Fishery Management Report No. 11-52

2012 Report to the Alaska Board of Fisheries on Yakutat Scallop Fisheries

by

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and

Adam Messmer

November 2011

Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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2012 REPORT TO THE ALASKA BOARD OF FISHERIES ON YAKUTAT SCALLOP FISHERIES

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November 2011

The Fishery Management Reports series was established in 1989 by the Division of Sport Fish for the publication of an overview of management activities and goals in a specific geographic area, and became a joint divisional series in 2004 with the Division of Commercial Fisheries. Fishery Management Reports are intended for fishery and other technical professionals, as well as lay persons. Fishery Management Reports are available through the Alaska State Library and on the Internet: http://www.adfg.alaska.gov/sf/publications/. This publication has undergone regional peer review.

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This document should be cited as:
Stratman, J., A. Messmer. 2011. 2012 Report to the Alaska Board of Fisheries on Yakutat scallop fisheries. Alaska Department of Fish and Game, Fishery Management Report No. 11-52, Anchorage.

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ABSTRACT

This report reviews the commercial fishery for weathervane scallops in Region I in Scallop Registration Area D, which includes Registration Area D and all waters of District 16. Weathervane scallop harvests in Region I totaled 160,340 lbs with an estimated value of $1.28 million during the last completed season.

The ability of the department to manage for sustained yields varies among the fisheries due to different levels of development of stock assessment programs and management plans. The weathervane scallop population in the Yakutat area is not annually surveyed and no estimate of abundance has been made. Statewide scallop research staff members have been in the process of transitioning from dredge surveys to surveys using a camera in a towed sled. Dockside sampling does not exist since scallops are processed and frozen at sea. Complete observer coverage exists for all participating vessels. The weathervane scallop fishery is managed by the State of Alaska according to guidelines in the *Alaska Scallop Fishery Management Plan*, adopted in 1993. The State of Alaska is delegated authority to manage weathervane scallop fisheries in the U.S. exclusive economic zone off Alaska in accordance with the federal *Fishery Management Plan for the Scallop Fishery Off Alaska*.

Keywords: Weathervane scallop, *Patinopecten caurinus*, Scallop Registration Area D, Yakutat, Fisheries management, Invertebrate fisheries, Region I, Harvest statistics, Fishery Management Plan

CHAPTER 1: INTRODUCTION TO WEATHERVANE SCALLOP FISHERIES

INTRODUCTION

This report reviews the commercial fishery for weathervane scallops in Region I in Scallop Registration Area D, which includes Registration Area D and all waters of District 16 (Figure 1.1). Commercial dredging for the weathervane scallop in Registration Area D occurs in open coastal waters between Cape Fairweather and Cape Suckling. Known offshore scallop beds are extensive and overlap state and U.S. Exclusive Economic Zone (EEZ) waters. The known offshore scallop beds in District 16 (between Cape Spencer and Cape Fairweather) are small in comparison to those historically fished elsewhere in Alaska and overlap state and EEZ waters.

This is the second Alaska Board of Fisheries (BOF) meeting where proposals for all Region I shellfish fisheries are considered in one meeting. In previous years, proposals for Dungeness crab, shrimp, and scallops were combined into one meeting held in Southeast Alaska, while king and Tanner crab proposals were considered separately during the statewide king and Tanner crab BOF meeting. The reason for including the Southeast king and Tanner crab meeting in the Southeast meeting is to allow for increased participation of stakeholders.

The weathervane scallop harvest in Region I totaled 160,340 lbs valued at $1.28 million during the last completed season (Table 1.1). Ranking by poundage and value based on the last season when a fishery was conducted, the weathervane scallop fishery is the largest, most valuable shellfish fishery in Registration Area D (Yakutat).

SCALLOP RESEARCH AND MANAGEMENT

Weathervane scallops in the U. S. exclusive economic zone off Alaska are jointly managed by the State of Alaska and federal government under terms of the *Fishery Management Plan for the Scallop Fishery Off Alaska* (FMP). The FMP divides management authority for weathervane scallops into two categories: Category 1 and Category 2. Category 2 management measures are delegated to the State of Alaska and include setting of harvest levels, fishing seasons, gear limitations, crew and efficiency limitations, closed areas, inseason adjustments, observer coverage requirements, bycatch limits, registration areas, recordkeeping and reporting requirements, and other management measures. Category 1 management measures are reserved for the federal government and are limited to overfishing specifications, essential fish habitat and habitat areas of particular concern designation, license limitation, and optimum yield specification.

Research on scallop stocks in Scallop Registration Area D is provided by biometric staff in the Kodiak office. The weathervane scallop population in the Yakutat area is not annually surveyed and no estimate of abundance has been made. Statewide scallop research staff has been in the process of transitioning from dredge surveys to surveys using a camera in a towed sled.

The commercial fishery is managed by the State of Alaska according to guidelines in the *Alaska Scallop Fishery Management Plan* (ASFMP), adopted in 1993. Management support is provided by a statewide scallop observer coordinator in the Kodiak office. Region I management staff are provided survey and observer data annually which are used to set guideline harvest levels (GHLs) for Area D and District 16. Observer reports are provided throughout the fishery and are used to track harvests in Area D and District 16.

