Regional Information Report No. 1J11-01

2011 Southeast Alaska Herring Spawn-On-Kelp Pound Fishery Management Plan

by

Justin Breese,

Eric Coonradt,

Dave Gordon,

Tom Kowalske,

Dave Harris,

Bo Meredith,

Kevin Monagle,

Troy Thynes,

and

Scott Walker

March 2011

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, Special Publications and the Division of Commercial Fisheries Regional Reports. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

Mathematics, statistics

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

REGIONAL INFORMATION REPORT NO. 1J11-01

2011 SOUTHEAST ALASKA HERRING SPAWN-ON-KELP POUND FISHERY MANAGEMENT PLAN

by
Dave Gordon and Eric Coonradt,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Sitka

Kevin Monagle and Dave Harris,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau

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

Scott Walker, Justin Breese, and Bo Meredith,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Ketchikan
and
Tom Kowalske
Alaska Department of Fish and Game, Division of Commercial Fisheries, Wrangell

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

March 2011

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 project operational plans, area management plans, budgetary information, staff comments and opinions to 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.sf.adfg.ak.us/statewide/divreprots/htlm/intersearch.cfm.

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

Kevin Monagle and Dave Harris,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
802 3rd St.,
P.O. Box 110024, Juneau, AK. 99811-0024 USA

Troy Thynes,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
16 Sing Lee Alley, PO Box 667
Petersburg, AK 99833 USA

Scott Walker, Justin Breese, and Bo Meredith,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
2039 Sea level Drive Suite 205,
Ketchikan, AK 99901, USA

and
Tom Kowalske,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
215 Front St. PO Box 200,
Wrangell, AK 99929, USA

This document should be cited as:
Gordon, D,, E. Coonradt, K. Monagle, D. Harris, T. Thynes, S. Walker, J. Breese, B. Meredith and T. Kowalske. 2011. 2011 Southeast Alaska herring spawn-on-kelp pound Fishery Management Plan. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 1J11-01, Douglas, Alaska.

TABLE OF CONTENTS

Page

LIST OF TABLES

Table **Page**

LIST OF FIGURES

Figure **Page**

ABSTRACT

This plan provides an overview of the management approach, permit requirements and regulations for the 2011 herring spawn-on-kelp pound fisheries in Southeast Alaska. Spawn-on-kelp pound fisheries will occur in Craig-Klawock, Ernest Sound and Hoonah Sound in 2011. 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 pallasi*, herring pound, Macrocystis kelp allocation, management plan, spawn on kelp.

INTRODUCTION

This plan provides an overview of the 2011 management approach, permit requirements, and regulations for the Southeast Alaska herring (*Clupea pallasi*) 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 fisheries and provides for fisheries in Sections 3-B (Craig/Klawock), 12-A (Tenakee Inlet), and 13-C (Hoonah Sound), and in District 7 (Ernest Sound).

A *closed-pound-fishery* involves releasing sexually mature herring 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 by a net 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 spawn-on-kelp fisheries, a closed or an open pound may be operated by one or more Commercial Fisheries Entry Commission (CFEC) permit holders. To reduce the amount of gear on the fishing grounds and the associated handling and impoundment of herring, the Alaska Board of Fisheries has provided an incentive to multiple permit pound operators by giving them a larger allocation of *Macrocystis* blades or fronds.

The 2010–2011 guideline harvest level (GHL) for the Craig/Klawock area is 2,710 tons. Forty percent (40%) or 1,084 tons is allocated to the spawn-on-kelp fishery plus any unharvested portion of the winter food and bait quota. The 2010–2011 winter food and bait harvest is confidential. In 2011, the GHL available to the spawn-on-kelp fishery in Craig/Klawock will allow for the maximum kelp allocation.

The total 2010–2011 GHL for Ernest Sound herring stock is 613 tons. The GHL for the Ernest Sound spawn-on-kelp pound fishery is any remaining GHL that is not harvested by the winter food and bait fishery or the bait pound fishery. The 2010/2011 winter food and bait harvest is confidential and there are no active bait pound permits in the district. That remaining GHL for the Ernest Sound spawn-on-kelp fishery is within the 100 ton to 299 ton range. This will allow for the minimum kelp allocation for closed pounds for each permit holder.

The 2010–2011 GHL for Hoonah Sound is 3,015 tons which will allow for the maximum kelp allocation.

No fishery will occur in Tenakee Inlet for the 2010-2011 season. Aerial surveys and skiff observations conducted April 16, 2010 to May 19, 2010 recorded a total of only 2.7 nautical miles of herring spawn. Dive surveys were conducted May 11, 2010 to estimate the density of

herring eggs. From these estimates and given the total miles of spawn, it was determined that the Tenakee Inlet herring population was well below its threshold level of 3,000 tons. Therefore no forecast was developed for the 2010-2011 season.

The Alaska Board of Fisheries made a finding that the use of test fish revenues to develop new commercial herring fisheries is consistent with the ADF&G Division of Commercial Fisheries Test Fishery Policy. The department conducted closed pound spawn-on-kelp (SOK) test fisheries in 2003, 2004, 2005 and 2008. In 2006, 2007, 2009 and 2010 carry-over test fish revenues and budget allocations provided adequate funding and no test fisheries occurred. In 2011 no test fisheries are planned to support management of any of the Southeast Alaska commercial SOK fisheries.

HERRING STOCK STATUS AND HISTORIC FISHERY PERFORMANCE

METHODS OF FORECASTING HERRING BIOMASS

The Biomass Accounting (BA) method of forecasting is used to determine the expected pre-fishery 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 age-structured-analysis (ASA) for the Seymour Canal 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 department 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 between 10 and 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%.

Based on a recent review of the department's herring scale aging methodologies, the department has discovered inconsistencies in methods in aging herring using scales. This discovery brought into question the reliability of age estimates back to 1999. The department is in the process of re-aging archived scale samples. Because of the very large numbers of scales that have to be aged, the department cannot estimate the date the aging will be completed. The department will re-

examine 2011 forecasts for herring spawning aggregates as time permits and as re-aged scale data becomes available.

Biomass forecasts in both the Craig/Klawock and Ernest Sound stocks changed after re-aging of scales were done for those two stocks. GHL's in this document are based on this re-aged scale data and news releases announcing GHL's for these stocks were issued on March 1, 2011.

CRAIG-KLAWOCK (SECTION 3-B)

Winter food and bait herring fisheries have occurred in Section 3-B (in the Meares Passage and Bocas de Finas area) since the 1960s. Seasonal landings from the 1960s through 1985 were small, averaging approximately 210 tons. From the start of the herring spawn-on-kelp fishery in 1992, the Craig/Klawock herring GHLs have averaged 1,358 tons, ranging from a low of 626 tons in 2000 to this year's high of 2,710 tons (Table 1). Spawn-on-kelp fishing effort, harvest, spawning dates, fishery dates, and product values are summarized in Table 2.

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. The 2011 forecast for the Craig area is 17,886 tons. The allowable 15.2% harvest rate will allow a combined quota of 2,710 tons for the winter food and bait and the spawn-on-kelp fisheries. The age class structure is anticipated to be predominantly younger herring, with 4 and 5 year old fish making up 58% of the spawning biomass. This forecast in an increase from the forecast that was issued by department news release on November 23, 2010 due to a re-ageing of herring scales.

The GHL for the Section 3-B stock is allocated between both the winter food and bait fishery and the herring spawn-on-kelp fishery. Initially, the GHL allocation was 85% for the winter food and bait fishery and 15% for the spawn-on-kelp fishery. In 1998 the allocation was modified so that the winter food and bait fishery is allocated 60% of the GHL with the remaining 40% going to the herring spawn-on-kelp fishery. Therefore, for the 2011 season, the GHL for the winter food and bait fishery was 1,626 tons, and the GHL for the spawn-on-kelp fishery will be 1,084 tons plus the unharvested portion of the winter food and bait fishery GHL. The winter food and bait harvest is confidential. The 2011 herring allocation for the Section 3-B spawn-on-kelp fishery is more than 1,000 tons, therefore, the Macrocystis kelp allocation will be at the highest end of the allocation range.

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 occurred April 9, 2005. Traditionally, herring spawn on Fish Egg, Wadleigh, Clam, and Abbess Islands. However, spawning has also been recorded in the area of Portillo Channel, Port Real Marina, the northern and southern shore of San Fernando Island, San Juan Bautista Island, Blanquizal Island, and along the Prince of Wales Island shore at San Christoval Channel and Shinaku Inlet. Figure 1 shows the open area for the Craig/Klawock spawn-on-kelp fishery.

ERNEST SOUND (DISTRICT 7)

Winter food and bait herring fisheries have occurred intermittently at Deer Island and other locations in District 7 since 1969. The major fishery in the district historically occurred near Deer Island throughout the 1970s with average season landings of around 500 tons. The fishery was then closed for a number of years until the 1992–1993 season. From 1992–1993 until 1998–1999, the fishery was opened five seasons and harvest were less than 25% of the available GHL, averaging 88 tons. The inaugural Ernest Sound spawn-on-kelp fishery occurred in the spring of 2004. The 2010–2011 season will bring the fourth Ernest Sound herring spawn-on-kelp fishery. Historical spawning biomass, forecast, GHLs spawning dates, harvest, and fishery dates, are summarized in Table 4.

