

Fishery Management Report No. 06-41

**Annual Management Report for the Commercial
Weathervane Scallop Fisheries in Alaska's Westward
Region, 2004/05**

by

Jeffrey P. Barnhart

July 2006

Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



Symbols and Abbreviations

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

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

FISHERY MANAGEMENT REPORT NO. 06-41

**ANNUAL MANAGEMENT REPORT FOR THE COMMERCIAL
WEATHERVANE SCALLOP FISHERIES IN ALASKA'S WESTWARD
REGION, 2004/05**

by

Jeffrey P. Barnhart

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

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1565

July 2006

The Cooperative Management of Statewide Weathervane Scallop Fisheries project is funded in part by a cooperative agreement from the National Oceanic and Atmospheric Administration under Federal Grant NA04NMF4370176. The views expressed herein are those of the author and do not necessarily reflect the views of NOAA or any of its subagencies.

The Division of Sport Fish Fishery Management Reports series was established in 1989 for the publication of an overview of Division of Sport Fish management activities and goals in a specific geographic area. Since 2004, the Division of Commercial Fisheries has also used the Fishery Management Report series. 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.sf.adfg.state.ak.us/statewide/divreports/html/intersearch.cfm>. This publication has undergone regional peer review.

*Jeffrey P. Barnhart,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
211 Mission Road, Kodiak, Alaska 99615, USA*

This document should be cited as:

Barnhart, J. P. 2006. Annual management report for the commercial weathervane scallop fisheries in Alaska's Westward Region, 2004/05. Alaska Department of Fish and Game, Fishery Management Report No. 06-41, Anchorage.

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

If you believe you have been discriminated against in any program, activity, or facility, or if you desire further information please write to ADF&G, P.O. Box 25526, Juneau, AK 99802-5526; U.S. Fish and Wildlife Service, 4040 N. Fairfax Drive, Suite 300 Webb, Arlington, VA 22203 or O.E.O., U.S. Department of the Interior, Washington DC 20240.

For information on alternative formats for this and other department publications, please contact the department ADA Coordinator at (voice) 907-465-6077, (TDD) 907-465-3646, or (FAX) 907-465-6078.

TABLE OF CONTENTS

	Page
LIST OF TABLES.....	ii
LIST OF FIGURES.....	ii
ABSTRACT.....	1
INTRODUCTION.....	1
MANAGEMENT HISTORY.....	2
Historic Management Measures.....	2
CURRENT MANAGEMENT.....	3
Observer Program.....	5
Industry.....	6
KODIAK REGISTRATION AREA.....	6
Historic Background.....	6
2004/05 Fishery.....	7
Northeast District.....	7
Stock Status.....	8
Shelikof District.....	8
Stock Status.....	9
Semidi Island District.....	9
Stock Status.....	9
ALASKA PENINSULA REGISTRATION AREA.....	9
Historic Background.....	9
2004/05 Fishery.....	10
Stock Status.....	10
BERING SEA REGISTRATION AREA.....	10
Historic Background.....	10
2004/05 Fishery.....	10
Stock Status.....	11
DUTCH HARBOR REGISTRATION AREA.....	11
Historic Background.....	12
2004/05 Fishery.....	12
Stock Status.....	12
ADAK REGISTRATION AREA.....	12
Historic Background.....	12
2004/05 Fishery.....	13
Stock Status.....	13
ACKNOWLEDGEMENTS.....	13
REFERENCES CITED.....	13
TABLES AND FIGURES.....	15

LIST OF TABLES

Table	Page
1. Historic statewide commercial weathervane scallop catch, number of vessels, and number of landings, 1967 - 2004/05.	16
2. Federal and State Weathervane Scallop Permits, 2004.	18
3. Crab bycatch limits by registration area and district, in percent of the crab abundance estimate or number of crab.	19
4. Historic commercial catch, effort, and value of weathervane scallops, Kodiak Registration Area, 1967 - 2004/05.	20
5. Kodiak Registration Area, Northeast District, scallop fishery summary statistics, 1993/94 – 2004/05.	22
6. Commercial harvest, average shell height from retained catch, and catch per unit effort from observer data, Westward Region, 1993/94 - 2004/05.	23
7. Estimated round weight of the retained commercial scallop catch and catch per unit effort, Westward Region, 1993/94 - 2004/05.	24
8. Kodiak Registration Area, Shelikof District, scallop fishery summary statistics, 1993/94 – 2004/05.	25
9. Kodiak Registration Area, Semidi Island District, scallop fishery summary statistics, 1993/94 – 2004/05.	26
10. Historic commercial catch, effort and value of weathervane scallops, Alaska Peninsula Registration Area, 1975 - 2004/05.	27
11. Alaska Peninsula Registration Area scallop fishery summary statistics, 1993/94 – 2004/05.	28
12. Historic commercial catch, effort and value of weathervane scallops, Bering Sea Registration Area, 1987 - 2004/05.	29
13. Bering Sea Registration Area scallop fishery summary statistics, 1993/94 – 2004/05.	30
14. Historic commercial catch, effort, and value of weathervane scallops, Dutch Harbor Registration Area, 1982 - 2004/05.	31
15. Dutch Harbor Registration Area scallop fishery summary statistics, 1993/94 – 2004/05.	32

LIST OF FIGURES

Figure	Page
1. Major weathervane scallop fishing locations in coastal waters of Alaska.	33
2. State of Alaska weathervane scallop fishing registration areas.	34
3. Kodiak weathervane scallop fishing registration area and closed waters.	35
4. Kodiak Northeast District scallop shell heights from resampling observer data, 1997/98 - 2004/05.	36
5. Weathervane scallop harvest by round weight, shucked meat weight, dredge hours, and CPUE, Northeast District, Kodiak Registration Area, 1993/94 - 2004/05.	37
6. Kodiak Shelikof District scallop shell heights from resampling observer data, 1997/98 - 2004/05.	38
7. Weathervane scallop harvest by round weight, shucked meat weight, dredge hours, and CPUE, Shelikof District, Kodiak Registration Area, 1993/94 - 2004/05.	39
8. Alaska Peninsula weathervane scallop fishing registration area and closed waters.	40
9. Bering Sea weathervane scallop fishing registration area and closed waters.	41
10. Bering Sea Registration Area scallop shell heights from resampling observer data, 1997/98 - 2004/05.	42
11. Weathervane scallop harvest by round weight, shucked meat weight, dredge hours, and CPUE, Bering Sea Registration Area, 1993/94 - 2004/05.	43
12. Dutch Harbor weathervane scallop fishing registration area and closed waters.	44
13. Adak weathervane scallop fishing registration area and closed waters.	45

ABSTRACT

The Alaska Department of Fish and Game (ADF&G), Westward Region, includes all waters of the Territorial Sea and Exclusive Economic Zone (EEZ) in the Gulf of Alaska south of Cape Douglas (58° 51.10' N lat.) and west of 149° W long. and the Bering Sea to the U.S.-U.S.S.R. Maritime Boundary Agreement Line of 1990. This report presents details on the historic and present-day fishery management measures for the commercial weathervane scallop *Patinopecten caurinus* fishery occurring in the Kodiak, Alaska Peninsula, Bering Sea, Dutch Harbor, and Adak Registration Areas. A synopsis of the 2004/05 fishing season and stock status is discussed for each scallop registration area.

The Alaska Scallop Fishery Management Plan, 5 AAC 38.076 (g), allows ADF&G to require a vessel to carry an onboard observer unless the department determines that carrying an observer in that fishery will not serve the purpose of the onboard observer program. Management relies heavily on observer-collected data to help manage the weathervane scallop fishery. Onboard observers greatly enhance management, primarily by facilitating information gathering and by improving regulatory compliance.

Key words: Weathervane scallop, Westward Region, fishery observer, Kodiak, Alaska Peninsula, Bering Sea, Dutch Harbor, Adak, Aleutian Islands, Fishery Management Plan, crab bycatch, fishery cooperative

INTRODUCTION

Alaskan weathervane scallop *Patinopecten caurinus* populations were first evaluated for commercial potential in the early 1950s by both government and private sector research (Kaiser 1986). However, it was not until the late 1960s as catches declined in the United States and Canadian scallop fisheries on Georges Bank, that interest in a fishery off Alaska began to take shape (Orensanz 1968). Initial commercial fishing effort took place in 1967 when two vessels harvested weathervane scallops from fishing grounds off the east side of Kodiak Island. By the following year, 19 vessels consisting of New England-type scallop vessels, converted Alaskan crab boats, salmon seiners, halibut longliners, and shrimp trawlers entered the fishery (Kaiser 1986). The commercial fishery in Alaska progressed through several developmental phases. From 1967 through 1973, virgin scallop beds throughout the state were identified and exploited. This was followed by a period of declining scallop harvests from 1974 to the end of the decade. A smaller, more stable harvest followed through the 1980s (Shirley and Kruse 1995). In the early 1990s, the fishery again expanded with an influx of scallop boats from the east coast of the United States (Table 1).

In 1997, participation in the Alaska weathervane scallop fishery was limited by vessel moratoria in both federal and state waters. By 2001, a federal license limitation program (LLP) replaced the federal moratorium permanently limiting participation in the exclusive economic zone (EEZ). During the same year, the majority of vessel owners formed a fishing cooperative. The result of these actions, associated with a conservative management approach by the Alaska Department of Fish and Game (ADF&G), has been a reduction in the statewide scallop harvest since the late 1990s (Table 1).

The fishery changed in the 1990s from one distinguished by short trips with numerous deliveries each season to one of long trips with fewer deliveries as the majority of the fleet converted from icing to freezing of the product on board the vessel (Barnhart 2000). Between the 1990 and 1994/95 seasons when the product was iced on board and delivered fresh, the fleet averaged 136 deliveries per year (Table 1). Of the 136 deliveries, 114 were made by vessels participating in the statewide fishery (outside of Cook Inlet). By 1996, all scallop catcher boats participating exclusively in the statewide fishery (outside of Cook Inlet) were converted to catcher-processors

with freezing capability. Freezing product onboard allowed longer trips. As a result, the annual average number of deliveries between 1996/97 and 2002/03 for the catcher-processor fleet operating exclusively in the statewide fishery (outside of Cook Inlet), decreased to 20. However, the average number of deliveries over the same time period, including the Cook Inlet fishery, was 27. During the most recent season, 2004/05, the catcher-processor fleet operating exclusively in the statewide fishery, made 16 deliveries. During the same time period, the number of deliveries for all scallop vessels and all registration areas combined was 22.

Variable quantities of weathervane scallops are found in patchy distribution along the continental shelf from Southeast Alaska to the Bering Sea and Aleutian Islands. Scallop “beds” are typically elongated and oriented in a north-south direction consistent with prevailing currents parallel to Alaska’s coastline. Major scallop fishing locations in Alaska coastal waters are shown in Figure 1. Scallops are typically found at depths of 20–125 fathoms (120-750 feet), with the majority of the fishing effort occurring between 40 and 60 fathoms (240 and 360 feet; Barnhart and Rosenkranz 2000). Statewide, during the 2004/05 scallop season, a maximum of 97 nmi² were fished as calculated by area swept estimates. Bottom substrate types inhabited by weathervanes are variable throughout the state and include mud, clay, silt, sand, and pebble.

There are nine scallop fishing registration areas in Alaska (Figure 2). Unless otherwise indicated, this report describes fisheries within the ADF&G Westward Region (Registration Area J), including Kodiak (Area K), Alaska Peninsula (Area M), Bering Sea (Area Q), Dutch Harbor (Area O), and Adak (Area R) scallop registration areas. Registration Area J includes all waters of the Territorial Sea and EEZ in the Gulf of Alaska south of Cape Douglas (58° 51.10' N lat.), west of 149° W long. and the Bering Sea to the U.S.-U.S.S.R. Maritime Boundary Agreement Line of 1990.

MANAGEMENT HISTORY

HISTORIC MANAGEMENT MEASURES

Prior to an influx of boats from the east coast of the U. S. into the Alaska weathervane scallop fishery in the early 1990s, the fishery was open year-round in many parts of the state, without harvest restrictions. However, vessels were registered to fish under a commissioner’s permit, which could stipulate location and duration of harvest, limit gear and other harvest procedures, and require periodic or annual reporting. ADF&G required all vessels fishing scallops in Alaska to register with the state. Under federal law, because vessels were registered with the state, the state could regulate the fishery in federal waters. By 1993, scallop fishery management changed in response to increased effort. The fishery was declared to be a high impact and emerging fishery on May 21, 1993 by the Commissioner of ADF&G and was closed until a conservative management plan could be developed by the department. The resulting interim Alaska Scallop Fishery Management Plan approved by the ADF&G Commissioner in 1993 and established as regulation 5 AAC 38.076 by the Alaska Board of Fisheries (BOF) in 1994 includes a provision for onboard observer coverage, measures designed to limit efficiency and slow the pace of fishing, gear regulations that reduce the capture rate of small scallops, and crab bycatch limits.

At the BOF meeting in March 1994, the Westward Region regulatory season was established as July 1 through February 15. At the March 1997 BOF meeting, the regulatory season in all registration areas of the state, except the Cook Inlet Registration Area, was also established as July 1 through February 15. Although season dates were established to protect molting and

mating crab, they have the added benefit of not disturbing scallops prior to and during their spawning period of May through early-July.

Federal regulatory actions also changed the fishery. In January 1995, the captain of a scallop vessel returned his 1995 scallop interim use permit card to the Commercial Fisheries Entry Commission (CFEC) in Juneau and proceeded to harvest scallops in the Gulf of Alaska EEZ with disregard to harvest limits, observer coverage, and all other state regulatory and management measures. In response to the uncontrolled fishing for scallops in the EEZ by this single vessel outside the jurisdiction of the state of Alaska, the fishery was closed by the federal government from February 23, 1995 to August 1, 1996. Fishing in the EEZ was initially closed by federal emergency rule (60 FR 11054). Subsequent to expiration of the emergency rule on May 30, 1995, it was extended by the National Marine Fisheries Service (NMFS) for an additional 90 days through August 28, 1995. The emergency rule was activated to control unregulated scallop fishing in federal waters until a federal fishery management plan (FMP) could be adopted closing the fishery in federal waters. Prior to the August 28, 1995 emergency rule expiration date, the North Pacific Fishery Management Council (NPFMC) submitted a draft FMP that closed federal waters to scallop fishing for up to one year, with an expiration date of August 28, 1996. Amendment 1 to the FMP became effective August 1, 1996 allowing the fishery to reopen in federal waters. Scallop fishing in state waters, scheduled to open July 1, 1996, was delayed until August 1, 1996 to coincide with the federal water opening. Amendment 2 to the Fishery Management Plan for the Scallop Fishery off Alaska (FMP) was approved on April 11, 1997 (62 FR 17749). Amendment 2 established a federal moratorium on the entry of new vessels into the fishery. The vessel moratorium remained in effect until June 30, 2000. The moratorium was replaced by the LLP that became effective on January 16, 2001. Between June 30, 2000 and January 16, 2001 the fishery was in open access status. In 1998, Amendment 3 to the federal FMP delegated authority to the state of Alaska to manage all aspects of the scallop fishery in federal waters, except limited access (Barnhart 2000). This included the authority to regulate vessels not registered under the laws of Alaska. There have been a total of 10 amendments to the scallop FMP.

