchors left on the grounds will be removed and impounded or destroyed.

It is the responsibility of permit holders to carefully review and follow these regulations.

HARVEST AND ALLOCATION OF KELP FOR 2020

A permit issued by ADF&G is required to harvest kelp for use in pounds (5 AAC 37.900). Kelp harvest permits may be obtained from local department offices. Kelp blades will be allocated equally among permit holders fishing the same type of gear. The amount of kelp allowed for harvest for each permit holder is based on the kelp allocation table as indicated under regulation 5 AAC 27.185 (d) plus an allowance for breakage and loss during transport.

Section 3-B (Craig/Klawock):

- Single permit closed pound—600 blades of *Macrocystis* kelp;
- Double permit closed pound—900 blades of *Macrocystis* kelp;
- Triple permit closed pound—1,000 blades of *Macrocystis* kelp;
- Quadruple permit or more closed pound—1,000 blades of *Macrocystis* kelp;
- Single permit open pound—3,000 blades of *Macrocystis* kelp;
- Multiple permit open pounds—9,000 blades of *Macrocystis* kelp.

FISHERY CONDUCT AND MANAGEMENT

The Craig/Klawock herring pound fishery will be the only SOK fishery in Southeast Alaska for 2020.

ADF&G will be closely monitoring herring activity using vessel and aerial surveys. Results of aerial surveys will be announced by department advisory announcements.

ADF&G will continue to monitor the practice of *top-off fishing*. Regulation 5 AAC 27.185 (q) prevents a permit holder from releasing any herring from their pound when they are adding fresh herring.

To avoid mortality, the transport of herring to the pound site should be done with the pound itself or a pushable/towable net pen. Towable net pens used only for transporting herring must be marked "Tow Pound" and include the CFEC permit number of a participating permit holder. Transporting with a purse seine is discouraged except for very short distances. Pound operators should slowly push pounds or tow the pound alongside to avoid prop wash and prevent crushing herring against the net. Permit holders are asked to avoid making and holding large sets intended to fill multiple pounds to avoid herring mortality and stress.

Although regulations determine the maximum allowable number of kelp blades that can be harvested and placed in each permit holder's pound, fishermen are encouraged to fish the number of blades which will provide the maximum overall quality and value of their product rather than simply to fish the total amount allowed. Other measures have successfully been used in the fishery that may be considered when trying to maximize spawn on kelp quality and value including the following:

- 1) Pound nets may be shaped with internal frames to provide the full net volume;
- 2) The kelp depths in the pound may be matched with the depth of active spawning by testing spawn deposition with a weighted string;
- 3) Fishing and transferring herring to pounds should only occur once herring are fully mature;
- 4) Top-off sets may be added over a 4 day period;
- 5) The herring density in the pound should be closely monitored since successful spawning is inhibited by excessive crowding;
- 6) Web depth may be adjusted (consistent with specifications under 5 AAC 27.130 (e)(1)(C) or 5 AAC 27.185(cc)) to provide good water exchange.

Open Waters

The open waters for Section 3-B were modified during the 2018 BOF meeting in Sitka and now include: the waters of the Gulf of Esquibel, San Alberto Bay, Shinaku Inlet, and San Christoval Channel south of the latitude of the northernmost tip of Saint Philips Island at 55°39.31' N. lat., east of a line from the northernmost tip of Saint Phillips Island at 55°39.31' N. lat., to the northernmost tip of Point Garcia at 55°33.65' N. lat., 133°26.47' W. long., and north of a line from Entrance Point at 55°31.10' N. lat., 133°09.00' W. long., to the southernmost tip of Clam Island at 55°30.96' N. lat., 133°09.43' W. long., to the southernmost tip of Fern Point 55°30.05' N. lat., 133°16.97' W. long., and east of 133°20.00' W. long. (Figure 1).

Closed Waters

In Section 3-B, certain areas are closed to the operation of herring pounds and seines for taking of herring for placement in pounds. Those areas are shown in Figure 1 and include:

- Klawock Inlet and Big Salt Lake;
- Those waters of San Christoval Channel in the main channel enclosed by a line from 55°35.62' N. lat., 133°20.00' W. long., to 55°35.17' N. lat., 133°20.00' W. long. to 55°33.37' N. lat., 133°17.52' W. long., to 55°33.50' N. lat., 133°17.28' W. long.;

- Those waters of Fish Egg and Ballenas Islands south of 55°31.00' N. lat. and north of the southernmost tip of Cape Suspiro at 55°27.47' N. lat., 133°08.40' W. long., and east of the longitude of Ballena Island Shoal Light at 133°13.25' W. long.

OTHER AGENCY REQUIREMENTS

Prospective pound operators are advised to consider other agency requirements for constructing and operating pounds in Craig/Klawock, Ernest Sound, Tenakee Inlet, and Hoonah Sound. Pound operators are urged to contact the Alaska Department of Natural Resources, U.S. Forest Service, the U.S. National Marine Fisheries Service, and the U.S. Coast Guard to determine other regulations and requirements. Phone numbers for those agencies are listed below.

ALASKA DEPARTMENT OF NATURAL RESOURCES

The Alaska Department of Natural Resources (907-465-3400) manages the use of tidelands and submerged lands seaward of mean high water.

U.S. FOREST SERVICE

The U.S. Forest Service has jurisdiction over and manages most of the lands above mean high tide. People who plan to use National Forest land in connection with the fishery must apply for a special use permit from the U.S. Forest Service prior to any occupancy. Special use permit applications are available from local USFS offices. Completed applications should be submitted well in advance of operations to ensure that a permit is received in time for the fishery. Examples of use needing a permit include (but are not limited to): camping on National Forest land in conjunction with the commercial fishery and storage of gear on the National Forest.

U.S. COAST GUARD

Structures such as floating fish pens are subject to the requirements of the Code of Federal Regulations, Title 33, Part 64. This regulation requires an owner to apply for a U.S. Coast Guard permit and to install and maintain a light or other private aid to navigation if the U.S. Coast Guard determines it to be necessary to protect maritime navigation.

Herring pounds used in the SOK pound fishery do not require permits for private aids to navigation at this time, provided the owners:

Place two signs on opposite corners of the structure. These signs will be worded “Danger, Fish Pens” (Figure 3).