In 2004, the spawn-on-kelp GHL was over 700 tons which allowed for the maximum kelp allocation. The total harvest of spawn-on-kelp product was 112,286 pounds (56.14 tons) split amongst 64 permit holders. Types of pounds fished included 51 single-closed, 6 double-closed, and one single-open. Like the 2004 fishery, the 2008 spawn-on-kelp GHL was greater than 700 tons allowing for the maximum kelp allocation; however, effort and harvest were minimal. The total harvest was 19,650 pounds (9.83 tons) of product harvested from 6 double-closed pounds and 1 single-closed pound. The GHL for 2009 fell into the 100 to 299 ton range after the winter food and bait harvest was subtracted from the total GHL of 529 tons. Four permit holders landed a total of 4,911 pounds (2.46 tons) of product from two double-permit closed pounds. Spawning activity was concentrated around Vixen Point, as it has been for the last five seasons, and most pounds were set up south of Vixen Point. The fishery opened to seining on April 1 and pounders quit fishing before spawning ended so there was no official closure of seining. Fishing occurred from April 16 to April 24, and harvesting occurred from April 20 to April 25.

The Alaska Board of Fisheries created the Ernest Sound spawn-on-kelp pound fishery in January of 2003. Additionally, the Board created a herring bait pound fishery that is allocated 10% of the area's GHL. The spawn-on-kelp fishery 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 spawn-on-kelp fishery. The 2010–2011 winter food and bait fishery GHL was 476 tons and the herring bait pound fishery GHL was 53 tons. To date there has been no interest in the bait pound fishery. The winter bait fishery closed on February 28, 2011. That leaves a GHL for the spawn-on-kelp pound fishery in the 100-299 ton range.

The established threshold level for the Ernest Sound stock is 2,500 tons. The 2011 re-aged forecast for Ernest Sound is 5,080 tons. The allowable 12.1% harvest rate results in a combined quota of 613 tons for the bait and spawn-on-kelp fisheries. The expected age structure for 2011 is 32% age-3, 49% age-4, 7% age-5, 3% age-6, 8% age-7, and 2% age-8+.

Herring spawning normally occurs in Ernest Sound in early to mid April. The earliest observed spawn since 1991 was April 5 and the latest date of initial spawning was April 26. Traditionally, herring spawn along the Cleveland Peninsula shoreline between Union Bay and Emerald Bay. However, spawning has also been recorded south to Ship Island, north of Point Eaton, and along the east side of Brownson Island. Figure 2 shows the open area for the Ernest Sound spawn-on-kelp fishery.

TENAKEE INLET (SECTION 12-A)

No spawn on kelp fishery will occur in Tenakee Inlet for the 2010-2011 season since the stock is not expected to exceed the 3,000-ton threshold for a fishery.

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 3). Regulations adopted by the Alaska Board of Fisheries (BOF) in January 2003 provide for a spawn-on-kelp fishery in Tenakee Inlet if sufficient GHL remains at the close of the winter food and bait fishery. This fishery occurred for the first time in April 2003. Summary results of the Tenakee Inlet spawn-on-kelp fisheries are presented in Table 4.

ADF&G has been conducting 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, and spawn-deposition dive surveys have been used since 1987 as the most reliable and accurate means to assess the spawning biomass

The Tenakee spawning stock has historically exhibited cycles of abundance. After a decade of fisheries, the stock declined below threshold in the early 1990's 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 in 2009 and 2010 indicated once again a decreasing trend in mature spawning biomass. Only 2.7 nautical miles of herring spawn was documented in 2010.

Spawning in Tenakee Inlet has generally occurred between the last week in April and the first week in May (Tables 3 and 5). Traditionally, herring spawn primarily along the south shoreline of Tenakee Inlet between Saltery Bay and South Passage Point with the core areas centered east and west of Kadashan flats. In addition, spawn has been documented intermittently along the Chatham Straits shoreline from South Passage Point to Basket Bay.

HOONAH SOUND (SECTION 13-C)

Since the department first monitored the population in 1981, the Hoonah Sound herring spawning stock has averaged 7.9 nautical miles of spawn and 4,239 tons of spawning biomass. Since 1990, the year the spawn-on-kelp fishery started, the stock has averaged 11.5 nautical miles of spawn and 5,881 tons of spawning biomass (Table 6). The highest recorded spawning biomass occurred in 2008 with an estimated 14.5 nautical miles of spawn and an escapement of 19,975 tons based on the spawn deposition survey. In 2010, 12.4 nautical miles of spawn was documented with an estimated escapement of 16,022 tons.

A higher than expected herring return in 2008 and a high spawn deposition survey estimate for 2009 led the department to assume the 2009 return would be well above threshold and at a level that would provide for a maximum kelp allocation for the spawn-on-kelp fishery. Therefore, the 2009 GHL in Hoonah Sound was set at the same level as in 2008. This allowed the department to allocate biometric staff time to address other priorities in Southeast herring fisheries. The biomass accounting method was used to forecast a return of 15,912 tons for the 2010 season. The 2011 forecast biomass is 15,073 tons which results in a GHL of 3,073 tons.

Herring spawning normally occurs in Hoonah Sound during the last two weeks of April (Tables 7 & 8). The earliest recorded spawning occurred on April 13, 1990, and the latest recorded spawning was on May 17, 1971. During the 2010 season, spawning occurred from April 22 through April 28. Comparative spawn timing for Hoonah Sound and Tenakee Inlet is shown in Table 5. Traditionally, spawning occurs in Hoonah Sound around Vixen and Emmons Islands and the shoreline from Fick Cove to Ushk Point. Spawning has also been observed in Peril Strait along the Chichagof Island shoreline from Finger River to Broad Island, at False Island, and along the Baranof Island shoreline from Deadman Reach to Point Benham. The open fishing area for Hoonah Sound is shown in Figure 3.

In Hoonah Sound during the 2010 season, a total of 101 permit-holders reported landings totaling 580,715 pounds (290.4 tons) of spawn on kelp (Table 9). The average price was $4.44/pound for a total exvessel value of $2,580,517.

CALENDAR OF EVENTS

The following is a calendar of events to be considered by pound operators for the 2011 fishing season.

November 10	News Release announcing the 2011 Hoonah Sound GHL.
November 23	News Release announcing the 2011 Craig/Klawock, Ernest Sound, Hobart Bay/Port Houghton and Tenakee Inlet GHLs. Note: GHL's on Craig/Klawock and Ernest Sound stocks were based on inaccurate scale data and were later revised.
No Specific Deadline	U.S. Forest Service special-use permit applications (for use of National Forest land above mean high tide) must be submitted to obtain a special-use permit. Special-use permits are required to camp or store gear on National Forest land in conjunction with this fishery. Please contact the USFS directly for applications at (907) 747-4220.
March 1	News release announcing Ernest Sound and Craig/Klawock SOK kelp allocations.
March 2	Kelp permits will be available at department area offices; ADF&G will issue a news release announcing the actual harvest of the bait herring fisheries and kelp allocation for Craig/Klawock and Tenakee Inlet.
March 7	2011 spawn-on-kelp Pound Fisheries Management Plan available at all Southeast Alaska area offices.
March 17	The Craig/Klawock fishery will be open to seining of herring for placement in pounds effective 12:00 noon.
April 1	The Ernest Sound fishery will open to seining of herring for placement in pounds effective 12:00 noon.
April 6	The Hoonah Sound fishery will open to seining of herring for placement in pounds effective 12:01 a.m.
May 31	Pounds must be completely removed from the waters of the herring pound fishing area in Section 3-B and in District 7. This includes the area covered by extreme high tide.
June 10	Pounds must be completely removed from the waters of the herring pound fishing area in Sections 12-A and 13-C. This includes the area covered by extreme high tide.

REGULATIONS

GENERAL SPAWN-ON-KELP REGULATIONS

The regulatory framework for the spawn-on-kelp fishery is found in 5 AAC 27.185. MANAGEMENT PLAN FOR HERRING SPAWN ON KELP IN POUNDS IN SECTIONS 3-B, 12-A, AND 13-C, AND DISTRICT 7. The Alaska Board of Fisheries met in Sitka on February 17–26, 2009 and adopted two regulatory changes to the management plan. These changes included; removing the requirement that a permit holder be present at the pound fishing site when kelp is being placed into the permit holder's pound structure [5 AAC 27.185 (o)(1)], and the definition of "the first day" herring are introduced into a herring pound was clarified [5 AAC 27.185(q)].

Definition of a Closed Pound

A *closed-pound* is defined as a single, floating, rectangular frame structure with suspended webbing that is used to enclose herring for a period of time in order to produce spawn-on-kelp. The webbing of a closed pound may not have a mesh size of more than one and one-half inches. The opening of the closed pound must be rectangular at the water surface and may not exceed 800 square feet in area. Neither the vertical wall nor the near-vertical wall may exceed a depth below the water surface when the pound contains herring as follows:

Surface square footage	Maximum depth
Less than 400	30 feet
401–500	24 feet
501–600	20 feet
601–700	17 feet
701–800	15 feet

Herring Pound Marking Requirements

Permit holders are required to mark the pound with a sign that has on it the permit holder's first and last name and the five-digit CFEC permit number. The sign must be vertical and the markings must be clearly visible and above the surface of the water at all times (Figure 3). The sign must be left on the pound structure or the net support system the entire time any part of the pound system is in the water.

All lines or structures used to suspend kelp must have legible tags affixed above the water surface that state the number of blades or fronds on that line or structure along with the permit holder's first and last name. In a multiple permit pound, each permit holder must keep their kelp on lines or structures separate from lines or structures that support kelp belonging to other permit holders.