In 1997, the Alaska legislature enacted a temporary moratorium, AS 16.43.906, on vessels for state waters (0-3 nautical miles). In 2001, the legislature authorized a 3-year extension of the moratorium, with an expiration date of July 1, 2004. Passage of HB206 during the 2002 legislative session, resulted in changes to the limited entry statutes allowing for a vessel-based limited entry program. The CFEC adopted regulations 20 AAC 05.1400 through 20 AAC 05.1444 to establish a vessel permit limited entry system for the statewide weathervane scallop fishery prior to the moratorium expiration on July 1, 2004.

CURRENT MANAGEMENT

The weathervane scallop fishery, in both state and federal waters, is managed by the ADF&G. Provisions of the Magnuson-Stevens act and the scallop FMP apply in federal waters. Vessels eligible to fish in the EEZ are limited by the LLP, while vessels in state waters (0-3 nautical miles) are limited by a state limited entry vessel permit (Table 2).

Section 303(a)(7) of the Magnuson-Stevens Act requires all FMPs to describe and identify Essential Fish Habitat (EFH), which it defines as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” In addition, FMPs must minimize effects on EFH caused by fishing and identify other actions to conserve and enhance EFH. These

EFH requirements are detailed in Amendment 5 to the FMP for the Scallop Fishery off Alaska (NPFMC 2005). The scallop fishery does not occur on any areas designated as Habitat Areas of Particular Concern (HAPC). According to the Environmental Impact Statement (EIS) for EFH Identification and Conservation in Alaska, the potential impacts on EFH from the scallop fishery are “minimal and temporary” (NMFS 2005).

The regulatory fishing season is from July 1 through February 15 or unless closed by emergency order. Scallop guideline harvest ranges (GHRs) and crab bycatch limits for the 2004/05 season were announced by news release on June 4, 2004. The upper limit of the GHRs in the Westward Region totaled 395,000 lb.

Crab Bycatch Limits (CBLs) for red king crabs *Paralithodes camtschaticus*, Tanner crabs *Chionoecetes bairdi* and snow crabs *Chionoecetes opilio* have been established for registration areas and districts within the weathervane scallop fishery. Hybrid *Chionoecetes* crabs are included in the snow crab CBL. Each registration area or district has separate CBLs. The bycatch of crabs in the scallop fishery is controlled through the use of the CBLs. The state first instituted CBLs in July 1993. Methods used to determine CBLs in 1993 were approved by the ADF&G Commissioner and in 1994 were approved by the BOF and also the NPFMC (FMP Amendment 1) and, with few exceptions, remain unchanged. Annual CBLs are established pre-season by the ADF&G based on the most current crab resource abundance information. However, in some registration areas or districts, the CBL is a fixed number of crabs and is not adjusted seasonally.

In the Kodiak, Alaska Peninsula, and Dutch Harbor Registration Areas, the CBLs are set at 0.5% or 1.0% of the total crab stock abundance estimate based on the most recent survey data (Table 3). In registration areas or districts where red king crab or Tanner crab abundance is sufficient to support a commercial crab fishery, the cap is set at 1.0% of the most recent red king crab or Tanner crab abundance estimate. In registration areas or districts where the red king crab or Tanner crab abundance is insufficient to support a commercial fishery, the CBL is set at 0.5% of the most recent red king crab or Tanner crab abundance estimate. Bycatch caps are expressed in numbers of crabs and include all sizes of crabs caught in the scallop fishery.

In the Kamishak District of the Cook Inlet Registration Area, the Tanner crab bycatch limit is fixed at 0.5% of the total crab stock abundance and the red king crab limit is fixed at 60 crabs. In the Prince William Sound Registration Area the CBL for Tanner crab is fixed at 0.5% of the total crab stock abundance, although this is a recent change from a fixed number of crabs.

CBLs in the Bering Sea (Registration Area Q) have evolved from fixed numbers in 1993 to a three tier approach used in the current fishery. In 1993, Bering Sea CBLs were set by the ADF&G to allow the fleet adequate opportunity to explore and harvest scallop stocks while protecting the crab resource. CBLs were established at 260,000 Tanner and snow crab combined and 17,000 red king crabs. In 1995, ADF&G recommended that CBLs be established at 0.003176% of the best available estimate of *C. opilio* (snow crab) and 0.13542% of the best available estimate of Tanner crab abundance in Registration Area Q. That equated to 300,000 snow and 260,000 Tanner crabs based on 1994 crab abundance estimates in Registration area Q. In Amendment 1 of the federal scallop FMP, the NPFMC approved the CBLs established by the ADF&G. The NPFMC also recommended that king crab bycatch limits be set within a range of 500 to 3,000 crabs annually. Beginning with the 1996/97 fishing season, ADF&G took a conservative approach and set the red king crab limit in Registration Area Q at 500 red king crabs annually.

From the 1996/97 through 1998/99 scallop fishing seasons, the CBL for Tanner and snow crabs in the Bering Sea was established annually by applying the percentages established for snow and Tanner crab limits in Amendment 1 of the FMP. In 1998, consistent with the Tanner crab rebuilding plan in the Bering Sea, crab bycatch limits were modified utilizing a three tier approach.

The current three tier approach was established utilizing the bycatch limits established in Amendment 1 of the FMP, 300,000 snow crab and 260,000 Tanner crab. The three tiers include (1) Tanner crab spawning biomass above minimum stock size threshold (MSST); bycatch limit is set at 260,000 crabs, (2) Tanner crab spawning biomass below MSST; bycatch limit is set at 130,000 crabs, and (3) Tanner crab spawning biomass is below MSST and the commercial fishing season is closed; Tanner crab limit is set at 65,000 crabs. A similar three tier approach was taken with the snow crab bycatch caps. The three tiers include (1) snow crab spawning biomass above the MSST; bycatch limit is set at 300,000 crabs, (2) snow crab spawning biomass below MSST; bycatch limit is set at 150,000 crabs, and (3) snow crab spawning biomass below MSST and the commercial fishing season is closed; the snow crab limit is set at 75,000 crabs.

Closures based on the fleet reaching CBLs have decreased over the years since inception of CBLs in 1993, possibly due to decreased crab abundance (Barnhart and Rosenkranz 2003). During the 1993/94 season, four statewide areas were closed due to attainment of CBLs. Since the 2000/01 season, two areas have closed due to crab bycatch.

One management tool used by ADF&G when setting annual GHRs is evaluation of catch per unit effort (CPUE). Fishery-dependent data such as CPUE is affected by many variables and therefore must be used with caution. CPUE is expressed in two ways, scallop round weight and scallop meat weight. These are standardized to a dredge-hour, which is defined as one dredge towed for 60 minutes. Round weight represents the retained weight in lb of the live or whole animals. The round weight of retained scallops is estimated by the vessel operator for each tow by counting the number of bushels of retained scallops and multiplying by an estimated average weight per bushel. Processed product (scallop meat in the form of adductor muscles) is typically weighed directly during the case-up process. Therefore, CPUE based on scallop meat weight vs an estimate of round weight, provides a more standard measure of fishery performance across the fleet. Estimated round weight is used in conjunction with weighed scallop meats to determine estimated recovery rates, thus helping assure the accuracy of reported data.

OBSERVER PROGRAM

The Alaska Scallop Fishery Management Plan, 5 AAC 38.076 (g), allows ADF&G to require a vessel, in a scallop fishery with a guideline harvest range established by regulation, to carry an onboard observer unless the department determines that carrying an observer in that fishery will not serve the purpose of the onboard observer program. The primary purposes of the onboard scallop observer program are to collect a variety of biological and fishery-based data, monitor bycatch, and provide for regulatory enforcement. Data are collected on crab and halibut bycatch, discarded scallop catch, retained scallop catch, catch composition, CPUE, scallop meat-weight recovery, and location, area and depth fished (Barnhart and Rosenkranz 2003). Onboard observers report scallop harvest, number of tows, area fished, and crab bycatch to ADF&G tri-weekly during the season by radio, email, or satellite phone. Observer-collected data are used to manage the fishery in-season and to set GHRs for the following season. Data are provided to local advisory committees, BOF, NPFMC, NMFS and the public to help answer a myriad of

questions pertaining to the weathervane scallop fishery. These data have been invaluable for preparing EFH and HAPC documents. For analyzing fine-scale spatial and temporal impacts of the fishery, observer data are critical.

Onboard observer coverage is funded by industry through direct payments to independent contracting agents (Barnhart 2003). Independent contracting agents provide personnel that are trained at the University of Alaska North Pacific Fisheries Observer Training Center (OTC) in Anchorage, Alaska.

INDUSTRY

Prior to the 2000/01 regulatory season, six of the nine LLP owners formed a cooperative under authority of the Fishermen's Cooperative Marketing Act, 48 Stat. 1213 (1934), 15 U.S.C. § 521. No federal or state regulations established the cooperative, nor is it managed by the ADF&G or any federal agency. The cooperative is a voluntary association of vessels with no legal harvest allocation. That is, there is no direct harvest allocation under state or federal regulations. Within the cooperative, vessel owners allocate themselves shares of the scallop GHRs and CBLs based on historic participation in the fishery. The majority of the owners opted to remove their boats from the fishery and arranged for their co-op shares to be caught by others members of the cooperative. The formation of the cooperative extended the fishing season over a longer time period compared to the pre-cooperative fishery.

Vessel owners and operators within the cooperative, have taken an active role in developing measures aimed at reducing crab bycatch. Vessel operators provide their confidential inseason fishing information to an independent consulting company contracted by the cooperative. The independent consultant reviews the crab bycatch data, fishing location information, and scallop harvest, allowing for real-time identification of any high crab abundance areas discovered during the fishery. If at any time, an area of high crab abundance is identified, the co-op fleet is provided with location information and directed to avoid fishing in that area. This mechanism only works if vessel operators submit their fishing data and crab bycatch to the consultant in a timely fashion.

Vessel operators also voluntarily release their confidential fishing information to ADF&G so that it can be used in this and other reports to help the BOF make informed decisions on management issues in areas where few fishermen participate.

KODIAK REGISTRATION AREA

The Kodiak Registration Area (Area K) includes the waters of the Pacific Ocean south of the latitude of Cape Douglas (58° 51.10' N lat.), east of the longitude of Cape Kumlik (157° 27' W long.) and west of 149° W long. (Figure 3). The Kodiak Registration Area is comprised of the Northeast, Shelikof, and Semidi Island Districts. Extensive areas are closed to scallop fishing to protect crab habitat.

HISTORIC BACKGROUND

In 1967, when commercial fishing for weathervane scallops began in Alaska, vessel operators targeted fishing grounds along the east side of Kodiak Island. In 1968, 734,084 lb of scallop meats were landed from eight vessels (Table 4). The Kodiak scallop fishery peaked in 1970 when 1.4 million lb of scallop meats were landed from seven vessels. Catches declined by the mid-1970s with no participation in 1977 or 1978. Since 1979, landings have fluctuated from

24,826 lb to 689,497 lb of scallop meats, excluding 1995/96 when the scallop season in federal waters was closed by federal emergency rule and the Kodiak area season was closed by an ADF&G emergency order.

When the Alaska weathervane scallop fishery began in 1967, there were no closed seasons. Within two years from inception of the scallop fishery, concerns about dredging impacts on crab resources, specifically red king crab, began to develop. In 1969, by emergency order, the ADF&G closed extensive areas off the south end of Kodiak Island as well as Marmot Bay at the north end of Kodiak Island, to scallop fishing. These areas were closed due to concerns about crab bycatch and conflict with other gear types. Subsequently, the BOF adopted the department's recommendation, and closed both areas by regulation. During the early 1970s, to protect spawning, molting, or softshell red king crab, regulatory season opening dates of either June 1 or July 15 (depending upon geographical area) through March 31 were established by the BOF (Barnhart 2003). In 1990, to protect depressed red king and Tanner crab populations, the BOF closed scallop fishing in Kodiak's westside bays which had been previously closed to non-pelagic trawling. With development of the Alaska Scallop Fishery Management Plan in 1993, crab bycatch limits were developed for the Kodiak Area. In 1994, the regulatory season for weathervane scallops in the Westward Region was established by the BOF as July 1 through February 15.

2004/05 FISHERY

The 2004/05 scallop fishing season was open July 1, 2004 through February 15, 2005. Two catcher-processors fished in the Kodiak Registration Area. To facilitate distribution of fishing effort and crab bycatch limits, red king crab districts as described in 5 AAC 34.405 were utilized.

Northeast District

The Northeast District (Figure 3) of the Kodiak Registration Area as applied to the scallop fishery includes all waters northeast of a line extending 180° from the easternmost tip of Cape Barnabas, east of a line from the northernmost tip of Inner Point on Kodiak Island to the southernmost tip of Afognak Point, east of 152° 30' W long. in Shuyak Strait, and east of the longitude of the northernmost tip of Shuyak Island at 152° 20' W. long.

The GHR for the Northeast District was set at zero to 80,000 lb of shucked scallop meats (Table 5). For a second consecutive year, the GHR for the Northeast District of the Kodiak Registration Area was subdivided into harvest caps by individual statistical area or group of statistical areas. A statistical area is a defined block 30' of latitude by 1° of longitude in offshore waters, and smaller irregular areas inshore which are used as catch reporting areas for shellfish harvest (Urban 1996). The harvest cap in statistical area 525702 was 40,000 lb of shucked meats while the harvest cap in statistical area 525630 was 20,000 lb of shucked meats. The remaining 20,000 lb of the overall GHR was allocated to any other waters open to scallop fishing in the Northeast District.

Two catcher-processors participated in the fishery with initial effort in early July. Based on inseason observer reports, an estimated 30,000 Tanner crabs and no red king crabs were caught from a bycatch limit of 527,388 Tanner crabs and 40 red king crabs. Based on indications from observer reports that upper-end harvest caps would be met, statistical area 525630 was closed on July 19, 2004, statistical area 525702 was closed on July 31, 2004 and the remainder of the district was closed on August 10, 2004. The Northeast District scallop harvest as reported on fish tickets, totaled 80,105 lb of shucked meats (Table 5).

Figure 4 depicts the estimated shell height (SH) distributions of the retained and discarded scallop catch in the Northeast District, based on statistical resampling of the discarded and retained SH measurements in equal proportion. The plots depict annual recruitment to the Northeast District scallop population with above average recruitment in 2004/05, based on the estimated frequency of scallops <115 mm SH in the size distribution. A strong mode is evident between 105 and 115 mm SH. The average SH of retained scallops in the Northeast District during the 2004/05 season was 144 mm as compared to 145 mm SH during the previous season (Table 6).

A summary of the scallop catch in round weight (lb) of retained scallops, shucked meat weight (lb) of retained scallops, dredge hours, and CPUE expressed in lb of shucked scallop meats per dredge-hour (meat lb/drg-hr) from the 1993/94 through 2004/05 seasons is depicted in Figure 5. Since the 1999/2000 season, the fishery in this district is characterized by relatively steady effort (dredge hours), level harvest of shucked meats, and increasing to stable fishery performance as measured by CPUE in meat lb/drg-hr.