STAFF

All Region I crab, beam trawl shrimp, and scallops fisheries are managed by the regional shellfish management staff. All Region I shellfish stock assessment and research programs, aside from weathervane scallops, are managed by the regional shellfish research staff. The shrimp pot fishery is the only shellfish fishery managed individually by area offices within the region. These fisheries are managed by Area Management Biologists under the supervision of Bill Davidson, Regional Management Coordinator, stationed in Sitka. All other shellfisheries research (non-salmon) and management is under the supervision of Forrest Bowers, Southeast Regional Shellfish and Groundfish Fisheries Program Supervisor, stationed in Douglas. The regional stock biology staff conducts dockside sampling and skipper interviews with assistance from the shellfish and area management staffs.

SHELLFISH PROJECT STAFF

Name	Title	Job Class	Location
Forrest Bowers	Region I Shellfish/Groundfish Fisheries Program Supervisor	Fisheries Biologist IV	Douglas
Bill Davidson	Region I Management Coordinator	Fisheries Biologist IV	Sitka
Joe Stratman	Region I Shellfish Management Project Leader	Fisheries Biologist III	Petersburg
Gretchen Bishop	Region I Crab Research Project Leader	Fisheries Biologist III	Douglas
Chris Siddon	Shellfish and Dive Fisheries Biometrician	Biometrician III	Douglas
Adam Messmer	Shellfish Management Biologist	Fisheries Biologist II	Douglas
Quinn Smith	Southeast Regional Shrimp Biologist	Fisheries Biologist II	Douglas
Andrew Olsen	Shellfish Research Biologist	Fisheries Biologist I	Douglas
Kellii Wood	Shellfish Technician	Fish & Wildlife Technician IV	Petersburg

CHAPTER 1—WEATHERVANE SCALLOP FISHERIES TABLES AND FIGURES

Table 1.1–Registration Area A (Southeast Alaska) and Registration Area D (Yakutat) list of shellfish fisheries, harvest, and approximate exvessel values from the last completed season or calendar year.

Area/ Season	Fishery	Harvest (lbs)	Approximate exvessel Value
Southeast			
2005/2006	Red and blue king crab	209,799	$1,099,000
2010/2011	Tanner crab (*C. bairdi*)	891,344	$2,425,059
2010/2011	Golden king crab	687,505	$4,656,267
2010/2011	Dungeness crab	3,245,265	$5,525,404
2010/2011	Pot shrimp	556,574	$1,519,447[a]
2010/2011	Beam trawl shrimp	132,383	$107,813
	Subtotal	**5,722,870**	**$15,332,990**
Yakutat			
2000/2001	Red and blue king crab	391	$2,960
1999/2000	Tanner crab	[b]	[b]
1999/2000	Dungeness crab	65,386	$133,145
2010/2011	Pot shrimp	[b]	[b]
2004/2005	Otter trawl shrimp	[b]	[b]
2010/2011	Weathervane scallop	160,340	$1,282,720[c]
	Subtotal	**230,499**	**$1,427,272**
	Grand Total	**5,953,369**	**$16,760,262**

[a] Value estimate based on 2010 exvessel price data from Commercial Fisheries Entry Commission.
[b] Confidential data, fewer than three permits fished.
[c] Value estimate based on 2009 exvessel price data.

