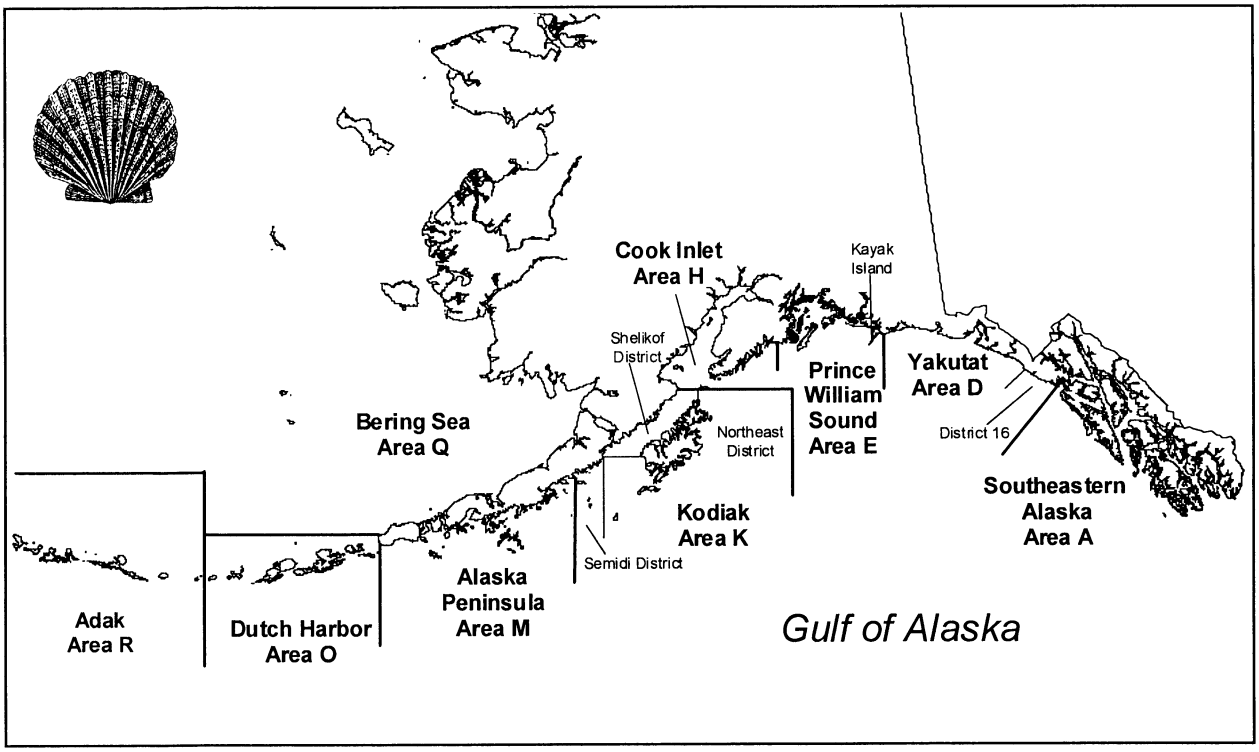
STOCK ASSESSMENT AND FISHERY EVALUATION REPORT

FOR THE WEATHERVANE SCALLOP

FISHERY OFF ALASKA



Compiled by

The Scallop Plan Team

With contributions by:
Kenneth J. Goldman, Gretchen Harrington, Scott Miller, Gregg Rosenkranz, Herman Savikko, Diana Stram, Charles E. Trowbridge and Jie Zheng

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North Pacific Fishery Management Council
605 West 4th Avenue, Suite 306
Anchorage, Alaska 99501

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1 Introduction

The *National Standard Guidelines for Fishery Management Plans* published by the National Marine Fisheries Service (NMFS) require that a stock assessment and fishery evaluation (SAFE) report is prepared and reviewed annually for each fishery management plan (FMP). The SAFE report summarizes the current biological and economic status of the fishery and analytical information used in fishery management such as guideline harvest ranges (GHRs) and harvest strategies. The report is assembled by the scallop plan team with contributions from the State of Alaska Department of Fish and Game (ADF&G), the National Marine Fisheries Service (NMFS), and the North Pacific Fishery Management Council (NPFMC). The SAFE report is presented to the Council on an annual basis and is also available to the public.

The Scallop Plan Team met in Anchorage on February 21-22, 2008 to review the status of the weathervane scallop stocks, to discuss additional issues of importance in scallop management and to compile the annual SAFE report. The Plan Team review was based on presentations by staff of the NPFMC, NMFS and ADF&G with opportunity for public comment and input. Members of the Plan Team who compiled the report were Gregg Rosenkranz, Diana Stram, Gretchen Harrington, Scott Miller, Jie Zheng and Herman Savikko.

The scallop fishery in Alaska's Exclusive Economic Zone (EEZ; 3-200 miles offshore) is jointly managed by the state and federal government under the FMP. Most aspects of scallop fishery management are delegated to the State of Alaska, while limited access and other federal requirements are under jurisdiction of the federal government. The FMP was developed by the NPFMC under the Magnuson Stevens Act and approved by NMFS on July 26, 1995. The NPFMC updated and adopted a revised FMP in 2006.

Although the FMP covers all scallop stocks off the coast of Alaska including weathervane scallops (*Patinopecten caurinus*), pink or reddish scallops (*Chlamys rubida*), spiny scallops (*Chlamys hastata*), and rock scallops (*Crassadoma gigantea*), the weathervane scallop is the only commercially exploited stock at this time. Commercial fishing for weathervane scallops occurs in the Gulf of Alaska, Bering Sea, and Aleutian Islands. Scallop registration areas used by ADF&G in management of the fishery are shown in Figure 1, and general fishing locations are shown in Figure 2.

In 1996, optimum yield (OY) was established as 0 to 1.8 million pounds of shucked scallop meats. A more conservative approach was taken in 1998, when OY was defined as 0 to 1.24 million pounds of shucked scallop meats. Statewide scallop harvest has not exceeded OY, and scallop stocks are not overfished.

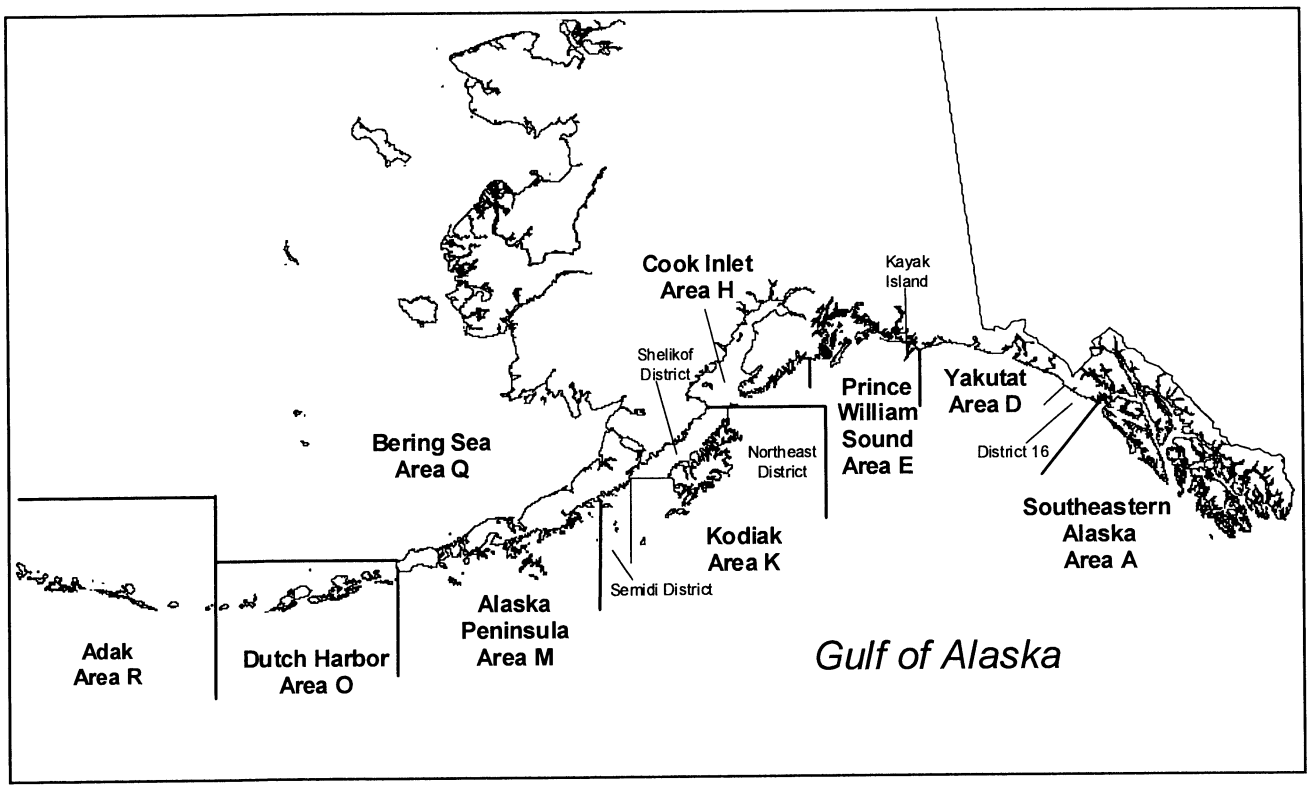

Figure 1 Alaska weathervane scallop fishing registration areas.

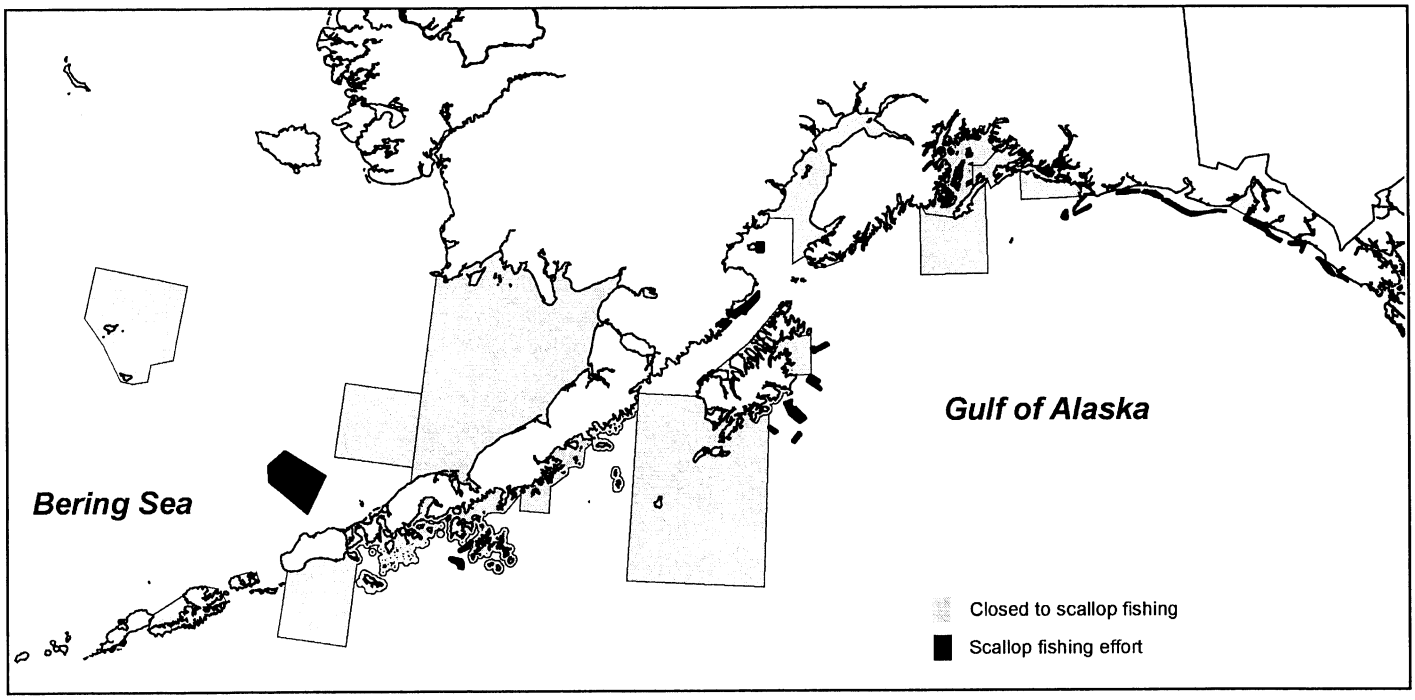

Figure 2 **Scallop fishing locations (dark polygons) outside Cook Inlet during the 2003/04 season.**

1.1 Summary of New Information Included in the SAFE Report

This SAFE Report includes updated information through the 2006/2007 fishing season. New information which is included in this report since the previous report (NPFMC 2006) includes the following:

1) Response to SSC comments section added;
2) Updated observer program summary data through 2006/2007 fishing season;
3) Overview section on fishery management added;
4) Economic overview section updated;
5) Clarification regarding definition of GHRs and GHLs;
6) Updated information on recent regulatory actions with respect to the scallop fishery;
7) Many sections moved, reorganized, and rewritten for greater clarity.

1.2 Response to SSC comments

1) *In describing the state's future approach to managing scallops, it would be useful to add the conceptual framework explaining why the state is moving towards visual assessment techniques and population modeling so the reader understands the direction managers want to go.*
   Response: Additional explanation was added to section 2.1 regarding this.
2) *Including a specific section for responses to SSC comments in the SAFE document itself will enhance communication between the state and the council.*
   Response: section added.
3) *There are several issues in interpreting CPUE indices as a management tool or as a fishery performance statistic. Part of the rationale for moving to a visually-based survey is that CPUE is not reliable as a management tool or an index of population abundance. Therefore, should the CPUE be removed from the SAFE document entirely? At a minimum the SAFE should contain a paragraph describing the limitations of CPUE information and caveats about its use in the SAFE.*
   Response: Additional explanation was added to section 2.1 regarding the limitations of the use of CPUE data. However, until such a time as survey data is available for all areas we still feel that it is important to report CPUE data in the SAFE report, particularly for those areas where survey data is absent or limited information exists historically.
4) *For clarity, and information synthesis among areas, a "summary of stock status" section would be helpful in comparing information among areas, understanding overall fishery performance, and integrating survey information for the entire managed range.*
   Response: A section (3.1) was added this year.
5) *The SAFE document would also be enhanced if information was included on natural history characteristics, such as age, growth, reproduction, and other biological information to provide biological background and to be used as population models are developed. In addition, a discussion of factors influencing size-based discard and discard mortality would be helpful in the document and would be important in developing a population model. This information would also help to identify and direct future research efforts.*
   Response: A section (1.4) was added on this as a placeholder until such a time as additional staff time allows for an expansion of this information.
6) *The SSC is pleased at the addition of an ecosystem considerations section. As this section is developed, it should include more information on predator-prey relationships, crab bycatch impacts, and habitat impacts. The National Academy of Sciences report on trawling impacts recommended three mechanisms for habitat impacts to be minimized (creating areas closed to trawling, reducing fishing effort, and modifications to fishing gear). The scallop fishery has already taken measurable steps in these three areas and these could be described in the ecosystem considerations section.*

Further, the visual survey data can be used to index habitat or other biological features, such as invertebrates, and provides an opportunity for future study as resources allow. In developing the ecosystem considerations section, it may be useful to consult the format used in the ecosystem considerations sections of the groundfish SAFE documents.

Response: The ecosystems considerations section was reorganized this year and the SPT continues to work to improve this section. However this section should in no way be intended to replace information contained in the comprehensive Ecosystem Considerations Chapter of the annual groundfish SAFE Reports, but rather to complement information contained within it. As such we have specifically referenced the reader to that document.