Stock Status

The weathervane scallop population in the Northeast District of the Kodiak Registration Area is not currently surveyed and no estimate of abundance has been made. There are currently no plans to survey this population. Since the 1999/2000 season, the commercial catch has remained level, ranging from 77,000 to 80,000 lb of shucked meats (Table 5). Over the same time period, the estimated round weight of the retained scallop catch ranged from 681,192 lb to 952,972 lb (Table 7).

Shelikof District

The Shelikof District of the Kodiak Registration Area includes all waters north of a line from the westernmost tip of Cape Ikolik to the southernmost tip of Cape Kilokak, west of a line from the northernmost tip of Inner Point on Kodiak Island to the southernmost tip of Afognak Point, west of 152° 30' W long. in Shuyak Strait, and west of the longitude of the northernmost tip of Shuyak Island at 152° 20' W long. (Figure 3).

The GHR for the Shelikof District was set at zero to 180,000 lb of shucked meats (Table 8). Two catcher-processors participated in the fishery with initial effort in late-July. Based on inseason observer reports, an estimated 35,188 Tanner crabs and no red king crabs were caught from a bycatch limit of 35,069 Tanner crabs and 25 red king crabs. Inseason observer reports indicated the CBL would be reached by December 9, 2005 prompting an emergency order closing the Shelikof District to scallop fishing on that date. The Shelikof District scallop harvest as reported on fish tickets, totaled 174,622 lb of shucked meats (Table 6).

Figure 6 depicts the estimated SH distributions of the retained and discarded scallop catch in the Shelikof District, based on statistical resampling of the discarded and retained SH measurements in equal proportion. Plots indicate annual recruitment to the population by the frequency of scallops <115 mm SH in the size distribution. In 2004/05, a strong mode occurred between 105 mm and 115 mm SH. A broad range of scallop sizes supports the fishery. The average SH of retained scallops in the Shelikof District during the 2004/05 season of 137 mm was similar to the average SH of 135 mm recorded the previous season. Since the 1993/94 season, the average annual SH has ranged from 128 mm to 140 mm (Table 6).

A summary of the scallop catch in round weight (lb) of retained scallops, shucked meat weight (lb) of retained scallops, dredge hours, and CPUE (meat lb/drg-hr) in the Shelikof District from 1993/94 through 2003/04 is depicted in Figure 7. CPUE decreased from 55 meat lb/drg-hr during the 2003/04 season to 50 meat lb/drg-hr in 2004/05 season (Table 8).

Stock Status

The weathervane scallop population in the Shelikof District of the Kodiak Registration Area is not currently surveyed. Experimental scallop video research was conducted in the Shelikof District in 2004. A scallop video stock assessment is planned for 2007. Between the 1998/1999 and 2003/04 seasons, the commercial catch has remained level, as the department allowed the annual harvest to reach the upper limit of the GHR, set at 180,000 lb of shucked meats. However, in 2004/05, the season was closed prior to reaching the GHR cap due to the attainment of the CBL. Between 1998/1999 and 2004/05, the estimated round weight of the retained scallop catch ranged from 1,641,608 lb to 2,129,025 lb, averaging 1,836,369 lb each season (Table 7).

Semidi Island District

The Semidi Island District of the Kodiak Registration Area includes all Pacific Ocean waters west of the longitude of Cape Kilokak (156° 20.22' W long.) and east of the longitude of Cape Kumlik at 157° 27' W long. (Figure 3). A GHR has not been developed for this district.

State waters of the Semidi Island District were closed to scallop dredging by the BOF at the March 2000 meeting; however, federal waters (EEZ) remain open. No fishing activity occurred in the Semidi Island District during the 2004/05 fishing season, although it was open from July 1, 2004 to February 15, 2005.

Since the 1993/94 season, harvest has ranged from zero to 55,487 lb of scallop meats (Table 9). Considering years when fishing occurred, CPUE ranged from 16 to 37 meat lb/drg-hr, which is lower than any other registration area or district within the Westward Region (Table 6).

Stock Status

The weathervane scallop population in the Semidi Island District is not surveyed and no estimate of abundance has been made. There are currently no plans to survey this population. No fishing effort has occurred since the BOF closed state waters to scallop fishing in 2000.

ALASKA PENINSULA REGISTRATION AREA

The Alaska Peninsula Registration Area (Area M) includes waters of the Pacific Ocean west of the longitude of Cape Kumlik (157° 27' W long.) and east of the longitude of Scotch Cap Light at 164° 44' W long. (Figure 8).

Areas closed to fishing include all state waters and offshore waters of Unimak Bight and Mitrofanina Island. Justification for the Unimak Bight closure adopted in the early 1970s was to protect king crab habitat. Closing the area to weathervane scallop fishing removed potential conflict with other gear types such as crab pots. The Mitrofanina Island closure was adopted in the mid-1980s to protect Tanner crabs.

HISTORIC BACKGROUND

Historic fishing effort for scallops in the Alaska Peninsula Registration Area was sporadic. Most catch and effort information prior to 1993 is confidential because few fishermen participated in

any given year. However, the average annual harvest during the nine years of participation prior to 1993 was 41,888 lb of scallop meats. The highest harvest occurred in 1982 when a reported 205,691 lb of shucked meats were landed from six vessels (Table 10). Since the 1993/94 season, CPUE has ranged from 24 to 61 meat lb/drg-hr (Table 11). Commercial harvest data from this registration area was misreported in the 1980s as evidenced in logbooks seized by Fish and Wildlife Protection agents. The extent of misreporting in the 1980s is unknown, but may have lead to artificially high catch data attributed to the Alaska Peninsula Registration Area in some years.

2004/05 FISHERY

In the Alaska Peninsula Registration Area, the historically important scallop grounds between 160° W long. and 161° W long. remained closed for stock conservation during the 2004/05 fishery. The remainder of the Alaska Peninsula Registration Area opened with a GHR of 0-10,000 lb.

STOCK STATUS

The weathervane scallop population in the Alaska Peninsula Registration Area is not currently surveyed and no estimate of abundance has been made. There are currently no plans to survey this population.

BERING SEA REGISTRATION AREA

The Bering Sea Registration Area (Area Q) includes waters of the Bering Sea north of a line extending from the latitude of Cape Sarichef at 54° 36' N lat. to 171° W long., north to 55° 30' and west to the U.S.-U.S.S.R. Maritime Boundary Agreement Line of 1990 (Figure 9). Large portions of the eastern Bering Sea shelf and the Pribilof Islands Habitat Conservation Area are closed to scallop fishing to protect blue king crab *Paralithodes platypus*, red king crab, juvenile Pacific halibut *Hippoglossus stenolepis*, and to provide for habitat conservation.

HISTORIC BACKGROUND

ADF&G records indicate that scallops were first harvested from the Bering Sea in 1987, and then again in 1990 and 1991 (Table 12). During those years, few fishermen participated in any given year, so catch and effort information is confidential. However, the average annual catch for the three confidential years was 68,189 lb of shucked meats. No additional landings were made from this area until calendar year 1993 (January 1-June 30, 1993 and 1993/94 regulatory seasons combined) when 605,953 lb of scallop meats were landed from ten different vessels. During the 1994/95 fishery, 505,439 lb of shucked meats were landed from eight different vessels. The 1995/96 fishery was closed by federal emergency rule. Between the 1993/94 and 1999/2000 regulatory seasons, scallop catches were constrained by Tanner crab or snow crab CBLs. Over this same time period, catches averaged 127,000 lb of shucked meats per season. Since the 2000/01 season, the Bering Sea fishery has not been constrained by CBLs.

2004/05 FISHERY

The GHR for the Bering Sea Registration Area was set at zero to 50,000 lb of shucked meats (Table 13). One catcher-processor participated in the Bering Sea fishery with initial effort in early July when the season opened. Inseason observer reports showed that an estimated 16,680 Tanner crabs, 4,183 snow and hybrid crabs, and zero red king crabs were caught from a bycatch limit of 65,000 Tanner crabs, 150,000 snow and hybrid crabs and 500 red king crabs. The

2004/05 fishery closed by regulation on February 15, 2005. The Bering Sea scallop harvest as reported on fish tickets, totaled 10,050 lb of shucked meats (Table 13).

Figure 10 depicts the estimated SH distributions of the retained and discarded scallop catch in the Bering Sea Registration Area, based on statistical resampling of the discarded and retained SH measurements in equal proportion. With exception of the 1998/99 and 2001/02 seasons, there has been little recruitment to the population. Predominately large, old animals support the fishery. Since the 1993/94 season when onboard observers began collecting data, scallop SH has ranged from 141 mm to 151 mm in the Bering Sea. They are among the largest scallops harvested in the Westward Region. The average SH of retained scallops during the 2004/05 season was 144 mm compared to the previous year at 148 mm SH (Table 6).

A summary of the scallop catch in round weight (lb) of retained scallops, shucked meat weight (lb) of retained scallops, dredge hours, and CPUE (meat lb/drg-hr) is depicted in Figure 11. The 2004/05 season CPUE of 36 meat lb/drg-hr was the lowest since data was first collected by the observer program during the 1993/94 season (Table 6).

STOCK STATUS

Experimental scallop video stock assessment research was conducted in May 2003. The video stock assessment survey methodology is in a developmental phase; however, there are some interesting results with regard to scallop distribution in the Bering Sea. Typically, scallop beds in the Gulf of Alaska are elongated, have well defined margins and are oriented in a north-south direction consistent with the prevailing coastal currents. However, the Bering Sea scallop bed does not exhibit those same characteristics. The margins are not well defined; nor is it oriented in a north-south direction. The scallops are distributed over a large area at low densities; at least one weathervane scallop was counted from each video tow. This is consistent with the low CPUE in this fishery. Small scale aggregations of weathervane scallops necessary for successful broadcast spawning were infrequently observed on the video. This is consistent with data collected from the onboard observer program that brings into question the reproductive viability of the population.

The 2004/05 harvest of 10,050 lb of scallop meats is the lowest on record (Table 13). The highest catch occurred in calendar year 1993 when 605,953 lb of scallop meats were harvested. Calendar year 1993 includes the pre-Scallop Management Plan harvest of 321,539 lb taken from January 1, 1993 – June 30, 1993 and the post-Scallop Management Plan harvest of 284,414 lb beginning July 1, 1993 (recorded as the 1993/94 regulatory season) (Table 12).

Since inception of the onboard observer program in July 1993 (1993/94 season), the estimated round weight of the retained scallop catch ranged from 129,220 lb in 2004/05 to 5,942,912 lb in 1994/95 (Table 7).

DUTCH HARBOR REGISTRATION AREA

The Dutch Harbor Registration Area (Area O) includes Aleutian Island waters west of the longitude of Scotch Cap Light (164° 44' W long.), east of 171°W. long. and south of the latitude of Cape Sarichef at 54° 36' N lat. (Figure 12).

HISTORIC BACKGROUND

In the Dutch Harbor Registration Area, closed waters were established in 1986 to protect crab nursery areas (Figure 12). Prior to the 1993 season, the registration area was open year-round to scallop dredging. At the March 1994 BOF meeting, the regulatory season date for this registration area was established as July 1 through February 15.

The first harvest of weathervane scallops from the Dutch Harbor Registration Area was in 1982 when 62,105 lb of scallop meats were landed from five vessels (Table 14). Catch data for most years between 1985 and 1992 is confidential, because few vessels participated; however, the average annual catch for those years was 203,695 lb of scallop meats. Commercial harvest data from this registration area was also misreported in the 1980s as evidenced in logbooks seized by Fish and Wildlife Protection agents. The extent of misreporting in the 1980s is unknown, but may have lead to artificially high catch data attributed to the Dutch Harbor Registration Area in some years. In addition, productive grounds that contributed significantly to the overall harvest were closed by 1986. Since the 1993/94 season, catches have ranged from zero to 46,432 lb of scallop meats per regulatory season (Table 15). Scallop fishing was limited to state waters during the 1995/96 season because the EEZ was closed by federal emergency rule.

2004/05 FISHERY

The Dutch Harbor Registration Area remained closed for stock conservation.

STOCK STATUS

The Dutch Harbor Registration Area was open one season, 2002/03, out of the last five seasons (Table 15). During that open season one vessel participated, but stopped fishing due to low catches, prior to achieving the upper-end of the GHR. The Dutch Harbor Registration Area may remain closed for up to five years to allow adequate time for juvenile scallops to mature and spawn prior to reopening the fishery under a conservative GHR.

The weathervane scallop population in the Dutch Harbor Registration Area is not surveyed and no estimate of abundance has been made. There are currently no plans to survey this population.

ADAK REGISTRATION AREA

The Adak Registration Area (Area R) includes Aleutian Island and Bering Sea waters west of 171°W. long., and east of the U.S.-U.S.S.R. Maritime Boundary Agreement Line of 1990 and south of 55° 30' N. lat. (Figure 13).

HISTORIC BACKGROUND

ADF&G records indicate that weathervane scallops were first harvested from the Adak Registration Area in 1979, and then again in 1992, and 1995. During those years few fishermen participated in any given year, so catch and effort information is confidential. Little is known about scallop populations in this area.

The Petrel Bank, between 51°30' N lat. and 54° 30' N lat., west of 179° W long. and east of 179° E long. was closed by emergency order on March 21, 1991 due to concerns about king crab bycatch in the *Chlamys* (pink scallop) fishery (Figure 13). On November 1, 1991, before the initial emergency order expired, a second emergency order was issued closing this area until June 1, 1994. This allowed time for ADF&G to bring the conservation concerns to the attention

of the BOF. In 1993, the BOF adopted the department's recommendation, and closed the area by regulation.

2004/05 FISHERY

The 2004/05 fishery opened July 1, 2004 and closed by regulation on February 15, 2005. A GHR of zero to 75,000 lb was announced by news release. No vessels participated in the fishery during 2004/05 season.

STOCK STATUS

The weathervane scallop population in the Adak Registration Area is not surveyed and no estimate of abundance has been made. There are currently no plans to survey this population. The continental shelf adjacent to the Aleutian Islands is narrow, providing limited weathervane scallop habitat.

ACKNOWLEDGEMENTS

The following staff from the Alaska Department of Fish and Game are acknowledged for their assistance; Gregg Rosenkranz analyzed data, and Heidi Morrison edited data, entered data, and contributed to the report preparation.

A special thanks to vessel operators Mr. Tom Minio, Mr. John Lamar, and Mr. Scott Hulse for voluntarily releasing their confidential fishing information so that it could be included in this report. This spirit of cooperation from industry is commendable and it is imperative to the management of the weathervane scallop resource in the state.

The following observers were deployed onboard commercial fishing vessels during the 2004/05 regulatory season: Mr. Terry Arndt, Ms. Kathy Bereza, Mr. Steve Brown, Mr. Jim Fitzpatrick, and Mr. John Hargrove. Their diligence with collecting biological and commercial fishing data under adverse conditions, while living at sea for extended periods, has greatly assisted the ADF&G with the management of Alaska's weathervane scallop resource.

This report is funded by a grant-cooperative agreement from the Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), and NMFS for the cooperative management of scallop fisheries in the EEZ off Alaska. The views expressed herein are those of the author and do not necessarily reflect the views of NOAA or any of its sub agencies.