Placement and Release of Herring in Pounds

Herring may be placed in or added to a pound for four days starting with the initial placement of herring in a pound. After 11:59 p.m. on the fourth day, no additional herring may be added to the pound (5 AAC 27.185 (q)) and those herring in the pound must be released by 11:59 p.m. on the sixth day after the initial placement of herring in a pound (5 AAC 27.185 (s)). Under 5 AAC 27.185 (s) the "*first day*" is defined as the day herring are first placed into a pound. The "*first*

day" under 5 AAC 27.185 (q), is the day that herring are first put into the pound. During the Board of Fisheries meeting in Sitka, February 17–26, 2009, the board adopted language clarifying the definition of "*first day*" in this regulation. Once herring have been released or spawn-on-kelp product has been harvested no additional herring or kelp may be introduced into a pound (5 AAC 27.185 (q)). When releasing herring at least one full side of the pound's webbing must be lowered a minimum of six feet below the surface of the water (5 AAC 27.185 (s)). These regulations are fundamental to the health of the herring spawning stocks and, along with gear size and kelp allocation limits, provide for sustainable use by limiting the harvest of herring by the fishery. Fishermen must take responsibility to ensure that when adding herring to a pound that herring are not at the same time swimming out of the pound as this would be a violation of 5 AAC 27.185 (q).

Connection of Herring Pounds

After the last herring has been placed into the pounds and the permit holders have notified a department representative, two pounds of two or more permit holders may drop a wall of their respective pounds to allow herring to swim between two connected pounds. Additional herring may not be transferred into the pounds once the two of them are joined. This does not change the definition of pounds as found in 5 AAC 27.130. LAWFUL GEAR FOR SOUTHEASTERN ALASKA AREA. (e)(1) which states that webbing of a closed pound may not be part of the webbing of another closed pound. Therefore, after fishing operations have ended two pounds may be joined, but they must remain up to that point a single unit of gear. If two pounds are joined the regulation that allows for retention of herring for six days will be enforced on the pound which first had herring placed into the structure. Under this regulation only two pounds can be joined together.

Units of Gear

For the purpose of this fishery, a closed pound is considered to be *fishing* once herring have been introduced into the closed pound structure; a closed pound is considered to have *stopped fishing* once all of the herring have been released and all spawn-on-kelp product has been removed from the closed pound structure. For the purpose of this fishery, an open pound is considered to be *fishing* once kelp has been attached to the open pound structure; an open pound is considered to have *stopped fishing* once the entire spawn-on-kelp product has been removed from the open pound structure.

The Northern Southeast Alaska area includes Sections 12-A and 13-C and the Southern Southeast Alaska area includes Section 3-B and District 7. Since Northern and Southern Southeast Alaska have different limited entry permits a permit holder may have gear in the water in both areas but a permit holder must still be physically present at those times that the pound is actively fished as defined in 5 AAC 27.185. While the permit holder may have gear in both the Northern area and the Southern area at the same time, they may not fish multiple units of gear in either area.

Presence of Permit Holders Required

A permit holder must be physically present at the permit holder's pound site during the operation of the pound as defined in sections (o) and (p) of 5 AAC 27.185 MANAGEMENT PLAN FOR HERRING SPAWN ON KELP IN POUNDS IN SOUTHEASTERN ALASKA AREA.

Post Harvest Requirements

After a permit holder releases herring and harvests product from the pound, the permit holder must maintain the webbing in place for at least four weeks. To optimize hatching success, the permit holder must position egg-covered webbing in the original size and configuration of the pound structure with adequate water circulation on all sides. The webbing support system must be above the surface of the water and clearly marked as per 5 AAC 27.185 (k).

Harvest and Production

Each permit holder's spawn-on-kelp blades must remain separate from other permit holder's spawn-on-kelp blades until after processing and grading is completed. Permit holders will be allowed to harvest all spawn on kelp produced in their pounds. A permit holder's fish ticket must report only the spawn on kelp they harvested from their pound. Each permit holder fishing a jointly operated pound shall be issued a fish ticket and the sum of the weights of those tickets shall equal the total weight of product produced in the jointly operated pound. All permit holders and any vessel carrying commercial spawn-on-kelp product from the fishing grounds must first contact the ADF&G with the estimated amount of spawn-on-kelp product harvested and indicate the intended time and location of the delivery. For any product that has been delivered on the grounds to a licensed processor, the processor (not the permit holder) will be required to contact the department with delivery weight for each landing on board.

Requirements for Buyers

Reporting requirements for buyers and processors of spawn-on-kelp product from Southeast Alaska spawn-on-kelp fisheries can be found in 5 AAC 27.187 BUYER AND PROCESSORS REPORTING REQUIREMENTS FOR SPAWN ON KELP IN POUNDS FOR THE SOUTHEASTERN ALASKA AREA. Buyers, processors, and permit holders should read and become familiar with these reporting requirements.

Operators of floating processing vessels, tender vessels, and catcher-processors will be required to report in person, by VHF radio, or by telephone, to the Department of Fish and Game office or directly to department area management biologists on the grounds before the start of processing operations in Southeast Alaska. These reporting requirements are specified by regulation 5 AAC 39.130 (f) and (g).

Other Regulations

Additional regulations pertaining to the Craig, Ernest Sound, Hoonah Sound and Tenakee Inlet pound fisheries can be found in the 2009–2010 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), and 5 AAC 27.185 MANAGEMENT PLAN FOR HERRING SPAWN ON KELP IN POUNDS(a) through (x), and 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 are found in 5 AAC 37.100 PERMITS. AND 5 AAC 37.300 HARVESTING REQUIREMENTS FOR MACROCYSTIS.

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

SECTION 3-B REGULATIONS

Open Waters

The open waters for Section 3-B include: the waters of San Alberto Bay, Shinaku Inlet and San Christoval Channel north of a line from Entrance Point to the southernmost tip of Clam Island to the southernmost tip of Fern Point and East of 133° 20' W. longitude (Figure 1).

In Section 3-B (Craig/Klawock) herring may be captured for placement in closed pounds starting at 12:00 noon on March 17, 2011 until closed by emergency order.

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. latitude, 133° 20' W longitude to 55° 35.17' N. latitude, 133° 20' W longitude to 55° 33.37' N. latitude, 133° 17.52' W. longitude to 55° 33.50' N. latitude, 133°17.28' W. longitude.
- Those waters of Fish Egg and Ballena Islands south of 55° 31' N. latitude and north of the southernmost tip of Cape Suspiro and east of the longitude of Ballena Island Shoal Light.

DISTRICT 7 REGULATIONS

Open Waters

The waters open for the District 7 (Ernest Sound) fishery include: the waters of Ernest Sound east of a line from Point Eaton to Lemesurier Point (Figure 2).

In open waters of District 7 herring may be captured for placement in closed pounds starting at 12:00 noon on April 1, 2011 until closed by emergency order.

SECTION 12-A REGULATIONS

Open Waters

The open waters for Section 12-A include: the waters of Chatham Strait and Tenakee Inlet south of 57° 46.00' N. latitude, north of the latitude of Peninsular Point at 57°30.30' N. latitude, and west of 134°50.00' W. longitude. (Figure 3).

In Section 12-A (Tenakee Inlet) herring may be captured for placement in closed pounds after 12:01 a.m. April 6, 2010 until closed by emergency order.

SECTION 13-C REGULATIONS

Open Waters

The waters open for the Hoonah Sound fishery include: the waters of Hoonah Sound north and west of a line from Point Marie to a point on the northern shore of Hoonah Sound at 57° 37.38' N. latitude, 135° 27' W. longitude (Figure 3).

In Section 13-C (Hoonah Sound) herring may be captured for placement in closed pounds after 12:01 a.m. April 6, 2010 until closed by emergency order.

EXPERIMENTAL GEAR PERMITS

The department has the authority to provide experimental gear permits under AS 16.05.050(10). The issuance of experimental gear permits in past years has played a significant role in the enhancement and development of spawn-on-kelp fisheries in Southeast Alaska. The department will continue to carefully consider requests for experimental gear permits on a case by case basis. The department must be provided a detailed plan that demonstrates innovation and the potential to increase spawn-on-kelp product quality and/or quantity without increasing the use of herring.

HARVEST AND ALLOCATION OF KELP FOR 2011

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. Specific allocation limits are for individual permit holders and are dependent upon the herring GHL and the type of gear to be used and will be announced following closure of the winter food and bait fishery. The kelp allocations for the 2011 season are listed below. The Craig/Klawock allocation is based on a GHL greater than 1,000 tons remaining following the winter bait fishery; the Ernest Sound allocation is based on a GHL of 100-299 tons remaining following the winter bait fishery; and the Hoonah Sound allocation is based on a GHL greater than 800 tons.

Section 3-B (Craig/Klawock):

- Single permit closed pounds—600 blades of *Macrocystis* kelp;
- Double permit closed pounds—750 blades of *Macrocystis* kelp (per permit holder);
- Triple permit closed pounds—1,125 blades of *Macrocystis* kelp (per permit holder);
- Single permit open pounds—2,500 blades or 250 fronds of *Macrocystis* kelp;
- Multiple permit open pounds—7,500 blades or 750 fronds of *Macrocystis* kelp.

District 7 (Ernest Sound):

- Single permit closed pounds—200 blades of *Macrocystis* kelp;
- Double permit closed pounds—400 blades of *Macrocystis* kelp (per permit holder);
- Triple permit closed pounds—500 blades of *Macrocystis* kelp (per permit holder);
- Single permit open pounds—1,500 blades or 150 fronds of *Macrocystis* kelp;
- Multiple permit open pounds—4,500 blades or 450 fronds of *Macrocystis* kelp.

Section 13-C (Hoonah Sound):

- Single permit closed pounds—2,000 blades of *Macrocystis* kelp;
- Double permit closed pounds—3,000 blades of *Macrocystis* kelp (per permit holder);
- Triple permit closed pounds—1,500 blades of *Macrocystis* kelp (per permit holder);
- Single permit open pounds—3,000 blades or 300 fronds of *Macrocystis* kelp;
- Multiple permit open pounds—3,000 blades or 300 fronds of *Macrocystis* kelp.