1.3 Historical Overview of the Scallop Fishery

Alaska weathervane scallop *Patinopecten caurinus* populations were first evaluated for commercial potential in the early 1950s by government and private sector investigators. Interest in the Alaska fishery increased in the late 1960s as catches from U.S. and Canadian sea scallop *Placopecten magellanicus* fisheries on Georges Bank declined. Commercial fishing effort first took place in Alaska during 1967 when two vessels harvested weathervane scallops from fishing grounds east of Kodiak Island. By the following year, 19 vessels including New England scallopers, converted Alaskan crab boats, salmon seiners, halibut longliners, and shrimp trawlers, entered the fishery.

From the inception of the fishery in 1967 through mid May 1993, the scallop fishery was passively managed with minimal management measures. Closed waters and seasons were established to protect crabs and crab habitat. When catches declined in one bed, vessels moved to new areas. While this may have been acceptable for a sporadic, low intensity fishery, increased participation inevitably led to boom and bust cycles (Barnhart 2003).

In the early 1990s, the Alaska weathervane scallop fishery expanded rapidly with an influx of boats from the East Coast of the United States. Concerns about overharvest of scallops and bycatch of other comercially important species such as crabs prompted the ADF&G Commissioner to designate the weathervane scallop fishery a high-impact emerging fishery on May 21, 1993. This action required ADF&G to close the fishery and implement an interim management plan prior to reopening. The interim management plan contained provisions for king and Tanner crab bycatch limits (CBLs) for most areas within the Westward Region. Since then, crab bycatch limits have been established for the Kamishak District of the Cook Inlet Registration Area and for the Prince William Sound Registration Area. The commissioner adopted the regulations and opened the fishery on June 17, 1993, consistent with the measures identified in the interim management plan. The interim management plan included a provision for 100% onboard observer coverage to monitor crab bycatch and to collect biological and fishery data. In March 1994, the Alaska Board of Fisheries (BOF) adopted the interim regulations identified as the Alaska Scallop Fishery Management Plan, 5 AAC 38.076.

From 1967 until early 1995, all vessels participating in the Alaska scallop fishery were registered under the laws of the State of Alaska. Scallop fishing in both state and federal waters was managed under state jurisdiction. In January 1995, the captain of a scallop fishing vessel returned his 1995 scallop interim use permit card to the State of Alaska Commercial Fisheries Entry Commission in Juneau and proceeded to fish scallops in the EEZ with total disregard to harvest limits, observer coverage, and other management measures and regulations. In response to this unanticipated event, federal waters in the EEZ were closed to scallop fishing by emergency rule on February 23, 1995. The initial emergency rule was in effect through May 30, 1995, and was extended for an additional 90 days through August 28, 1995. The intent of the emergency rule was to control the unregulated scallop fishery in federal waters until an FMP could be implemented to close the fishery. Prior to August 28, NPFMC submitted a proposed FMP which closed scallop fishing in the EEZ for a maximum of one year with an expiration date of August 28, 1996. The final rule implementing Amendment 1

to the FMP was filed July 18, 1996 and published in the Federal Register on July 23, 1996. It became effective August 1, 1996, allowing the weathervane scallop fishery to reopen in the EEZ. Scallop fishing in state waters of the Westward Region was delayed until August 1, 1996 to coincide with the opening of the EEZ. The state continued as the active manager of the fishery with in-season actions duplicated by the federal system (Barnhart 2003).

In March 1997, NPFMC approved Amendment 2, a vessel moratorium under which 18 vessels qualified for federal moratorium permits to fish weathervane scallops in federal waters off Alaska. By February 1999, the Council recommended replacing the federal moratorium program with an LLP, which became Amendment 4 to the FMP. The Council's goal was to reduce capacity to approach a sustainable fishery with maximum net benefits to the Nation, as required by the Magnuson-Stevens Act. NPFMC's preferred alternative created a total of nine licenses with no area endorsements; each vessel is permitted to fish statewide. However, vessels that fished exclusively in the Cook Inlet Registration Area where a single 6-foot dredge was the legal gear type during the qualifying period were also limited to fishing a single 6-foot dredge in federal waters outside Cook Inlet. The NPFMC later modified the gear restriction in Amendment 10 to allow these vessels to fish 2 dredges with a combined maximum width of 20 feet. Amendment 10 was approved on June 22, 2005. NMFS published final regulations on July 11, 2005, which were effective August 10, 2005. NMFS implemented Amendment 10 by reissuing the two LLP licenses with the larger gear restriction.

1.4 Weathervane Scallop Biology

This section is currently a placeholder; the SPT hopes to expand it with input from the new ADF&G scallop biologist after the position is filled. The goal will be to summarize what is known about weathervane scallop biology and to delineate the most important directions for future research.

Alaska weathervane scallops spawn between May and early July. Spermatozoa and eggs are released directly into the water where fertilization occurs. Fertilized eggs settle to the bottom and hatch into larvae within several days; they then rise in the water column and drift with prevailing currents for about a month while undergoing metamorphosis. Scallops then settle to the bottom as juveniles and may attach to the substrate with byssal threads. A combination of large-scale (overall spawning population size and oceanographic conditions) and small-scale (site suitability for settlement) processes influence recruitment of scallops.

1.5 Economic Overview of the Scallop Fishery

An overview of historic Alaska weathervane scallop harvest and wholesale revenue is presented in Table 1. This data is reprinted from Kruse et al. (2005) and updated with information from annual scallop harvest information (Barnhart, 2006). Vessel participation and numbers of landings in this fishery have varied considerably over time. Participation increased rapidly from an historic low of 2 vessels in 1967 to 19 in both 1968 and 1969. Similarly, only 6 landings occurred in 1967 but by 1969, 157 landings were made and that year is the historical peak in participation, landings, and catch and among the years with highest first wholesale gross revenue.

Following 1969, participation, landing, and catch trended downward through 1976. In 1977, 1978, and 1979 the fishery was open but fishermen opted not to fish. In 1980 there were 8 participants making 56 landings totaling more than 600,000 pounds of scallop meats. In the following years, participation, landings, and catch trended upwards until 1983 before cycling downward. There followed an upward trend in landings and catch through the mid 1990s. Since the mid 1990s, participation, landings, and catch stabilized somewhat with catch consistently between 500,000 and 850,000 pounds each year; however, the 2004/05 catch of 431.596 pounds is the lowest level in nearly a decade. Vessel participation has been limited in recent years by the formation of the

voluntary cooperative in May 2000, and by the implementation of the LLP in 2001. The Federal LLP limits the participation to 9 permit holders. Since 2000, no more than 8 vessels have participated and in recent years there have been as few as 3 participants.

Table 1 also provides historical statewide average price per pound of landed scallop meats. It is important to note that presently most landed scallop meats have been processed (shucked) and frozen at sea. Prior to 1996 almost all scallop meats were placed in muslin bags and iced (not frozen) at sea and this is still the method used to deliver Cook Inlet scallops fresh to market. Thus, although landed price is often referred to as an ex-vessel price, since 1996 it has actually been reported as an average first wholesale price in that the majority of landed product is a primary processed product. Thus, in most years gross revenue is identified as first wholesale value here. The exception is that in the past two seasons, number of landings and first wholesale prices have not been available due to staffing constraints. Thus, the price that is used for 2005/06 and 2006/07 has been estimated by the Alaska Commercial Fisheries Entry Commission (CFEC) and are based a weighted average of ex-vessel fresh product delivery price and limited first wholesale price from voluntary Commercial Operators Annual Reports that some catcher processors prepare.

Price generally trended upwards during the late 1960s and through the 1970s. However, catch and value began to decline in the late 1970s. Following the three years of no effort, prices rose dramatically to nearly $3.6 per pound, possibly in response to shortage of weathervane scallops caused by the closures but also likely due to closures and shortages in other areas. Historic prices peaked in 1983 at $5 per pound before trending downward through the mid 1990s, upward during the late 1990s and then back downward from 1999 through 2002-03 when wholesale prices averaged $5.25 per pound. This trend may be directly related to U.S. east coast scallop stock conditions and related market prices as well as import prices. The dependence of market prices in the Alaska scallop fishery on east coast and import markets is a topic for further research.

First wholesale revenue in this fishery has varied considerably over the years as both price and landings have varied. The peak value in the fishery occurred in 1992 when more than $7 million was earned. Since that time, total first wholesale revenue in the fishery has trended downward along with landings, catch, and prices. In 2002-03, the fishery yielded about $2.7 million in total first wholesale revenue. The downward trend continued with the 2003-04 and 2004-05 seasons yielding $2.7 million and $2.6 million respectively. The 2004-05 season revenue of $2.4 million was the lowest return in the Alaska scallop fishery since 1988. With higher prices, revenue has rebounded to $4.3 million and $3.8 million in the past two seasons. However; the considerably higher prices recorded in these two seasons are based on a combination of ex-vessel and limited first wholesale value data and may not be an accurate representation of either. These price discrepancies between CFEC and ADF&G data will be a topic for further research and resolution pending upcoming staffing changes at ADF&G.

Scallop vessel operators have reported difficulty, in the most recently concluded season, with marketing scallops harvested from the Yakutat District 16 area. There are two primary problems with marketing scallops from this area (Kandianis, 2008). The first is that the scallops from this area tend to have small meats that are not as valuable as larger meat scallops taken elsewhere in Alaska. This means that these scallops must compete with large volumes of imported aquaculture scallops in this size range from countries such as China (Coulter, 2008). In 2006, for example, China exported more than 30 million pounds of frozen scallops to the United States with an average wholesale value of about $2.85 per pound.

The second primary problem with Yakutat District 16 scallops has been a tendency toward lower quality. This has occurred as off color and/or "weak" meats that have high water content and are lacking in firmness and texture. Scallops in this condition do not prepare well in primary food service applications and are utilized in secondary processed food products (e.g. breaded or frittered). Some past buyers of these scallops have refused to purchase scallops from this area this year and have substituted imported aquaculture scallops that are of

similar size, slightly better quality, and are offered a lower first wholesale prices (Coulter, 2008). The cause of reduced quality of scallops from this area is not known and there have been reports of similar problems with some scallops taken from the Kamishak Bay area this season (Goldman, 2008).

Market and quality conditions are having an operational impact on the Yakutat District 16 fishery. The district 16 scallop harvest was 13,445 lbs in 2006/07, which did not achieve the 21,000 lb harvest ceiling. Scallop vessel operators have indicated that with high fuel costs their breakeven price was around $6 per pound, which is well above the less than prevailing market price of $3 per pound that Chinese frozen scallop imports averaged. They have also tried to move harvest in this district to late in the season in hopes of better quality; however, their catch rates were reportedly cut in half. (Mineo, 2008) Thus, the harvest that did occur in Yakutat District 16 was reportedly a financial loss and was done more to maintain harvesting history in the voluntarily rationalized fishery (Kandianis, 2008. Mineo, 2008.).

Table 1 Historic Statewide Commercial Weathervane Scallop Revenue Statistics, 1967-2006/07

Year	Vessels	Landings[a]	Catch (lbs meats)[b]	Average Price/Lb.	Wholesale Value
1967	2	6	778[c]	$0.70	$545
1968	19	125	1,677,268	$0.85	$1,425,678
1969	19	157	1,849,947	$0.85	$1,572,455
1970	7	137	1,440,338	$1.00	$1,440,338
1971	5	60	931,151	$1.05	$977,709
1972	5	65	1,167,034	$1.15	$1,342,089
1973	5	45	1,109,405	$1.20	$1,331,286
1974	3	29	504,438	$1.30	$655,769
1975	4	56	435,672	$1.40	$609,941
1976	7	21	264,788	$1.59	$421,013
1977-79 **No Fishery**					
1980	8	56	616,717[c]	$3.60	$2,220,181
1981	18	101	924,441	$4.00	$3,697,764
1982	13	120	913,996	$3.25	$2,970,487
1983	5	30	192,310	$5.00	$961,550
1984	6	52	383,512	$4.00	$1,534,048
1985	7	47	615,564	$4.00	$2,462,256
1986	8	74	667,258	$4.25	$2,835,847
1987	4	54	599,947[d]	$3.45	$2,069,817
1988	4	47	341,070	$3.68	$1,255,138
1989	7	55	534,763	$3.87	$2,069,533
1990	9	144	1,481,136	$3.43	$5,080,296
1991	6	136	1,136,649	$3.82	$4,341,999
1992	8	136	1,785,673	$3.96	$7,071,265
1993[e]	7	51	568,077	$5.15	$2,925,597
1993/94	15	111	984,583	$5.15	$5,070,602
1994/95	15	104	1,240,775	$5.79	$7,184,087
1995/96	10	29	410,743[d]	$6.05	$2,484,995
1996/97	9	30	732,424	$6.30	$4,614,271
1997/98	9	31	818,913	$6.50	$5,322,935
1998/99	8	35	822,096	$6.40	$5,261,414
1999/00	10	22	837,971	$6.25	$5,237,319
2000/01	8	20	750,617	$5.50	$4,128,394
2001/02	6	26	572,838	$5.25	$3,007,400
2002/03	6	28	509,455	$5.25	$2,674,639
2003/04	4	32	500,379	$5.25	$2,626,990
2004/05	5	22	431,594	$5.50	$2,373,767
2005/06	3	f	532,741	$8.02 [g]	$4,272,583
2006/07	3	f	486,564	$7.78 [g]	$3,785,468

a Prior to and including 1995, number of landings equals number of fish tickets. After 1995, the number of landings equals number of deliveries (off-loads). A delivery typically includes multiple tickets, normally one per week.

b Pounds of shucked scallop meats.

c Unshucked scallop deliveries were converted to shucked meats using a 10% conversion factor.

d Includes illegal harvest.

e January 1 through June 30

f data presently unavailable.

g estimated by fresh product ex-vessel price and limited first wholesale product value data.

2 Overview of Scallop Fishery and Management

The scallop fishery is managed jointly by NMFS and ADF&G under the Federal Fishery Management Plan (FMP) for the Scallop Fishery off Alaska. Most management measures under the FMP are delegated to the State for management under Federal oversight. ADF&G management of the weathervane scallop fishery covers both state and federal waters off Alaska. The following sections provide background on the fishery and its managment, including registration areas, season, guideline harvest ranges (GHRs), the observer program, crab bycatch limits (CBLs), and the LLP.

2.1 Management

Registration Areas. The State of Alaska Scallop Fishery Management Plan established 9 scallop registration areas in Alaska for vessels commercially fishing scallops (Figure 1). These include the Southeastern Alaska Registration Area (Area A);Yakutat Registration Area (Area D and District 16); Prince William Sound Registration Area (Area E); Cook Inlet Registration Area (Area H); Kodiak Registration Area (Area K), which is subdivided into the Northeast, Shelikof and Semidi Districts; Alaska Peninsula Registration Area (Area M); Dutch Harbor Registration Area (Area O); Bering Sea Registration Area (Area Q); and Adak Registration Area (Area R). Scallop seasons have never been opened in Area A, and effort occurred in Area R during 1995 only.

Seasons. The regulatory fishing season for weathervane scallops in Alaska is July 1 through February 15 except in the Cook Inlet Registration Area. In the Kamishak District of Cook Inlet, the season is August 15 through October 31, and in all other districts of Cook Inlet, the season is from January 1 through December 31 under conditions of an exploratory permit. Scallop fishing in any registration area in the state may be closed by emergency order prior to the end of the regulatory season. Scallop GHRs and CBLs are typically announced by ADF&G approximately one month prior to the season opening date.

Guideline Harvest Ranges. Although the FMP overfishing definition (2.7) is based on the statewide scallop stock, statewide estimates of stock size are not available, and ADF&G manages the fishery by registration areas and districts. To add to the confusion, two types of GHRs have been used by the State of Alaska: regulatory GHRs written into Alaska state law, and seasonal GHRs set annually by ADF&G. To reduce confusion, ADF&G will henceforth use the term GHL (guideline harvest level) to refer to seasonal harvest targets that are set annually for each fishing area.