REFERENCES CITED

- Barnhart, J. P. 2000. Annual management report for the weathervane scallop fisheries of the westward region, 1999/00. [In] Annual management report for the shellfish fisheries of the Westward Region, 1999. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 4K00-55, Kodiak.
- Barnhart, J. P. 2003. Weathervane scallop fishery in Alaska with a focus on the Westward Region, 1967-2002. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K03-5, Kodiak.
- Barnhart, J. P., and G. Rosenkranz. 2000. Summary and analysis of onboard observer collected data from the 1998/1999 statewide commercial weathervane scallop fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K00-8, Kodiak.

REFERENCES CITED (Continued)

- Barnhart, J. P., and G. Rosenkranz. 2003. Summary and analysis of onboard observer-collected data from the 1999/2000 through 2001/2002 statewide commercial weathervane scallop fishery. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K03-9, Kodiak.
- Kaiser, R. J. 1986. Characteristics of the Pacific weathervane scallop (*Pecten [Patinopecten] caurinus*, Gould 1850) fishery in Alaska, 1967-1981. Alaska Department of Fish and Game. Kodiak.
- NMFS (National Marine Fisheries Service). 2005. Environmental impact statement for essential fish habitat identification and conservation in Alaska. NMFS-Alaska Region, PO Box 21668, Juneau, AK 99802-1668.
- NPFMC (North Pacific Fishery Management Council). 2005. EA/RIR/FRFA for Amendment 10 to the FMP for the scallop fishery off Alaska to modify the license limitation program. North Pacific Fishery Management Council, 605 West 4th Ave, Ste 306. Anchorage, AK 99587
- Orensanz, J. M. 1968. Size, environment, and density: the regulation of a scallop stock and its management implications. Pages 195-227. [In] G. S. Jamieson and N. Bourne (eds.). North Pacific workshop on stock assessment and management of invertebrates. Canadian Special Publication of Fisheries and Aquatic Sciences 92.
- Shirley, S. M., and G. H. Kruse. 1995. Development of the fishery for weathervane scallops, *Patinopecten caurinus* (Gould, 1850), in Alaska. Journal of Shellfish Research, 14(1):71-78.
- Urban, D. 1996. Shellfish key words. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K96-6, Kodiak.

TABLES AND FIGURES

Table 1.—Historic statewide commercial weathervane scallop catch, number of vessels, and number of landings, 1967-2004/05.

Year	Number Vessels	Number Landings ^a	Commercial Catch ^b
1967	2	6	778 ^c
1968	19	125	1,677,268
1969	19	157	1,849,947
1970	7	137	1,440,338
1971	5	60	931,151
1972	5	65	1,167,034
1973	5	45	1,109,405
1974	3	29	504,438
1975	4	56	435,672
1976	7	21	264,788
1977		No Effort	
1978		No Effort	
1979	1	4	24,826
1980	8	56	616,717 ^c
1981	18	101	924,441
1982	13	120	913,996
1983	5	30	192,310
1984	6	52	383,512
1985	7	47	615,564
1986	8	74	667,258
1987	4	54	599,947 ^d
1988	4	47	341,070
1989	7	55	534,763
1990	9	144	1,481,136
1991	6	136	1,136,649
1992	8	136	1,785,673
1993 ^e	7	51	568,077
1993/94	15	111	984,583
1994/95	15	104	1,240,775
1995/96	10	29	410,743 ^d
1996/97	9	30	732,424
1997/98	9	31	818,913
1998/99	8	35	822,096
1999/2000	10	22	837,971
2000/01	8	20	750,617
2001/02	6	26	572,838
2002/03	6	28	509,455
2003/04	4	32	500,379
2004/05	5	22	431,594

AVERAGE 1990-1994/95 was 136 deliveries per year. January 1-June 30, 1993 was combined with 1993/94 and considered a single year.
AVERAGE 1995/96 - 2002/03 was 28 deliveries per year.

-continued-

Table 1.—Page 2 of 2.

- ^a Prior to and including 1994/95, reported number of landings (deliveries) equals number of fish tickets. After 1995/96, the reported number of landings equals number of off-loads. An off-load typically includes multiple fish tickets, normally one fish ticket per week of fishing.
- ^b Pounds of shucked scallop meats.
- ^c Deliveries of unshucked scallops were converted to shucked meats using a 10% conversion factor.
- ^d Includes illegal harvest.
- ^e January 1 through June 30.

Table 2.-Federal and State Weathervane Scallop Permits, 2004.

<u>Federal Scallop License Limitation Permits</u>		
<u>License Holder</u>	<u>MLOA^a</u>	<u>Dredge-Size Restriction</u>
Ocean Fisheries, LLC ^b	95	None
Alaska Scallop, LLC ^c	96	None
Forum Star, Inc.	97	None
Hogan, Thomas C.	75	2 scallop dredges with a combined width of no more than 20 feet (6.1m)
Hulse, Max et al.	79	2 scallop dredges with a combined width of no more than 20 feet (6.1m)
Ocean Fisheries, LLC	100	None
Gilmartin, Thomas ^d	70	None
Provider, Inc	124	None
Pursuit, Inc	101	None
<u>State Scallop Limited Entry Vessel Permits</u>		
<u>License Holder</u>	<u>Statewide Permit</u>	<u>Dredge-Size Restriction</u>
Ocean Fisheries, LLC	Yes	None
Provider, Inc	Yes	None
Carolina Boy, Inc	Yes	None
Forum Star, LLC	Yes	None
Future Fisheries	Yes	None
La Brisa, Inc	Yes	None
Hogan, Thomas C.	Yes	None
Gilmartin, Thomas	Yes	None

^a Maximum length overall measured in feet. This is a license limitation program (LLP) provision.

^b Original LLP permit holder was Carolina Boy, Inc.

^c Original LLP permit holder was Carolina Girl, Inc.

^d Original LLP permit holder was Oceanic Research Services.

Table 3.-Crab bycatch limits by registration area and district, in percent of the crab abundance estimate or number of crab.

Scallop Registration Areas	Red King Crab	Tanner Crab	Snow Crab
Yakutat (D)			
District 16	NA ^a	NA ^a	NA ^a
Remainder of Area D	NA ^a	NA ^a	NA ^a
Prince William Sound (E)			
Eastern Section of outside District	NA ^a	0.5% ^b	NA ^a
Cook Inlet (H)			
Kamishak District	60 crabs ^b	0.5% ^b	NA ^a
Outer/Easter/Barren Island Districts	NA ^a	NA ^a	NA ^a
Kodiak (K)			
Northeast District	0.5% or 1.0%	0.5% or 1.0%	NA ^a
Shelikof District	0.5% or 1.0%	0.5% or 1.0%	NA ^a
Semidi District	Regulated inseason	Regulated inseason	NA ^a
Alaska Peninsula (M)	0.5% or 1.0%	0.5% or 1.0%	NA ^a
Bering Sea (Q)	500 crabs ^b	Three Tier Approach	Three Tier Approach
Dutch Harbor (O)	0.5% or 1.0%	0.5% or 1.0%	NA ^a
Adak (R)	50 ^c	10,000 ^c	NA ^a

^a Not applicable. Bycatch caps not established.

^b Fixed crab bycatch limit.

^c Bycatch limit set to allow scallop fleet adequate opportunity to explore and harvest scallop stocks while protecting the crab resource.

Table 4.-Historic commercial catch, effort, and value of weathervane scallops, Kodiak Registration Area, 1967-2004/05.

Year	Number Vessels	Number Landings ^a	Commercial Catch (lb) ^b	Average Landing (lb) ^b	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows
1967 ^c	2	6	778	130	0.70	545	d
1968 ^c	8	89	734,084	8,248	0.85	623,971	d
1969	11	86	1,012,860	11,777	0.85	861,000	d
1970	7	102	1,417,612	13,898	1.00	1,500,000	d
1971	5	48	841,211	17,525	1.05	883,000	d
1972	5	68	1,038,793	15,276	1.15	1,200,000	d
1973	4	42	935,705	22,279	1.20	1,123,000	d
1974	3	14	147,945	10,568	1.30	192,000	d
1975	3	29	294,142	10,143	1.40	412,000	d
1976	1	6	75,245	12,541	1.59	119,000	d
1977				No Effort			
1978				No Effort			
1979	1	4	24,826	6,206	2.78	69,000	d
1980 ^c	7	33	355,200	10,763	3.60	1,278,720	d
1981	15	62	439,804	7,094	4.00	1,759,216	d
1982	8	62	435,645	7,026	3.25	1,416,000	d
1983	4	24	147,747	6,156	5.00	739,000	d
1984	7	37	309,502	8,365	4.00	1,238,000	d
1985	3	10	46,971	4,697	4.00	188,000	d
1986	5	21	180,600	8,600	4.25	767,550	d
1987	3	25	253,451	10,138	3.45	874,406	d
1988	3	21	195,811	9,324	3.68	720,584	d
1989	5	29	242,557	8,364	3.87	938,696	d
1990	7	73	689,497	9,445	3.43	2,364,974	10,950
1991	4	61	514,348	8,432	3.82	1,964,809	12,884
1992	3	43	389,854	9,066	3.96	1,543,822	8,328
1993 ^{e,f}	4	16	88,279	5,517	5.15	454,637	1,708
1993/94	10	48	315,626	6,576	5.15	1,625,474	7,028
1994/95	11	32	355,628	11,113	5.79	2,052,543	6,449
1995/96				Closed			
1996/97	5	13	268,545	20,657	6.30	1,691,833	2,760
1997/98	5	14	360,339	25,739	6.50	2,342,203	4,757
1998/99	8	12	301,600	25,133	6.40	1,930,240	3,515
1999/2000	6	9	266,012	29,557	6.25	1,662,575	2,673
2000/01	5	7	260,052	37,150	5.50	1,430,286	1,989
2001/02	4	8	257,582	32,459	5.50	1,428,196	2,439
2002/03	3	11	260,580	23,689	5.20	1,355,016	2,779
2003/04	2	13	259,976	19,998	5.25	1,364,874	2,397
2004/05	2	9	254,727	28,303	5.50	1,400,998	2,454

-continued-

Table 4.-Page 2 of 2.

- ^a Prior to 1995/96, reported number of landings equals number of fish tickets. After 1995/96, the reported number of landings equals number of off-loads.
- ^b Pounds of shucked scallop meats.
- ^c Deliveries of unshucked scallops were converted to shucked meats using a 10% conversion factor.
- ^d Not available.
- ^e January 1 - June 30.
- ^f Includes harvest from exploratory fishery.

Table 5.-Kodiak Registration Area, Northeast District, scallop fishery summary statistics, 1993/94–2004/05.

Season	Number vessels	GHR ceiling (lb meat)	Dredge hours	Catch (lb meat)	CPUE (lb meat per dredge hr)
1993/94	10	NA ^a	6,940	155,122	22
1994/95	7	NA ^a	1,773	35,207	20
1995/96		Closed			
1996/97	3	NA ^a	581	11,430	20
1997/98	3	NA ^a	2,604	95,858	37
1998/99	4	NA ^a	2,749	120,010	44
1999/2000	3	75,000	1,384	77,119	56
2000/01	4	80,000	1,101	79,965	73
2001/02	3	80,000	1,142	80,470	70
2002/03	2	80,000	1,350	80,000	59
2003/04	2	80,000	1,248	79,965	64
2004/05	2	80,000	1,227	80,105	65

^a Not applicable. A guideline harvest range (GHR) ceiling was not established.

Table 6.-Commercial harvest, average shell height from retained catch, and catch per unit effort from observer data, Westward Region, 1993/94-2004/05.

Season	REGISTRATION AREA/DISTRICT ^a																			
	Kodiak Area									Alaska Peninsula			Bering Sea			Dutch Harbor				
	Northeast District			Shelikof District			Semidi Island District			Harvest ^b	SH ^c	CPUE ^d	Harvest ^b	SH ^c	CPUE ^d	Harvest ^b	SH ^c	CPUE ^d	Harvest ^b	SH ^c
1993/94	155,122	144	22	105,017	128	42	55,487	145	32	112,152	119	61	284,414	146	49	38,731	128	46		
1994/95	35,207	151	20	314,051	131	36	^e	153	^e	65,282	127	39	505,439	147	45	1,931	158	24		
1995/96	Closed			Closed			Closed			Closed			Closed			26,950	134	26		
1996/97	11,430	144	20	219,305	136	63	37,810	154	37	12,560	126	38	150,295	147	65	No Effort				
1997/98	95,858	140	37	258,346	139	47	6,135	147	18	51,616	135	29	97,002	151	43	5,790	127	34		
1998/99	120,010	127	44	179,870	137	44	1,720	151	16	63,290	128	39	96,795	147	42	46,432	128	45		
1999/2000	77,119	131	56	187,963	130	44	930	152	21	75,610	124	37	164,929	145	50	6,465	134	24		
2000/01	79,965	135	73	180,087	134	62	No Effort			7,660	119	24	205,520	142	61	Closed				
2001/02	80,470	140	70	177,112	140	52	No Effort			Closed			140,871	141	46	Closed				
2002/03	80,000	140	59	180,580	138	48	No Effort			Closed			92,240	149	45	6,000	133	33		
2003/04	79,965	145	64	180,011	135	55	No Effort			No Effort			42,590	148	42	Closed				
2004/05	80,105	144	65	174,622	137	50	No Effort			No Effort			10,050	144	36	Closed				

^a Confidential data voluntarily released by vessel operators.

^b Harvest in pounds of shucked meats.

^c Average scallop shell height (SH) in mm.

^d Catch per unit effort (CPUE) in pounds of shucked scallop meats per dredge hour.

^e Confidential.

Table 7.-Estimated round weight of the retained commercial scallop catch and catch per unit effort, Westward Region, 1993/94 - 2004/05.

Season	REGISTRATION AREA/DISTRICT ^a												Total Harvest ^b
	Kodiak Area						Alaska Peninsula	Bering Sea	Dutch Harbor	Total			
	Northeast District		Shelikof District		Semidi Island District								
Harvest ^b	CPUE ^c	Harvest ^b	CPUE ^c	Harvest ^b	CPUE ^c	Harvest ^b	CPUE ^c	Harvest ^b	CPUE ^c	Harvest ^b	CPUE ^c		
1993/94	2,214,427	319	1,169,664	467	579,836	319	1,061,925	575	3,447,681	598	432,970	517	8,906,503
1994/95	389,202	220	3,522,517	404	^d	^d	619,473	372	5,942,912	535	23,590	291	10,497,694
1995/96	Closed		Closed		Closed		Closed		Closed		289,398	276	289,398
1996/97	147,269	253	1,878,268	537	288,117	283	130,235	398	1,432,160	619	No Effort		3,876,049
1997/98	1,143,926	439	3,101,152	565	61,320	176	654,960	374	1,082,825	482	55,725	326	6,099,908
1998/99	1,365,836	497	2,129,025	522	15,806	149	617,120	383	1,193,071	514	427,422	417	5,748,280
1999/2000	952,972	689	1,903,345	442	11,310	253	781,596	386	1,851,620	562	68,070	249	5,568,913
2000/01	681,192	619	1,768,376	608	No Effort		95,510	299	2,376,601	708	Closed		4,921,679
2001/02	822,110	720	1,830,265	539	No Effort		Closed		1,700,578	554	Closed		4,352,953
2002/03	871,918	646	1,857,466	489	No Effort		Closed		952,958	468	59,116	322	3,741,458
2003/04	747,517	600	1,724,498	529	No Effort		No Effort		537,552	527	Closed		3,009,567
2004/05	848,527	692	1,641,608	473	No Effort		No Effort		129,220	470	Closed		2,619,355

^a Confidential data voluntarily released by vessel operators.