FISHERY CONDUCT AND MANAGEMENT

Suitable sites for pounds in Craig/Klawock, Ernest Sound, Tenakee Inlet, and Hoonah Sound are limited. To avoid herring mortality and damage to the pounds, permit holders should locate their pounds in an area with minimal exposure to wind and wave action, and a relatively deep bottom. The distance between the locations where herring are captured and where the pound will be

anchored should be minimized since long towing distances can cause stress induced spawning, egg loss, de-scaling and mortality of herring.

All permit holders involved in the operation of a pound, whether a single or a multiple permit pound, must be physically present at their pound fishing site at all times during the *operation of the pound. Operation of the pound* is defined as:

1. The capture and transfer of herring into the pound;
2. When an open pound is being moved;
3. The collection and sale of herring spawn-on-kelp product produced in the pound;
4. All permit holders must be present when two pounds are joined together.

For multiple permit closed pounds, all permit holders assigned to the pound must be present at their pound site when herring are introduced into the pound. If only one permit holder is present at this time then that pound must be operated for the remainder of the season as a single permit closed pound and no more than the number of blades of kelp allocated to a single closed pound may be harvested.

The ADF&G will be closely monitoring herring activity using vessel and aerial surveys. Prior to the onset of active fishing the results of aerial surveys will be announced by department news release or in fishery updates. This information will also be available by recorded message at 907-225-6870 (Ketchikan office) for Section 3-B (Craig/Klawock); 907-772-3700 (Petersburg office) for District 7 (Ernest Sound); 907-465-8905 (Juneau Office) for Section 12-A (Tenakee Inlet); and at 907-747-1009 (Sitka office) for 13-C (Hoonah Sound).

In 2011, the department will continue to monitor the practice of *top-off-fishing***.** This practice has been successfully used to stimulate new spawning in pounds and therefore to produce better spawn on kelp quality and quantity. The department has a concern, based on observations during the 2003 season, that the practice of “top off fishing” was abused by some fishermen. If a permit holder allows herring to swim out of their pound when they are adding fresh herring to their pound thereby exchanging spawned-out herring for fresh herring this is a violation of 5 AAC 27.185 (q). If any such cases are observed or reported in 2011, then the department will turn such cases over to the Alaska Wildlife Troopers (AWT) for citation. Additionally, the department will consider closure of the fishery to all further fishing by emergency order or limiting fishing to specific daylight hours only. Should the latter two measures become necessary, then such measures may have the unwanted consequence of preventing some permit holders from the capture of herring that season. The department is requesting the assistance of permit holders to ensure that additions of *top-off-fishing* are only conducted in compliance with regulations.

In Hoonah Sound and Ernest Sound, the department will station a vessel and personnel on the grounds when herring are available for capture. In Craig/Klawock department personnel can be contacted through the ADF&G office in Craig**.** Department personnel will closely monitor all phases of the fishery. All fishery announcements, including updates of herring activities and fishery openings/closures, will be broadcast by VHF radio, channel 10. Permit holders are expected to have a VHF radio.

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". 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. Pound operators are also advised to minimize the distance herring are towed to avoid stressing the herring or causing egg loss, which can result in poorer quality product. Permit holders are asked to avoid making and holding large sets intended to fill multiple pounds to avoid herring mortality and stress. The department may close the fishery or limit fishing to daylight hours to minimize stress and mortality, to reduce potential set size, or to better monitor the fishery.

Although regulations determine the maximum allowable number of kelp blades that can be harvested and placed in each permit holder's pound, fishers 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 include 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) Small top-off sets may be added over a 2–3 day period;
5) The herring density in the net should be limited since spawning is retarded by excessive crowding;
6) Web depth adjustments may be adjusted (consistent with specifications under 5 AAC 27.130 (e)(1)(C)) to provide good water exchange;
7) Working in a small group of permit holders may help to provide adequate time for harvesting herring and tending pounds.

The spawn-on-kelp fisheries take place in high-use subsistence, recreational, and commercial use areas valued for their fish and wildlife resources as well as their wilderness character. 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. Some permit holders in this fishery have for years been leaving a significant amount of gear in the water year round conflicting with these uses. Also, over the years a significant amount of derelict gear has accumulated on area beaches. Despite increased efforts to enforce regulations in recent years this continues to be a problem. Residents of the communities near where these fisheries exist have become increasingly upset with the poor stewardship shown by some permit holders and have lodged numerous complaints with the department, insisting on better enforcement of regulations.

Though this problem occurs in all four spawn-on-kelp areas, this has become particularly a conflict in Section 13-C where the fishery occupies the best anchorage in the Hoonah Sound area, where few good anchoring alternatives exist during inclement weather. During 2010, two specific complaints in Hoonah Sound involved vessels becoming entangled in lines associated with the pound fishery while attempting to anchor during a period of poor weather. One of those incidents resulted in significant damage to the vessel. These events occurred well after the date gear is required to be removed from the water by regulation. The Sitka Fish and Game Advisory

Committee is aware of these complaints and is considering proposals to the Alaska Board of Fisheries, for the 2012 cycle, to address this issue.

The ADF&G and the Alaska Wildlife Troopers (AWT) are advising permit holders; after the 2011 season any pounds, nets, buoys, lines and anchors left on the grounds will be removed, and impounded or destroyed.

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

In the Hoonah Sound and Tenakee Inlet areas, 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 at the Sitka Ranger District Office, 204 Siginaka Way, Sitka, Alaska 99835, (907-747-6671). Completed applications should be submitted to the Sitka Ranger District 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. NATIONAL MARINE FISHERIES SERVICE

The U.S. National Marine Fisheries Service (907-747-6940) regulates activities that might harm marine mammals.

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 spawn-on-kelp 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 5).

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) (Figures 1-3).

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.

PRIVATE LANDS

Some of the area in which pounds may be operated is adjacent to privately owned lands. Pound operators should contact the landowners if they intend to use any of that land above mean high tide. Private land owners in the Craig/Klawock area include the Klawock/Heenya Corporation, Shaan-Seet Corporation, and Sealaska Corporation and private individuals. Figure 6 shows the approximate areas of privately held lands in the Craig/Klawock area.

LIST OF MANAGEMENT CONTACTS

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

Name and Title	Address and Phone Number
Scott Kelley Region I Supervisor	P.O. Box 110024 Douglas, Alaska 99811-0024 (907) 465-4250
Bill Davidson Region I Management Biologist	304 Lake St., Rm. 103 Sitka, Alaska 99835 (907) 747-6688
Kyle Hebert Herring Research Biologist	P.O. Box 110024 Douglas, Alaska 99811-0024 (907) 465-4250
Scott Walker Area Management Biologist Bo Meredith or Justin Breese Assistant Management Biologists	2030 Sea Level Dr. Ste. 205 Ketchikan, Alaska 99901 (907) 225-5195
Troy Thynes Area Management Biologist Kevin Clark Assistant Management Biologist	P.O. Box 667 Petersburg, Alaska 99833 (907) 772-3801
Tom Kowalske Assistant Management Biologist	215 Front Street P.O. Box 200 Wrangell, AK 99929-0200 (907) 874-3822
Dave Gordon Area Management Biologist Eric Coonradt Assistant Management Biologist	304 Lake St., Rm. 103 Sitka, Alaska 99835 (907) 747-6688
Kevin Monagle Area Management Biologist Dave Harris Assistant Management Biologist	P.O. Box 110024 Juneau, Alaska 99811-0024 (907) 465-4250

TABLES AND FIGURES

Table 1.–Craig/Klawock stock size and winter food and bait harvests, 1987–2010.

Year	Miles Spawn[a]	Forecasted Pre-fishery Biomass[b]	Total GHL Bait and SOK[c](Tons)	Bait GHL (Tons)	Bait Harvest (Tons)
1987–1988	5	16,550	N/A	2,200[d]	2,014
1988–1989	27	16,350	N/A	1,810	1,730
1989–1990	31.7	19,800	N/A	3,150	3,221
1990–1991	30	18,350	N/A	2,841	3,272
1991–1992	22	17,800	2,684	2,281	2,295
1992–1993[e]	23	12,350	1,602	1,362	623
1993–1994	8.4	7,996	895	760	636
1994–1995	8	6,778	725	617	124
1995–1996	5.5	6,262	658	558	4
1996–1997	9.9	6,755	715	615	517
1997–1998[f]	13.2	7,018	755	455	254
1998–1999	11	6,951	750	450	102
1999–2000	15.4	6,013	626	376	346
2000–2001	12.9	9,091	1,058	635	145
2001–2002	16.7	8,387	952	571	92
2002–2003	18	6,045	630	378	145
2003–2004	11.2	13,204	1,754	1,052	157
2004–2005	12	15,577	2,217	1,330	553
2005–2006	18	14,262	1,955	1,173	689
2006–2007	8.2	13,768	1,860	1,116	576
2007–2008	22.3	14,213	1,945	1,167	565
2008–2009	11	14,213	1,945	1,167	142
2009–2010	17	14,870	2,074	1,244	confidential
2010–2011	18.7	17,886[g]	2,710[g]	1,626[g]	confidential
Average	15.7	12,104	1,426	1,206	827

[a] Spawn year is beginning 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 07–08.

[c] Spawn On Kelp (SOK)

[d] 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 spawn-on-kelp fishery summary, 1992–2010.