Place a single, all-points white light on one corner of structures less than 400 square feet in size.

Place a single, all-points white light on every corner of structures larger than 400 square feet in size.

Anchor fish pens within the boundary areas specified in ADF&G regulation 5 AAC 27.185 (f) (Figure 1).

If all these conditions are not met, the permit holder must apply to the U.S. Coast Guard for an individual “Private Aids to Navigation Permit.” If you have questions, call the U.S. Coast Guard Aids to Navigation office, at (907) 463-2254.

LIST OF MANAGEMENT CONTACTS

Following are ADF&G Division of Commercial Fisheries contacts regarding this management plan:

Name and Title	Address and Phone Number
Lowell Fair Southeast Alaska Regional Supervisor	802 3rd Street Douglas, Alaska 99824 (907) 465-4250
Troy Thynes Southeast Alaska Regional Management Biologist	16 Sing Lee Alley Petersburg, AK 99833 USA (907) 772-3801
Kyle Hebert Herring Research Biologist	802 3rd Street Douglas, Alaska 99824 (907) 465-4250
Bo Meredith Area Management Biologist and Justin Breese or Whitney Crittenden Assistant Management Biologists	2030 Sea Level Dr. Ste. 205 Ketchikan, Alaska 99901 (907) 225-5195
Paul Salomone Area Management Biologist and Katie Taylor Assistant Management Biologist	16 Sing Lee Alley Petersburg, AK 99833 USA (907) 772-3801
Tom Kowalske Assistant Management Biologist	215 Front Street Wrangell, AK 99929-0200 (907) 874-3822
Aaron Dupuis Assistant Management Biologist	304 Lake St., Rm. 103 Sitka, Alaska 99835 (907) 747-6688
Dave Harris Area Management Biologist and Scott Forbes Assistant Management Biologist	802 3rd Street Douglas, Alaska 99824 (907) 465-4250
Jim Craig Southeast Alaska Regional Publications Manager	802 3rd Street Douglas, Alaska 99824 (907) 465-4236

TABLES AND FIGURES

Table 1.—Craig/Klawock herring stock size and fishery summary, 1987–2019.

Season	Miles Spawn ^a	Forecasted Pre- fishery Biomass ^b	Total GHL Bait and SOK ^c (Tons)	Bait Quota (Tons)	Bait Harvest (Tons)	Number of Permits	Ex-Vessel Value
87–88 ^d	27.0	16,550	N/A	2,200	2,014	21	\$564,000
88–89	31.7	16,350	N/A	1,810	1,730	22	\$465,000
89–90	30.0	19,800	N/A	3,150	3,221	23	\$ 998,200
90–91	22.0	18,350	N/A	2,841	3,272	27	\$981,600
91–92	23.0	17,800	2,684	2,281	2,295	28	\$619,650
92–93 ^e	8.4	12,350	1,602	1,362	623	10	\$150,960
93–94	8.0	7,996	895	760	636	6	\$187,578
94–95	5.5	6,778	725	617	***	***	***
95–96	9.9	6,262	658	558	***	***	***
96–97	13.2	6,755	715	615	517	4	\$137,788
97–98 ^f	11.0	7,018	755	455	***	***	***
98–99	15.4	6,951	750	450	***	***	***
99–00	12.9	6,013	626	376	***	***	***
00–01	16.7	9,091	1,058	635	***	***	***
01–02	18.0	8,387	952	571	***	***	***
02–03	11.2	6,045	630	378	***	***	***
03–04	12.0	13,204	1,754	1,052	***	***	***
04–05	18.0	15,577	2,217	1,330	553	3	\$199,012
05–06	8.2	14,262	1,955	1,173	689	3	\$247,934
06–07	22.3	13,768	1,860	1,116	576	3	\$139,000
07–08	11.0	14,213	1,945	1,167	565	3	\$133,300
08–09	17.0	14,213	1,945	1,167	142	3	\$51,304
09–10	18.7	14,870	2,074	1,244	***	***	***
10–11 ^g	14.8	17,886	2,710	1,140	***	***	***
11–12	14.9	34,235	6,847	4,060	309	3	\$113,784
12–13	15.3	23,391	4,060	2,436	321	3	\$116,000
13–14	13.6	26,085	4,808	2,884	***	***	***
14–15	11.5	15,803	2,362	1,367	964	3	\$396,205
15–16	12.3	12,303	1,590	954	898	3	\$369,660
16–17	22.8	7,833	872	523	527	3	\$210,800
17–18	17.3	16,083	2,312	1,387	710	5	\$310,000
18–19	28.9	22,810	3,906	2,344	995	5	\$423,000
19–20	–	55,072	11,014	6,608			
Average	16.3	15,276	2,286	1,546	1,078	6	\$340,739

Note: *** indicates data is confidential.

^a Spawn year is second year of regulatory season listed in the adjacent year column.

^b Forecasted pre-fishery biomass values were estimated with hydroacoustics for 86/87, spawn deposition surveys for 87/88 to 92/93, and age-structured models for 93/94 to 18/19.

^c Spawn-On-Kelp (SOK).

^d Bait quota reduced to 1,600 tons on the grounds.

^e First year bait quota was split between pound fishery 85%:15%.

^f Herring allocation changed to 60% for the winter food and bait fishery, 40% to the pound fishery.

^g Updated forecast based on updated scale ages.

Table 2.—Craig/Klawock herring SOK detailed fishery summary, 2002–2019.