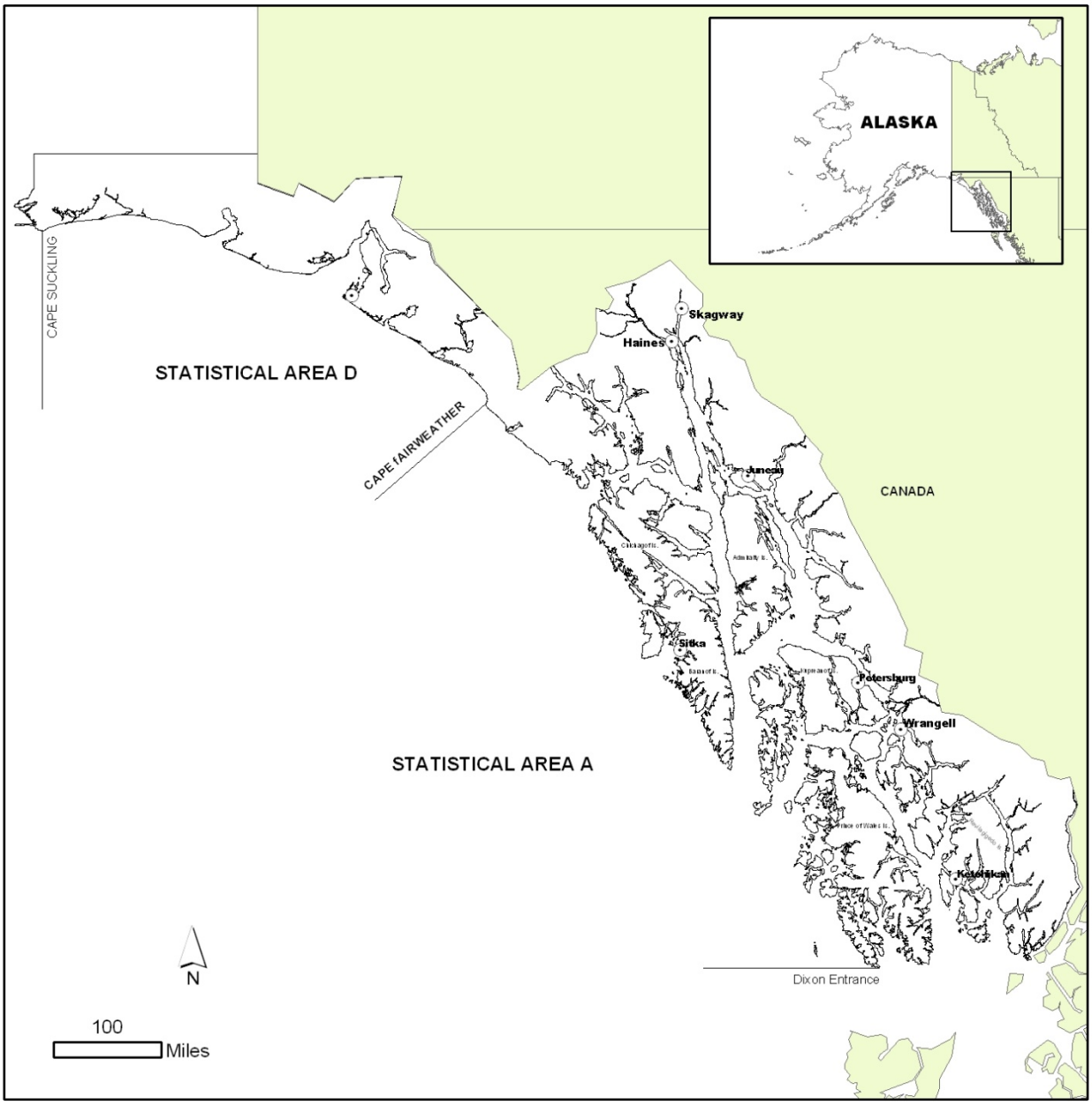

Figure 1. 1–Registration Area A (Dixon Entrance to Cape Fairweather) and Registration Area D (Cape Fairweather to Cape Suckling).

CHAPTER 2: YAKUTAT SCALLOP FISHERY

INTRODUCTION

LIFE HISTORY

The weathervane scallop, *Patinopecten caurinus*, is widely distributed over sandy substrates at depths of 15–110 fathoms (Barnhart and Rosenkranz 2000), primarily in areas with relatively high bottom currents. A filter feeder on near bottom plankton, this species becomes sexually mature in Alaska at a diameter of three inches at which time they are approximately three years of age (Hennick 1970). However, the oldest scallop aged in Alaska was estimated to be 28 years of age; it measured 10 inches across the shell (Hennick 1970). Although there is no minimum legal size, harvest is limited to scallops of four inches in shell width or greater by the minimum inside diameter of the dredge ring. This allows the escapement of mature scallops. Weathervanes are dioecious and in Alaska release gametes into the water column for fertilization from mid May to early July. Fertilized eggs settle to the bottom where they hatch into larvae within several days and settle after two to three weeks. Other commercially exploited species that are captured during scallop dredging include Dungeness crab, *Cancer magister*, and Tanner crab, *Chionoecetes bairdi*, that are found over similar substrates.

FISHERY

Commercial scallop harvest in Region I occurs in Scallop Registration Area D (Yakutat area), defined as Registration Area D and all waters of District 16 [5 AAC 38.076(b)(2)]. Commercial dredging for the weathervane scallop in Registration Area D occurs in open coastal waters between Cape Fairweather and Cape Suckling. Known offshore beds are extensive and overlap state and federal Exclusive Economic Zone (EEZ) waters. Harvestable populations also occur in Yakutat Bay, but scallop dredging in the bay is prohibited by regulation [5 AAC 38.180]. The known offshore beds in District 16 (between Cape Spencer and Cape Fairweather) are small in comparison to those historically fished elsewhere in Alaska and overlap state and EEZ waters. Many of the productive beds are discontinuous or dispersed between foul grounds.

The fishery is managed by the State of Alaska according to guidelines in the *Alaska Scallop Fishery Management Plan* (ASFMP), adopted in 1993. The major features of the plan are required registration, minimum ring sizes of 3 or 4 inches depending on the scallop species targeted, prohibition on chafing gear and shucking machines, maximum opening of 15 ft for a scallop dredge, maximum of 12 crew members, guideline harvests ranges by registration area, and a requirement for complete observer coverage on all participating vessels.

The determination of the number of vessels allowed to participate in the statewide fishery is under the jurisdiction of the North Pacific Fishery Management Council, which set the maximum number of vessels at nine in 1999, and identified the permitted vessels at that time. Most vessels working in this fishery are very seaworthy, in excess of 70 ft, and based in Kodiak, Seward, and in other states. The fleet is highly mobile. Most vessels fish New Bedford-type dredges, approximately 12 to 15 ft in width, with one set off each side of the vessel. These dredges have heavy, rectangular steel frames supporting a mesh bag made from heavy steel rings. Ideally, the

dredge skims the bottom just deeply enough to flip scallops into the mesh bag without plowing into the substrate.