Statistic	1992	1993	1994	1995	1996	1997	1998
Herring GHL (tons)	403	240	135	109	100	200	500
Total harvest SOK (tons)	25.7	5.7	16.5	25.4	37.3	21.9	22.4
Exvessel value	$180,000	$47,882	$364,199	$1,000,000	$1,490,000	$270,306	$152,203
Average Price/lb	$3.50	$4.17	$11.00	$19.00	$20.00	$6.00	$3.39
Average Income	$784.00	$2,081	$4,388	$5,107	$9,700	$1,890	$1,072
Number of pounds	248	209	147	159	162	119	112
Number of landings	229	23	83	146	154	143	148
Blade allocation	310	292	233	174	156	[a]	[b]
Total kelp harvest (tons)	7.8	3.7	3	3	2.6	3.2	3.5
Herring spawning dates	3/15–4/10	3/26–4/21	3/23–4/12	3/27–4/9	3/22–4/12	4/7–4/14	3/19–4/8
Miles of spawn	23	8.3	8	5.5	9.9	13.2	12.5
Forecasted Pre-Fishery biomass (tons)	17,800	12,350	7,996	6,778	6,262	6,755	7,018

Statistic	1999	2000	2001	2002	2003	2004	2005
Herring GHL (tons)	650	280	914	852	528	1,579	1,667
Total harvest SOK (tons)	36	0	26.9	41.7	69.2	50	115.2
Exvessel value	$212,121	$0	$146,859	$218,700	$423,000	$325,000	$603,723
Average Price/lb	$2.94	$0	$2.70	$3.10	$3.00	$3.25	$2.62
Average Income	$2,060	$0	$2,880	$2,460	$3,385	$3,420	$9,011
Number of pounds	70	50	31	50	61	50	42
Number of landings	103	0	51	89	118	95	67
Blade allocation	[c]	[d]	[e]	[e]	[e]	[d]	[f]
Total kelp harvest (tons)	2.9	2	3.2	8.2	7.5	14	4.9
Herring spawning dates	3/23–3/28	3/22–4/5	4/1–4/7	3/31– 4/7	3/31– 4/7	3/26–4/7	4/9-4/14
Miles of spawn	15.4	12.9	16.7	18.4	11.2	12	18
Forecasted Pre-Fishery biomass (tons)	6,951	9,951	8,042	8,387	6,045	13,204	15,577

Statistic	2006	2007	2008	2009	2010
Herring GHL (Tons)	1,266	1,284	1,380	1,802	1,953
Total harvest SOK (tons)	28.9	44.5	148.5	137.3	116.7
Exvessel value	$298,575	$1,087,532	$3,066,788	$1,256,777	$884,715
Average Price/lb	$5.15	$12.08	$10.33	$4.58	$3.80
Average Income	$8,782	$23,139	$25,138	$9,107	$8,268
Number of pounds	50	52	66	96	63
Number of landings	34	47	122	137	107
Blade allocation	[g]	[g]	[g]	[g]	[g]
Total kelp harvest (tons)	4.6	5.6	12.2	7.3	8.2
Herring spawning dates	3/30-4/3	4/3–4/12	4/3–4/12	4/3-4/10	4/5-4/14
Miles of spawn	8.2	22.3	11	17	18.7
Forecasted Pre-Fishery biomass (tons)	14,262	13,768	14,213	14,213	14870

[a] 100 blades for single-closed pound, 150 blades for multiple pound permit holder, and 300 blades for open pound permits.

[b] 120 blades for a single closed pound, 180 blades for a multiple pound permit holder, 360 blades for single open pound.

[c] 155 blades for a single closed pound, 235 blades for a multiple pound permit holder, 470 blades for a single open pound.

[d] 70 blades for a single closed pound, 210 for a multiple pound permit holder.

[e] 200 blades for a single closed pound, 600 blades for a multiple pound permit holder

[f] 350 blades for a single closed pound, 750 blades for a double closed pound, 1,125 blades for a triple closed pound.

[g] 600 blades for a single closed pound, 750 blades for a double closed pound, 1,125 blades for a triple closed pound.

Table 3.–A comparison of Craig and Ernest Sound herring spawning dates for years 1992–2010. Black bar indicates dates of active spawning.

Table 4.–Ernest Sound miles of spawn stock size and harvest, 1969–2010.

Season	Date of first spawn[a]	Nautical miles of spawn[b]	Forecast Used for GHL Determination[c] (tons)	Spawning Biomass (tons)[d]	Guideline Harvest Level (tons)[e]	Bait harvest (tons)[f]	SOK Harvest (lbs)	Sac Roe Harvest (tons)	Remaining 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	5/3	--	3,035	1,505	455	340	--	--	115
1978–1979	4/16	2.6	1,505	255	--	--	--	--	--
1979–1980	5/2	4	255	500	--	--	--	--	--
1980–1981	--	3.5	500	410	--	--	--	--	--
1981–1982	--	--	410	160	--	--	--	--	--
1982–1983	--	--	160	1,640	--	--	--	--	--
1983–1984	4/11	--	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	4/21	2	--	--	--	--	--	--	--
1988–1989	4/17	2.4	--	500	--	--	--	--	--
1989–1990	--	2.1	500	1,000	--	--	--	--	--
1990–1991	--	ns	1,000	3,000	--	--	--	--	--
1991–1992	4/16	9.1	3,000	2,650	--	--	--	--	--
1992–1993	4/23	9	2,650	684	200	8	--	--	192
1993–1994	4/26	8.4	684	2,544	0	--	--	--	--
1994–1995	4/25	6.5	2,544	2,470	255	111	--	--	144
1995–1996	4/16	6.9	2,744	2,665	280	220	--	--	60
1996–1997	4/16	0	4,852	0	377	6	--	--	371
1997–1998	4/9	11.8	--	5,998	0	--	--	--	--
1998–1999	4/5	1.8	5,381	No survey	662	96	--	--	566
1999–2000	4/8	9.1	--	920	0	--	--	--	--
2000–2001	4/11	6.9	--	2,052	0	--	--	--	--
2001–2002	4/15	4.8	1,653	2,406	0	--	--	--	--

-continued-

Note: Table footnotes are at the bottom of the following page.

Table 4.–continued (page 2 of 2)

Season	Date of first spawn[a]	Nautical miles of spawn[b]	Forecast Used for GHL Determination[c] (tons)	Spawning Biomass (tons)[d]	Guideline Harvest Level (tons)[e]	Bait harvest (tons)[f]	SOK Harvest (lbs)	Sac Roe Harvest (tons)	Remaining GHL (tons)
2002–2003	4/10	8.5	2,407	5,509	0	--	--	--	--
2003–2004	4/11	7.1	6,592	2,413	875	44	112,286	--	775
2004–2005	4/22	10.1	1,906	3,268	0	--	--	--	--
2005–2006	4/6	7.9	2,284	2,538	0	--	--	--	--
2006–2007	4/19	11.3	1,955	7,353	0	--	--	--	--
2007–2008	4/20	15.4	9,060	4,846	1,382	**	19,650	--	**
2008–2009	4/17	6.6	4,545	2,862	529	**	4,911	--	**
2009–2010	4/14	7.8	2,879	3,523	297	**	--	--	**

Note: ** indicates data is confidential.

Footnotes:

[a] Since 1997–1998 the first spawn and the major spawn have been within 5 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.

[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] 1969–1970 through 1983–1984 biomass estimates were hyrdoacoustical-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 GHLs are based upon 20% of the acoustical estimate. 1977–1978 GHL is based upon 15% of the acoustical estimate.

[e] 2003–2004 GHL includes 90 tons rolled over from the bait pound fishery.

[f] 1973–1974,1974–1975, 1976–1977 also include harvests from Fools and Menefee Inlets. Does not include harvests from statistical area 107-40.

[g] Since 1976–1977 season the threshold for a fishery has been 2,500 tons.

Table 5.–Tenakee Inlet herring spawn deposition timing, location, biomass estimates, and food & bait harvests.

Season	Major Spawning Dates	Nautical Miles of Spawn (nm)	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	654
1982–1983	4/25–5/6	13.1	8,870	875	799
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	97.5
1997–1998	4/24–4/29	12.4	10,419	825	692
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	393
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	5,825	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	12,699	———No fishery———	
2008–2009	4/25–4/26;4/29–4/30	6.9	5,283	788	254
2009–2010	5/7–5/9	2.7	1,437	525	confidential

[a] Spawning biomass estimates were calculated from hydro-acoustical surveys from 1979 through 1986, from spawn deposition surveys from 1987 through 2009.

Table 6.–Tenakee Inlet herring spawn-on-kelp fishery summary, 2003–2005 and 2009.

Statistic	2003	2004	2005
Tenakee Inlet GHL (tons)	528	399	476
GHL Available for SOK (tons)	180	360	476
SOK Harvest (tons)	47.6	95	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	91
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
Tenakee Inlet GHL (tons)	875
GHL Available for SOK (tons)	621
SOK Harvest (tons)	64.1
Exvessel Value	$558,900
Average Price/lb	$4.36
Average Income/permit	$6,499
Number of Permits participating	86
Number of Pounds	11/27/7/0 [a]
Number Permits Landing Product	86
Kelp Allocation (blades)	400/500/500/0 [a]
Kelp Blade Harvest (lbs)	42,600
Fishery Open—Closed	4/6–5/5
Fishing Occurred	4/28–5/1
Harvest Occurred	5/2–5/5

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

[a] single/double/triple/test
[b] single/double/triple/long line/test

Table 7.–A comparison of Hoonah Sound and Tenakee Inlet herring spawn dates for years 1993–2009. Black bar indicates dates of actual spawn.