Regulatory GHRs for traditional scallop fishing areas were first established by the State of Alaska in 1993 under the Interim Management Plan for Commercial Scallop Fisheries in Alaska. Regulatory GHRs (lbs of shucked scallop meats) were set at 0–250,000 lbs for Yakutat, 0–50,000 lbs for Prince William Sound, 0–20,000 lbs for the Kamishak District of Cook Inlet, 0–400,000 lbs for Kodiak, and 0–170,000 lbs for Dutch Harbor. These area GHR ceilings were determined by averaging historic catches from 1969 to 1992 excluding years when there was no fishing or a "fishing-up effect" occurred (Barnhart 2003).

Prior to the August 1, 1996 re-opening of the weathervane scallop fishery, the State of Alaska established GHRs for non-traditional registration areas, including 0–200,000 lbs for the Alaska Peninsula, 0–600,000 lbs for the Bering Sea, 0–35,000 lbs for District 16, and 0–75,000 lbs for Adak. The combined total of the upper limits from traditional and non-traditional areas was 1.8 million lbs, which was defined as maximum sustainable yield (MSY) in Amendment 1 to the federal FMP.

In 1998, the scallop plan team recommended a more conservative definition of MSY. Based on average landings from 1990–1997 excluding 1995 when the fishery was closed for most of the year, MSY was subsequently established in Amendment 6 of the FMP at 1.24 million lbs, with optimum yield (OY) defined as

the range 0–1.24 million pounds. To accommodate the new definition, regulatory GHR ceilings were reduced by the State of Alaska from 400,000 to 300,000 lbs for Kodiak, from 170,000 to 110,000 for Dutch Harbor, and from 600,000 to 400,000 lbs for the Bering Sea. Hence, MSY and the regulatory GHR ceiling written into Alaska law are both 1.24 million lbs.

Stock Assessments and Seasonal GHLs. ADF&G manages the scallop fishery conservatively, with scallop fishing prohibited in large areas known to contain scallops (4.3), and onboard observers required on all vessels operating outside Cook Inlet. Onboard observers transmit summary data to fishery managers thrice weekly or more frequently, and fishing areas may be closed before the GHL is reached due to concerns about localized depletion, trends in CPUE, or bycatch rates. Methods and data used in setting seasonal GHLs vary by region.

ADF&G has conducted biennial dredge surveys in the Kamishak District of the Cook Inlet Registration Area and near Kayak Island in the Prince William Sound Registration Area since the late 1990s. Data from these surveys are used to set GHLs, and some age-structured population modeling work has been performed. In the Kamishak District fishery, observers are not required, but vessels are limited to a single 6 ft dredge, and ADF&G staff have regularly been deployed on scallop vessels to observe fishing and sample the catch.

In registration areas not assessed by dredge surveys, data from the scallop observer program are the primary source of information used to set GHLs. These data consist of time sereis of scallop harvest and fishing effort, including catch per unit effort (CPUE), fishing locations, size structure of the catch, discard of scallops, and crab bycatch. Spatially explicit catch and effort data that cannot be displayed in the SAFE report due to State of Alaska confidentiality requirements are examined by ADF&G staff each year when GHLs are set.

ADF&G and the SPT recognize inherent weaknesses in using fishery data for management purposes. CPUE may be an unreliable index of scallop abundance due to factors such as market conditions, weather on the grounds, tides, gear efficiency, captain and crew performance, etc. Industry have noted that the time of year when fishing occurs can drastically affect CPUE due to differences in weather and sea state between summer and winter. Size composition data from the commercial catch are affected by choice of fishing locations and gear selectivity and hence may not be representative of the true size composition of any scallop population.

Concerns such as these led ADF&G to begin exploring underwater video techniques for scallop stock assessment in 2000. A new camera sled system recently constructed records high resolution images of the bottom on computer hard drives while towing 3–5 knots (Rosenkranz et al., *in review*). ADF&G is currently working on a comparative study of imaging and sample dredge survey data, imaging survey methodology, computerized image data review (cooperative project with HabCam from Wood's Hole Oceanographic Institution), manual image data review, and ways to incorporate image data into fishery management. Age- or size-structured models that combine image survey data with observer data will likely be developed as research using this new tool progresses.

2.2 Fishery

Scallop vessels in the Alaska fishery are 58–124 feet length overall, with maximum 1,200 horsepower. Standard New Bedford style scallop dredges are used in the fishery. On average, a 15-foot dredge weighs a minimum of 2,600 pounds and a 6-foot dredge weighs about 900 pounds. The frame design provides a rigid, fixed dredge opening. Attached to and directly behind the frame is a steel ring bag consisting of 4-inch (inside diameter) rings connected with steel links; 4 inch or larger rings are required by state law. A sweep chain footrope is attached to the bottom of the mesh bag. The top of the bag consists of 6-inch stretched mesh polypropylene netting which helps hold the bag open while the dredge is towed along the ocean floor. A club stick attached to the end of the bag helps maintain the shape of the bag and provides for an attachment point to dump the dredge contents on deck. Steel dredge shoes that are welded onto the lower corners of the frame bear

most of the dredge's weight and act as runners, permitting the dredge to move easily along the substrate. Each dredge is attached to the boat by a single steel wire cable operated from a deck winch.

Scallop fishing operations involve the following steps: (a) dredge deployment; (b) dredge towed for 50 to 60 minutes on the bottom at an average speed of 4.7 knots; (c) dredge retrieved; (d) dredge contents emptied on deck; (e) retained scallops sorted from the catch and bycatch discarded overboard; (f) baskets of retained scallops moved from the deck to the shucking area; (g) gear prepared for the next set; (h) gear deployed; aand (i) shuck, wash, grade, package and freeze scallop meats. The scallop meat is the single adductor muscle that is removed from the scallop by crew members using specialized hand-held scallop knives. Scallop meats represent approximately 8-12% of the round weight depending on area and season (Barnhart and Rosenkranz 2003). Scallop meats are graded by size and sold primarily to domestic seafood markets, with a smaller amount going to foreign markets (Kruse et al. 2005).

2.3 Observer Program

The primary purposes of the onboard scallop observer program are to collect biological and fishery data and to monitor bycatch. ADF&G requires observers on all trips of all vessels fishing scallops outside Cook Inlet in both state and federal waters. Observers are briefed and debriefed by ADF&G staff in each management area where fishing occurs prior to and after deployment.

Dredge hauls are sampled to collect data on retained scallop catch, crab and halibut bycatch, scallop discards, and catch composition. Detailed logbooks completed by vessel operators are checked by observers and submitted to ADF&G along with other observer data forms. Observers send summary reports to ADF&G fishery managers thrice weekly or more frequently during the season by radio or email. Data are entered, stored, and maintained by ADF&G staff in Kodiak. Observer data are used for inseason management and in setting seasonal GHLs. Scallop observer data are released to the public in reports prepared by ADF&G (e.g., Barnhart and Rosenkranz 2003).

Onboard observer coverage is funded by industry through direct payments to independent contracting agents. Scallop observers are trained at the University of Alaska North Pacific Fisheries Observer Training Center in Anchorage. Observer training manuals (e.g., Banrhart 2003) are prepared by ADF&G staff.

Observer cost for vessels limited to a single 6-ft dredge in federal waters was addressed in Amendment 10, section 6.8 of the Scallop FMP. The Council determined that given existing observer requirements and their associated costs, the single 6-ft dredge restriction created a disproportionate economic hardship when fishing in federal waters (NPFMC 2004). Amendment 10 allows two vessels to fish with two 10-ft dredges to capture a larger share of the total catch, thus allowing them to offset observer costs and perhaps enhance their economic viability.

2.4 Crab Bycatch Limits

Bycatch of crabs in the scallop fishery is controlled through the use of Crab Bycatch Limits (CBLs) based on individual crab stock abundance. CBLs were first instituted by the state in July 1993. Methods used to determine CBLs in 1993 and 1994 were approved by the BOF and the NPFMC and, with few exceptions, remain unchanged. Annual CBLs are established preseason by 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 2). 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 set at 0.5% of the total crab stock abundance and the red king crab limit is fixed at 60 crabs. In 2001, ADF&G set Tanner crab bycatch caps in the Prince William Sound Registration Area at 0.5% of the Tanner crab population estimate from the 2000 scallop survey. This resulted in bycatch limits of 2,700 and 8,700 for the east and west harvest areas. These levels have remained in place for all subsequent years.

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 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 *Chionoecetes* spp. and 17,000 red king crabs. In 1995, ADF&G recommended that CBLs be established at 0.003176 percent of the best available estimate of *C. opilio* (snow crab) and 0.13542 percent of the best available estimate of Tanner crab abundance in Registration Area Q. That equated to about 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 ADF&G. The NPFMC also recommended that king crab bycatch limits be set within a range of 500 to 3,000 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 fishing seasons the CBL for *Chionoecetes* sp. 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.

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.

Table 2 Statewide crab bycatch limits, in percent of the crab abundance estimate or number of crab.

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

NA= Not applicable

[a]Fixed CBL

[b]Bycatch limit set to allow scallop fleet adequate opportunity to explore and harvest scallop stocks while protecting the crab resource.

Bycatch of snow crab, Bairdi Tanner crab and Bristol Bay red king crab by scallop fisheries in comparison with groundfish and directed crab fisheries are shown in Tables 3–5. Bycatch of snow, king, and Tanner crabs in the Bering Sea scallop fishery is much lower than in other Bering Sea fisheries. Scallop fishery closures due to attainment of CBLs have decreased over the years, in part due to decreased crab abundance (Barnhart and Rosenkranz 2003). ADF&G closely monitors bycatch rates during scallop seasons and has used a rate of one crab per pound of scallop meats as a benchmark since 1993. Bycatch may affect harvest and CPUE in the Bering Sea scallop fishery as vessel operators move or cease fishing when bycatch rates meet or exceed this benchmark.

Table 3 Bycatch of *C. opilio* crabs (numbers of crab) in Bering Sea fisheries, 1995-2006.

Year	Directed crab pot	Groundfish Trawl	Groundfish fixed gear	Scallop dredge	Total
1995	48,734,000	5,165,555	230,233	0	54,129,788
1996	56,570,785	3,643,612	267,395	104,836	60,586,628
1997	75,005,446	5,276,208	554,103	195,345	81,031,102
1998	51,591,453	4,122,648	549,139	232,911	56,496,151
1999	47,093,200	1,544,747	269,778	150,421	49,058,146
2000	5,020,800	2,207,279	270,000	105,602	7,603,681
2001	6,123,100	1,293,143	215,000	68,458	7,699,701
2002	15,823,300	882,967	n/a	70,795	n/a
2003	22,140,336	615,012	86,313	16,206	22,857,867
2004	4,800,043	1,693,101	140,428	3,843	6,637,415
20051	4,966,178	3,292,520	124,171	5,211	8,388,080
20052	9,141,057	--------	---------	---------	*17,529,1373*
2006/07	16,690,724	1,028,969	236,970	8,543	17,965,206

Table 4 Bycatch of Bristol Bay red king crabs (numbers of crab) in Bering Sea fisheries, 1995-2006.

Year	Directed crab pot	Groundfish Trawl	Groundfish fixed gear	Scallop dredge	Total
1995	0	44,934	3,257	0	48,191
1996	605,000	30,967	75,675	0	711,642
1997	985,000	50,711	25,579	0	1,061,290
1998	4,593,800	42,003	7,017	146	4,642,966
1999	957,800	84,709	8,968	1	1,026,178
2000	1,701,000	70,787	39,754	2	1,653,542
2001	2,419,100	58,552	19,000	0	2,496,652
2002	1,677,800	89,955	27,477	2	1,795,234
2003	5,808,200	91,937	13,531	0	5,913,668
2004	2,470,868	78,742	15,014	0	2,564,624
20054	5,724,919	111,249	19,723	2	5,855,893
2006/07	2,003,970	101,546	14,434	10	2,119,960

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1 This estimate is from the 2005 pre-rationalized opilio fishery (January 15, 2005-May 2005) and the 2005/2006 rationalized Bristol Bay red king crab seasons; does not include some bycatch during the 2005/2006 EBS snow and Tanner crab fisheries

2 This estimate is from the 2005/06 rationalized opilio fishery October 15, 2005-May 2006. Note 97% of the effort during the 15 Oct 2005 to May 2006 opilio fishery occurred after 1 January 2006

3 Total reflects sum of both 2005 and 2005/06 bycatch numbers as listed

4 From the 2005/2006 rationalized BB red king crab fishery (Oct 15 2005 to January 15 2006) but little or no catch or effort from January 1-15. This does not include any bycatch from the rationalized 2005/2006 Tanner crab fishery.

Table 5 Bycatch of *C. bairdi* crabs (numbers of crab) in Bering Sea fisheries, 1995-2006.

Year	Directed crab pot	Groundfish Trawl	Groundfish fixed gear	Scallop dredge	Total
1995	15,897,300	2,212,181	87,674	0	18,197,155
1996	4,588,000	1,836,031	279,560	17,000	6,930,591
1997	4,865,900	1,917,736	50,218	28,000	6,861,854
1998	4,293,800	1,477,816	46,552	36,000	5,854,168
1999	1,995,100	901,619	43,220	n/a	n/a
2000	491,000	1,002,074	140,453	53,614	1,539,141
2001	626,400	950,331	80,000	48,718	1,705,449
2002	1,282,600	1,086,286	98,848	48,053	2,515,787
2003	626,000	897,340	105,094	31,316	1,659,750
2004	334,593	800,794	38,592	15,303	2,849,032
20055	708,290	1,569,613	122,167	15,529	2,415,599
2006/07	10,000,443	921,267	402,377	45,204	11,369,291

2.5 Scallop License Limitation Program

Commercial weathervane scallop fishing in federal waters off Alaska is limited by a federal license limitation program (LLP), while participation in state waters (0-3 nautical miles) is limited by a vessel-based limited entry program. The LLP limits participation in the statewide scallop fishery in Federal waters to nine vessels.

The Federal Scallop License Limitation Program (LLP) became effective in 2001. The NPFMC created the scallop LLP under Amendment 4 to the FMP to limit the number of participants and reduce fishing capacity. The LLP license is required on board any vessel deployed in the weathervane scallop fishery in federal waters off Alaska. NMFS granted 7 vessel owners licenses to fish statewide outside Cook Inlet. Originally, NMFS granted two vessel owners licenses to fish statewide utilizing a single 6-foot dredge. In August, 2005, NMFS implemented Amendment 10 to the FMP, which modified the gear restriction to allow these two licenses to be used on vessels with up to two 10-foot dredges statewide. All 9 licenses allow vessel owners to fish inside Cook Inlet with a single 6-foot dredge. Vessel length is limited to that of the qualifying period.

All vessels fishing inside the Cook Inlet Registration Area are limited by state regulation to a single dredge not more than 6 feet in width. Unless otherwise restricted by the LLP, vessels fishing in the remainder of the state may simultaneously operate a maximum of 2 dredges that are 15 feet or less in width.

In 1997, the Alaska legislature approved legislation (AS 16.43.906) establishing a scallop vessel moratorium in state waters. In 2001, the legislature authorized a 3-year extension of the moratorium set to expire July 1, 2004. During the 2002 legislative session, passage of CSHB206 resulted in significant changes to the state's limited entry statutes. The changes authorized use of a vessel-based limited entry program in the weathervane scallop and hair crab fisheries. However, the program has a sunset provision. The vessel entry permits issued for the statewide weathervane scallop fishery will expire on December 30, 2008 unless statutory authority is extended. Eight vessel owners received permits to fish for weathervane scallops in state waters.

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5 This is from the pre-rationalized opilio fishery and the rationalized 2005/2006 BB red king crab fishery. This does not include bycatch during 2005 from the 2005/2006 EBS snow crab or directed Tanner crab fishery.