Scallop fishing, processing, and marketing operations are more vertically integrated than most other fisheries in Alaska. The same company that owns or operates the vessel also warehouses, transships, brokers, and sells the product to consumers. The primary product is the major adductor muscle, with most processing, and freezing or icing, conducted aboard the harvester vessel on the fishing grounds. The current guideline harvest range (GHR) is 0 to 250,000 lbs in Registration Area D and 0 to 35,000 lbs in District 16. Landed product weight is reported in lbs of frozen or iced meat, which comprises 6 to 11 percent of the live whole weight.

FISHERY DEVELOPMENT AND HISTORY

REGISTRATION AREA D

The first reports of scallop harvests in the Yakutat area were in 1968. Since then, harvests have varied widely (Table 2.1). The roller coaster highs and lows in the harvest reflect a largely unregulated fishery, driven by economics and market forces before adoption of the ASFMP in 1993. Since scallops live for many years after reaching harvestable size and worldwide demand has generally outstripped supply, the recurring crashes in the historical harvest record were strong circumstantial evidence that exploitation rates during some years had been too high. There was little consideration for long-term reproductive viability. Combined with sporadic recruitment, heavy harvests did not leave enough scallops on the grounds to carry the fishery over poor years.

The earliest years of the fishery were very productive. Virgin biomass supported harvests of over 900,000 lbs in 1968 and 800,000 lbs in 1969, by up to 14 vessels (Table 2.1). These years were followed by two decades of reduced effort and harvests. A statewide trend of increasing interest and participation in scallop fisheries in the early 1990s culminated in a peak harvest of over one million lbs in Registration Area D in 1992 (Table 2.1). In response, the department developed an interim management plan in 1993 under the *High Impact Emerging Fishery* regulation [5 AAC 39.210]. The Alaska Board of Fisheries subsequently adopted a management plan, the ASFMP, into regulation. Annual harvests in Registration Area D have been constrained to a maximum of 250,000 lbs under the ASFMP.

DISTRICT 16

The fishery in Southeast Alaska started in the early 1980s as stocks in Registration Area D to the north and west were fished down. Interest and harvests have been generally low and intermittent. District 16 stocks have been spared much of the roller coaster highs and lows prior to implementation of the *Alaska Scallop Fishery Management Plan* in 1993. Only a few vessels fished in most seasons, with a maximum of nine vessels in 1994 (Table 2.2), and one to nine vessels in each of the other 31 years of record. The peak harvest of 148,624 lbs occurred in 1990, with an overall historical average of about 19,000 lbs (Table 2.2). Annual harvests in District 16 have been constrained to a maximum of 35,000 lbs under the ASFMP.

Most of the effort in Southeast Alaska has occurred in District 16, although a few landings were reported during the 1982 season from three other districts around the outer coasts of Southeast Alaska before limitation of the fishery to District 16 in 1993. Due to the low numbers of participants and landings, historical data for much of this fishery is confidential.

REGULATION DEVELOPMENT

Until the 1992 fishing season the weathervane scallop fishery off Alaska was prosecuted in a relatively static regulatory environment. Changing fishery dynamics in the early 1990s prompted development of the ASFMP, which was implemented in 1993 and significantly enhanced the state's ability to manage the weathervane scallop fishery and has provided a regulatory framework under which weathervane scallop fishery management has been refined.

GUIDELINE HARVEST RANGES

A guideline harvest range (GHR) of 0 to 250,000 lbs for Registration Area D and 0 to 35,000 lbs for District 16 was established by the ASFMP in 1993. The ceilings are the approximate long-term average annual harvests for each area up to 1992.

GEAR RESTRICTIONS

As weathervane scallops become sexually mature at approximately three inches (Hennick 1970) a four inch minimum ring inside diameter for scallop dredges was established in order to permit the escape of juvenile and smaller sexually mature scallops. This was the primary passive management tool from 1969 through 1992, and continues to be used as a conservation measure to the present time. Since 1993, the width or horizontal front opening of scallop dredge gear has been limited to 15 ft and the use of any chafing gear or device that would tend to restrict the size of the rings has been prohibited.

To further discourage the entry of ever-larger vessels into the fishery, regulations adopted as part of the ASFMP in 1993 restricted the number of dredges that may be deployed at any time from a scallop vessel to two. Prohibiting mechanical or automated shuckers and restricting the crew size to 12, excluding the observer, has limited daily production per vessel. With the exception of experimental dredges operating under stringent permit conditions, only dredges as defined and restricted by regulation may be used.

FISHING SEASONS AND PERIODS

Registration Area D

For much of its history, this fishery has been open all year, with no closures during sensitive spawning periods. In late spring of 1991, Yakutat Bay was closed to commercial scallop dredging by the Board of Fisheries. Closure of the bay alleviated conflicts with commercial and subsistence salmon fishermen, Dungeness crab and shrimp pot fishermen, and other miscellaneous interests. Season closures went into effect in 1993, with the winter fishery managed for a harvest of about 125,000 lbs. The fishery lasted from January 1 through February 28. The ASFMP, with its observer requirement and new regulations, went into effect before the summer fishery, which opened on July 1 and closed on July 11, 1993. The next season opened on January 10, 1994. The delay was due to problems in scheduling training and certification for observers. The season lasted eight days, closing on January 18, 1994. The summer season opened on July 1 and closed on July 12, 1994. The Board of Fisheries formally changed the opening date for the winter fishery in late 1994 from January 1 to January 10 and from a split season to a single winter season. The single winter season lasted through 1997.