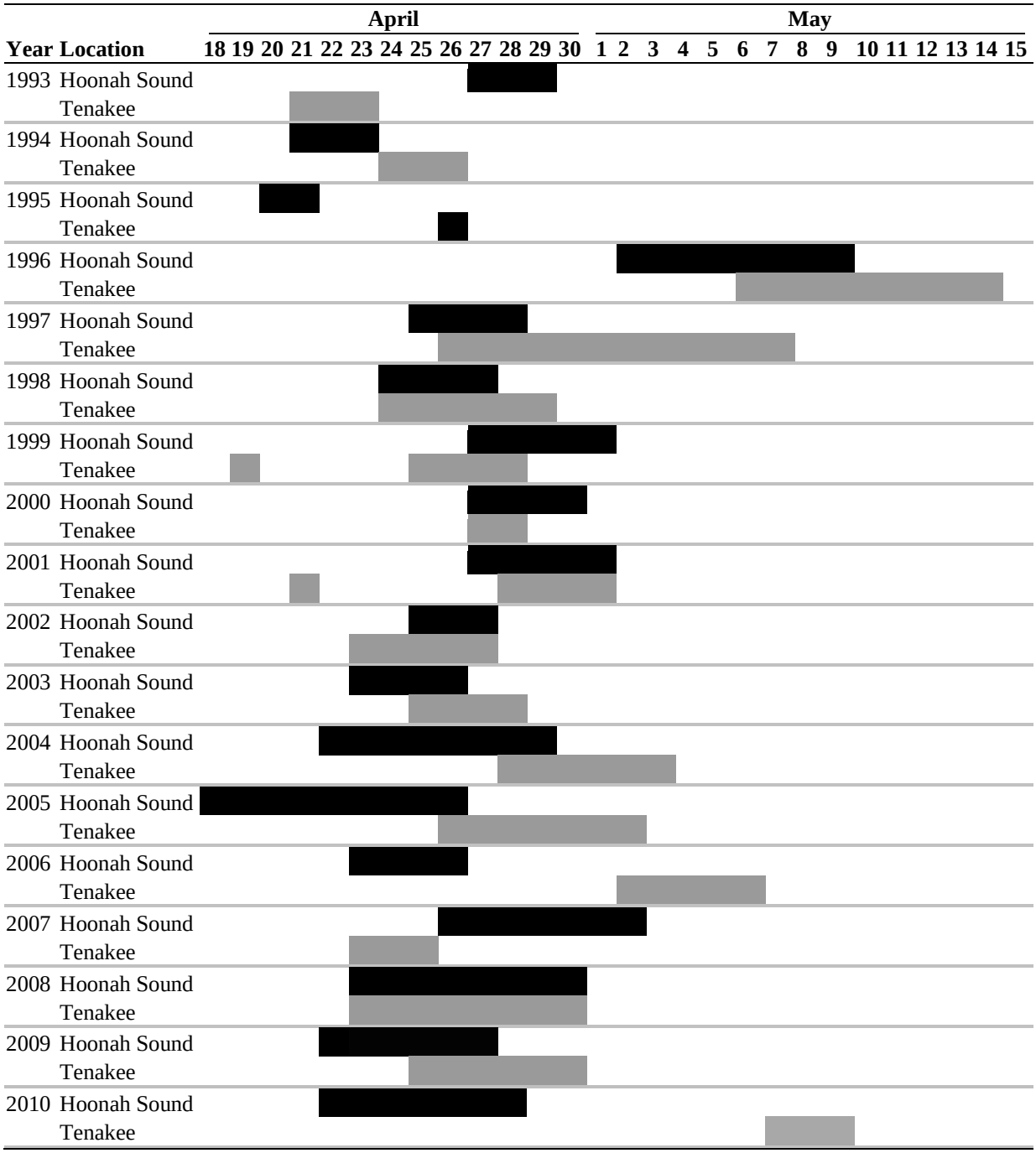

Table 8.–Hoonah Sound herring spawning stock and fishery performance, 1971–2010.

Year	Spawn	Nautical Miles	Estimated Escapement*	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
Average	1971–2010	7.9	4,239	NA
Average	1990–2010	11.5	6,851	10.1

*Shaded estimated escapements are based on average spawn density from years 1989–2002.

Table 9.–Hoonah Sound herring spawn-on-kelp fishery summary, 1997–2010.

Statistic	1997	1998	1999	2000	2001	2002
Herring Quota (tons)	1421	700	778	359	366	1,264
Harvest Quota (tons)	114	56	62	29	NA	NA
Harvest (tons)	65.2	85.9	71.6	35.7	66.2	136.6
Exvessel Value	$920,000	$1,160,523	$1,005,529	$587,568	$1,006,000	$1,970,000
Average Price/lb	$7.05	$6.75	$7.02	$8.23	$7.60	$7.32
Average Income	$6,694	$10,092	$11,692	$6,251	$11,559	$20,408
Number of Applicants	139	133	106	106	NA	NA
Number of Pounds	0/113/18[a]	115	96	46/2/0[a]	42/3/1[a]	106/0/2[a]
Number Selling Product	112/12[b]	115	86	84	87	98
Kelp Allocation (blades)	430/860[b]	400/800[b]	400/800[b]	110/300[b]	120/300[b]	1,000/3,600[b]
Kelp Blade Harvest	68,755	54,275	42,025	29,820	29,966	113,713
Fishery Open—Closed	4/6–4/29	4/6–4/27	4/6–5/3	4/6–5/3	4/6–5/3	4/6–5/1
Fishing Occurred	4/22–4/29	4/18–4/26	4/29–5/2	4/27–4/29	4/25–4/28	4/24–4/27
Harvest Occurred	4/27–5/3	4/25–4/27	5/3–5/5	5/2–5/4	4/30–5/2	4/28–5/1
Statistic	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Herring Quota (tons)	427	1,207	728	669	681	2238
Harvest Quota (tons)	NA	NA	NA	NA	NA	NA
Harvest (tons)	141.6	237.4	190.6	162.1	144.5	223
Exvessel Value	$1,922,500	$2,071,347	$1,117,568	$1,943,422	$4,491,070	$5,115,459
Average Price/lb	$6.79	$4.36	$2.93	$6.00	$14.09	$11.47
Average Income/Landing	$17,800	$19,541	$11,889	$24,600	$49,352	$51,155
Number of Applicants	NA	NA	NA	NA	NA	NA
Number of Pounds	49/1/3[d]	92/12/2[a]	81/5/3[c]	17/45[d]	67/12[d]	98/3[d]
Number Selling Product	108	106	94	79	91	100
Kelp Allocation (blades)	500/300/750[d]	1,000/1,000/3,000[a]	1,000/1,000/1,500[d]	2,500/1,000/1,500[d]	2,500/1,000/1,500[d]	3,000/2,000/1,500[d]
Kelp Blade Harvest	60,301	126,000	118,450	136,698	122,565	201,262
Fishery Open–Closed	4/6–4/25	4/6–4/28	4/6–4/28	4/6–4/27	4/6–5/4	4/6–5/02
Fishing Occurred	4/19–4/24	4/20–4/25	4/19–4/28	4/18–4/23	4/23–4/29	4/22–4/27
Harvest Occurred	4/24–4/27	4/26–4/28	4/25–4/28	4/23–4/27	4/30–5/4	4/27–5/1
Statistic	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Herring Quota (tons)	2,238	3,182				
Harvest Quota (tons)	NA	NA				
Harvest (tons)	234.7	290.4				
Exvessel Value	$2,332,514	$2,580,517				
Average Price/lb	$4.97	$4.44				
Average Income/Landing	$23,094	$25,550				
Number of Applicants	NA	NA				
Number of Pounds	99/4[d]	97/2[d]				
Number Selling Product	101	101				
Kelp Allocation (blades)	3,000/2,000/1,500[d]	3,000/2,000/1,500[d]				
Kelp Blade Harvest	196,492	178,898				
Fishery Open—Closed	4/6–4/30	4/6–4/30				
Fishing Occurred	4/22–4/25	4/21–4/25				
Harvest Occurred	4/26–4/29	4/22–4/28				

[a] Double closed pounds/single closed pounds/open pounds.
[b] Closed pound/Open Pound.
[c] Single-permit closed pound/double-permit closed pound/triple-permit closed pounds.
[d] Double closed pounds/single closed pounds/triple closed pounds
Note: No fishery occurred in 1996 since the biomass forecast was below the 1,000-ton threshold