Two vessels with multiple LLP permits as well as state vessel-based limited entry permits have harvested most of the scallop catch outside Cook Inlet over the past several seasons. Three vessels 80 feet or less LOA typically participate in the Cook Inlet Registration Area fishery. Occasionally, one or more of these vessels participate in the scallop fishery outside of Cook Inlet.

More information on the scallop LLP can be found on the NMFS Alaska Region web page at http://www.fakr.noaa.gov/ram/smp.htm.

2.6 Voluntary Scallop Cooperative

In May 2000, six of the nine LLP owners formed the North Pacific Scallop Cooperative under authority of the Fishermen's Cooperative Marketing Act, 48 Stat. 1213 (1934), 15 U.S.C. Sec. 521. The cooperative is self-regulated and is neither endorsed nor managed by ADF&G or NMFS. The cooperative regulates individual vessel allocations within the GHR and crab bycatch caps under the terms of their cooperative contract. Non-coop vessels are not bound by any contract provisions. The cooperative does not receive an exclusive allocation of the scallop harvest. Some owners opted to remove their boats from the fishery and arranged for their shares to be caught by other members of the cooperative. Since formation of the cooperative, harvest rates have slowed and fishing effort occurs over a longer time period each season

Vessel owners within the cooperative have taken an active role in reducing crab bycatch. Vessel operators provide confidential in-season fishing information to an independent consulting company contracted by the cooperative. This firm reviews crab bycatch data, fishing locations, and scallop harvest, which allows for real time identification of high crab bycatch areas. When these areas are identified, the fleet is provided with the information and directed to avoid the area.

More information on the voluntary scallop cooperative can be found in the EA/RIR/IRFA for Amendment 10 to the Scallop FMP available on the Council website at:
http://www.fakr.noaa.gov/npfmc/analyses/analyses.htm

2.7 Overfishing Definition

Overfishing is a level of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. MSY is defined as the largest long-term average catch that can be taken from a stock under prevailing ecological and environmental conditions. Amendment 6 to the scallop FMP established MSY for weathervane scallops at 1.24 million lbs of shucked meats based on the average catch from 1990-1997 excluding 1995. Optimum Yield (OY) was defined as 0–1.24 million lbs, and the overfishing control rule was defined as a fishing rate in excess of the natural mortality rate, which has been estimated as $F_{overfishing} = M = 0.13$ (12% per year) statewide. At this time, abundance is estimated for only two of the nine registration areas and a determination of MSST cannot be made. The fishery is managed conservatively with harvest levels well below MSY. Figure 3 shows statewide scallop catch and MSY levels both prior to amendment 6 and following inception of the new MSY level in 1996. Since 1996, catches have averaged between 39% to 66% of MSY (Table 6, Figure 3,). Control rules for other Alaskan scallop species have not been developed as no commercial harvests occurs.

Table 6 **Alaska weathervane scallop harvest and Maximum Sustainable Yield from FMP, 1993/94–2006/07 seasons.**

Season	Harvest (lbs meat)	MSY	% MSY
1993/94	984,583	1,800,000	55
1994/95	1,240,775	1,800,000	69
1995/96	410,743	1,800,000	23
1996/97	732,424	1,800,000	41
1997/98	818,913	1,800,000	45
1998/99	822,096	1,240,000	66
1999/2000	837,971	1,240,000	68
2000/01	750,617	1,240,000	61
2001/02	572,838	1,240,000	46
2002/03	509,455	1,240,000	41
2003/04	492,000	1,240,000	40
2004/05	425,477	1,240,000	34
2005/06	525,357	1,240,000	42
2006/07	485,561	1,240,000	39

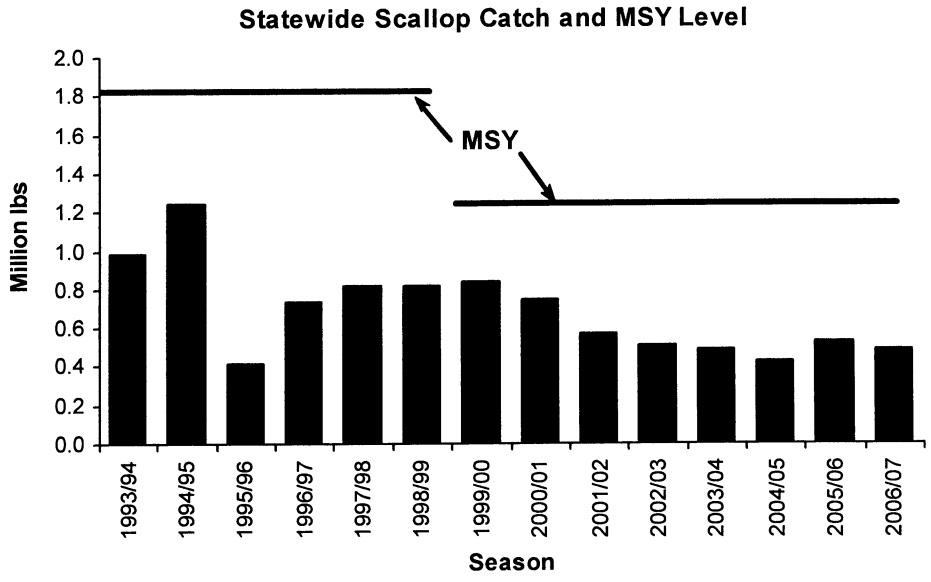

Figure 3 Statewide scallop harvest (pounds shucked scallop meats) and MSY levels from the FMP.

3 Stock Status

The following sections provide summaries of recent scallop fishery performance overall for the statewide stock and individually for each registration area.

3.1 Summary of statewide stock status

ADF&G Central Region staff conducts biennial dredge surveys in the Kamishak District of the Cook Inlet Registration Area and near Kayak Island in the Prince William Sound Registration Area. Harvest limits (GHLs) in these areas are set based on survey data. For registration areas without surveys, the fishery is managed conservatively based on data sets collected by the on-board scallop observer program. Appendix 1 contains the summary of observer data from the 2003/04 through 2004/05 scallop fisheries (Appendix 1, Barnhart and Rosenkranz 2007). These data consist of scallop harvest and fishing effort, including catch per unit effort (CPUE), fishing locations, size structure of the catch, discarded scallop catch, retained scallop catch, scallop meat weight recovery, and crab bycatch. Spatially explicit observer data that cannot be displayed in the SAFE report due to State of Alaska confidentiality regulations are examined in detail by ADF&G staff each year when GHLs are set. The observer program also provides management personnel with in-season summary reports. A fishing area may be closed prior to attainment of the upper end of the GHR due to concerns about localized depletion, overall trends in CPUE, or high crab bycatch.

ADF&G research personnel in Kodiak have developed methodology for fishery-independent video surveys of scallop stocks in the highest-producing beds and expect to survey the Yakutat area in spring of 2006. While camera sled image data have been collected in several management areas, to date, these data have not been used in fishery management. The video survey method is also being compared to the dredge survey conducted by Central Region staff. An experimental survey design was developed by Central Region research staff to provide a comparison between the systematic dredge survey, a systematic video survey and a line transect video survey. This comparison is essential for enabling Central Region to move forward in an attempt to replace the dredge survey with a video survey. It is also laying the groundwork for assessing all scallop beds in the state via fishery independent surveys using the video sled. Even if the video assessment method is adopted by Central Region for scallop assessment, Central Region staff still plan to conduct some dredging in order to maintain knowledge of the age structure of the population, which is critical for using an age structured model. It is also important to maintain knowledge of meat weights from Central Region scallop beds.

As described in section 2.7, overall statewide harvest levels remain well below MSY for the statewide stock. Harvests by region are constrained by individual GHLs. Areas where either the entire GHL was taken or catches were approximately equal to the GHL in the 2006/07 season include: Yakutat (Area D), Prince William Sound (Area E), Kodiak-Shelikof district and the Bering Sea (Area Q). Regions where the catch was below the GHL are Yakutat District 16, Cook Inlet, and Kodiak-Northeast District. Areas where limited or no effort occurred (despite the areas being available for fishing) are: Kodiak-Semidi District, Alaska Peninsula and Adak. The Dutch Harbor registration area (Area O) remains closed to scallop fishing.

Catch and survey information (where available) for each region are summarized in the sections below.

3.2 Yakutat Registration Area

By state regulation, total harvest in Yakutat Area D and District 16 is limited to 250,000 lbs scallop meats per season. Prior to the 2006/07 season, GHLs were set at 0–150,000 lbs for Area D and 0–21,000 lbs for District 16 (Tables 7–8).

Two co-op vessels participated in the 2006/07 fishery and harvested 151,223 lbs scallop meats from Area D and 13,500 lbs scallop meats from District 16. Fishery data from recent seasons are presented in Tables 7–8 and Figures 3–5. Reports from the scallop industry indicated that Yakutat scallop meat quality was better in 2006/07 than in recent seasons, when poor recovery rates, off-color meats, and 'weak meats' were problematic in parts of the Yakutat fishing area.

Table 7 Yakutat Area D scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993	7[b]	250,000	1,999	139,057	70
1994	10[b]	250,000	4,130	246,862	60
1995	8[c]	250,000	4,730	237,417	50
1996	4	250,000	4,438	238,736	54
1997	4	250,000	3,956	243,810	62
1998/99	8	250,000	4,154	242,929	58
1999/00	3	250,000	3,840	249,681	65
2000/01	3	250,000	4,241	195,699	46
2001/02	2	200,000	2,406	103,800	43
2002/03	2	200,000	2,439	122,718	50
2003/04	2	200,000	3,360	160,918	48
2004/05	2	200,000	2,132	86,950	41
2005/06	2	200,000	5,089	199,351	39
2006/07	2	150,000	2,817	150,950	53

[a]Confidential data released by vessel operators.
[b]One additional vessel fished by waiver without an observer; data not included.
[c]Two additional vessels fished by waiver without observers; data not included.

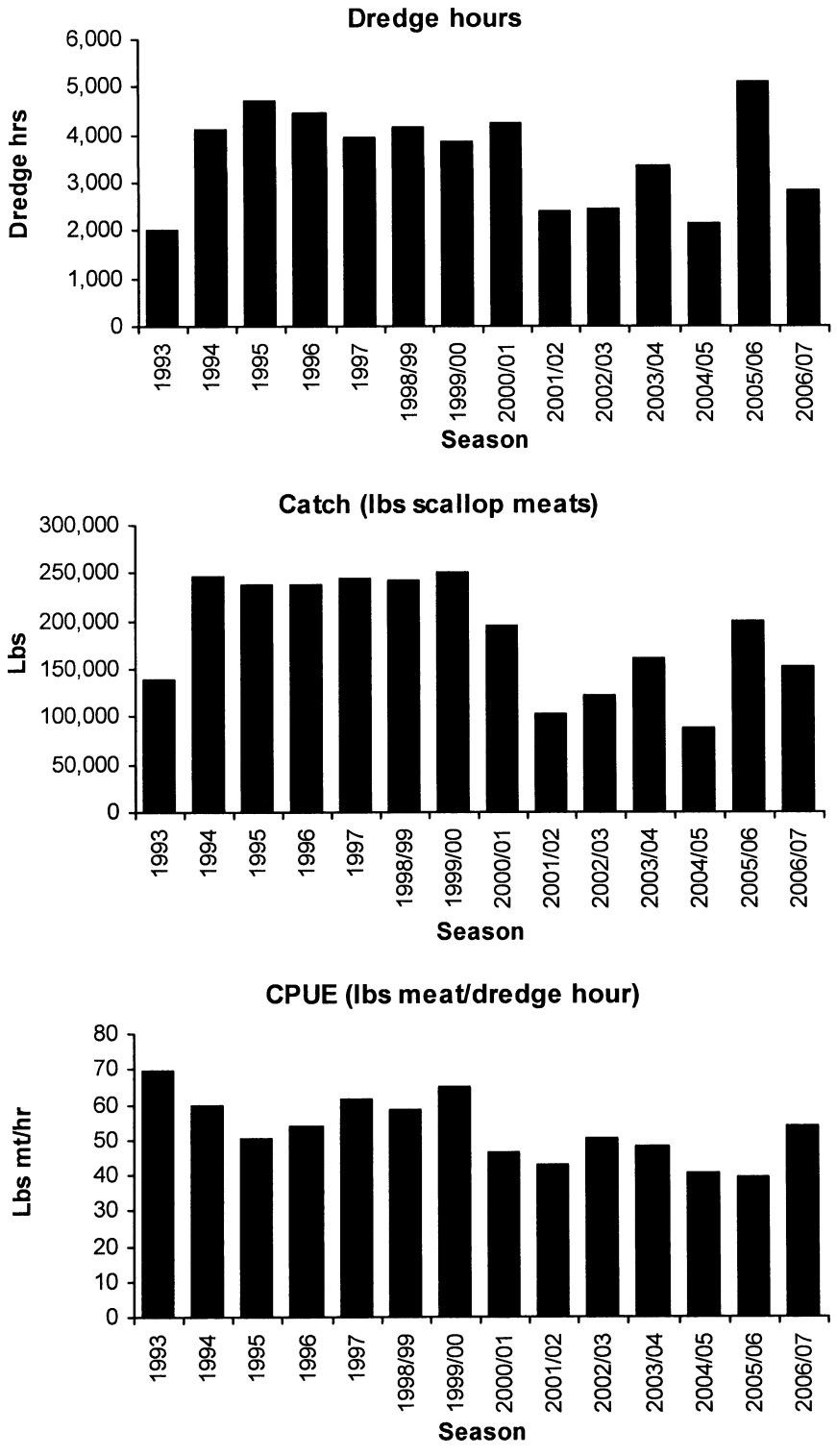

Figure 4 Barplots of Yakutat Area D scallop fishery statistics.

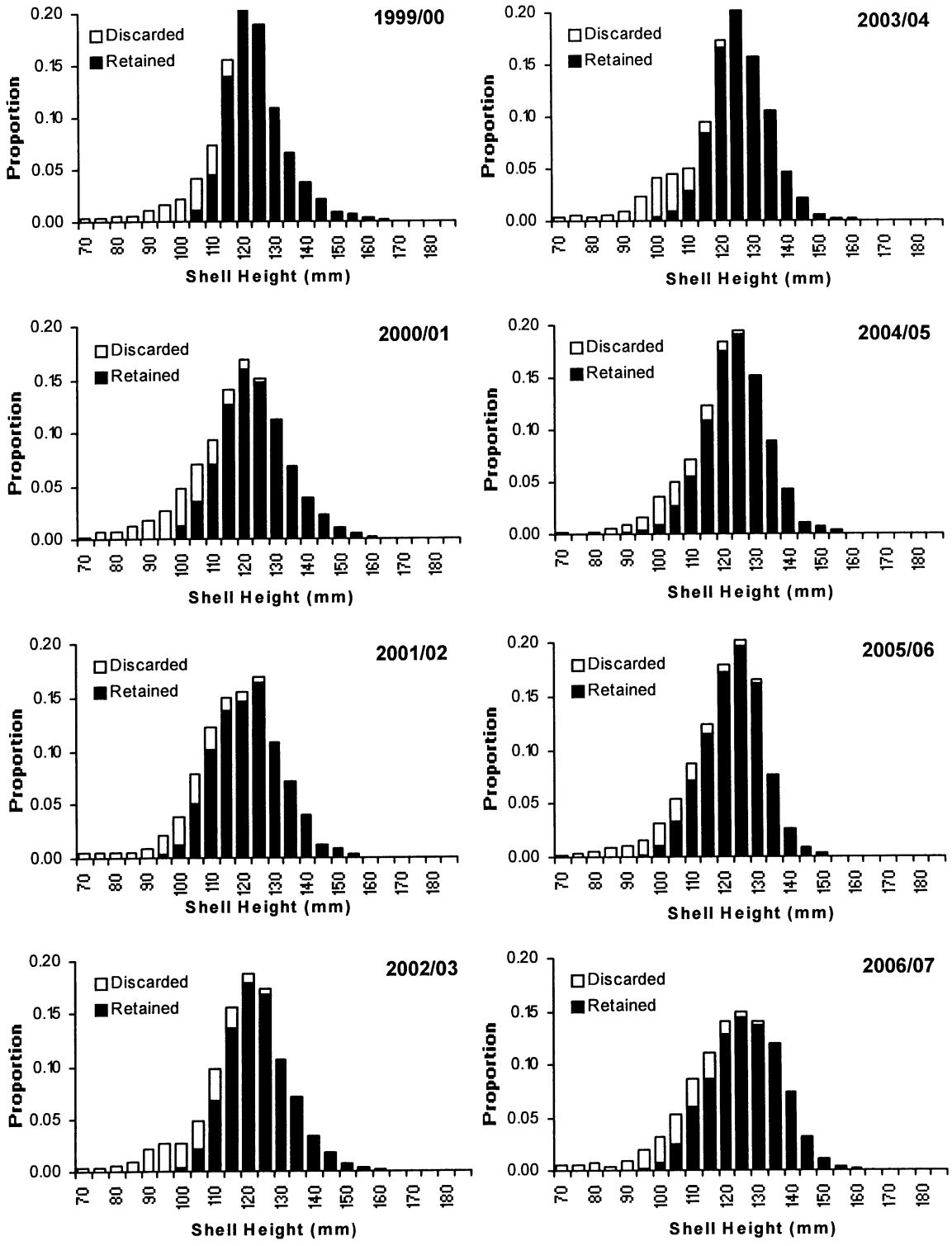

Figure 5 **Shell height histograms from resampling Yakutat Area D observer data, 1998/99–2006/07 seasons.**

Table 8 Yakutat District 16 scallop fishery summary statistics.