In 1995, the season opened January 10 and closed on February 2. The season was shorter in 1996, opening on January 10 and closing on January 25. The last year for the winter fishery was

in 1997 when the season opened on January 10 and closed on February 24. At the Board of Fisheries meeting in 1997 regulations changed so that the season was opened on July 1 and extended to February 15.

District 16

Prior to 1993, this fishery was open all year, with an accounting period of January 1 through December 31. Starting in 1993, the statewide management plan was implemented. For Southeast Alaska, it specified a split season, with a winter fishery starting on January 1 and a summer fishery starting on July 1. In 1994, because of high anticipated effort and catch levels, the winter season opened and closed after a one-day fishery on January 20. The following summer season, which opened by regulation on July 1 and closed by emergency order on October 31, was not as intense because productive areas in other parts of the state were open concurrently.

In 1995, there was only a winter fishery, which opened January 10 and closed on February 13. There were two seasons in 1996. The first one opened in state waters only on January 10 and closed on January 20. The summer fishery opened in federal waters on August 1 and continued through the fall to close on November 29. In 1997, there was a winter fishery lasting from January 10 to February 24. At the Board of Fisheries meeting in 1997 regulations changed so that the season was opened on July 1 and extended to February 15. There was not a summer fishery in 1997, as the annual allocation had been taken in the winter.

SIZE RESTRICTIONS

There are no size restrictions on scallops. Any scallop that is retained by 4 inch minimum diameter legal gear may be possessed and processed. In the past, a high percentage of the smaller scallops retained by this gear could not be economically hand-processed and were returned to the sea. These smaller scallops can now be processed and profitably marketed. Management assumes that adherence to the current GHR will be sufficient to insure overall stock viability despite retention of a larger percentage of smaller scallops.

OBSERVER PROGRAM

The ASFMP allows ADF&G to require vessels participating in the Yakutat area scallop fishery to carry an onboard observer. The purposes of the onboard observer program are to collect a variety of biological and fishery dependent data, monitor bycatch, and provide for regulatory enforcement (Barnhart et al. 2008). Data are collected on bycatch species, discarded and retained scallop harvest, harvest size composition, CPUE, meat recovery, and location, area and depth (Barnhart 2008). During the season, onboard observers e-mail tri-weekly reports detailing scallop harvest, number of tows, area fished, and crab bycatch. These harvest data are used to manage the fishery inseason and to track GHLs in Registration Area D and District 16. These data are also used to set GHLs for the following season, and are provided to local advisory committees (ACs), the Alaska Board of Fisheries (BOF), the North Pacific Fisheries Management Council (NPFMC), the National Marine Fisheries Service (NMFS), and the public to help answer questions pertaining to the weathervane scallop fishery in the Yakutat area (Barnhart et al. 2008).

CRAB BYCATCH LIMITS

Dungeness and Tanner crab are captured incidentally in scallop dredges in the Yakutat fishery. The estimated bycatch for District 16 and Registration Area D combined from 1993 through

1998 averaged 4,561 Tanner crab with a modal carapace width of approximately 28 mm and 966 juvenile Dungeness crab annually (Barnhart and Rosenkranz 2000). From the 1999/00 season through the 2010/11 season, the average estimated Tanner bycatch in Registration Area D and District 16 combined increased to 8,229, while the average estimated Dungeness bycatch decreased to 415 (Table 2.3). At its peak from 1980/81 through the 1990/91 seasons the Yakutat Dungeness crab fishery averaged an annual harvest of 2.2 million lbs or approximately 1.1 million crabs. During its peak from 1972/73–1981/82 seasons the Yakutat Tanner crab fishery averaged an annual harvest of 1.3 million lbs or approximately 0.6 million crabs (ADF&G 2002; Hebert et al. 2005).

Tanner crab bycatch caps are established for each management area or district except in the Yakutat area. These bycatch caps are based on the most recent Tanner crab trawl survey population estimate in each area. They are calculated as 1 percent of the surveyed population in areas where a commercial crab fishery has opened in the most recent season and .5 percent if it has not opened. Although the ASFMP states that bycatch limits may be required for scallop fisheries opened by permit, no bycatch limits have been established to date for the regular fishery in the Yakutat area. This is both because there is no annual survey to use to estimate populations of Tanner and Dungeness crab in the Yakutat area and because the observed bycatch of crab in the scallop fishery in this area is low in comparison to that of other areas (Barnhart and Rosenkranz 2000).

PERMITS AND REGISTRATION

Regulations specific to the Yakutat area date back to 1960. Between 1960 and 1969, the definition of legal gear was very broad; any device capable of being dragged on the ocean floor and taking scallops was legal, including longlines, trawls, and dredges. Declining harvest during the mid-1970s led to the deletion of longlines as legal gear in 1976, and of trawls in 1981. Permits were required of scallop dredgers from 1979 to 1985. The first closure of Yakutat Bay by regulation occurred in 1992.

In 1995, all of Registration Area D and District 16 in Registration Area A were combined into Scallop Registration Area D to expedite scallop management. Before the areas were combined, vessel operators had to return to Yakutat, deliver scallops caught in an area, void their registration, and register for the new area before they could fish in it. Under the current definition, vessels can fish in either area after reporting their intentions by radio to the management office in Yakutat.