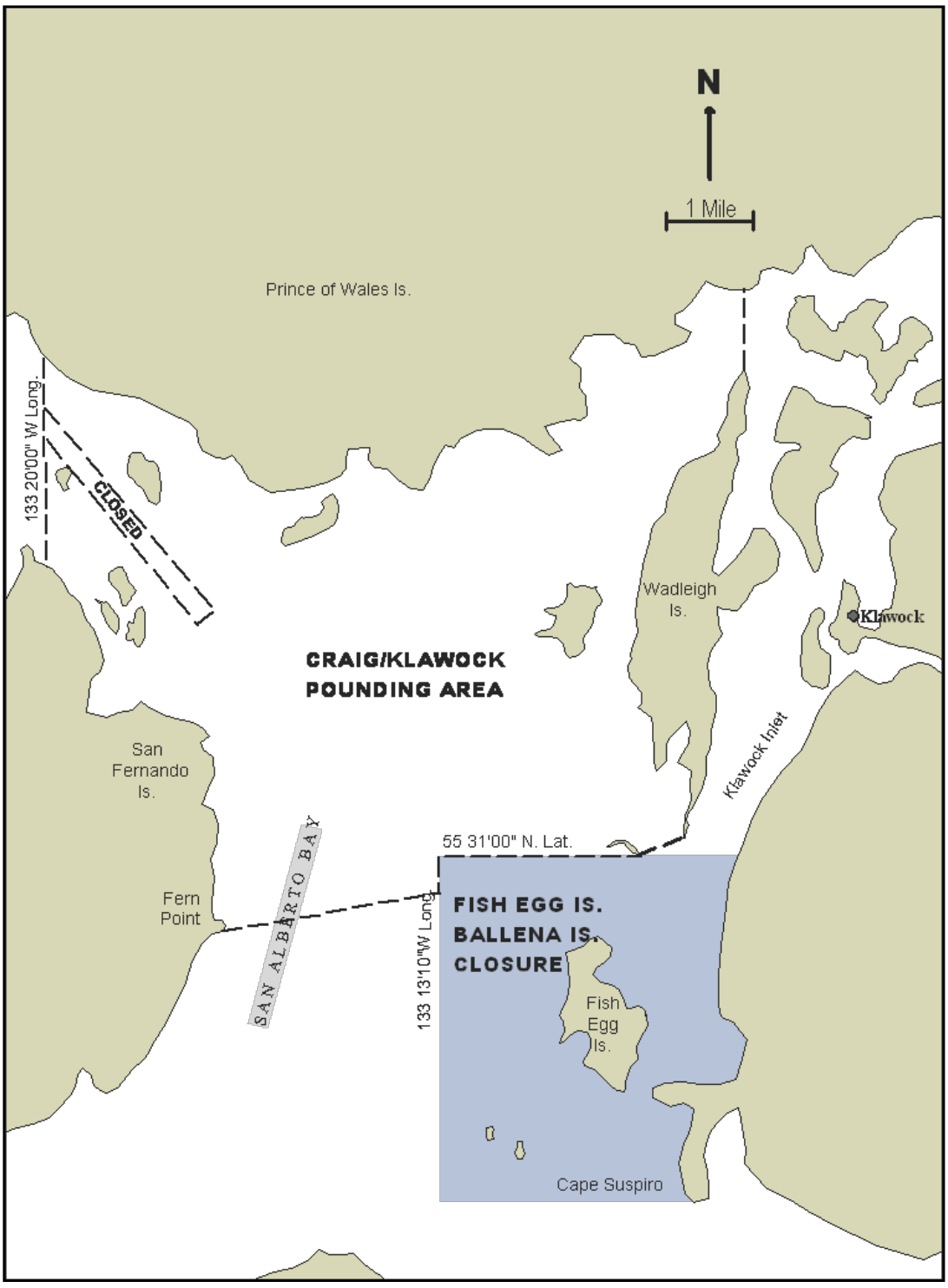

Figure 1.–Open area for Craig/Klawock pound fishery (Section 3-B).

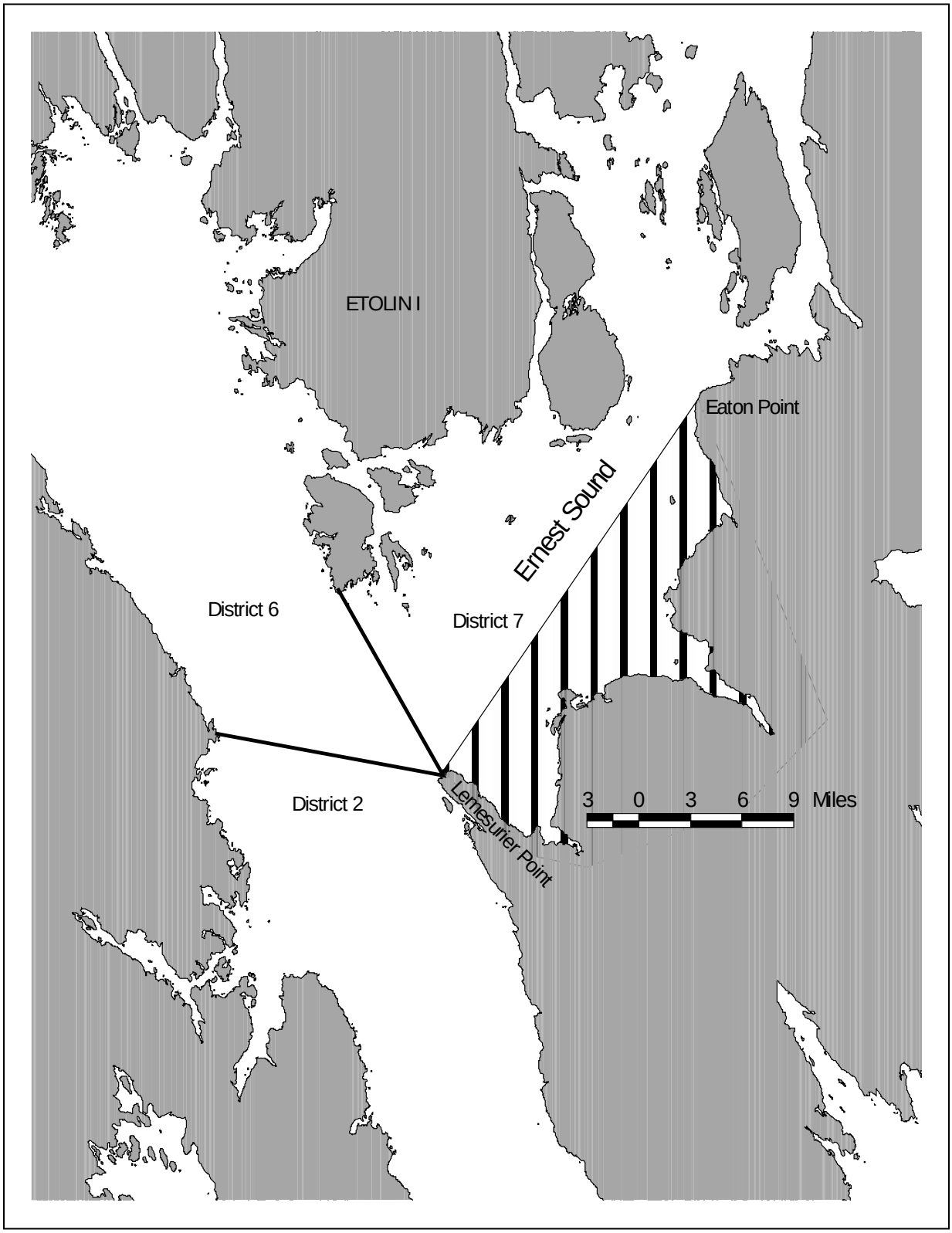

Figure 2.–Open area line for the district 7 Ernest Sound pound fishery.

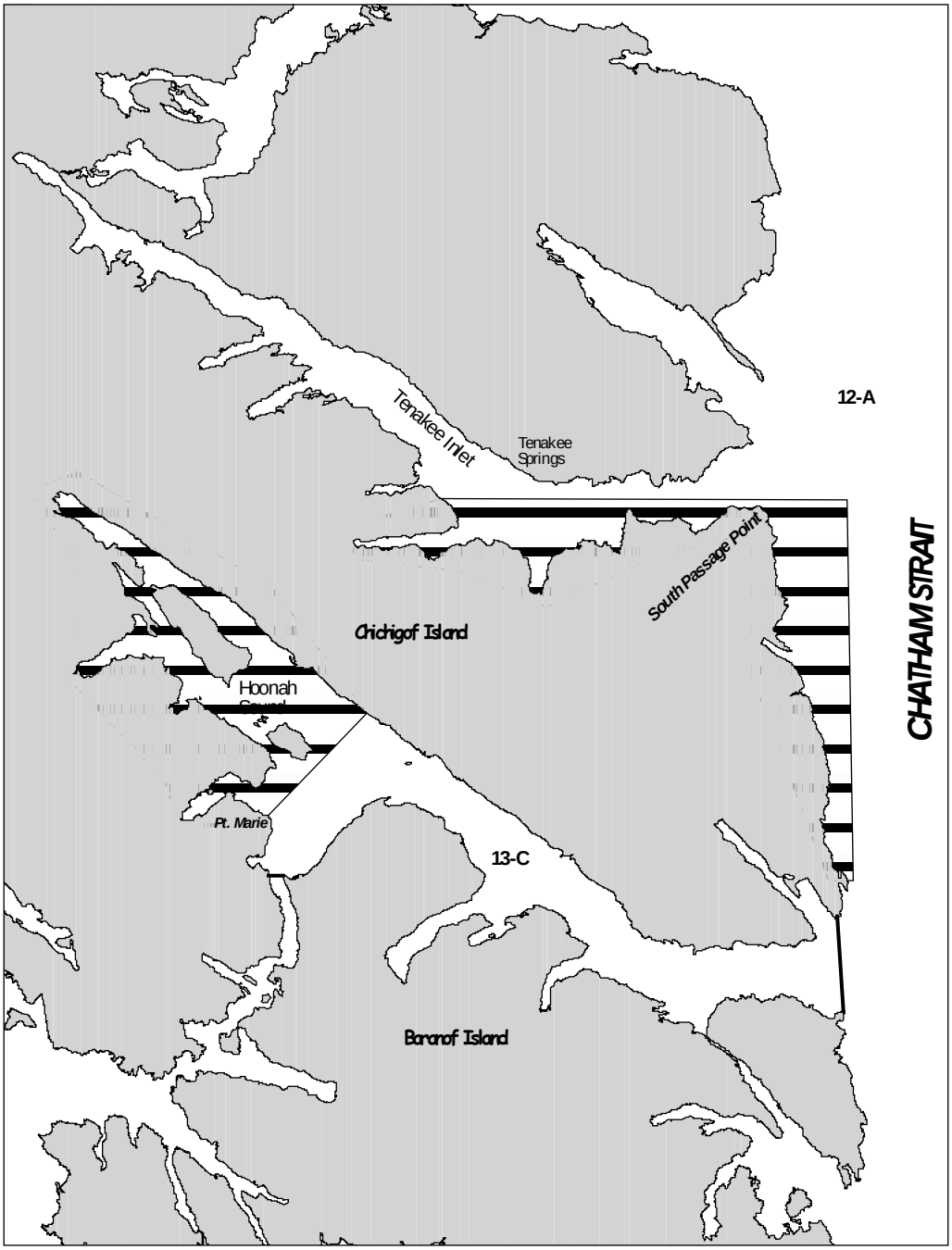

Figure 3.–Areas open (dark shade) to spawn-on-kelp fishery in Hoonah Sound and Tenakee Inlet.