Season	Number vessels	GHL ceiling (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993	1	35,000		confidential	
1994	7[b]	35,000	408	22,226	54
1995	6[b]	35,000	1,095	33,302	30
1996	2	35,000	917	34,060	37
1997	4	35,000	561	22,020	39
1998/99	2	35,000	702	34,153	49
1999/00	2	35,000	674	34,624	51
2000/01	3	35,000	476	30,904	65
2001/02	2	35,000	417	20,398	49
2002/03	2	35,000	100	3,685	37
2003/04	2	35,000	18	1,072	59
2004/05	2	35,000	419	24,430	58
2005/06	2	35,000	407	13,650	34
2006/07	2	21,000	309	13,445	44

[a]Confidential data released by vessel operators.
[b]One additional vessel fished by waiver without an observer; data not included.

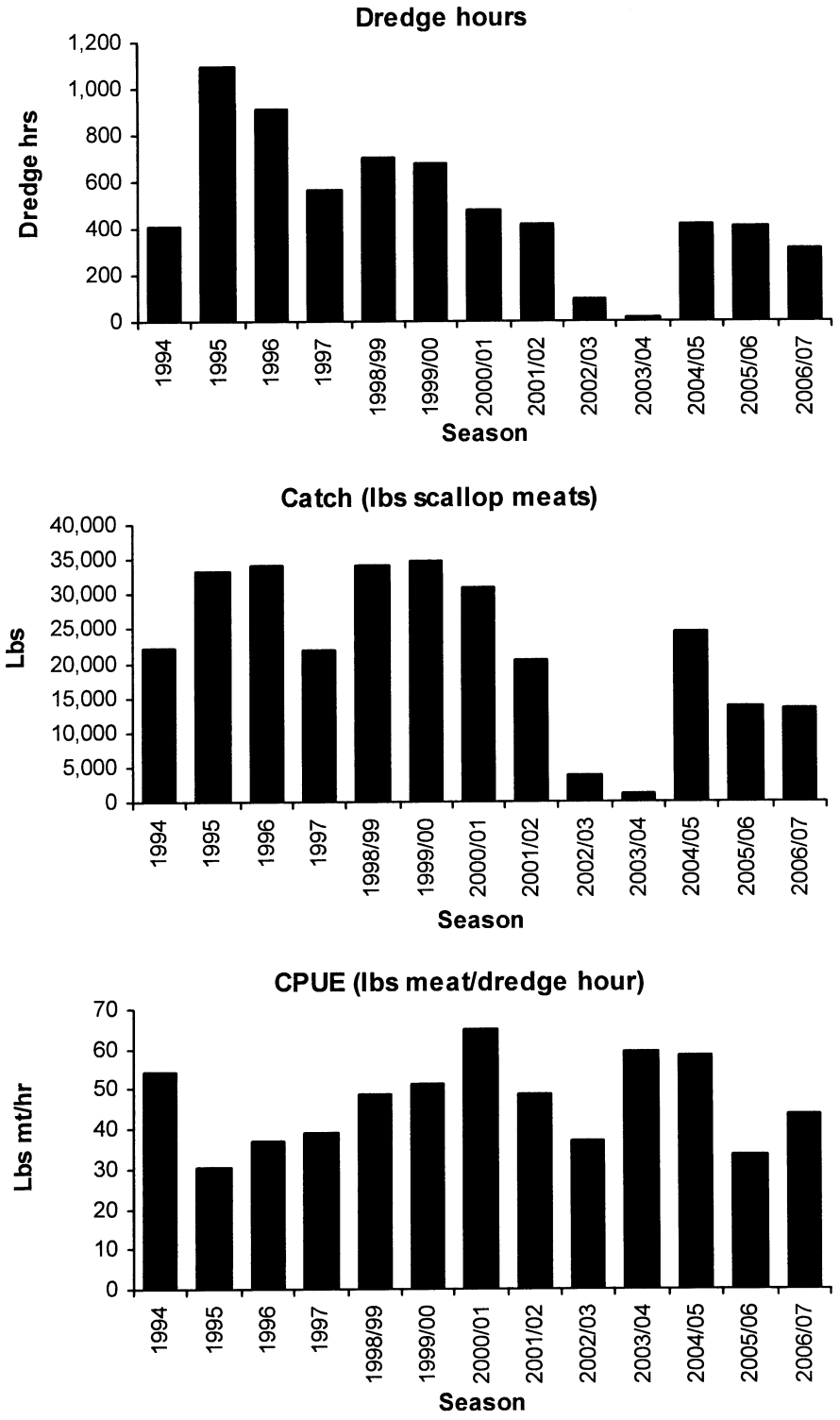

Figure 6 Barplots of Yakutat District 16 scallop fishery statistics.

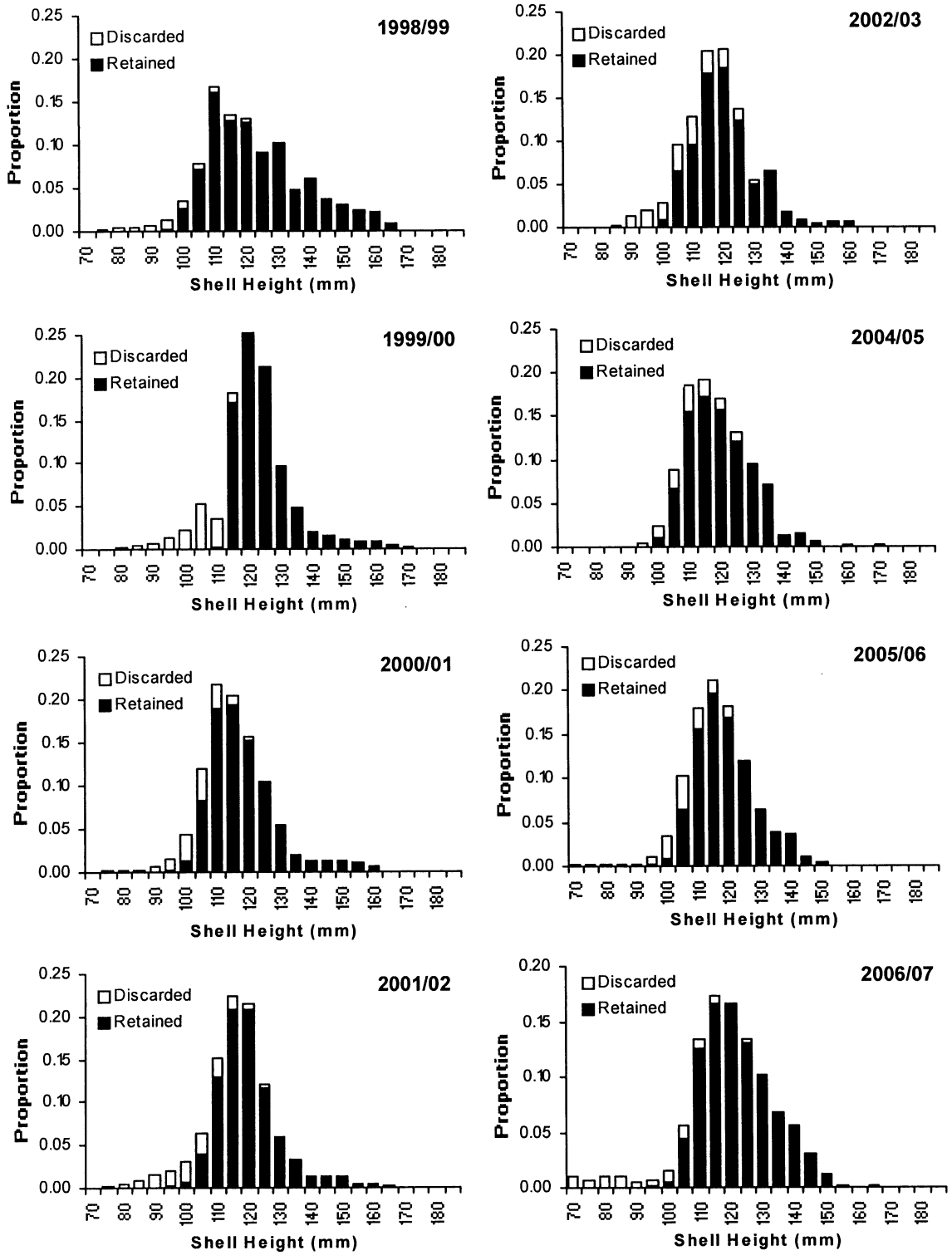

Figure 7 **Shell height histograms from resampling Yakutat District 16 observer data, 1998–2006/07 seasons. Insufficient data were collected to produce a plot for the 2003/04 season.**

3.3 Prince William Sound Registration Area

Scallop dredge surveys have been conducted biennially in the Prince William Sound Registration Area (Area E) near Kayak Island (Figure 1 and Figure 2) since 1996. Survey catches have varied considerably (Table 9), The 2006 survey produced a meat weight biomass estimate of 657,683 lbs (Table 9). The most recent published survey report (Bechtol 2003) contains information on survey methodology as well as catch rates and size and age structure of the stock from previous surveys. The survey area will be standardized for the upcoming 2008 survey, and a dredge video comparison will be conducted. Area E GHLs are established by ADF&G Central Region staff based on survey data.

Two catcher processors participated in the 2005/06 Area E fishery and harvested approximately 49,000 lbs of scallop meats (Table 10). Area E CPUE was 100 lbs meat/dredge hr for the 2005/06 season (Table 10, Figure 8), an increase over the two previous seasons. Area E CPUE remains the highest in the state.

Illegal fishing in the area by a single vessel outside the jurisdiction of the state of Alaska occurred in 1995 and led to a statewide scallop fishing closure in federal waters. While catch data are available for the illegal fishing incident, data on effort are not (Table 10).

Plots of Prince William Sound SH distributions from the commercial fishery (Figure 9) show a cohort of small scallops that began to appear in catches during the 2003/04 season and indications of future recruitment in 2005/06.

Table 9 Kayak Island dredge survey summary.

Survey Year	Number stations sampled	Area Swept by dredge (km^2)	Total Area surveyed (km^2)	Total scallops caught	Scallop Density (scal/$10m^2$)	Average weight (g/scal)	Estimated biomass (lbs meat)
East Bed							
1996	43	0.194	281	5,049	2.68	228	298,093
1998	21	0.095	144	2,278	2.47	251	145,928
2000	25	0.113	171	5,104	4.66	238	298,822
2002	9	0.041	62	668	1.69	254	40,678
2004	26	0.117	178	9,097	7.98	261	521,921
2006	23	0.104	171	5,020	4.98	279	367,265
West Bed							
1998	13	0.059	89	2,844	4.99	246	178,472
2000	16	0.072	110	9,577	13.65	196	460,488
2002	13	0.059	89	2,784	4.88	242	161,752
2004	15	0.068	110	9,257	14.07	228	419,632
2006	13	0.059	96	5,290	9.28	227	290,418

Table 10 Prince William Sound Area E scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993	7	50,000	638	63,068	99
1994		Closed			
1995	3	50,000		108,000[b]	
1996		Closed			
1997	1	17,200	171	18,000	105
1998/99	2	20,000	179	19,650	110
1999/00	2	20,000	149	20,410	137
2000/01	3	30,000	221	30,266	137
2001/02	1	30,000	263	30,090	114
2002/03	2	20,000	122	15,641	121
2003/04	1	20,000	216	19,980	93
2004/05	2	50,000	614	49,320	80
2005/06	3	50,000	491	49,205	100
2006/07	2	37,000	334	36,990	111

[a]Confidential data released by vessel operators.
[b]Poundage includes illegal fishing by one vessel; effort data not available.

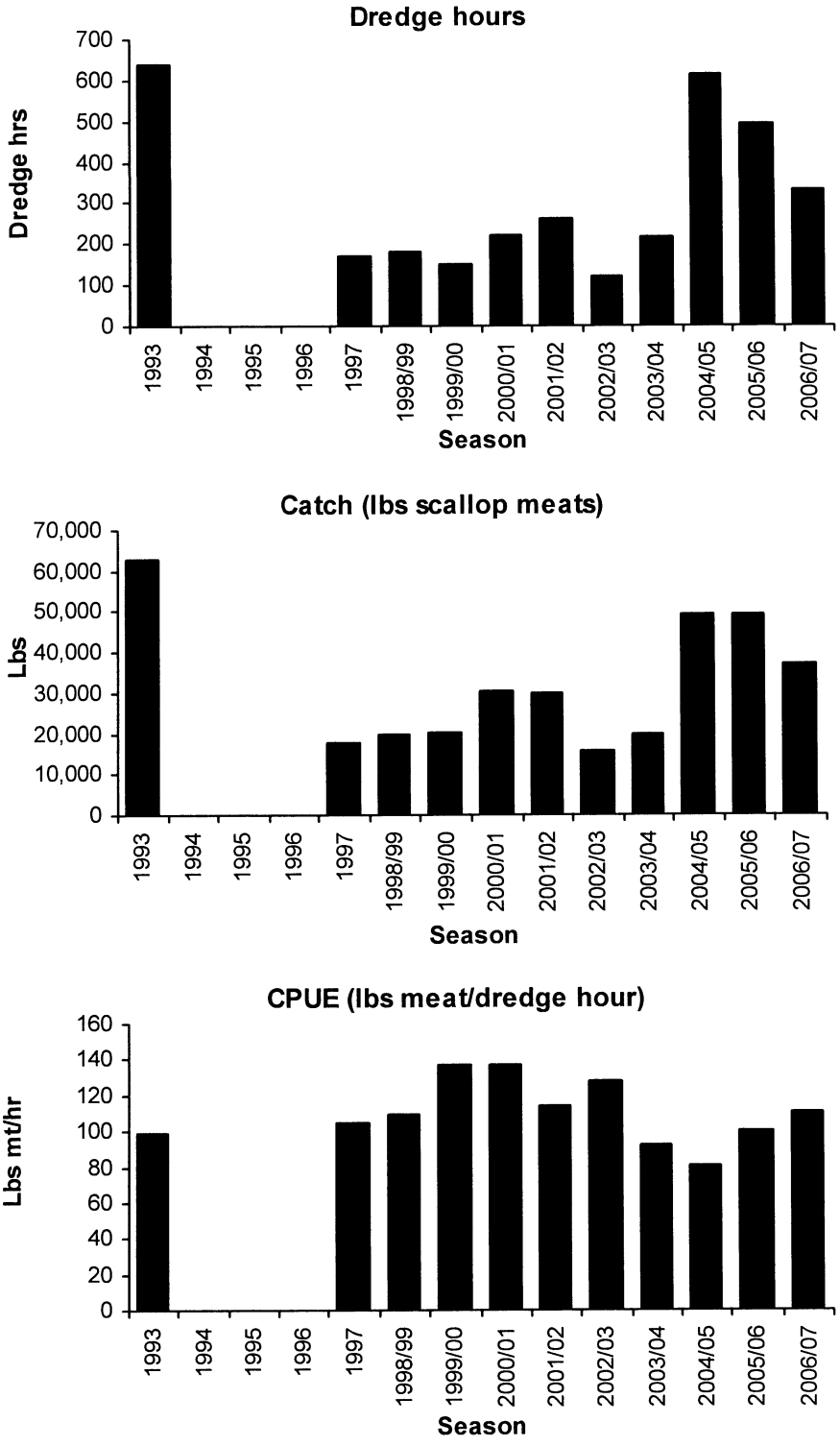

Figure 8 Barplots of Area E scallop fishery statistics.