MANAGEMENT CONCERNS

The Yakutat registration area is the only scallop registration area in Alaska that currently does not have crab bycatch caps in place. While red king crab bycatch is virtually nonexistent, and Dungeness crab bycatch is currently at very low levels, Region I shellfish management is concerned about the increasing amount of Tanner crab bycatch in the Yakutat registration area scallop fishery. Tanner crab bycatch has increased steadily in the last three full seasons, reaching a level of just under 15,000 crabs in the 2010/11 season (Table 2.3). This was the second highest amount of Tanner crab bycatch in the last eighteen full seasons, eclipsed only by the 2000/01 season when roughly 18,000 crabs were caught. Region I shellfish management will begin to explore means by which to set an equitable Tanner crab bycatch cap prior to the 2012/13 season.

Since Tanner crab bycatch caps will be a significant change to the Yakutat scallop fishery, industry will be made aware of any Tanner crab bycatch cap before it is implemented.

In addition to the lack of Tanner crab bycatch caps, the Yakutat registration area also differs from other areas in the amount of area closed to dredging. While scallop registration areas in Prince William Sound, Cook Inlet, Alaska Peninsula, Bering Sea, and Dutch Harbor have significant portions closed to dredging, the only water closed to dredging in the Yakutat area is Yakutat Bay. There is currently a vessel-based limited entry system in effect for the statewide scallop fishery in all state waters. Should the sunset date expire on the vessel based limited entry system now in effect for state waters - as it nearly did in 2008 before the sunset date was changed to December 31, 2013 - the fishery in state waters would revert to an open-entry fishery. With the large amount of open state waters in the Yakutat area it is likely that the inception of an open-entry fishery would attract effort to the Yakutat area. This would lead to more complicated management with differing amounts of effort on either side of the state and federal boundary. It would also very likely lead to higher amounts of Tanner crab bycatch than currently occurs, especially if no Tanner crab bycatch caps are instituted prior to the expiration of the sunset date.

STOCK ASSESSMENT

The weathervane scallop population in the Yakutat area is not annually surveyed and no estimate of abundance has been made. Statewide scallop research staff has been in the process of transitioning from dredge surveys to surveys using a camera in a towed sled. Initial tests of the camera survey have been conducted in the Yakutat area in 2002 and 2006 (Rosenkranz 2008; personal communication). As scallop survey technology is advanced, this population will likely be more regularly surveyed in the future.

RECENT SEASONS

2008/09 SEASON SUMMARY

Overview

Observer data from the 2008/09 season (Rosenkranz, 2009 memorandum) indicated stable catch rates, no evidence of localized depletion within beds, and a drop in Tanner bycatch. Industry reported that scallop quality in both Area D and District 16 was the best they'd seen in those areas since they began fishing them in 1997. Specifically in Area D, industry reported the largest shucked meat size they had seen. In District 16, industry noted very high quality and larger than usual meats for the area. Weak meat scallops, noted earlier in the decade, were no longer prevalent in the harvest.

Registration Area D

The 2008/09 commercial scallop season in Registration Area D opened on July 1, 2008 and achieved its GHL of 150,000 lbs on August 29, 2008. A harvest of 150,289 lbs of shucked meats was taken by three permits (Table 2.1).

District 16

The 2008/09 fishery in District 16 fishery opened on July 1, 2008 and achieved its GHL of 21,000 lbs on August 24, 2008. Harvest and effort data are confidential since only one permit made landings in District 16 (Table 2.2).

2009/10 SEASON SUMMARY

Overview

Observer data from the 2009/10 season (Rosenkranz, 2010 memorandum) indicated stable catch rates, no evidence of localized depletion in 5 out of 6 beds, a shift in effort within Area D, and a sharp increase in Tanner bycatch.

Registration Area D

Prior to the start of the 2009/10 season, Region I Shellfish increased the GHL for Registration Area D from 150,000 lbs to 160,000 lbs (<10%) to take advantage of large, high quality scallops seen in shell-height histograms at its largest size in the last eight seasons. Other factors considered in making the slight GHL increase were stable catch rates and no evidence of localized depletion since the last GHL adjustment prior to the 2006/07 season. The 2009/10 commercial scallop season in Registration Area D started on July 1, 2009 and achieved its GHL of 160,000 lbs on September 25, 2009. Harvest and effort data are confidential since only two permits made landings in Registration Area D (Table 2.1).

District 16

Prior to the start of the 2009/10 season, Region I Shellfish increased the GHL for District 16 20% from 21,000 lbs to 25,000 lbs proposing to take advantage of large, high quality scallops, seen in shell-height histograms as at its largest size since the 2002/03 season. Other factors considered in making the GHL increase included evidence of a larger than average recruitment event in the shell-height histograms, no evidence of localized depletion, and stable catch rates since the last GHL adjustment prior to the 2006/07 season. The 2009/10 District 16 fishery opened on July 1, 2009 and did not achieve its GHL of 21,000 lbs by the regulatory closing date of February 15, 2010. Harvest and effort are confidential as less than 3 vessels participated (Table 2.2).