Statistic	2002	2003	2004	2005	2006	2007
Herring Quota (tons)	852	528	1,579	1,667	1266	1284
Total harvest SOK (tons)	41.7	69.2	50	115.2	28.9	44.5
Exvessel value	\$218,700	\$423,000	\$325,000	\$603,723	\$298,575	\$1,087,532
Average Price/lb	\$3.10	\$3	\$3.25	\$2.62	\$5.15	\$12.08
Average Income	\$2,460	\$3,385	\$3,420	\$9,011	\$8,782	\$23,139
Number of pounds	50	61	50	42	50	52
Number of landings	89	118	95	67	34	47
Blade allocation	b	b	a	c	d	d
Total kelp harvest (tons)	8.2	7.5	14.0	4.9	4.6	5.6
Herring spawning dates	3/31–4/7	3/31–4/7	3/26–4/7	4/9–4/14	3/30–4/3	4/3–4/12
Miles of spawn	18.4	11.2	12.0	18.0	8.2	22.3
Forecasted Pre-Fishery biomass (tons)	8,387	6,045	13,204	15,577	14,262	13,768
	2008	2009	2010	2011	2012	2013
Herring Quota (tons)	1,380	1,802	1,953	2,710	6,847	4,060
Total harvest SOK (tons)	148.5	137.3	116.7	70	98.1	137.7
Exvessel value	\$3,066,788	\$1,256,777	\$884,715	\$728,147	\$2,099,002	\$3,099,002
Average Price/lb	\$10.33	\$4.58	\$3.80	\$5.13	\$10.69	\$12.00
Average Income	\$25,138	\$9,107	\$8,268	\$14,003	\$32,795	\$23,656
Number of pounds	66	96	63	34	35	80
Number of landings	122	137	107	52	64	131
Blade allocation	d	d	d	d	d	d
Total kelp harvest (tons)	12.2	7.3	8.2	4.6	5.3	9.3
Herring spawning dates	4/3–4/12	4/3–4/10	4/5–4/14	4/1–4/7	4/3–4/8	3/31–4/3
Miles of spawn	11.0	17.0	18.7	14.8	14.9	15.3
Forecasted Pre-Fishery biomass (tons)	14,213	14,213	14,870	17,886	34,235	23,391
	2014	2015	2016	2017	2018	2019
Herring Quota (tons)	4,808	2,362	1,590	872	1,602	2,911
Total harvest SOK (tons)	confidential	confidential	confidential	69.9	205.3	202.4
Exvessel value	confidential	confidential	confidential	\$932,917	\$3,262,900	\$3,300,000
Average Price/lb	confidential	confidential	confidential	\$6.68	\$7.95	\$8.15
Average Income	confidential	confidential	confidential	\$8,042	\$27,191	\$23,571
Number of pounds	75	76	46	19	66	73
Number of landings	136	135	133	116	120	140
Blade allocation	d	d	e	f	g	g
Total kelp harvest (tons)	19.2	19.2	9.2	10.2	9.4	9.8
Herring spawning dates	4/1–4/5	3/27–4/1	3/25–3/31	3/24–4/2 & 4/6–4/8	3/29–4/4	3/27–4/6
Miles of spawn	13.6	11.5	12.3	22.8	17.3	28.9
Forecasted Pre-Fishery biomass (tons)	26,085	15,803	12,303	7,833	16,039	22,810

^a 70 blades for a single closed pound, 210 for a multiple pound permit holder.^b 200 blades - single closed pound, 600 blades/permit holder multiple closed pound.^c 350 blades for a single closed pound, 750 blades for a double closed pound, 1,125 blades for a triple closed pound.^d 600 blades for a single closed pound, 750 blades for a double closed pound, 1,125 blades for a triple closed pound.^e 300 blades for a single closed pound, 400 blades for a double closed pound, 700 blades for a triple closed pound, 800 blades for a quad closed or more.^f 500 blades per permit with six permit holders per pound structure^g 600 blades for a single closed pound, 900 blades for a double closed pound, 1,000 blades for a triple closed pound, 1,000 blades for a quad closed or more.

Table 3.—Craig and Ernest Sound herring spawning dates comparison, 1997–2019.

Year	Location	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr							
1999	Craig																																																				
	Ernest Sound																																																				
2000	Craig																																																				
	Ernest Sound																																																				
2001	Craig																																																				
	Ernest Sound																																																				
2002	Craig																																																				
	Ernest Sound																																																				
2003	Craig																																																				
	Ernest Sound																																																				
2004	Craig																																																				
	Ernest Sound																																																				
2005	Craig																																																				
	Ernest Sound																																																				
2006	Craig																																																				
	Ernest Sound																																																				
2007	Craig																																																				
	Ernest Sound																																																				
2008	Craig																																																				
	Ernest Sound																																																				
2009	Craig																																																				
	Ernest Sound																																																				
2010	Craig																																																				
	Ernest Sound																																																				
2011	Craig																																																				
	Ernest Sound																																																				
2012	Craig																																																				
	Ernest Sound																																																				
2013	Craig																																																				
	Ernest Sound																																																				
2014	Craig																																																				
	Ernest Sound																																																				

-continued-

Table3.—continued (Page 2 of 2).

Year	Location	17-Mar	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	6-Apr	7-Apr	8-Apr	9-Apr	10-Apr	11-Apr	12-Apr	13-Apr	14-Apr	15-Apr	16-Apr	17-Apr	18-Apr	19-Apr	20-Apr	21-Apr	22-Apr	23-Apr	24-Apr	25-Apr	26-Apr	27-Apr	28-Apr	29-Apr	30-Apr			
2015	Craig																																																
	Ernest Sound																																																
2016	Craig																																																
	Ernest Sound																																																
2017	Craig																																																
	Ernest Sound																																																
2018	Craig																																																
	Ernest Sound																																																
2019	Craig																																																
	Ernest Sound																																																

Note: Black bars indicate dates of active spawning for the Craig stock and gray bars indicate dates of active spawning for the Ernest Sound stock.

Table 4.—Ernest Sound herring stock and fishery summary, 1969–2019.