^b Harvest in pounds of round scallops.

^c Catch per unit effort (CPUE) in estimated round weight of retained scallops per dredge-hour.

^d Confidential.

Table 8.-Kodiak Registration Area, Shelikof District, scallop fishery summary statistics, 1993/94 – 2004/05.

Season	Number vessels	GHR ceiling (lb meat)	Dredge hours	Catch (lb meat)	CPUE (lb meat per dredge hr)
1993/94	5	NA ^a	2,491	105,017	42
1994/95	11	NA ^a	8,662	314,051	36
1995/96		Closed			
1996/97	3 ^b	NA ^a	3,491	219,305	63
1997/98	4	NA ^a	5,492	258,346	47
1998/99	8	NA ^a	4,081	179,870	44
1999/2000	6	180,000	4,304	187,963	44
2000/01	5	180,000	2,907	180,087	62
2001/02	4	180,000	3,398	177,112	52
2002/03	3	180,000	3,799	180,580	48
2003/04	2	180,000	3,258	180,011	55
2004/05	2	180,000	3,467	174,622	50

^a Not applicable. A guideline harvest range (GHR) ceiling was not established.

^b One additional vessel fished but data are not available.

Table 9.-Kodiak Registration Area, Semidi Island District, scallop fishery summary statistics, 1993/94 – 2004/05.

Season	Number vessels	GHR ceiling (lb meat)	Dredge hours	Catch (lb meat)	CPUE (lb meat per dredge hr)
1993/94	6 ^b	NA ^a	1,819	55,487	32
1994/95	2	NA ^a	272	Confidential	
1995/96		Closed			
1996/97	3	NA ^a	1,017	37,810	37
1997/98	1	NA ^a	349	6,135	18
1998/99	2	NA ^a	106	1,720	16
1999/2000	1	NA ^a	45	930	21
2000/01		NA ^a		No Effort	
2001/02		NA ^a		No Effort	
2002/03		NA ^a		No Effort	
2003/04		NA ^a		No Effort	
2004/05		NA ^a		No Effort	

^a Not applicable. A guideline harvest range (GHR) ceiling was not established.

^b Two additional vessels registered but did not fish.

Table 10.-Historic commercial catch, effort and value of weathervane scallops, Alaska Peninsula Registration Area, 1975-2004/05.

Year	Number Vessels	Number Landings ^a	Commercial Catch (lb) ^b	Average Landing (lb) ^b	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows
1975	1	1	2,508	2,508	1.40	3,511	^c
1976			No Effort				
1977			No Effort				
1978			No Effort				
1979			No Effort				
1980			No Effort				
1981			Confidential				
1982	6	20	205,691	10,284	3.35	689,064	^c
1983			Confidential				
1984			No Effort				
1985			Confidential				
1986			No Effort				
1987			Confidential				
1988			Confidential				
1989			No Effort				
1990			Confidential				
1991			Confidential				
1992			No Effort				
1993 ^d			Confidential				
1993/94	8	7	112,152	16,012	5.15	577,583	949
1994/95	7	11	65,282	5,935	5.79	377,983	1,006
1995/96			Closed				
1996/97	2 ^e	2	12,560	6,280	6.30	79,128	185
1997/98	4	6	51,616	8,603	6.50	335,504	1,054
1998/99	4	4	63,290	15,822	6.40	405,056	684
1999/2000	5	5	75,610	15,107	6.25	472,094	1,107
2000/01	3	3	7,660	2,553	5.50	42,130	189
2001/02			Closed				
2002/03			Closed				
2003/04			No Effort				
2004/05			No Effort				

^a Prior to 1995/96, reported number of landings equals number of fish tickets. After 1995/96, the reported number of landings equals the number of off-loads.

^b Pounds of shucked scallop meats.

^c Not available.

^d January 1-June 30.

^e Vessel operators released confidential data.

Table 11.-Alaska Peninsula Registration Area scallop fishery summary statistics, 1993/94 – 2004/05.

Season	Number vessels	GHR ceiling (lb meat)	Dredge hours	Catch (lb meat)	CPUE (lb meat per dredge hr)
1993/94	8	NA ^a	1,847	112,152	61
1994/95	7	NA ^a	1,664	65,282	39
1995/96		Closed			
1996/97	2	200,000	327	12,560	38
1997/98	4	200,000	1,752	51,616	29
1998/99	4	200,000	1,612	63,290	39
1999/2000	5	200,000	2,025	75,610	37
2000/01	3	33,000	320	7,660	24
2001/02		Closed			
2002/03		Closed			
2003/04 ^b		10,000		No Effort	
2004/05 ^b		10,000		No Effort	

^a Not applicable. A guideline harvest range (GHR) ceiling was not established.

^b The area between 160° W long. and 161° W long. was closed. The remainder of the registration area was open to fishing.

Table 12.-Historic commercial catch, effort and value of weathervane scallops, Bering Sea Registration Area, 1987-2004/05.

Year	Number Vessels	Number Landings ^a	Commercial Catch (lb) ^b	Average Landing (lb) ^b	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows
1987				Confidential			
1988				No Effort			
1989				No Effort			
1990				Confidential			
1991				Confidential			
1992				No Effort			
1993 ^c	6	22	321,539	14,615	5.22	1,678,434	3,711
1993/94	9	16	284,414	17,776	5.22	1,484,641	3,578
1994/95	8	29	505,439	17,429	6.00	3,032,634	6,619
1995/96				Closed			
1996/97	1 ^d	2	150,295	75,147	NA	NA	952
1997/98	2 ^d	5	97,002	19,400	7.05	683,864	1,276
1998/99	4	4	96,795	24,198	6.30	609,808	1,175
1999/2000	2 ^d	4	164,929	41,232	6.25	1,030,806	1,736
2000/01	3	4	205,520	51,380	5.50	1,130,360	1,608
2001/02	3	5	140,871	28,174	5.25	739,572	1,406
2002/03	2 ^d	5	92,240	18,448	5.20	479,648	1,012
2003/04	2 ^d	3	42,590	14,197	5.25	223,597	517
2004/05	2 ^d	2	10,050	5,025	5.25	52,762	145

^a Prior to 1995/96, reported number of landings is equal to number of fish tickets. After 1995/96, the reported number of landings is equal to the number of off-loads.

^b Pounds of shucked scallop meats.

^c January 1- June 30.

^d Vessel operators released confidential data.

Table 13.-Bering Sea Registration Area scallop fishery summary statistics, 1993/94–2004/05.

Season	Number vessels	GHR ceiling (lb meat)	Dredge hours	Catch (lb meat)	CPUE (lb meat per dredge hr)
1993/94	9	NA ^a	5,764	284,414	49
1994/95	8	NA ^a	11,113	505,439	45
1995/96		Closed			
1996/97	1	600,000	2,313	150,295	65
1997/98	2	600,000	2,246	97,002	43
1998/99	4	400,000	2,319	96,795	42
1999/2000	2	400,000	3,294	164,929	50
2000/01	3	200,000	3,355	205,520	61
2001/02	3	200,000	3,072	140,871	46
2002/03	2	105,000	2,038	92,240	45
2003/04	2	105,000	1,020	42,590	42
2004/05	1	50,000	275	10,050	37

^a Not applicable. A guideline harvest range (GHR) ceiling was not established.

Table 14.-Historic commercial catch, effort, and value of weathervane scallops, Dutch Harbor Registration Area, 1982-2004/05.

Year	Number Vessels	Number Landings ^a	Commercial Catch (lb) ^b	Average Landings (lb) ^b	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows
1982	5	8	62,105	7,763	3.11	193,147	^c
1983				No Effort			
1984				No Effort			
1985				Confidential			
1986	5	37	406,642	10,990	3.50	1,423,247	8,752
1987				Confidential			
1988				Confidential			
1989				Confidential			
1990				Confidential			
1991				Confidential			
1992				Confidential			
1993 ^d				Confidential			
1993/94	2	6	39,346	6,558	^c	^c	572
1994/95	3	3	1,931	644	^c	^c	52
1995/96	1 ^e	2	26,650	13,475	^c	^c	747
1996/97				No Effort			
1997/98	1 ^e	1	5,790	5,790	7.05	40,819	105
1998/99	4	5	46,432	9,286	6.30	295,522	479
1999/2000	1 ^e	1	6,465	6,465	6.25	40,500	167
2000/01				Closed			
2001/02				Closed			
2002/03	1 ^e	1	6,000	6,000	5.20	31,200	115
2003/04				Closed			
2004/05				Closed			

^a Prior to 1995/96, reported number of landings is equal to number of fish tickets. After 1995/96, the reported number of landings is equal to the number of off-loads.

^b Pounds of shucked scallop meats.

^c Not available.

^d January 1–June 30.

^e Vessel operator released confidential data.

Table 15.-Dutch Harbor Registration Area scallop fishery summary statistics, 1993/94–2004/05.

Season	Number vessels	GHR ceiling (lb meat)	Dredge hours	Catch (lb meat)	CPUE (lb meat per dredge hr)
1993/94	2	170,000	838	39,346	46
1994/95	3	170,000	81	1,931	24
1995/96	1	170,000	1,047	26,950	26
1996/97		170,000		No Effort	
1997/98	1	170,000	171	5,790	34
1998/99	4	110,000	1,025	46,432	45
1999/2000	1	110,000	273	6,465	24
2000/01		Closed			
2001/02		Closed			
2002/03	1	10,000	184	6,000	33
2003/04		Closed			
2004/05		Closed			

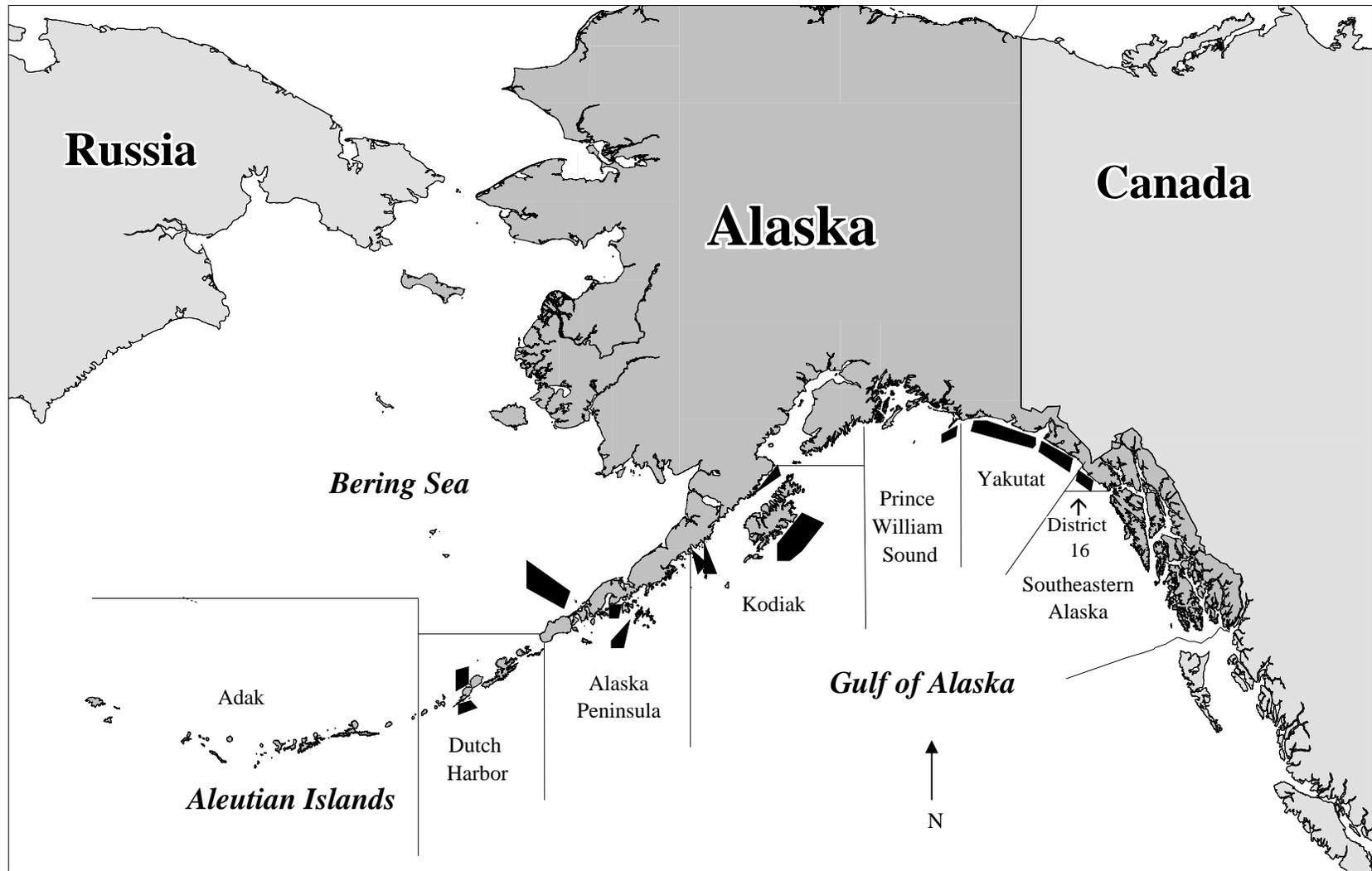


Figure 1.—Major weathervane scallop fishing locations in coastal waters of Alaska.