2010/11 SEASON SUMMARY

Overview

Observer data from the 2010/11 season (Rosenkranz, 2011 memorandum) indicated stable catch rates and no evidence of localized depletion. Also noted was a shift of effort within Registration Area D, a pulse of small scallops (<70mm) in Registration Area D, and continued high Tanner bycatch.

Registration Area D

The 2010/11 commercial scallop season in Registration Area D opened on July 1, 2010 and did not achieve its GHL of 160,000 lbs by the regulatory closing date of February 15, 2011. A harvest of 157,685 lbs of shucked meats was taken by three permits (Table 2.1).

District 16

The 2010/11 fishery in District 16 fishery opened on July 1, 2010 and did not achieve its GHL of 21,000 lbs by the regulatory closing date of February 15, 2011. Harvest and effort data are confidential since only one permit made landings in District 16 (Table 2.2).

2011/12 SEASON OUTLOOK

In the 2011/12 season, industry is currently targeting a 160,000 lb GHL in Registration Area D and a 25,000 lb GHL in District 16. There has been harvest in both management areas and management staff continues to track harvest through tri-weekly observer reports from the grounds. Management staff will close each fishery area by emergency order if the GHLs are reached prior to the February 15, 2012 regulatory closing date.

The 2011/12 fishing season was the first in which weathervane scallop GHLs were set under federal annual catch limit (ACL) requirements promulgated by changes to the *Magnuson-Stevens Fishery Conservation and Management Act* (MSA). These changes require that an acceptable biological catch (ABC) and ACL be set annually for the weathervane scallop resource and are meant to prevent exceeding the overfishing level (OFL). The weathervane scallop OFL, ABC, and ACL are set as a statewide level and the combined statewide scallop GHLs and other weathervane scallop removals may not exceed the ACL on an annual basis. The statewide ABC and ACL are equal and set at 90% of the statewide weathervane scallop OFL. This level does not constrain the 2011/12 statewide GHL.

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CHAPTER 2–YAKUTAT SCALLOP FISHERY TABLES AND FIGURES

Table 2.1.–Registration Area D historic commercial harvest and effort for weathervane scallops.

Year or Season	Harvest (pounds shucked meat)	Permits	Landings	Pounds per permit	Pounds per landing
1969	836,807	14	59	59,772	14,183
1970	[a]	[a]	[a]	[a]	[a]
1971	84,948	3	10	28,316	8,495
1972	128,241	4	6	32,060	21,374
1973	173,700	4	4	43,425	43,425
1974	[a]	[a]	[a]	[a]	[a]
1975	139,022	6	11	23,170	12,638
1976	189,543	6	15	31,591	12,636
1977	[a]	[a]	[a]	[a]	[a]
1978	0	0	0	0	0
1979	30	1	1	30	30
1980	255,667	8	22	31,958	11,621
1981	455,858	12	36	37,988	12,663
1982	168,353	7	24	24,050	7,015
1983	0	0	0	0	0
1984	74,010	3	15	24,670	4,934
1985	[a]	[a]	[a]	[a]	[a]
1986	98,513	3	19	32,838	5,185
1987	[a]	[a]	[a]	[a]	[a]
1988	[a]	[a]	[a]	[a]	[a]
1989	[a]	[a]	[a]	[a]	[a]
1990	442,310	9	49	49,146	9,027
1991	402,571	5	55	80,514	7,319
1992	1,063,838	9	70	118,204	15,198
1993	264,193	10	16	26,419	16,512
1994	253,060	12	18	21,088	14,059
1995	242,491	10	18	24,249	13,472
1996	238,736	5	15	47,747	15,916
1997	242,940	4	8	60,735	30,368
1998/99	240,086	7	49	34,298	4,900
1999/00	249,681	3	22	83,227	11,349
2000/01	195,699	3	34	65,233	5,756
2001/02	[a]	[a]	[a]	[a]	[a]
2002/03	[a]	[a]	[a]	[a]	[a]
2003/04	[a]	[a]	[a]	[a]	[a]
2004/05	[a]	[a]	[a]	[a]	[a]
2005/06	199,351	3	38	66,450	5,246
2006/07	150,041	3	16	50,014	9,378
2007/08	[a]	[a]	[a]	[a]	[a]
2008/09	150,289	3	21	50,096	7,157
2009/10	[a]	[a]	[a]	[a]	[a]
2010/11	157,685	3	23	52,562	6,856
Averages	201,418	4	21	45,261	10,127

[a] Fewer than 3 permits were fished; information is confidential.

Table 2.2.–District 16 historic commercial harvest and effort for weathervane scallops.