Season	Date of first spawn ^a	Nautical miles of spawn ^b	Forecast Used for GHL Determination ^{c,d} (tons)	Spawning Biomass (tons) ^e	Guideline Harvest Level (tons) ^f	Bait harvest (tons) ^g	SOK Harvest (lbs)	Sac Roe Harvest (tons)	SOK GHL (tons)
1969/1970	—	—	—	—	—	17	—	—	—
1970/1971	—	3	—	13,100	—	206	—	—	—
1971/1972	—	—	13,100	3,650	—	967	—	—	—
1972/1973	—	—	3,650	450	—	775	—	—	—
1973/1974	—	—	450	400	—	535	—	—	—
1974/1975	—	—	400	2,900	—	593	—	—	—
1975/1976	—	3	2,900	4,350	580	708	—	—	0
1976/1977 ^g	—	3	4,350	3,035	870	901	—	49	0
1977/1978	3-May	—	3,035	1,505	455	340	—	—	115
1978/1979	16-Apr	2.6	1,505	255	—	—	—	—	—
1979/1980	2-May	4	255	500	—	—	—	—	—
1980/1981	—	3.5	500	410	—	—	—	—	—
1981/1982	—	—	410	160	—	—	—	—	—
1982/1983	—	—	160	1,640	—	—	—	—	—
1983/1984	11-Apr	—	1,640	1,000	—	—	—	—	—
1984/1985	—	4.5	1,000	1,000	—	—	—	—	—
1985/1986	—	—	1,000	1,000	—	—	—	—	—
1986/1987	—	1	1,000	—	—	—	—	—	—
1987/1988	21-Apr	2	—	—	—	—	—	—	—
1988/1989	17-Apr	2.4	—	500	—	—	—	—	—
1989/1990	—	2.1	500	1,000	—	—	—	—	—
1990/1991	—	—	1,000	3,000	—	—	—	—	—
1991/1992	16-Apr	9.1	3,000	2,650	—	—	—	—	—
1992/1993	23-Apr	9	2,650	684	200	8	—	—	192
1993/1994	26-Apr	8.4	684	2,544	0	—	—	—	—
1994/1995	25-Apr	6.5	2,544	2,470	255	111	—	—	144
1995/1996	16-Apr	6.9	2,744	2,665	280	220	—	—	60
1996/1997	16-Apr	0	4,852	0	377	6	—	—	371
1997/1998	9-Apr	11.8	—	5,998	0	—	—	—	—
1998/1999	5-Apr	1.8	5,381	No survey	662	96	—	—	566
1999/2000	8-Apr	9.1	—	920	0	—	—	—	—
2000/2001	11-Apr	6.9	—	2,052	0	—	—	—	—
2001/2002	15-Apr	4.8	1,653	2,406	0	—	—	—	—

-continued-

Table 4.—continued (Page 2 of 2).

Season	Date of first spawn ^a	Nautical miles of spawn ^b	Forecast Used for GH L Determination ^{c,d} (tons)	Spawning Biomass (tons) ^e	Guideline Harvest Level (tons) ^f	Bait harvest (tons) ^g	SOK Harvest (lbs)	Sac Roe Harvest (tons)	SOK GH L (tons)
2002/2003	10-Apr	8.5	2,407	5,509	0	—	—	—	—
2003/2004	11-Apr	7.1	6,592	2,413	875	44	112,286	—	831
2004/2005	22-Apr	10.1	1,906	3,268	0	—	—	—	—
2005/2006	6-Apr	7.9	2,284	2,538	0	—	—	—	—
2006/2007	19-Apr	11.3	1,955	7,353	0	—	—	—	—
2007/2008	20-Apr	15.4	9,060	4,846	1382	***	19,650	—	>700
2008/2009	17-Apr	6.6	4,545	2,862	529	***	4911	—	100-299
2009/2010	14-Apr	7.8	2,879	3,523	297	***	—	—	<50
2010/2011	17-Apr	8.1	5,080	2,559	476	***	0	—	100-299
2011/2012	16-Apr	8.9	2,682	3,193	272	***	—	—	<50
2012/2013	16-Apr	9.7	3,509	7,556	379	***	129,265	—	100-299
2013/2014	14-Apr	3.7	7,613	2,631	1073	***	***	—	>700
2014/2015	8-Apr	5.5	1,991	562	0	—	—	—	—
2015/2016	10-Apr	4.4	1,207	346	0	—	—	—	—
2016/2017	14-Apr	4.4	—	—	—	—	—	—	—
2017/2018	24-Apr	3.5	—	—	—	—	—	—	—
2018/2019	14-Apr	1.0	—	—	—	—	—	—	—
10-yr Average	16-Apr	6.3	3,566	2,910	357	**	**	—	216
Total Average	16-Apr	6	3,836	3,511	377	44	**	—	831

Note: *** indicates data is confidential.

^a Since 997/1998 the first spawn and the major spawn have been within five days of each other.

^b 1996/1997 No survey, fish all spawned (7.5 miles) along Ship Island; 1998/1999 No survey, only 1.8 miles of spawn observed, surveys probably missed main spawn; spawn year is the beginning year of regulatory season.

^c 1971/1972 through 1984/1985 forecasts were based on hydroacoustical-computer generated estimates; 1985/1986 through 1991/1992 forecasts were based on visual estimates; 1992/1993 through 1994/1995 were based on spawn deposition estimates; 1995/1996 through 2006/2007 were biomass accounting forecasts.

^d Since 1976/1977 season the threshold for a fishery has been 2,500 tons.

^e 1969/1970 through 1983/1984 biomass estimates were hydroacoustical-computer generated estimates; 1984/1985 through 1990/1991 were visual estimates; and 1991/1992 through 2005/2006 were spawn deposition estimates. 1975/1976 & 1976/1977 GH Ls are based upon 20% of the acoustical estimate. 1977/1978 GH L is based upon 15% of the acoustical estimate.

^f 2003/2004 GH L includes 90 tons rolled over from the bait pound fishery.

^g 1973/1974, 1974/1975, 1976/1977 also include harvests from Fools and Menefee Inlets. Does not include harvests from statistical area 107-40.

Table 5.—Ernest Sound SOK detailed fishery summary, 2004, 2008–2009, 2011, and 2013–2014.