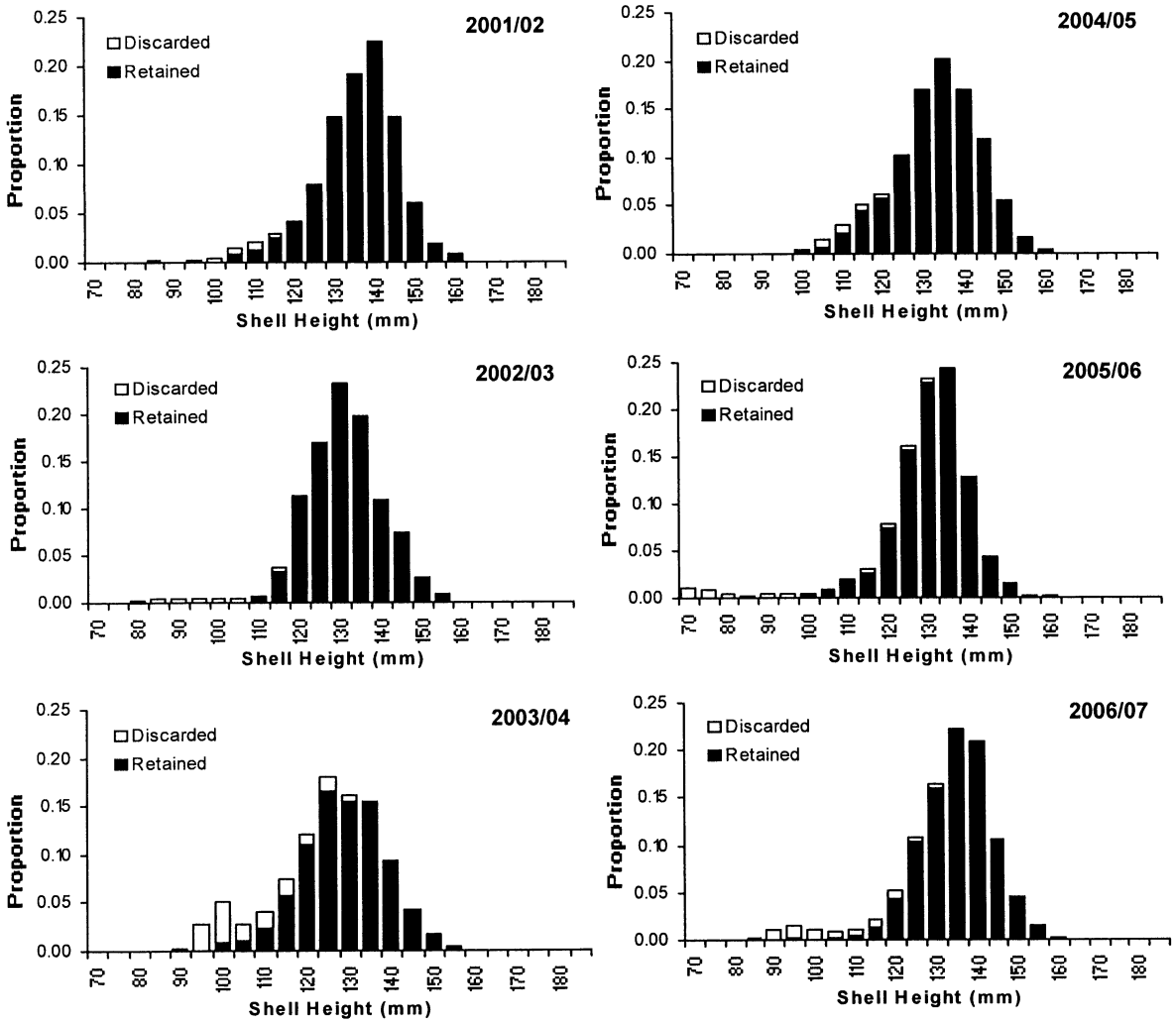

Figure 9 **Shell height histograms from resampling Area E observer data, 2000/01–2006/07. Insufficient data were available to produce plots for earlier seasons.**

3.4 Cook Inlet Registration Area, Kamishak District

The Cook Inlet scallop fishery is prosecuted in the Kamishak District by vessels that are limited to one 6-foot dredge. The third-party contract observer requirement is waived by the ADF&G fishery manager provided that participants accommodate an ADF&G observer when requested. Other areas of Cook Inlet were explored briefly by fishermen, and beginning in 2003 a smaller scallop bed adjacent to the main scallop bed began to be surveyed and commercially fished. Much of Cook Inlet, including all of Upper Cook Inlet and the Southern District, is closed to scallop dredging (Figure 2).

ADF&G conducted a dredge survey of the Kamishak District scallop population in 1984; however, it was not until 1996 that biennial surveys began. Biomass estimates from these surveys (Table 11) have been relatively stable until a die-off occurred in the main scallop bed in 2002. Information on survey methodology, catch rates and size and age structure of the stock from earlier surveys are available in published reports (e.g., Bechtol and Gustafson 2002). In 2006, the survey area was standardized and work was begun to compare the dredge survey to a video survey (see main stock status section above).

The GHR specified by state regulation for the Kamishak District is 10,000 to 20,000 pounds of shucked meats. During the 2004/05 season, 3 vessels participated in the fishery harvesting 6,117 lbs of scallop meats (Table 12). Since the adoption of the LLP program participation has ranged from one to three vessels (Table 12, Figure 10). Catch per unit effort in the fishery increased steadily from 1993 to 2000, but was heavily affected by the 2002 die-off.

Table 11 Kamishak Dredge Survey Summary.

Survey Year	Number stations sampled	Area Swept by dredge (km^2)	Total Area surveyed (km^2)	Total scallops caught	Scallop Density (scal/$10m^2$)	Average weight (g/scal)	Estimated biomass (lbs meat)
North Bed							
1984	47	0.206	192	3,664	1.78	361	209,305
1996	26	0.114	178	6,064	5.32	270	467,500
1998	14	0.061	199	2,531	4.12	352	438,290
1999	28	0.123	192	7,306	5.95	382	611,175
2001	25	0.110	178	5,297	4.83	435	510,701
2003	20	0.088	137	1,755	2.00	448	178,407
2005	23	0.101	158	1,802	1.79	448	185,291
South Bed							
2003	22	0.096	151	4,873	5.05	336	371,972
2005	13	0.057	89	1,360	2.39	302	94,524

Table 12 Cook Inlet, Kamishak District scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993	3		529	20,115	38
1994	4		454	20,431	45
1995		closed			
1996	5		534	28,228	53
1997	3	20,000	394	20,336	52
1998	1	20,000	390	confidential	
1999	3	20,000	333	20,315	61
2000	3	20,000	276	20,516	74
2001	2	20,000	406	confidential	
2002	3	20,000	311	8,591	28
2003	2	20,000	862	confidential	
2004	3	20,000	364	6,117	17
2005	2	7,000	199	confidential	
2006	1	7,000	10	confidential	

[a]Includes estimated dead loss.

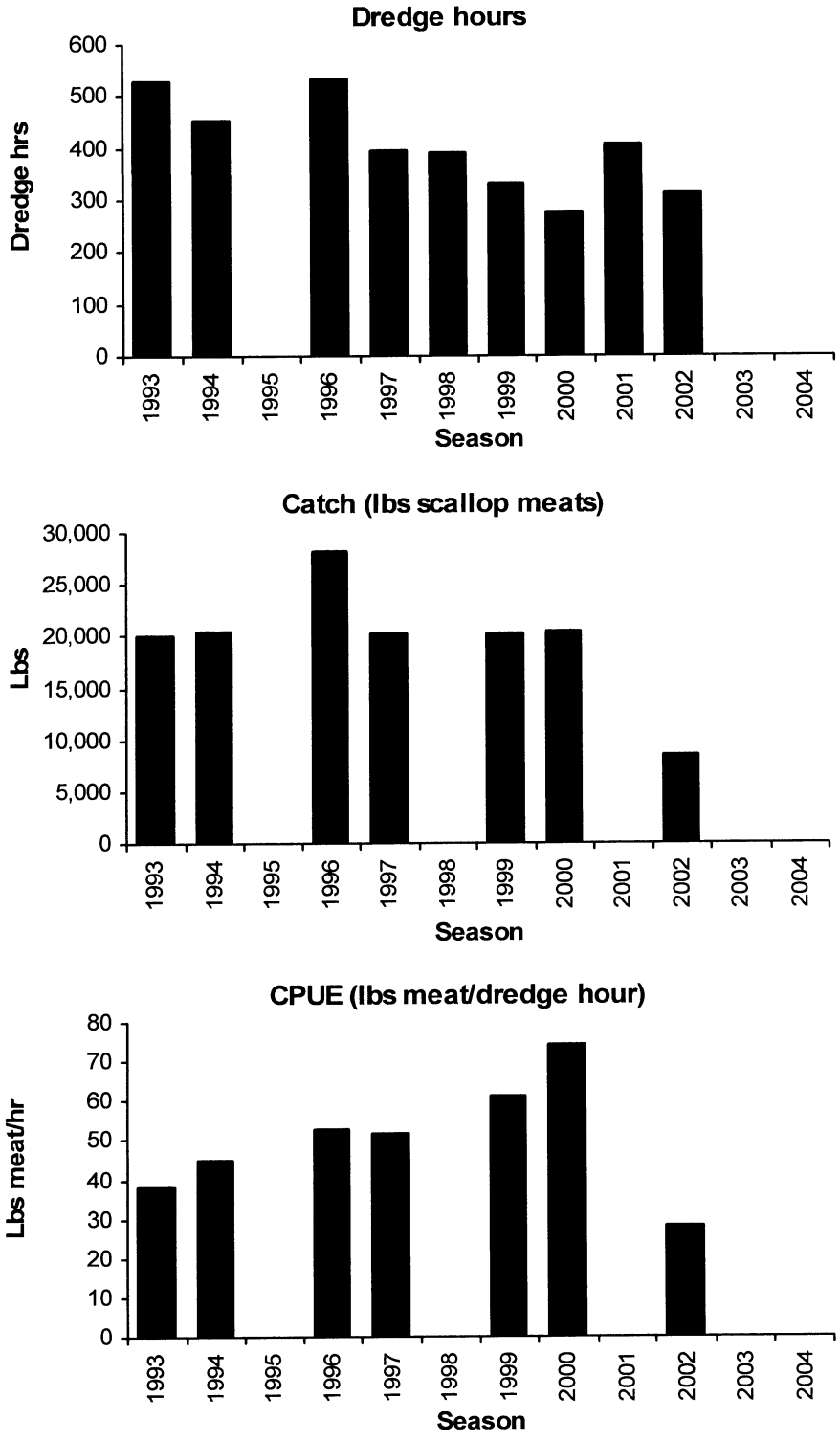

Figure 10 Barplots of Area H scallop fishery statistics.

3.5 Kodiak Registration Area, Northeast District

Two cooperative vessels harvested 75,000 lbs of scallop meats from the Northeast District of the Kodiak Management Area during the 2006/07 season. Summary statistics from recent fishery data are presented in Table 13 and Figures 11–12.

Large portions of the district known to contain scallops are closed to scallop dredging (Figure 2). These closures were recommended by ADF&G and adopted by the Alaska BOF over 30 years ago due to concerns about red king crab bycatch and conflict with other gear types.

The weathervane scallop population in the Northeast District of the Kodiak Registration Area has never been surveyed and no abundance estimates are available.

Table 13 Kodiak Northeast District scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	10	NA	6,940	155,187	22
1994/95	7	NA	1,773	35,207	20
1995/96		closed			
1996/97	3	NA	581	11,430	20
1997/98	3	NA	2,604	95,858	37
1998/99	4	NA	2,749	120,010	44
1999/00	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
2005/06	3	80,000	1,759	79,990	45
2006/07	2	90,000	1,168	75,150	64

[a]Confidential data released by vessel operators.

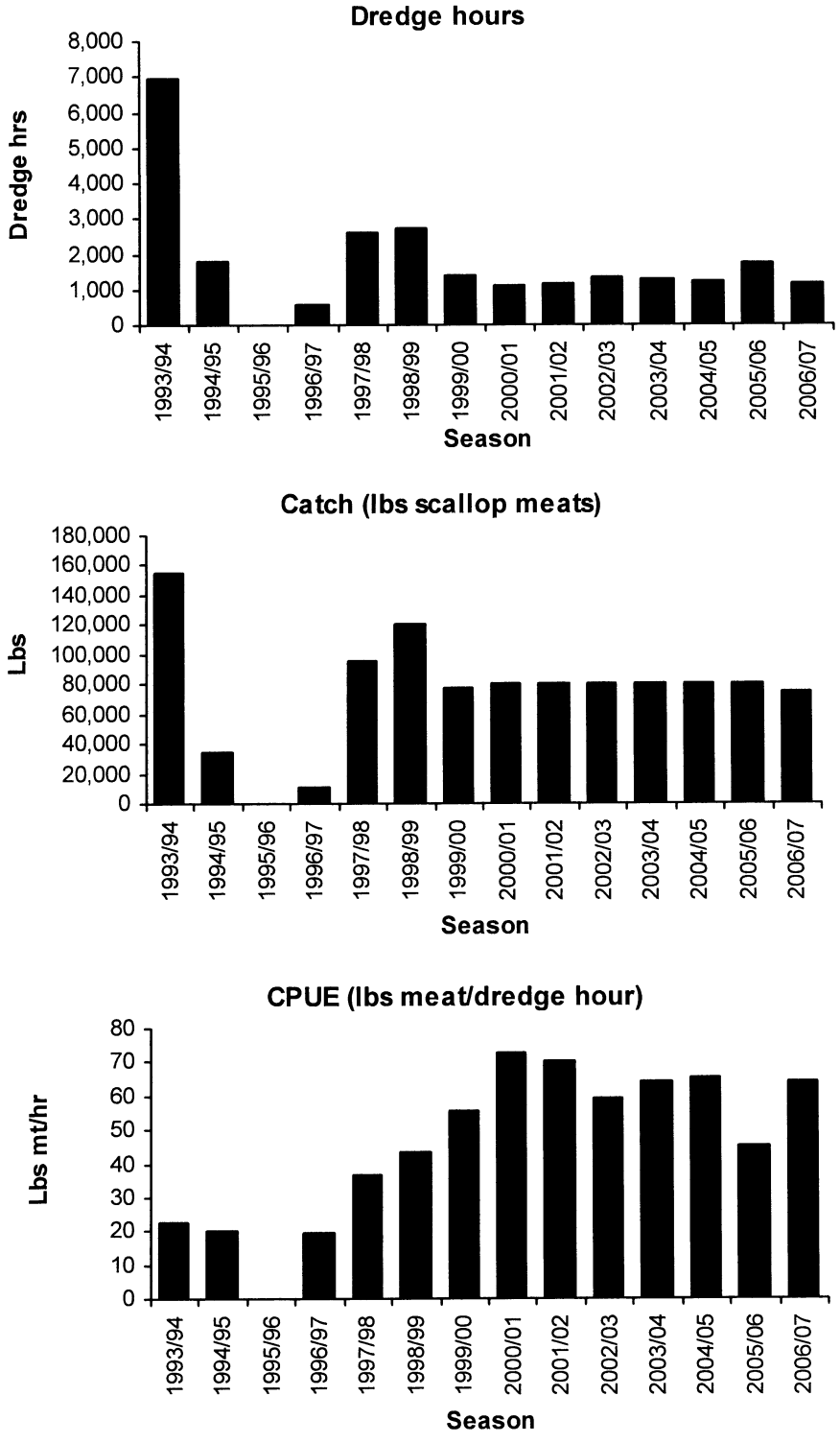

Figure 11 Barplots of Kodiak Northeast District scallop fishery statistics.