Year or Season	Harvest, lbs shucked meat	Permits	Landings	Pounds per permit	Pounds per landing
1980	[a]	[a]	[a]	[a]	[a]
1981	[a]	[a]	[a]	[a]	[a]
1982	[a]	[a]	[a]	[a]	[a]
1983	[a]	[a]	[a]	[a]	[a]
1984	0	0	0	0	0
1985	0	0	0	0	0
1986	0	0	0	0	0
1987	0	0	0	0	0
1988	0	0	0	0	0
1989	0	0	0	0	0
1990	148,624	5	8	29,725	18,578
1991	39,817	3	9	13,272	4,424
1992	[a]	[a]	[a]	[a]	[a]
1993	[a]	[a]	[a]	[a]	[a]
1994	27,613	9	10	3,068	2,761
1995	33,302	7	8	4,757	4,163
1996	[a]	[a]	[a]	[a]	[a]
1997	22,890	4	5	5,723	4,578
1998/99	[a]	[a]	[a]	[a]	[a]
1999/00	[a]	[a]	[a]	[a]	[a]
2000/01	30,904	3	11	10,301	2,809
2001/02	[a]	[a]	[a]	[a]	[a]
2002/03	[a]	[a]	[a]	[a]	[a]
2003/04	[a]	[a]	[a]	[a]	[a]
2004/05	[a]	[a]	[a]	[a]	[a]
2005/06	[a]	[a]	[a]	[a]	[a]
2006/07	[a]	[a]	[a]	[a]	[a]
2007/08	[a]	[a]	[a]	[a]	[a]
2008/09	[a]	[a]	[a]	[a]	[a]
2009/10	[a]	[a]	[a]	[a]	[a]
2010/11	[a]	[a]	[a]	[a]	[a]
Averages	18,991	2	4	7,684	3,507

[a] Confidential data, fewer than three permits fished.

Table 2.3.–Scallop Registration Area D (Yakutat) annual bycatch of Tanner, Dungeness, and king crab (updated from Barnhart and Rosenkranz 2000).

Year or Season	District 16			Registration Area D		
	Tanner	King	Dungeness	Tanner	King	Dungeness
1993	NA	NA	NA	1,700	40	351
1994	10	0	15	2,370	0	179
1995	469	0	93	3,751	0	2,379
1996	708	0	140	9,463	0	2,358
1997	129	0	1	5,884	0	277
1998/99	273	0	0	8,891	0	177
1999/00	48	0	0	4,993	0	584
2000/01	627	0	0	17,395	0	313
2001/02	833	0	22	6,770	0	1,150
2002/03	185	0	32	8,423	0	779
2003/04	0	0	0	1,650	0	905
2004/05	0	0	21	863	0	223
2005/06	175	0	0	5,189	0	394
2006/07	174	0	21	7,961	0	159
2007/08	12	0	170	13,429	0	145
2008/09	189	0	0	2,416	0	10
2009/10	1,009	0	23	11,609	0	0
2010/11	92	0	24	14,707	0	0
Average	290	0	33	7,081	2	577

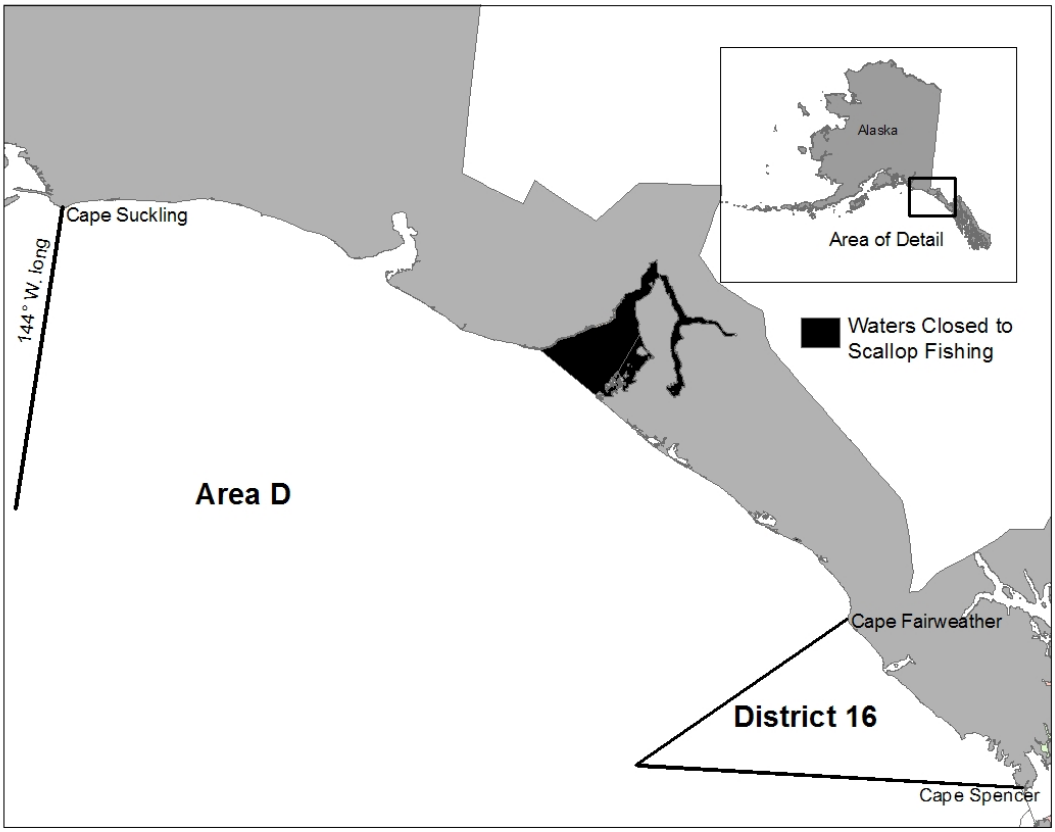

Figure 2.1.–Yakutat weathervane scallop fishing registration area and closed waters.