Statistic	2004	2008	2009
Ernest Sound GHL (tons)	875	1,382	529
GHG Available for SOK (tons)	775	***	***
SOK Harvest (tons)	56.1	9.8	2.5
Exvessel Value	\$514,912	\$131,059	\$18,359
Average Price/lb	\$4.59	\$6.87	\$3.67
Average Income/permit	\$8,046	\$10,091	\$4,590
Number of Permits participating	64	13	4
Number of Pounds	51/6/0/1 ^a	1/6/0/0 ^a	0/2/0/0 ^a
Number Permits Landing Product	64	13	4
Kelp Allocation (blades)	b	c	d
Kelp Blade Harvest (lbs)	4,600	29,400	2,400
Fishery Open—Closed	4/1–5/10	4/1–5/10	4/1–5/10
Fishing Occurred	4/10–4/17	4/16–4/24	4/17–4/21
Harvest Occurred	4/14–1/17	24-Apr	21-Apr
Statistic	2011	2013	2014
Ernest Sound GHG (tons)	476	379	1,073
GHG Available for SOK (tons)	***	***	***
SOK Harvest (tons)	0	64.3	***
Exvessel Value	\$0	\$1,574,729	***
Average Price/lb	\$0	\$12.25	***
Average Income/permit	\$0	\$19,441	***
Number of Permits participating	0	81	129
Number of Pounds	0	1/5/1/22/0 ^e	25/52/0 ^a
Number Permits Landing Product	0	81	129
Kelp Allocation (blades)	d	d	c
Kelp Blade Harvest (lbs)	0	6,400	29,000
Fishery Open—Closed	4/1–5/10	4/1–5/10	4/1–5/10
Fishing Occurred	NA	4/10–4/16	4/12–4/20
Harvest Occurred	NA	4/15–4/16	4/18–4/20

Note: *** indicates data is confidential.

^a Single/double/triple/open.

^b 1,000 blades single-closed/1,000 blades double-closed/1,000 blades triple-closed/2,500 blades single-open/7,500 multiple-permit-open.

^c 1,000 blades single-closed/2,000 blades double-closed/1,000 blades triple-closed/2,500 blades single-open/7,500 multiple-permit-open.

^d 200 blades single-closed/400 blades double-closed/500 blades triple-closed/1,500 blades single-open/4,500 multiple-permit-open.

^e Single/double/combined double/triple/open.

Table 6.—Tenakee Inlet herring stock and fishery summary, 1978–2019.

Season	Major Spawning Dates	Nautical Miles of Spawn (nmi)	Spawning Biomass ^a (tons)	Food/Bait GHL (tons)	Food/Bait Harvest (tons)
1978/1979	5/9–5/11	3.3	2,500	200	0
1979/1980	4/28–5/2	3.9	4,485	400	504
1980/1981	4/27–5/5	9.3	7,500	750	847
1981/1982	4/25–5/7	11.1	6,650	650	687
1982/1983	4/25–5/6	13.1	8,870	875	749
1983/1984	4/20–4/26	8.3	12,100	850	619
1984/1985	4/24–5/1	9.9	11,000	1,400	1,406
1985/1986	4/27–5/1	8.3	12,500	1,700	2,040
1986/1987	4/22–4/30	7.9	6,600	800	1,275
1987/1988	4/22–4/27	9.1	6,000	1,450	1,577
1988/1989	4/26–4/29	10.3	5,360	720	655
1989/1990	4/25–5/6	2.9	2000	650	595
1990/1991	4/25–5/4	2.1	400		No fishery
1991/1992	5/5	trace	200		No fishery
1992/1993	4/21–4/23	6.4	904		No fishery
1993/1994	4/24–4/26	0.25	400		No fishery
1994/1995	4/26	0.05	200		No fishery
1995/1996	5/4–5/14	18.1	4,560		No fishery
1996/1997	4/26–5/7	14.4	9,926	300	98
1997/1998	4/24–4/29	12.4	10,419	825	586
1998/1999	4/25–4/28	11.0	11,049	1,023	835
1999/2000	4/26–5/3	13.8	9,425	542	494
2000/2001	4/21–5/1	12.2	7,576	906	775
2001/2002	4/23–4/27	15.4	4,084	840	355
2002/2003	4/25–4/28	12.2	3,529	528	328
2003/2004	4/28–5/3	13.0	4,728	399	confidential
2004/2005	4/26–5/2	8.9	3,036	476	0
2005/2006	5/2–5/6	5.9	5,110		No fishery
2006/2007	4/23–4/26	4.4	3,346		No fishery
2007/2008	4/30; 5/7–5/8	11.4	11,252		No fishery
2008/2009	4/25–4/26; 4/29–4/30	6.9	5,283	875	254
2009/2010	5/7–5/9	2.7	1,437	583	confidential
2010/2011	5/9	1.0	N/A		No fishery
2011/2012	4/20–4/23	4.6	5,119		No fishery
2012/2013	5/7–5/10	5.4	4,936		No fishery
2013/2014	4/29	2.0	927	557	confidential
2014/2015	4/22–4/25	2.3	2,223		No fishery
2015/2016	none	0.0	No forecast		No fishery
2016/2017	5/13–5/16	2.1	No forecast		No fishery
2017/2018	5/7–5/9	1.4	No forecast		No fishery
2018/2019	5/12–5/14	0.5	No forecast		No fishery

^a Spawning biomass estimates were calculated from hydro-acoustical surveys from 1979 through 1986, and from spawn deposition surveys from 1987 through 2015—bolded values were derived from ASA models.

Table 7.—Tenakee Inlet herring SOK detailed fishery summary, 2003–2005, 2009, and 2014.

Statistic	2003	2004	2005
Tenakee Inlet GHL (tons)	528	399	476
GHL Available for SOK (tons)	180	confidential	476
SOK Harvest (tons)	47.6	100.7	101.4
Exvessel Value	\$580,500	\$981,464	\$512,900
Average Price/lb	\$6.10	\$4.68	\$2.53
Average Income/permit	\$10,555	\$11,684	\$5,636
Number of Permits participating	55	85	98
Number of Pounds	1/15/8/0 ^a	1/32/6/2/2 ^b	1/29/13/3 ^a
Number Permits Landing Product	55	85	91
Kelp Allocation (blades)	200/400/550/0 ^a	300/500/500/2000 ^a	300/500/500/2000 ^a
Kelp Blade Harvest (lbs)	35,375	39,000	53,850
Fishery Open—Closed	4/6–5/6	4/6–5/6	4/6–5/5
Fishing Occurred	4/25–4/28	4/28–5/1	4/27–4/30
Harvest Occurred	4/30–5/4	5/3–5/6	5/2–5/4
Statistic	2009	2014	
Tenakee Inlet GHL (tons)	875	557	
GHL Available for SOK (tons)	621	confidential	
SOK Harvest (tons)	64.1	84.4	
Exvessel Value	\$558,900	\$1,155,276	
Average Price/lb	\$4.36	\$6.85	
Average Income/permit	\$6,499	\$16,271	
Number of Permits participating	86	78	
Number of Pounds	11/27/7/0 ^a	2/25/5/1 ^c	
Number Permits Landing Product	86	71	
Kelp Allocation (blades)	400/500/500/0 ^a	300/500/500/0 ^a	
Kelp Blade Harvest (lbs)	42,600	41,250	
Fishery Open—Closed	4/6–5/5	4/6–5/4	
Fishing Occurred	4/28–5/1	4/27–5/1	
Harvest Occurred	5/2–5/5	5/2–5/4	