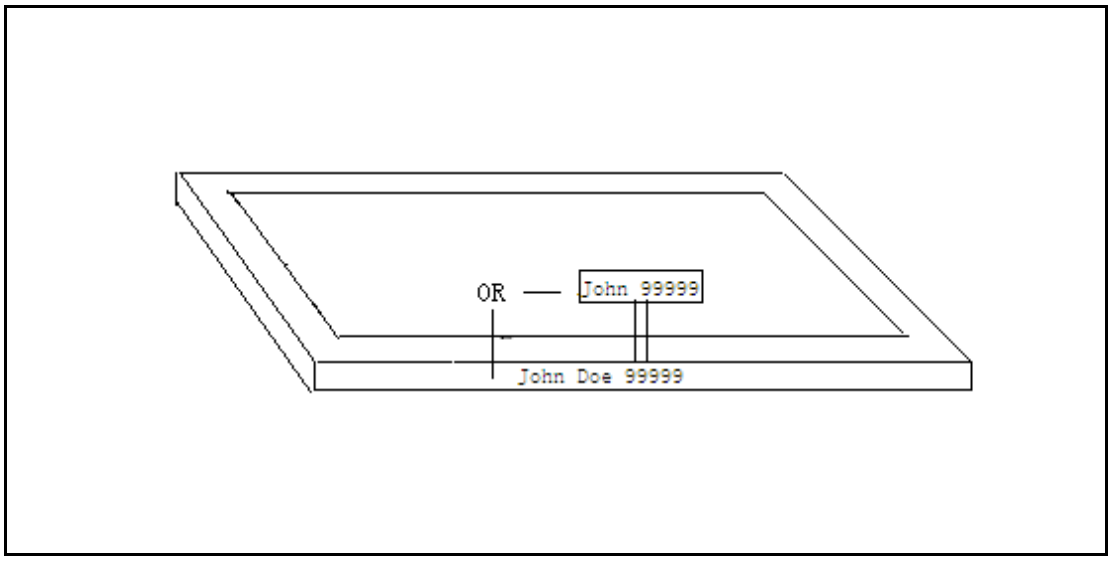

Figure 4.–Diagram of a herring pound showing two alternatives methods of marking herring pounds.

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 and must contrast with the background.

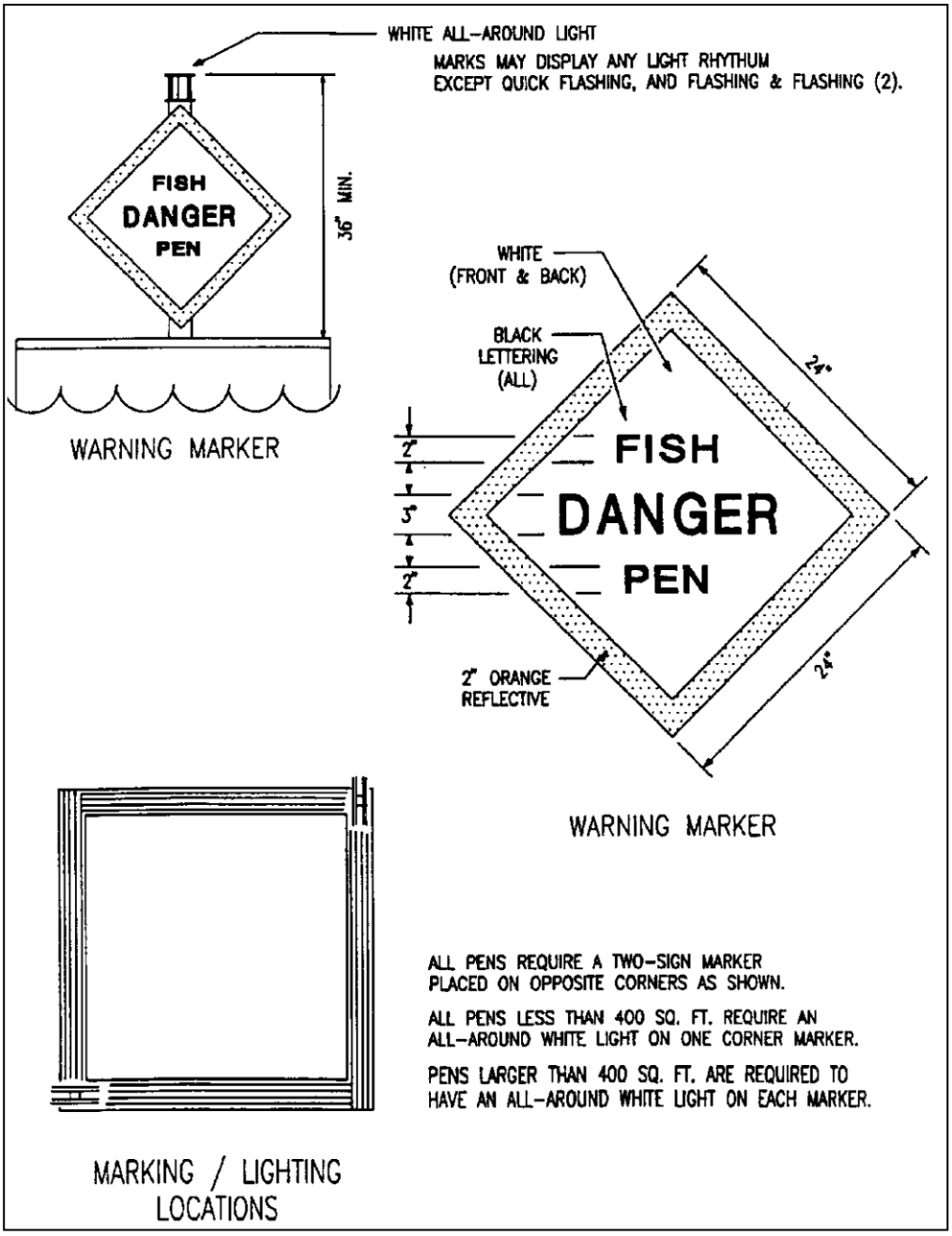

Figure 5.–Coast Guard Requirements for marking pounds.

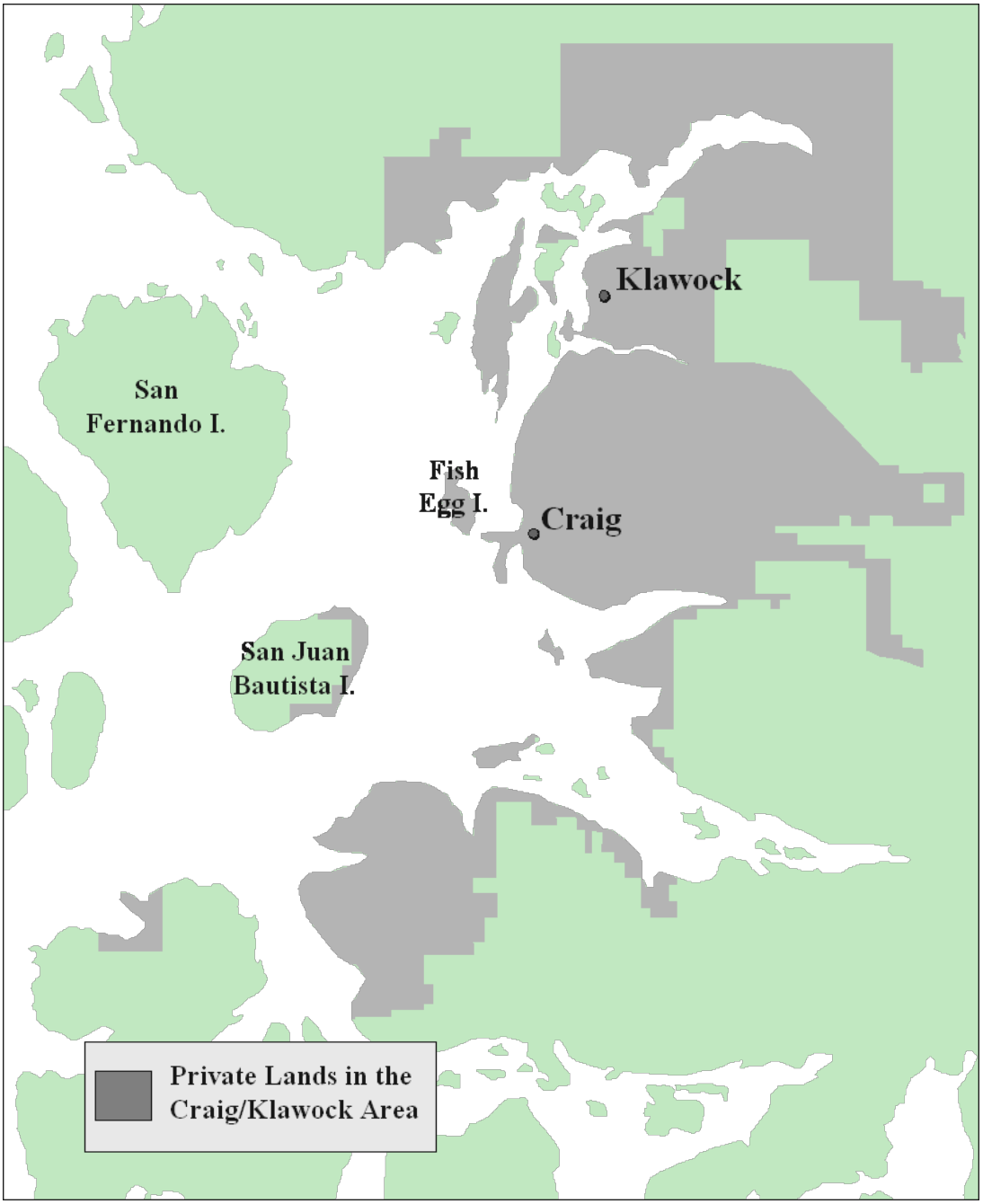

Figure 6.–Private lands in the Craig/Klawock area.