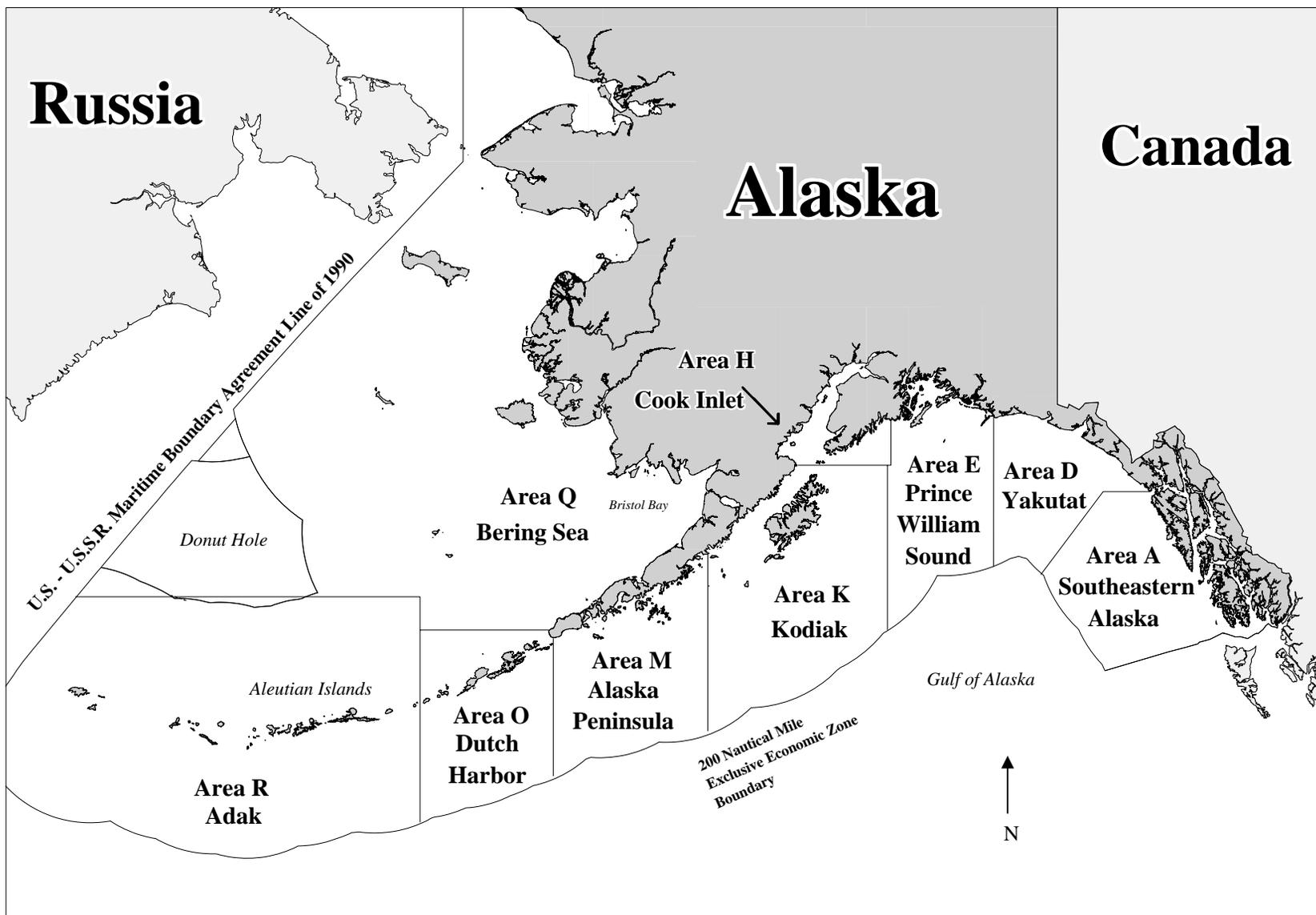


Figure 2.-State of Alaska weathervane scallop fishing registration areas.

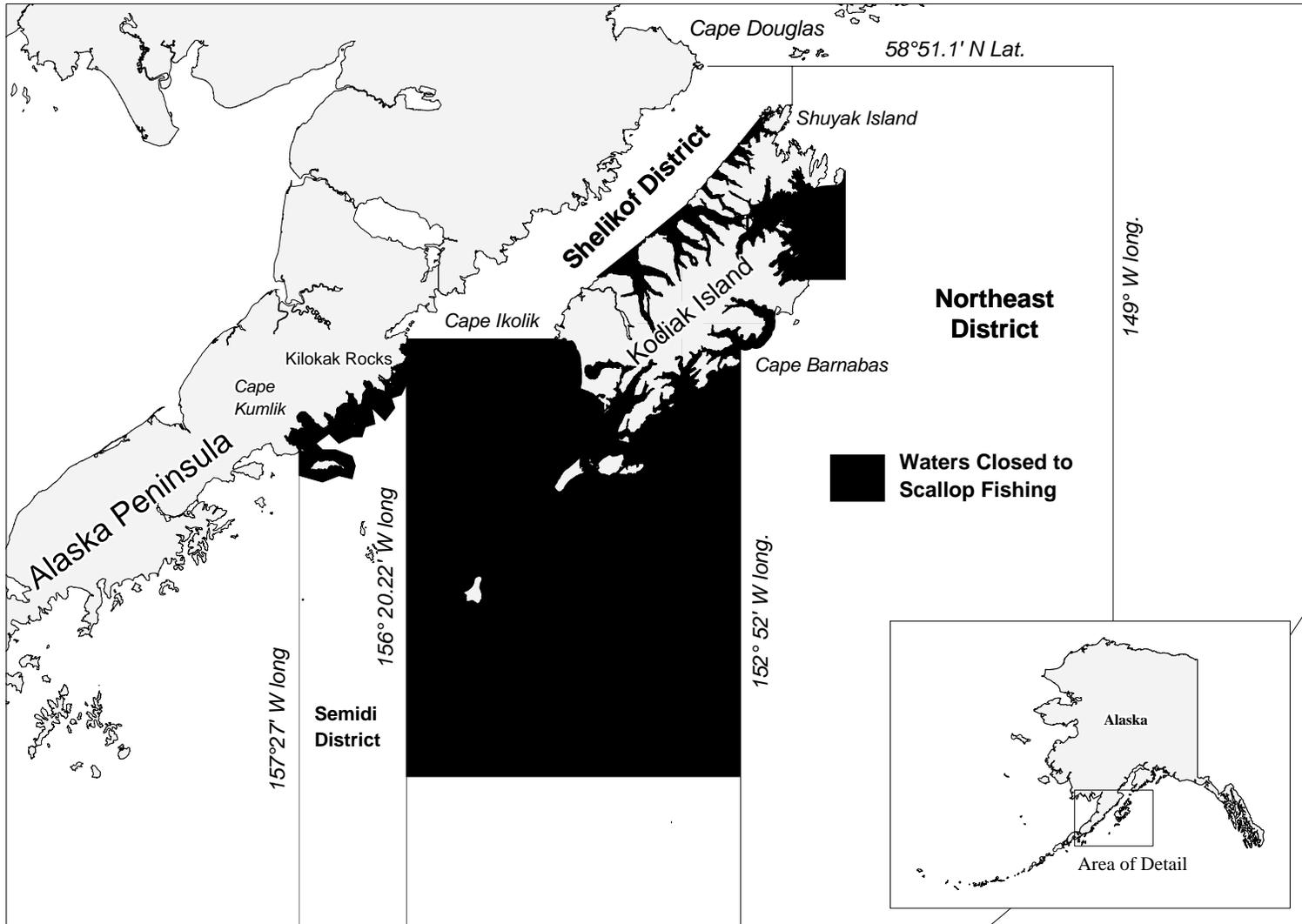


Figure 3.-Kodiak weathervane scallop fishing registration area and closed waters.

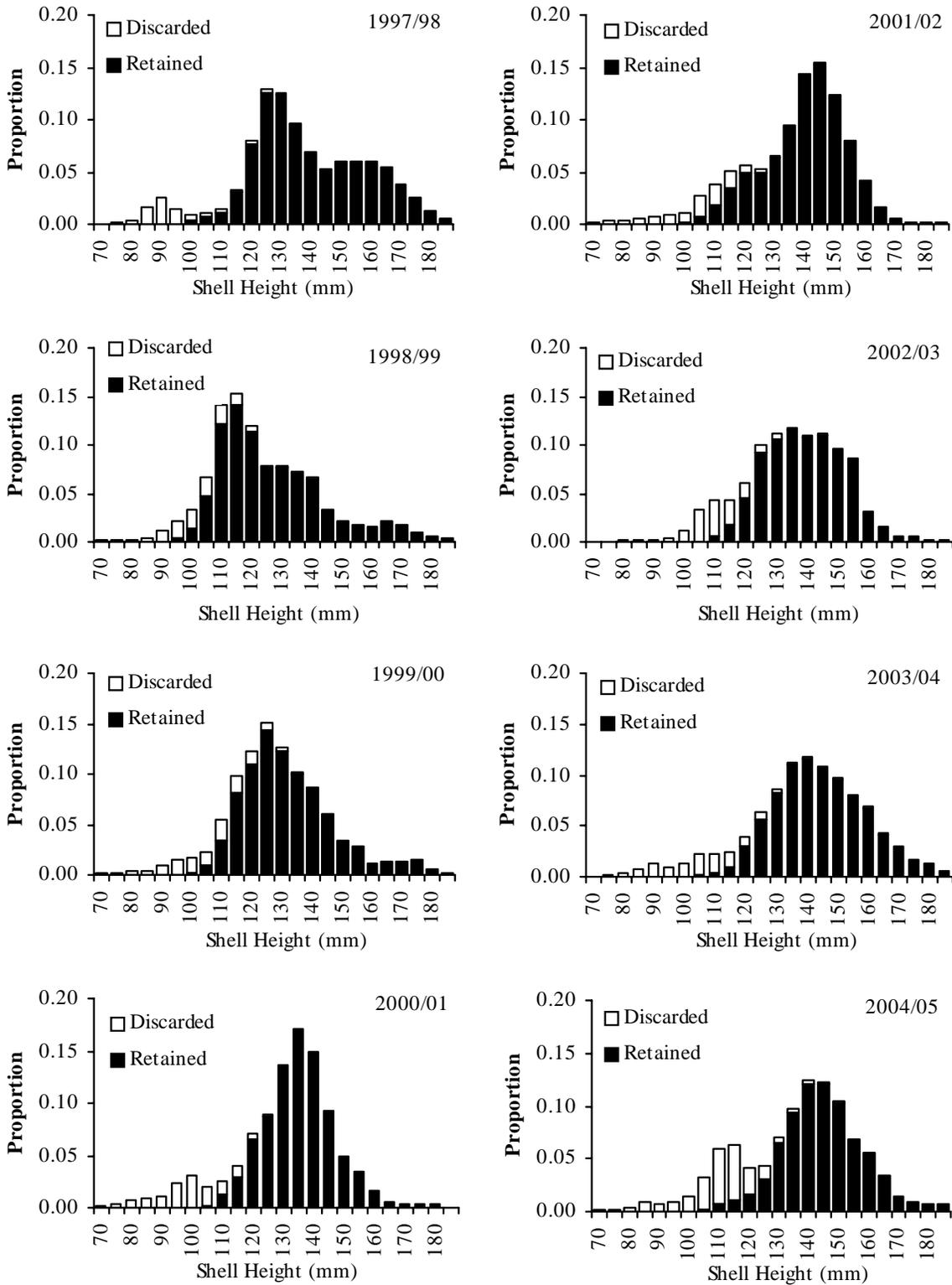


Figure 4.-Kodiak Northeast District scallop shell heights from resampling observer data, 1997/98-2004/05.

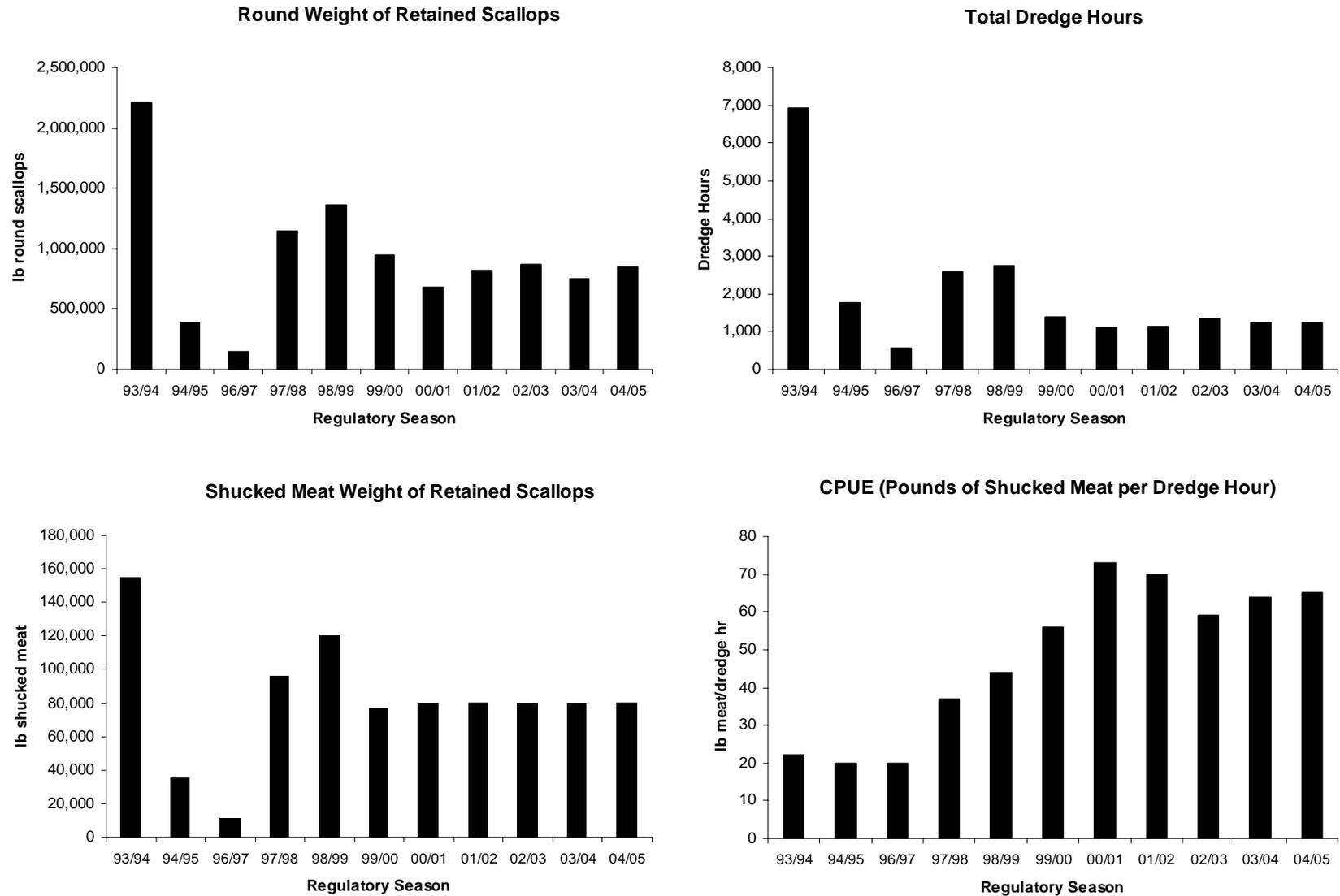


Figure 5.-Weathervane scallop harvest by round weight, shucked meat weight, dredge hours, and CPUE, Northeast District, Kodiak Registration Area, 1993/94-2004/05.