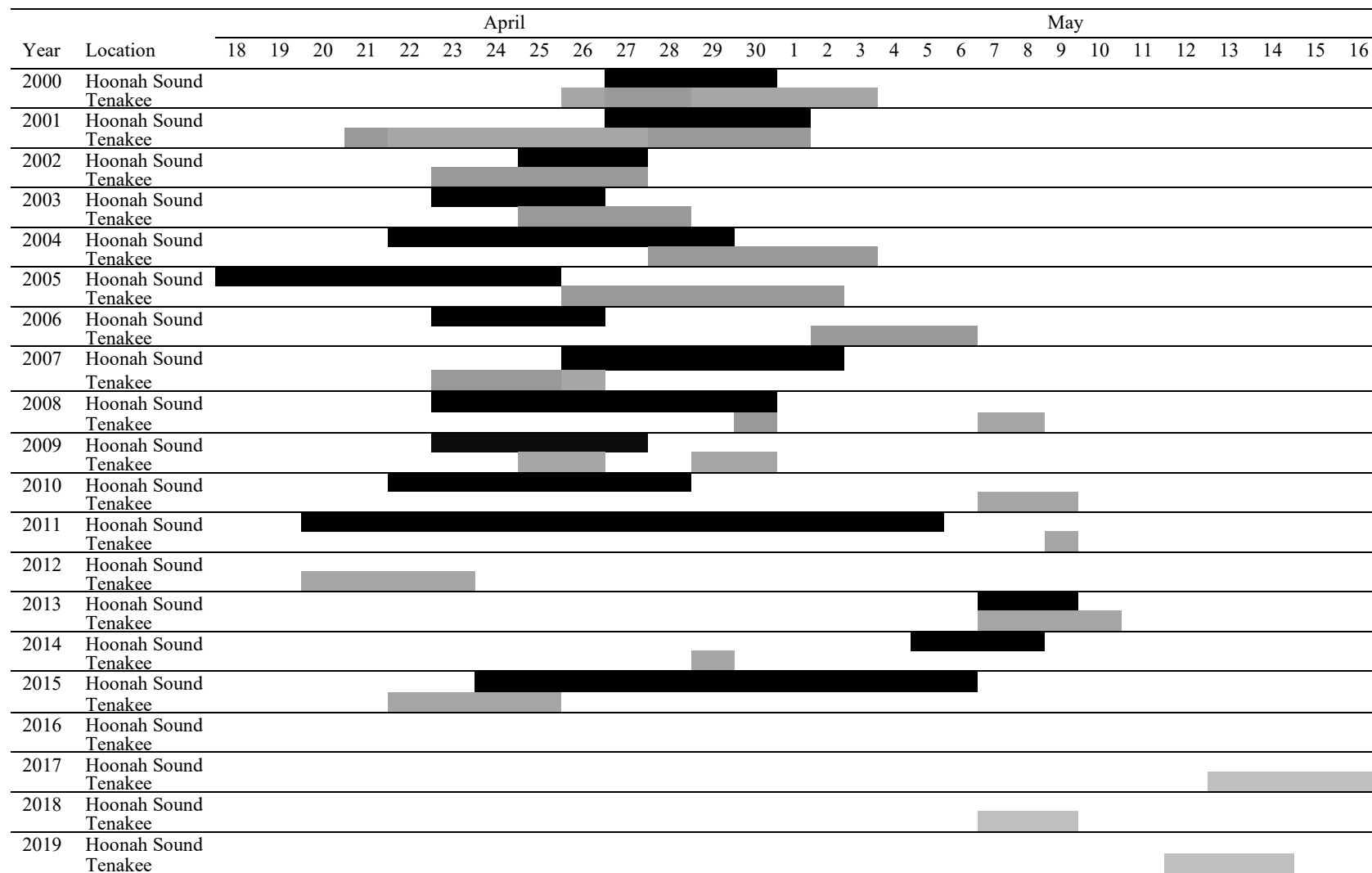
Note: No fishery occurred from 2006 to 2008 since the biomass forecast was below the 3,000-ton threshold.

^a Single/double/triple/test.

^b Single/double/triple/long line/test.

^c Single/double/triple/quadruple.

Table 8.—Hoonah Sound and Tenakee Inlet herring spawn dates comparison, 2000–2019.



Note: Black bars indicate spawning dates for Hoonah Sound and gray bars indicate spawning dates for Tenakee Inlet.

Table 9.–Hoonah Sound herring spawning stock and fishery summary, 1971–2019.