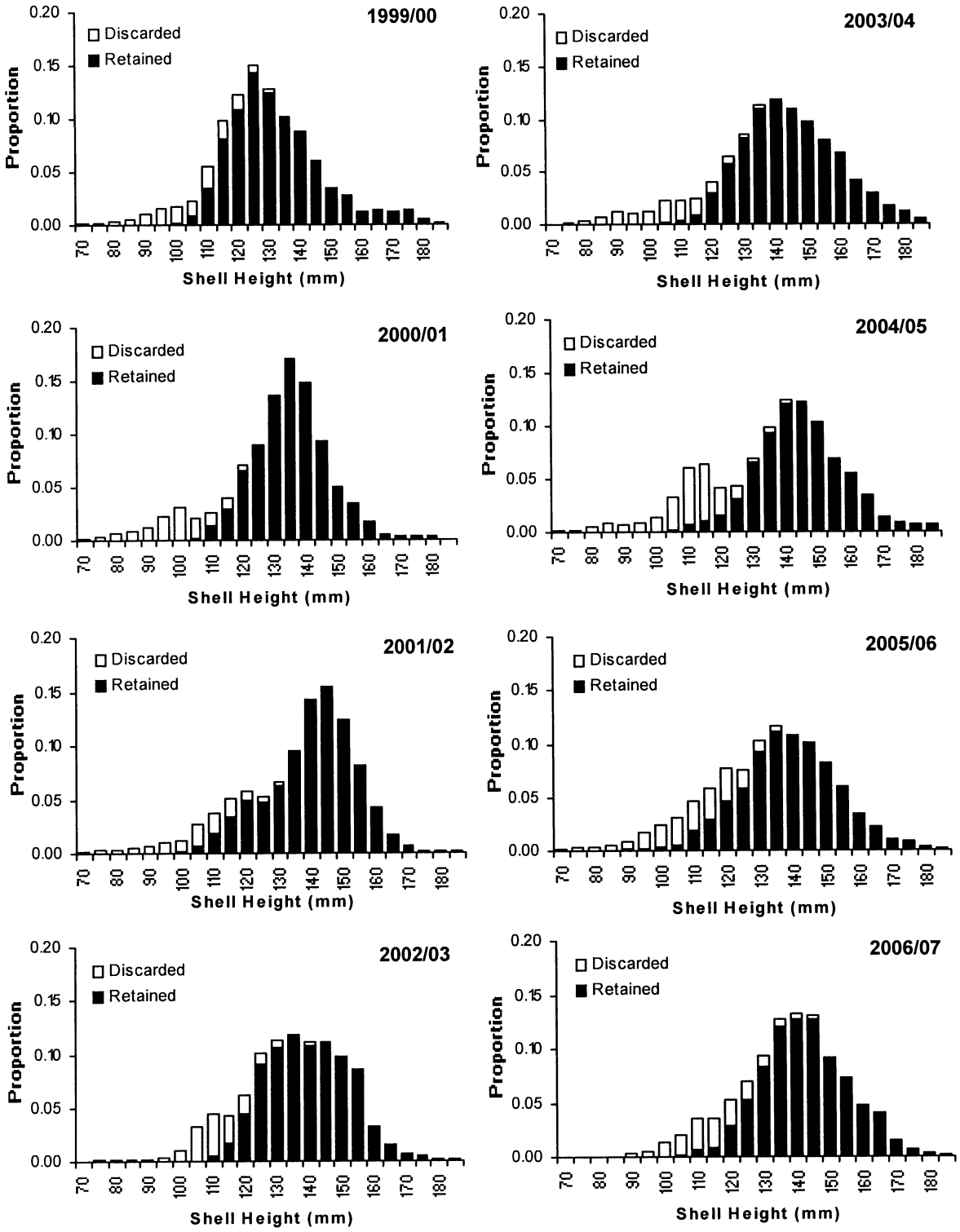

Figure 12 Shell height histograms from resampling Kodiak Northeast District scallop observer data, 1999/2000–2006/07.

3.6 Kodiak Registration Area, Shelikof District

Three vessels participated in the 2006/07 Shelikof District scallop season. Summary statistics from recent fishery data area presented in Table 14 and Figures 13–14.

To protect depressed red king crab and Tanner crab populations, the BOF closed Kodiak's westside bays to scallop fishing in1990; weathervane scallops are known to inhabit these closed waters (Figure 2).

Table 14 Kodiak Shelikof District scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	5	NA	2,491	105,017	42
1994/95	11	NA	8,662	314,051	36
1995/96		closed			
1996/97	3[b]	NA	3,491	219,305	63
1997/98	4	NA	5,492	258,346	47
1998/99	8	NA	4,081	179,870	44
1999/00	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
2005/06	2	160,000	2,280	159,941	70
2006/07	3	160,000	2,183	162,537	74

[a]Confidential data released by vessel operators.
[b]One additional vessel fished but data were not available.

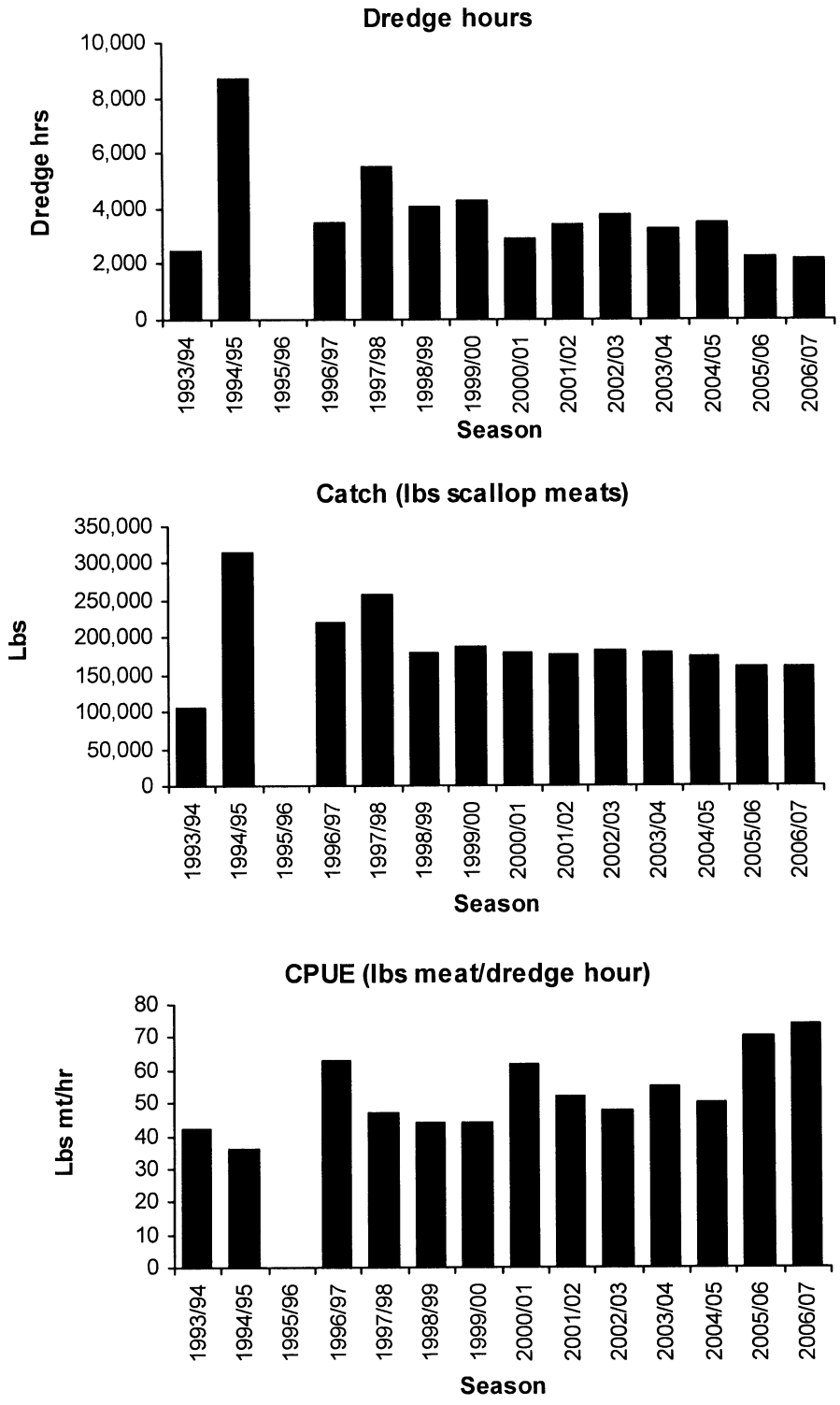

Figure 13 Barplots of Kodiak Shelikof District scallop fishery statistics.

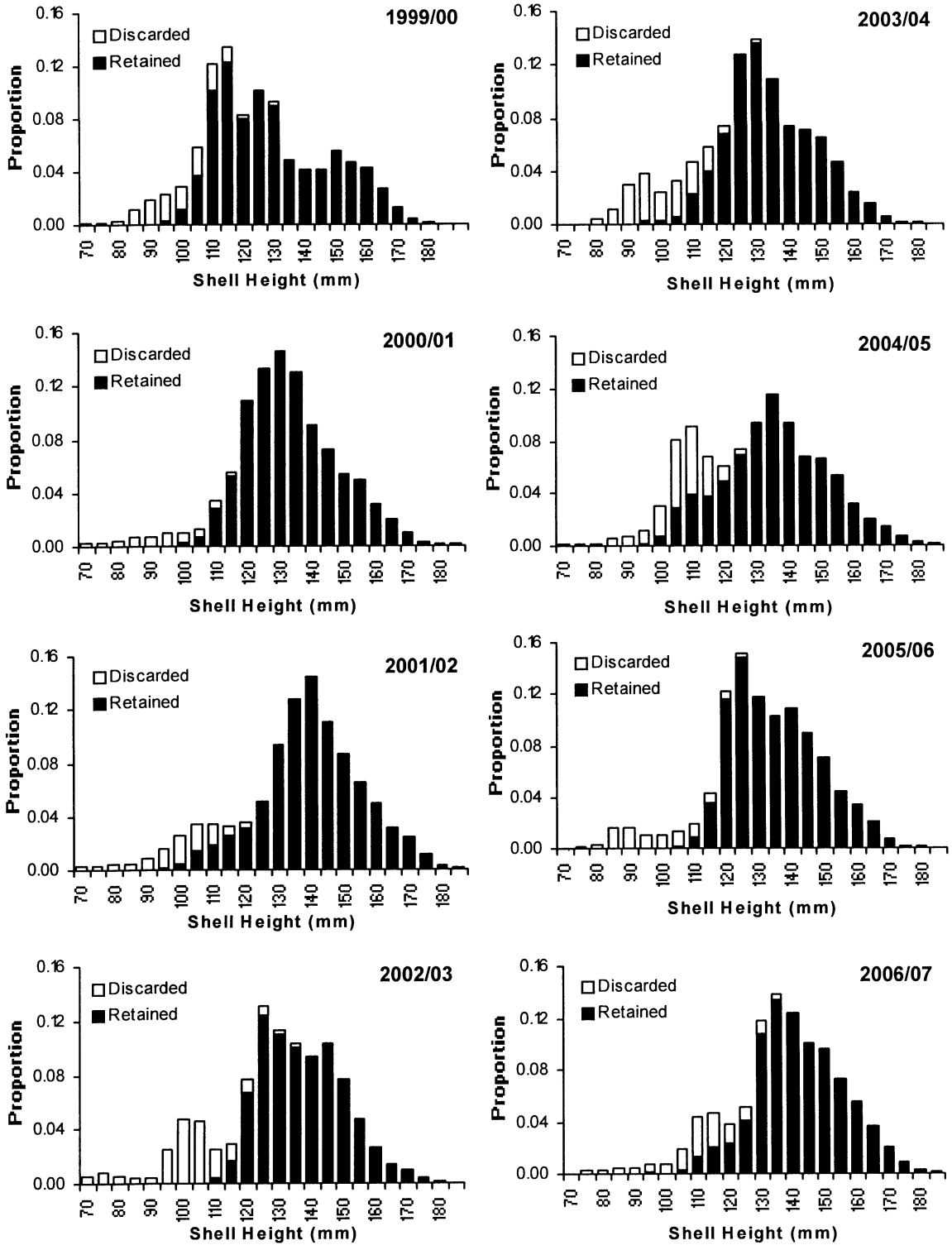

Figure 14 Shell height histograms from resampling Kodiak Shelikof District scallop observer data, 19992000–2006/07.

3.7 Kodiak Registration Area, Semidi District

Traditional scallop fishing areas of the Semidi District are located in state waters that were closed to scallop dredging by the BOF in 2000 (Figure 2). Other parts of the district remain open to fishing, but no effort has occurred since the 1999/00 season (Table 15).

Table 15 Kodiak Semidi District scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	6[b]	NA	1,819	55,487	32
1994/95	2	NA	272	confidential	
1995/96		closed			
1996/97	3	NA	1,017	37,810	37
1997/98	1	NA	349	6,315	18
1998/99	2	NA	106	1,720	16
1999/00	1	NA	45	930	21
2000/01		NA	0		
2001/02		NA	0		
2002/03		NA	0		
2003/04		NA	0		
2004/05		NA	0		
2005/06		NA	0		
2006/07		NA	0		

[a]Confidential data released by vessel operators.
[b]Two additional vessel fished but data are not available.

3.8 Alaska Peninsula Registration Area

Scallop fishing in the Alaska Peninsula Registration Area (Area M) was traditionally concentrated in a small region near the Shumagin Islands between 160° and 161° W. longitude. Area M was closed for the 2001/2002 and 2002/03 seasons due to concerns about potential localized depletion (Table 16, Figure 15).

For the 2003/04 and 2004/05 seasons, the area between 160° and 161° W. longitude remained closed for stock conservation, while the remainder of the area was opened with a 10,000 pound GHL. For the 2005/06 season, the area between 160° and 161° W. longitude opened with a GHL of 10,000 lbs, plus the remainder of the area was opened with a GHL of 10,000 lbs. No effort occurred. During the 2006/07 season, two cooperative vessels fished traditional areas and adjacent waters on an experimental basis and found poor scalloping; this was in the area closed for 4 years to allow for stock rebuilding.