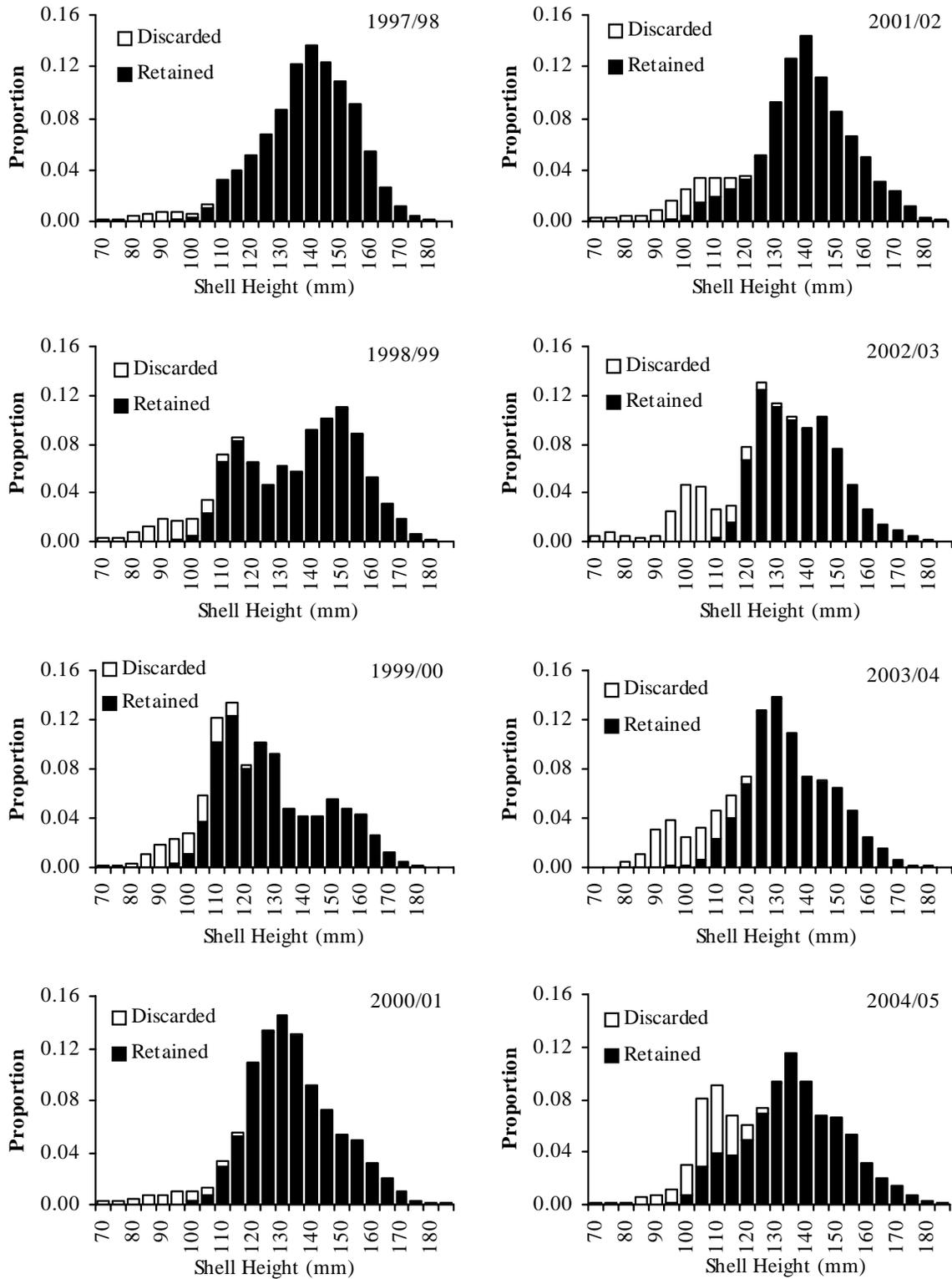


Figure 6-Kodiak Shelikof District scallop shell heights from resampling observer data, 1997/98-2004/05.

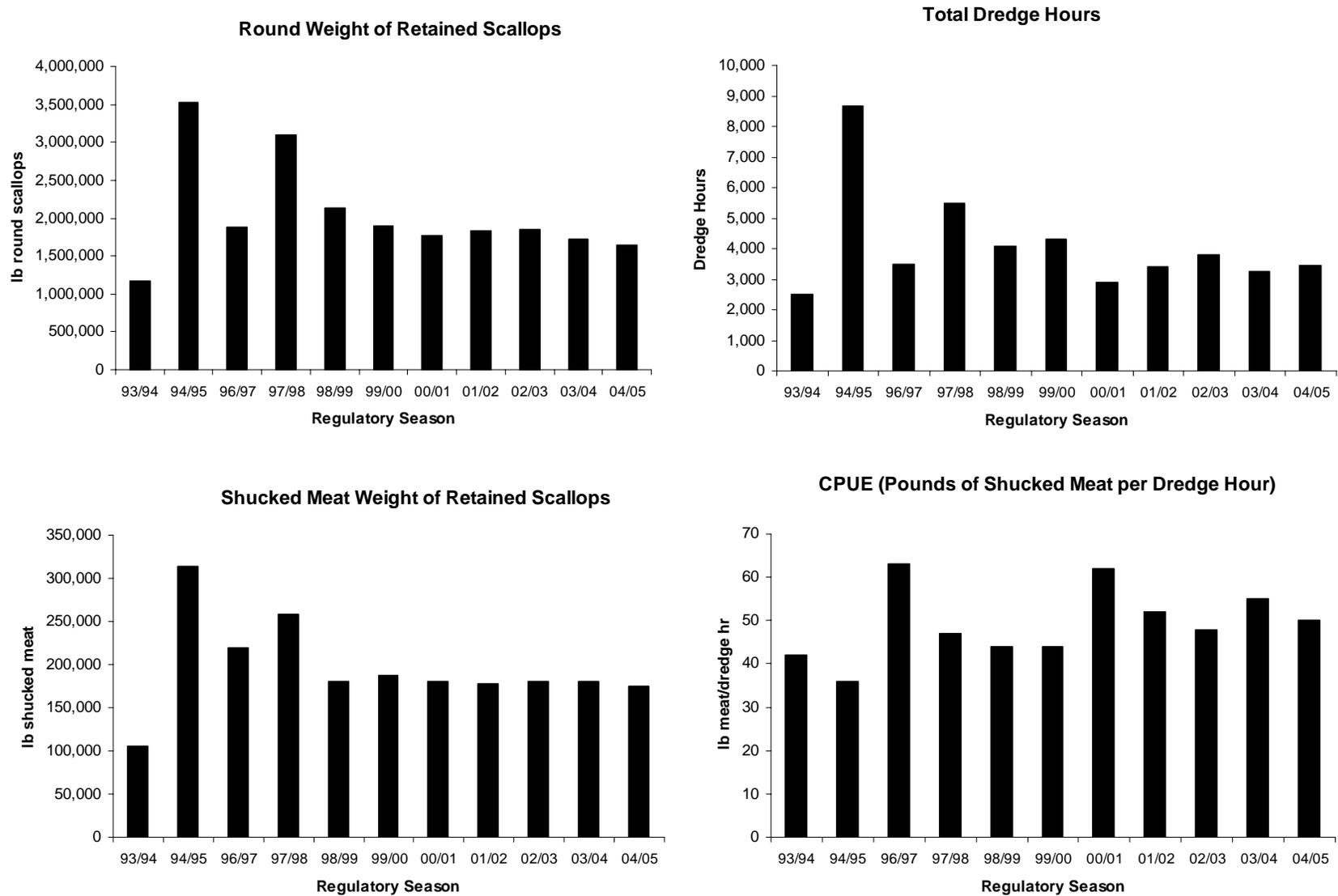


Figure 7.-Weathervane scallop harvest by round weight, shucked meat weight, dredge hours, and CPUE, Shelikof District, Kodiak Registration Area, 1993/94-2004/05.

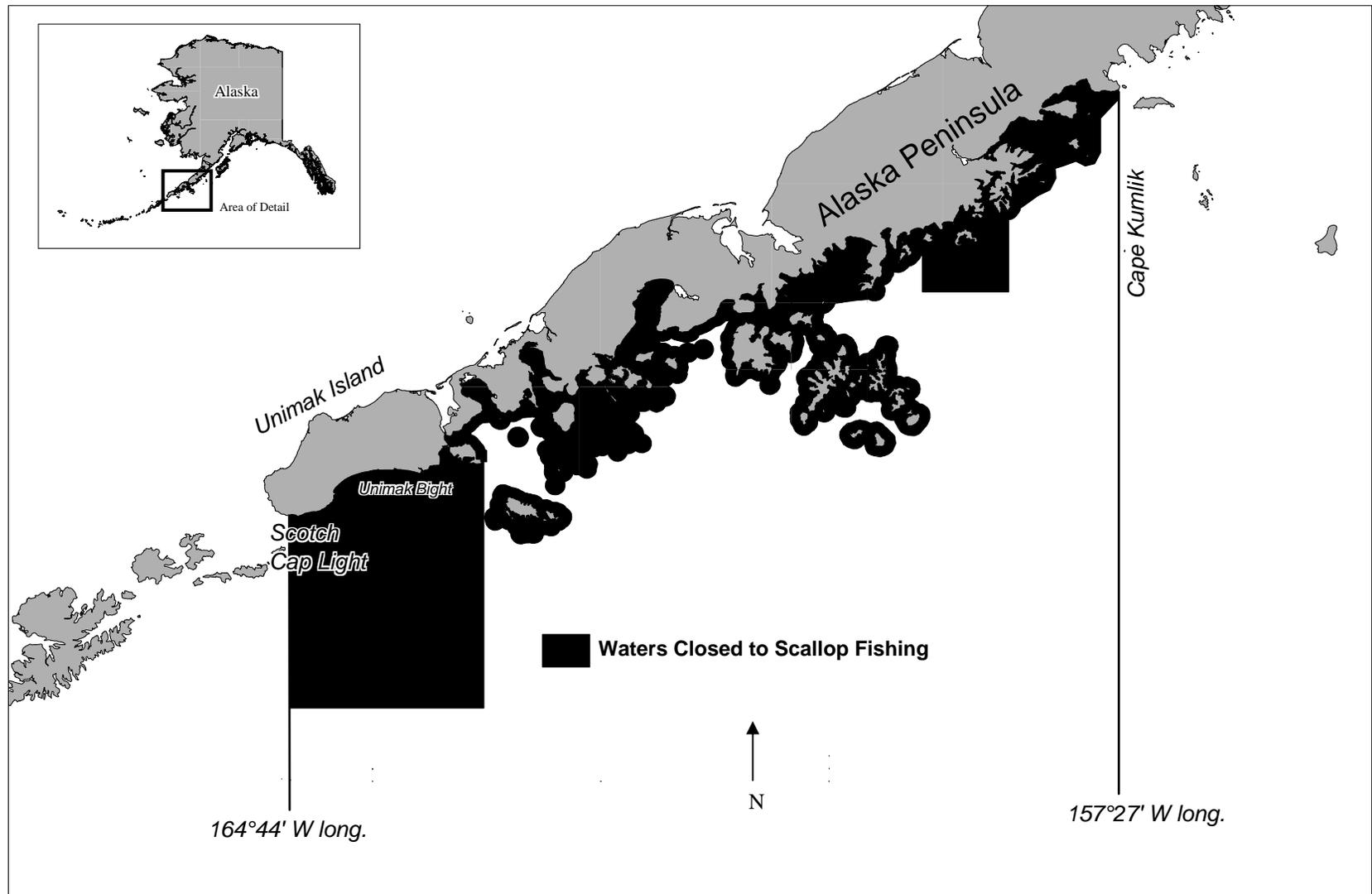


Figure 8.-Alaska Peninsula weathervane scallop fishing registration area and closed waters.

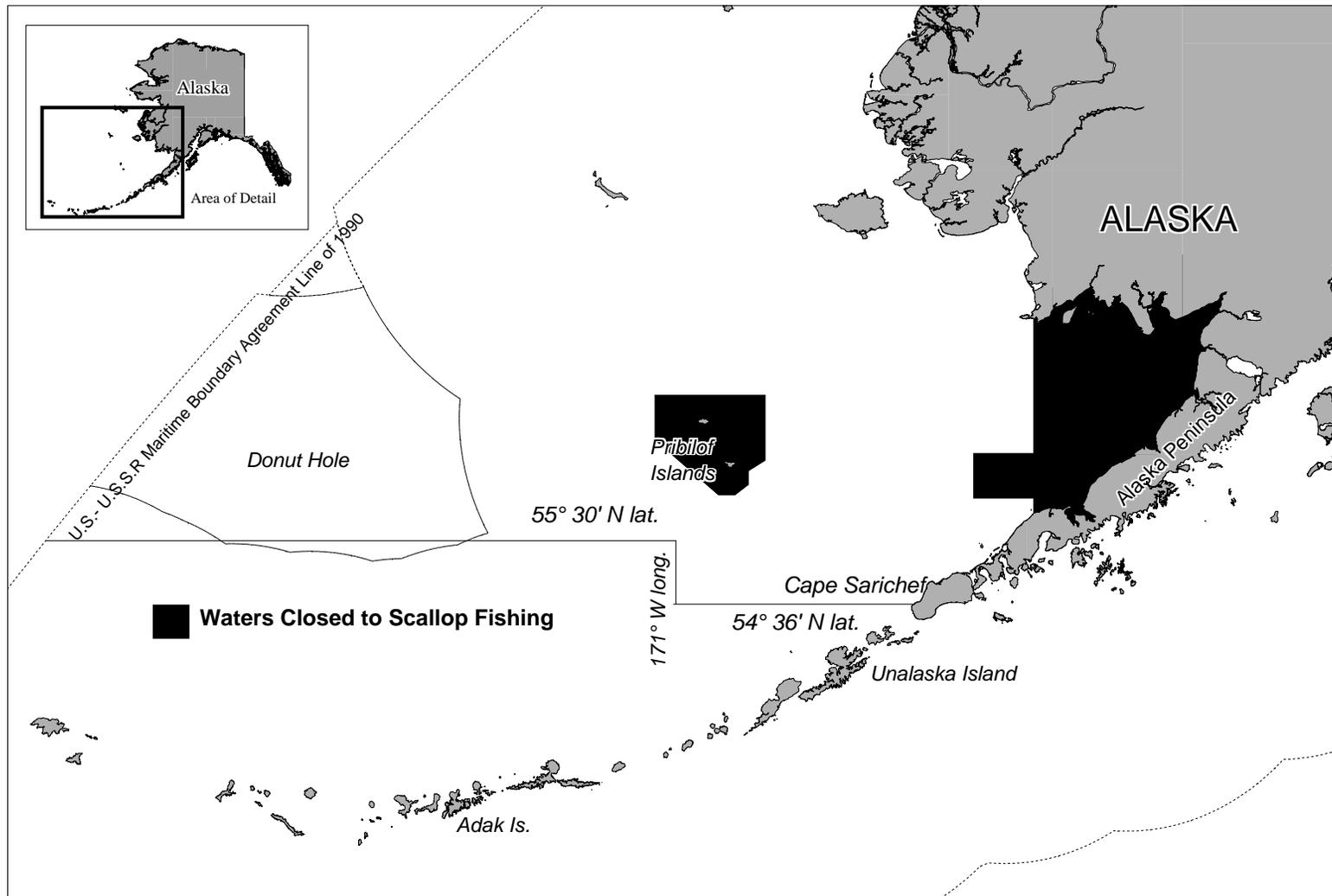


Figure 9.-Bering Sea weathervane scallop fishing registration area and closed waters.