Year	Spawn Dates	Nautical Miles Spawn	Estimated Escapement (tons)	SOK Harvested (tons)
1971	5/10–5/17	2.5	833	–
1972	5/11–5/12	1.5	666	–
1973	N/A	1.0	333	–
1974	14-May	3.0	999	–
1975	N/A	N/A		–
1976	5-May	1.0	333	–
1977	N/A	3.5	1,166	–
1978	N/A	5.3	1,765	–
1979	N/A	0.5	167	–
1980	N/A	N/A	–	–
1981	4/30–5/01	2.3	750	–
1982	4/29–5/01	1.5	500	–
1983	1-May	1.0	333	–
1984	4/26–5/01	3.0	540	–
1985	5/01–5/03	3.5	1,166	–
1986	4/28–5/01	3.8	1,249	–
1987	4/28–5/02	3.8	740	–
1988	4/30–5/01	5.0	1,665	–
1989	4/16–4/20	17.0	4,000	–
1990	4/13–4/28	10.0	2,350	11.9
1991	4/19–4/24	8.7	2,175	13.3
1992	4/22–4/24	10.8	5,714	23.1
1993	4/27–4/29	5.7	1,099	14.0
1994	4/21–4/23	9.0	2,450	32.7
1995	4/20–4/21	4.5	274	27.4
1996	5/02–5/9	10.1	4,023	–
1997	4/25–4/28	14.5	5,884	65.2
1998	4/23–4/27	14.5	6,472	85.6
1999	4/27–5/1	13.8	4,426	71.6
2000	4/27–4/30	13.0	3,635	35.7
2001	4/27–5/1	13.7	8,538	66.2
2002	4/25–4/27	11.9	4,936	136.6
2003	4/23–4/27	16.7	9,423	141.5
2004	4/22–4/29	11.1	7,502	237.4
2005	4/18–4/25	10.3	6,924	190.6
2006	4/23–4/26	9.0	6,028	162.1
2007	4/46–5/2	16.5	10,946	159.4
2008	4/23–4/30	14.5	19,975	202.3
2009	4/22–4/27	10.3	15,829	234.7
2010	4/22 – 4/28	12.4	15,264	290.4
2011	4/20–5/5	12.6	14,215	193.7
2012	4/20–4/23	4.2	923	186.0
2013	5/7–5/9	2.4	412	0.0
2014	5/5–5/8	3.2	444	0.0
2015	4/24–5/6	4.2	23	0.0
2016	N/A	N/A	–	0.0
2017	N/A	N/A	–	0.0
2018	N/A	N/A	–	0.0
2019	N/A	N/A	–	0.0
Average	1971–2018	7.0	3,774	N/A
Average	1990–2018	8.9	5,339	86.1

Note: Shaded estimated escapements are based on average spawn density from years 1989 to 2002; due to funding, comprehensive aerial surveys have not been conducted since 2016.

Table 10.—Hoonah Sound herring SOK detailed fishery summary, 2003–2017.

Statistic	2003	2004	2005	2006	2007
Herring Quota (tons)	427	1,207	728	669	681
Harvest Quota (tons)	NA	NA	NA	NA	NA
Harvest (tons)	141.6	237.4	190.6	162.1	144.5
Exvessel Value	\$1,922,500	\$2,071,347	\$1,117,568	\$1,943,422	\$4,491,070
Average Price/lb	\$6.79	\$4.36	\$2.93	\$6.00	\$14.09
Average Income	\$17,800	\$19,541	\$11,889	\$24,600	\$49,352
Number of Applicants	NA	NA	NA	NA	NA
Number of Pounds	49/1/3 ^a	92/12/2 ^b	81/5/3 ^c	17/45 ^a	67/12 ^a
Number Selling Product	108	106	94	79	91
Kelp Allocation (blades)	500/300/750 ^a	1,000/1,000/ 3,000 ^b	1,000/1,000/ 1,500 ^c	2,500/1,000/ 1,500 ^a	2,500/1,000/ 1,500 ^a
Kelp Blade Harvest	60,301	126,000	118,450	136,698	122,565
Fishery Open—Closed	4/6–4/25	4/6–4/28	4/6–4/28	4/6–4/27	4/6–5/4
Fishing Occurred	4/19–4/24	4/20–4/25	4/19–4/28	4/18–4/23	4/23–4/29
Harvest Occurred	4/24–4/27	4/26–4/28	4/25–4/28	4/23–4/27	4/30–5/4
Statistic	2008	2009	2010	2011	2012
Herring Quota (tons)	2,238	2,238	3,182	3,015	2,139
Harvest Quota (tons)	NA	NA	NA	NA	NA
Harvest (tons)	223	234.7	290.4	193.7	186.5
Exvessel Value	\$5,115,459	\$2,332,514	\$2,580,517	\$1,820,952	\$4,033,078
Average Price/lb	\$11.47	\$4.97	\$4.44	\$4.70	\$10.81
Average Income/Landing	\$51,155	\$23,094	\$25,550	\$20,460	\$55,248
Number of Applicants	NA	NA	NA	NA	NA
Number of Pounds	98/3 ^a	99/4 ^a	97/2 ^a	85/4 ^a	83/4 ^a
Number Selling Product	100	101	101	89	73
Kelp Allocation (blades)	3,000/2,000/ 1,500 ^a	3,000/2,000/ 1,500 ^a	3,000/2,000/ 1,500 ^a	3,000/2,000/ 1,500 ^a	3,000/2,000/ 1,500 ^a
Kelp Blade Harvest	201,262	196,492	178,898	169,922	155,104
Fishery Open—Closed	4/6–5/02	4/6–4/30	4/6–4/30	4/6–4/30	4/6–5/15
Fishing Occurred	4/22–4/27	4/22–4/25	4/21–4/25	4/20–4/24	4/19–4/21
Harvest Occurred	4/27–5/1	4/26–4/29	4/22–4/28	4/26–4/29	4/26–4/27
Statistic	2013	2014	2015	2016	2017
Herring Quota (tons)	130	0	0	0	0
Harvest Quota (tons)	NA	NA	NA	NA	NA
Harvest (tons)	0	0	0	0	0
Exvessel Value	\$0	\$0	\$0	\$0	\$0
Average Price/lb	\$0	\$0	\$0	\$0	\$0
Average Income/Landing	\$0	\$0	\$0	\$0	\$0
Number of Applicants	NA	NA	NA	NA	NA
Number of Pounds	3 open	0	0	0	0
Number Selling Product	0	0	0	0	0
Kelp Allocation (blades)	600 open	0	0	0	0
Kelp Blade Harvest	7,940	0	0	0	0
Fishery Open—Closed	4/6–5/15	NA	NA	NA	NA
Fishing Occurred	NA	NA	NA	NA	NA
Harvest Occurred	NA	NA	NA	NA	NA

Note: No fishery occurred in 1996 since the biomass forecast was below the 1,000-ton threshold; no fishery occurred 2014–2019.

^a Double closed pounds/single closed pounds/triple closed pounds.

^b Double closed pounds/single closed pounds/open pounds.

^c Single-permit closed pound/double-permit closed pound/triple-permit closed pounds.



Figure 1.— Craig/Klawock (Section 3-B) herring SOK fishery open area.

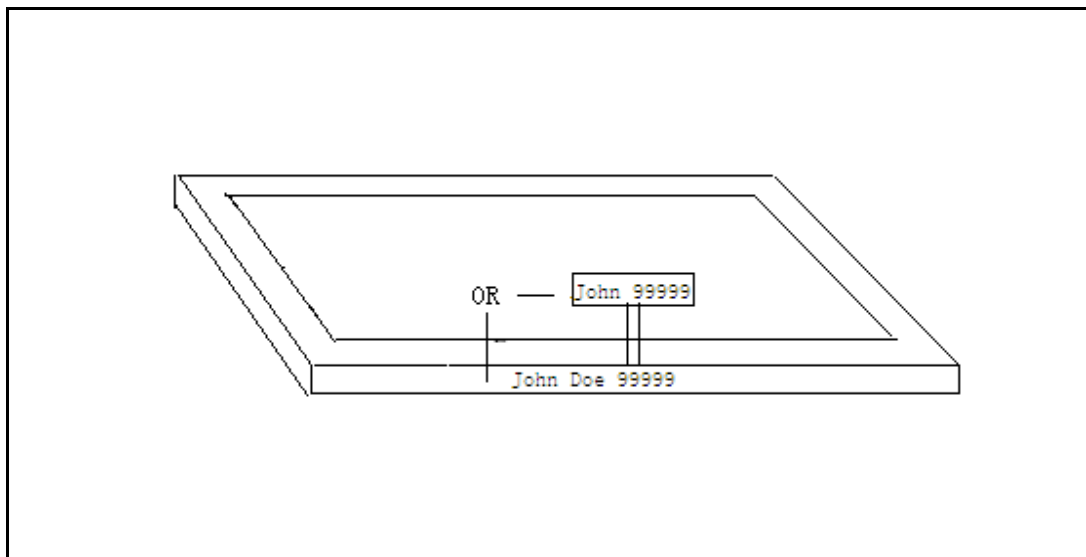


Figure 2.—Diagram of a herring pound showing two alternatives methods of marking herring pounds.
Note: Regulations require vertical signs with the permit holder's first and last name and five-digit CFEC permit number (5 AAC 27.185(k)). Letters and numbers must be at least six inches high and at least one-half inch wide, must contrast with the background and must be above the waterline at all times.

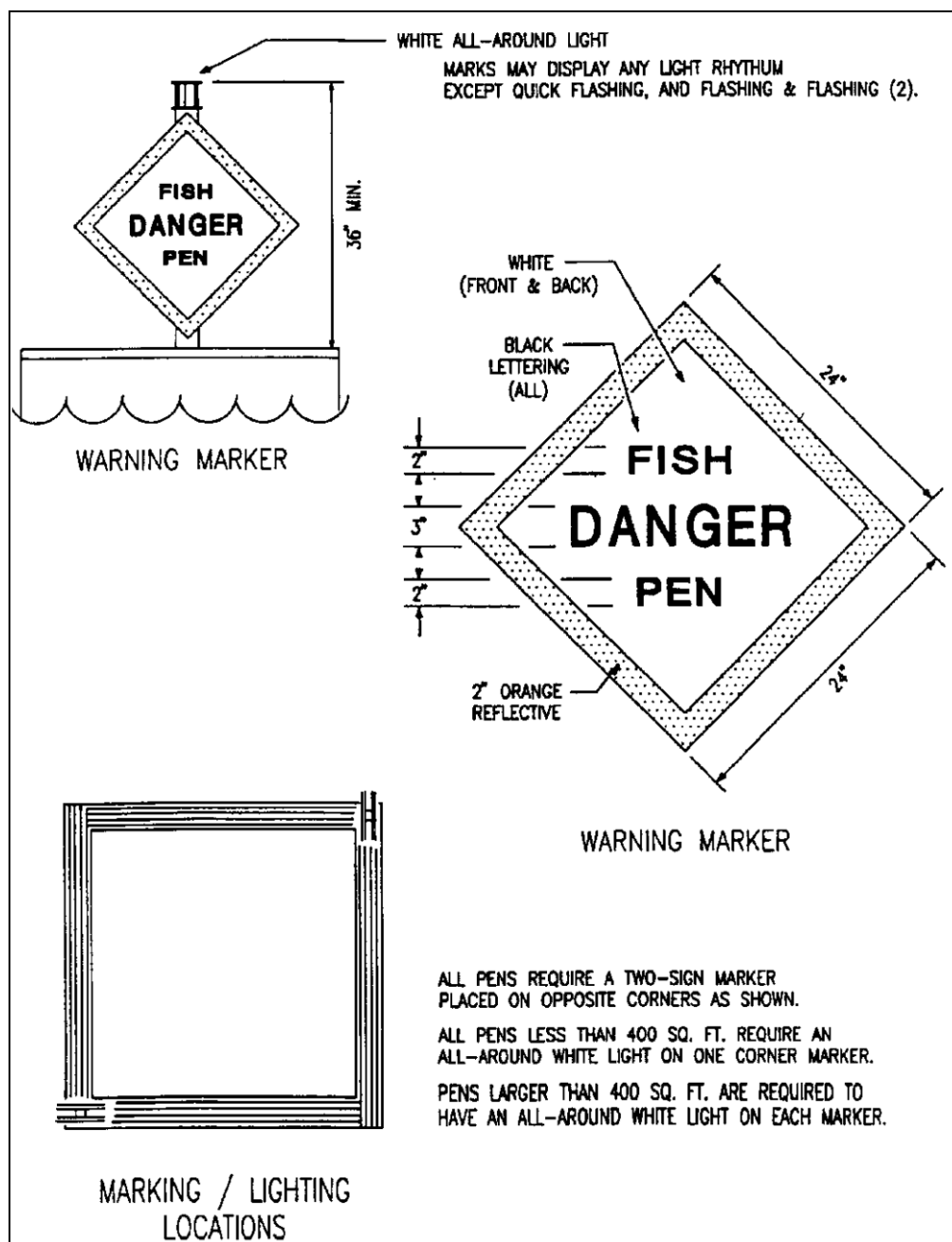


Figure 3.—Coast Guard requirements for marking pounds.