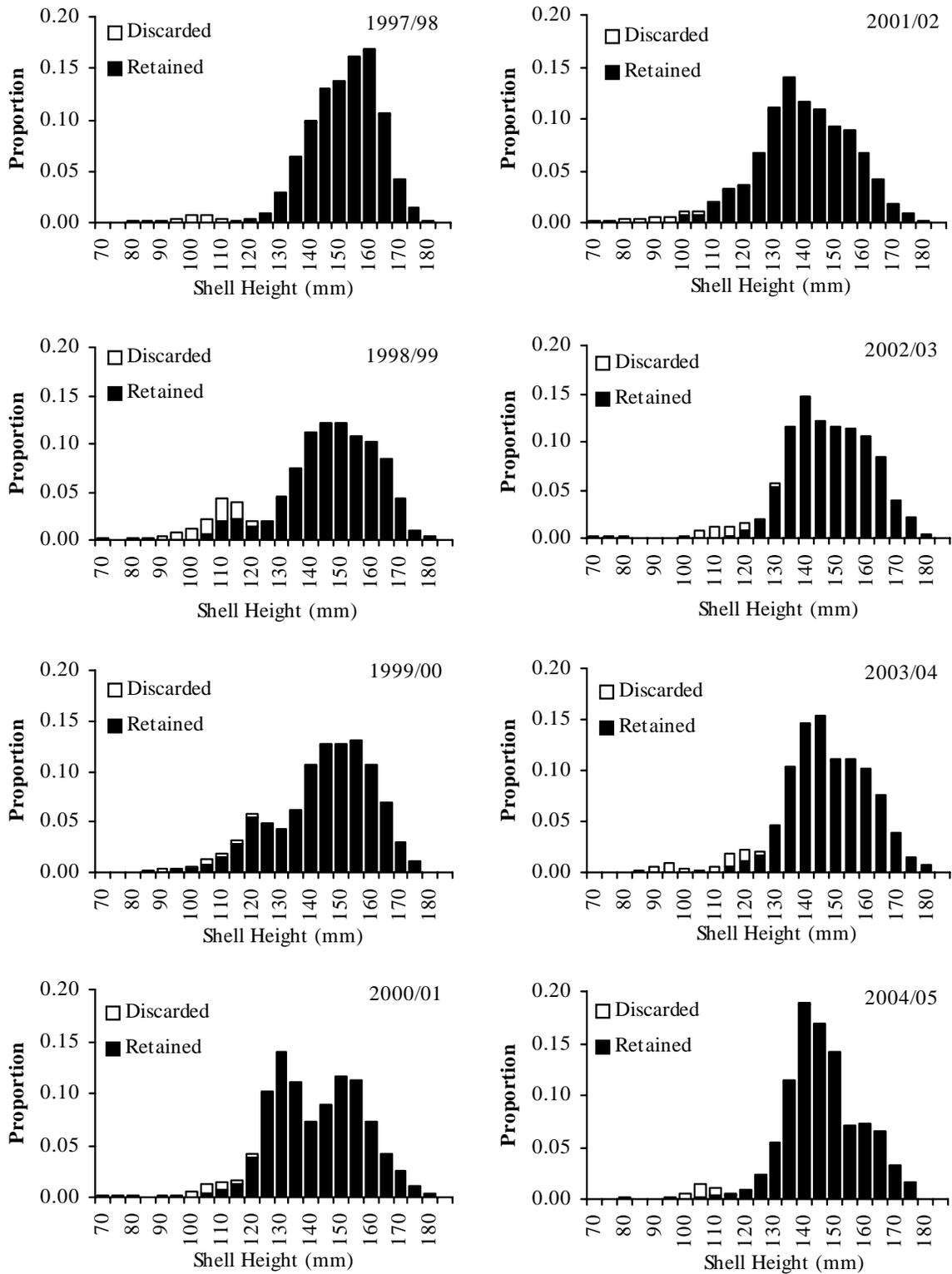


Figure 10.-Bering Sea Registration Area scallop shell heights from resampling observer data, 1997/98-2004/05.

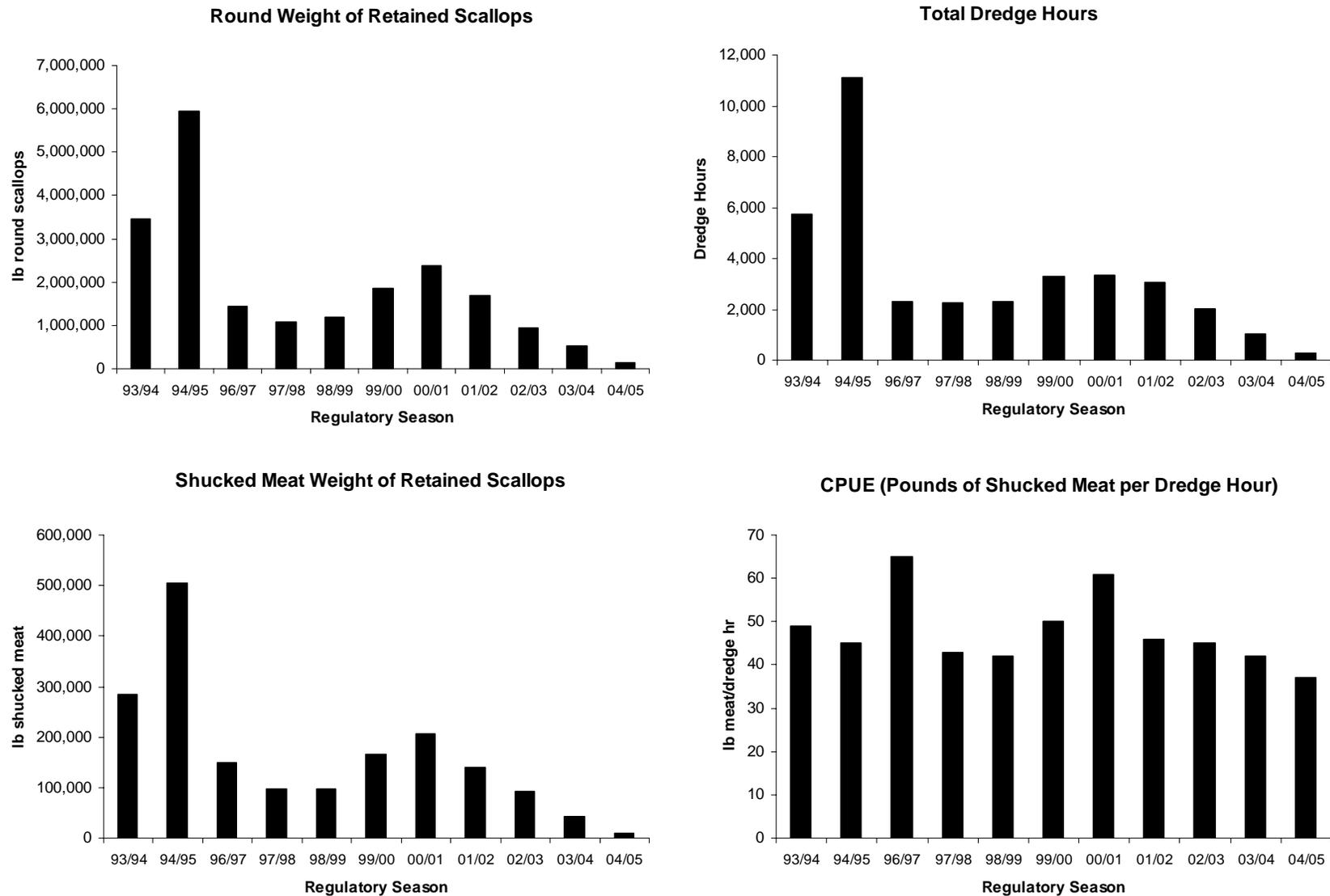


Figure 11. Weathervane scallop harvest by round weight, shucked meat weight, dredge hours, and CPUE, Bering Sea Registration Area, 1993/94 - 2004/05.

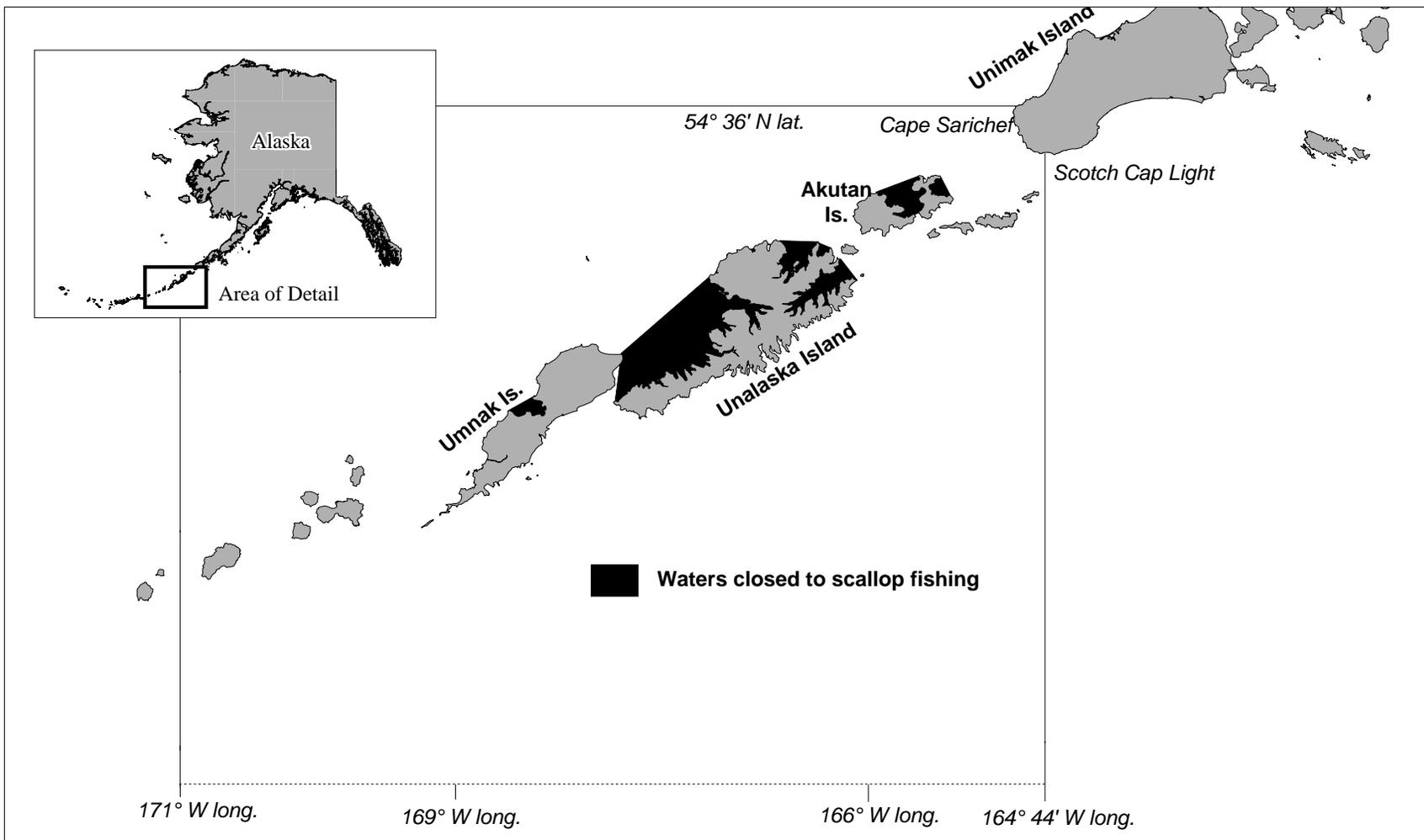


Figure 12.-Dutch Harbor weathervane scallop fishing registration area and closed waters.

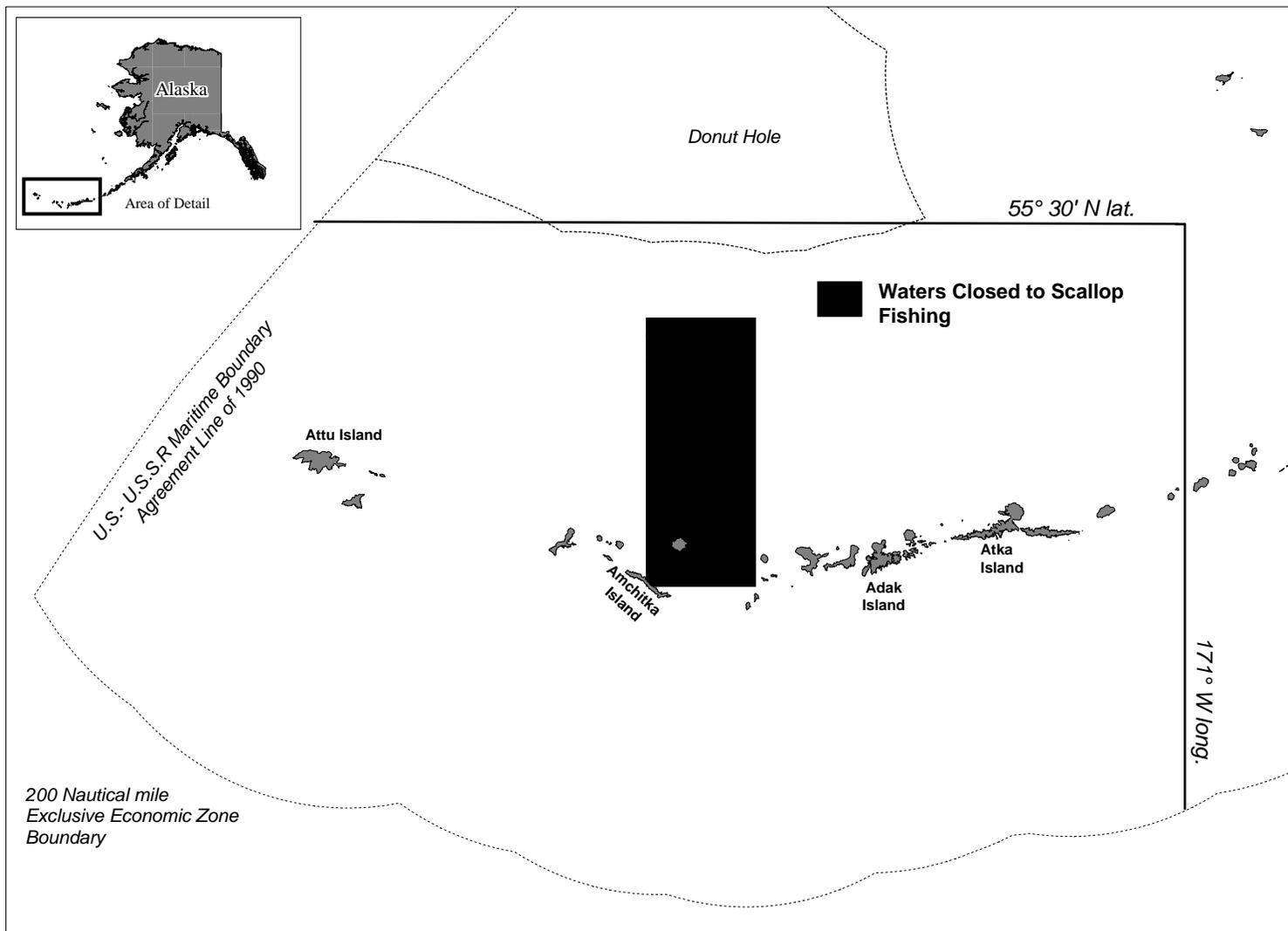


Figure 13.-Adak weathervane scallop fishing registration area and closed waters.