Table 16 Alaska Peninsula Area scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	8	NA	1,847	112,152	61
1994/95	7	NA	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
1999/00	5	200,000	2,025	75,535	37
2000/01	3	33,000	320	7,660	24
2001/02		closed			
2002/03		closed			
2003/04		10,000			
2004/05		10,000			
2005/06		20,000			
2006/07	2	25,000	64	155	2

[a]Confidential data released by vessel operators.

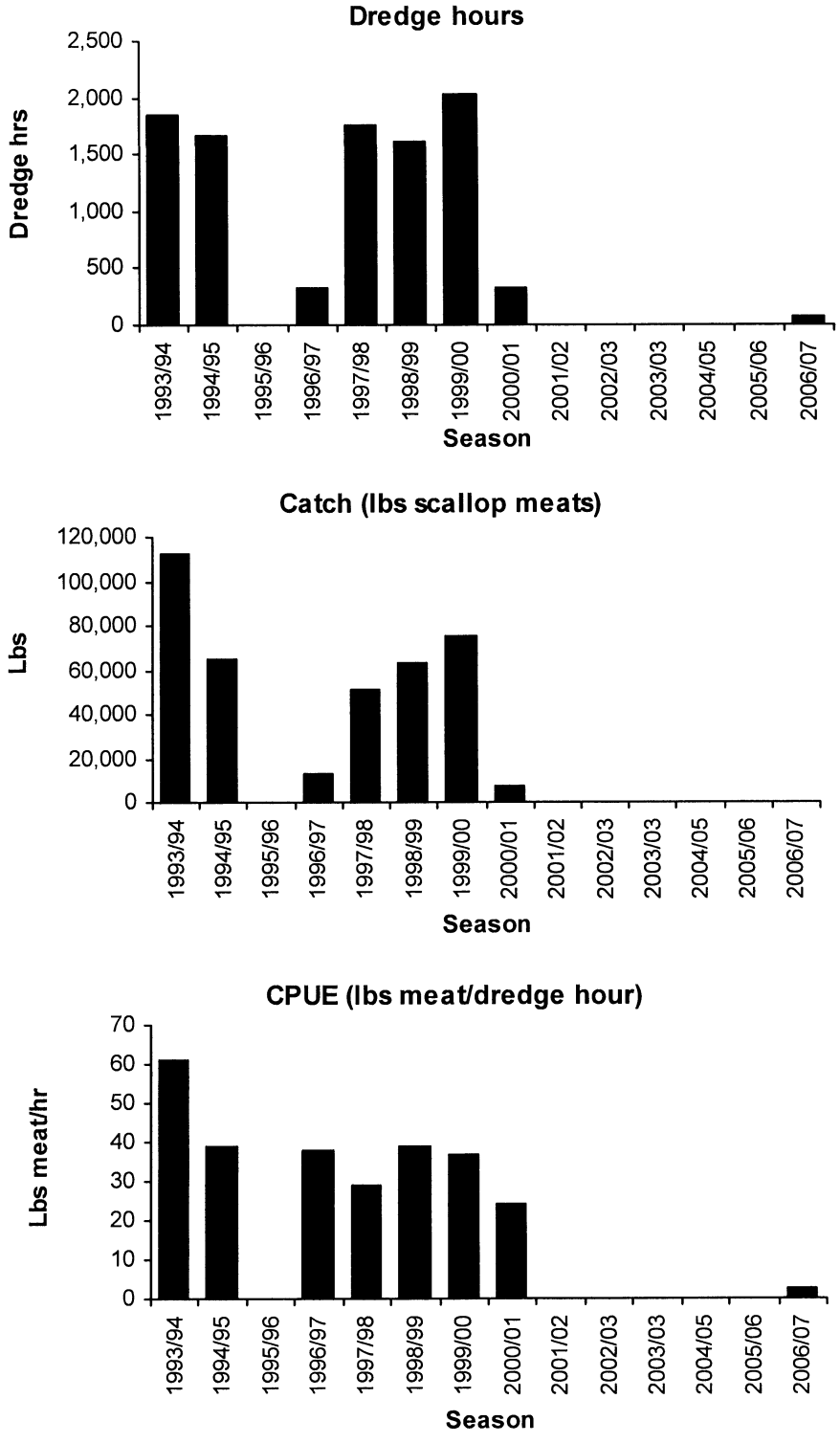

Figure 15 Barplots of Alaska Peninsula scallop fishery statistics.

3.9 Bering Sea Registration Area

Scallop fishing in the Bering Sea Registration Area (Area Q) occurs north of Unimak Island (Figure 1 and Figure 2), One vessel participated in the 2006/07 fishery and harvested 48,774 lbs of shucked scallop meats (Table 17, Figures 16–17). Large catches landed during the early 1990s do not appear to be sustainable.

Although incidental catches of *Chionoecetes* crabs in the Bering Sea scallop fishery have remained below CBLs in recent years, concerns about *Chionoecetes* bycatch rates often alter fleet behavior in the fishery. Scallop vessels frequently move to avoid high crab bycatch areas, which may in turn reduce CPUE and profitability. Dredging operations create feeding opportunities for crabs and juvenile flatfish, so when a profitable scalloping area is found, bycatch rates tend to increase over time and may force the vessel to move. Industry attributes harvests that have fallen below the upper end of the GHR in recent seasons to bycatch avoidance.

Large portions of the eastern Bering Sea shelf and the Pribilof Islands Habitat Conservation Area are closed to scallop fishing to protect red and blue king crab habitat and to provide for habitat conservation (Figure 2).

Experimental scallop video research was conducted in the Bering Sea Registration Area in 2003. Results from the survey showed that the stock is distributed over a wide, poorly defined portion of the Bering Sea shelf at low densities.

Table 17 Bering Sea Area scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	9	NA	5,764	284,414	49
1994/95	8	NA	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
1999/00	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	105,000	275	10,050	37
2005/06	1	50,000	602	23,220	39
2006/07	1	50,000	1,138	48,246	43

[a]Confidential data released by vessel operators.

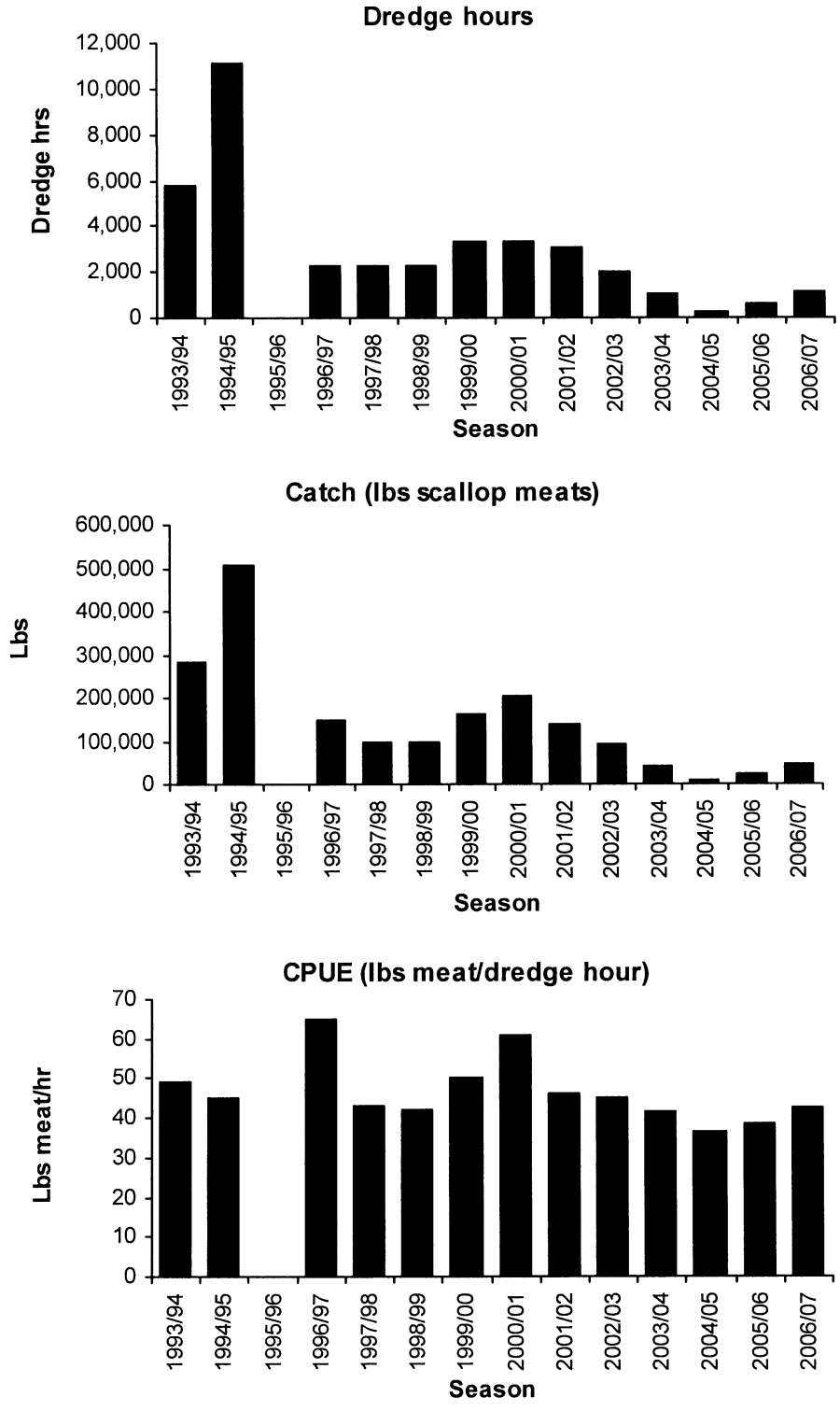

Figure 16 Barplots of Bering Sea scallop fishery statistics.

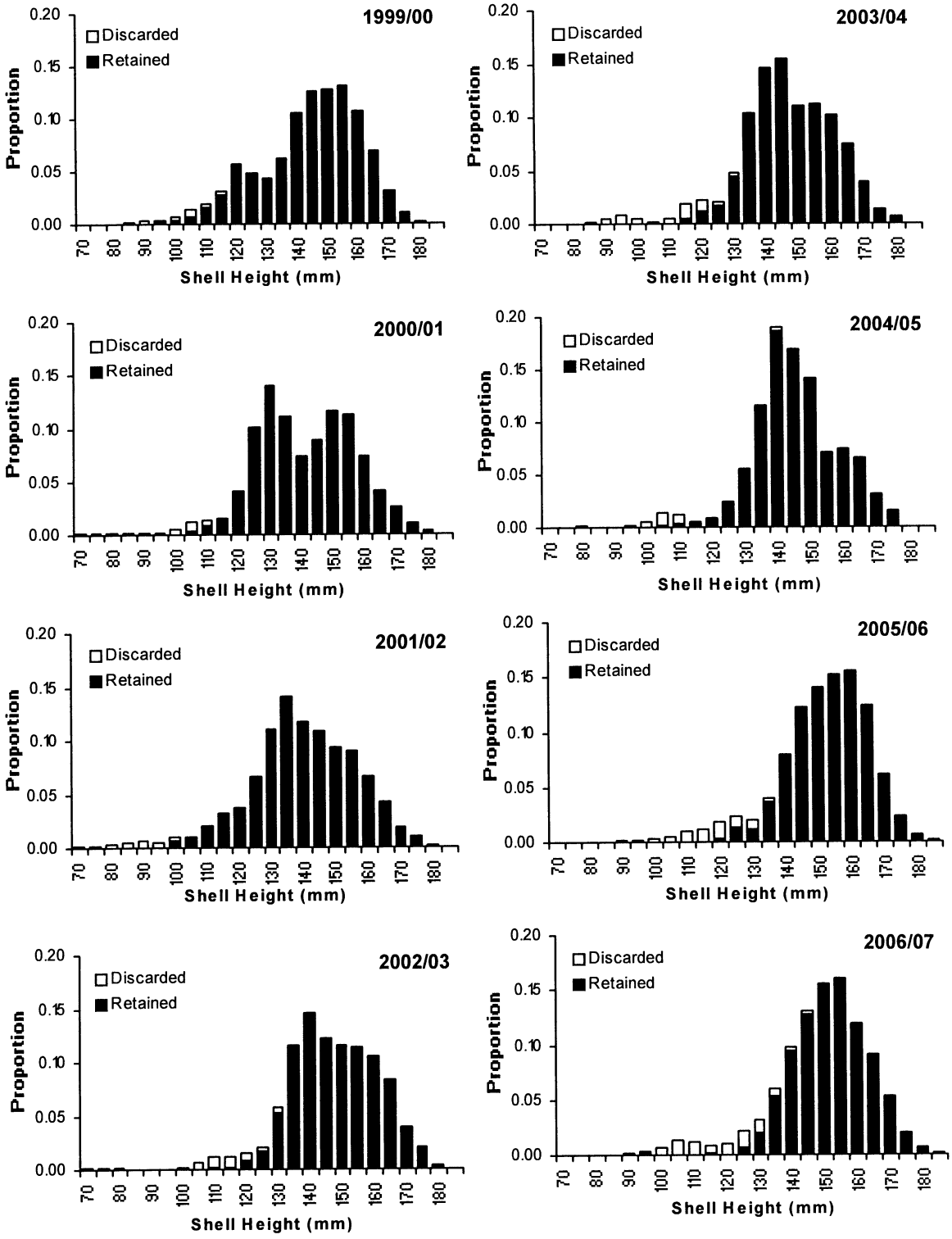

Figure 17 Shell height histograms from resampling Bering Sea scallop observer data, 1999/2000–2006/07.

3.10 Dutch Harbor Registration Area

The Dutch Harbor Registration Area (Area O) was opened during 2002/03 for the first time since the 1999/00 season. One vessel fished briefly and harvested about 6,000 lbs of scallop meats, with CPUE that was low but comparable to CPUE from earlier seasons (Table 18). Managers decided in 2003 to close the area for at least 3 additional years to allow for stock rebuilding. Productive scallop grounds that contributed significantly to the overall harvest were closed to scallop fishing before 1986, primarily as a protective measure for crab nursery areas (Figure 2).

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.

Table 18 Dutch Harbor Area scallop fishery summary statistics.

Season	Number vessels	GHL (lbs meat)	Dredge hours[a]	Catch[a] (lbs meat)	CPUE (lbs meat per dredge hr)
1993/94	2	170,000	838	confidential	46
1994/95	3	170,000	81	1,931	24
1995/96	1	170,000	1,047	26,950	26
1996/97		170,000			
1997/98	1	170,000	171	5,790	34
1998/99	4	110,000	1,025	46,432	45
1999/00	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			
2005/06		closed			
2006/07		closed			

[a]Confidential data released by vessel operators.

3.11 Adak Area

ADF&G records indicate that scallops were harvested from the Adak Registration Area in 1979, 1992, and 1995. Few vessels participated, so catch and effort data are confidential. Little is known about scallop populations in this area. The Petrel Bank between 51°30' N. latitude and 54°30' N. latitude, west of 179 ° W. longitude and east of 179 ° East longitude was closed in 1991 due to concerns about king crab bycatch during the *Chlamys* (pink scallop) fishery. ADF&G opens the area each season with a GHL of 0–75,000 pounds, but no vessels have participated since 1995.

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.

4 Ecosystem Considerations

The Ecosystem Considerations section was added to the SAFE in 2006. The SPT is continuing to organize and improve the section. A wealth of information on climate effects on ecosystems and ecosystem trends contained in the GOA Groundfish Plan Team Ecosystems Considerations document is equally relevant to the scallop fishery and may be accessed at http://www.fakr.noaa.gov/npfmc/SAFE/SAFE.htm

4.1 Habitat

The Alaska weathervane scallop fishery occurs in continental shelf waters at depths 40–150 m in three main areas: the eastern Gulf of Alaska between Prince William Sound and Cape Spencer, around Kodiak Island, and in the eastern Bering Sea (Figure 2). Because the fishery footprint is confined to these areas and many areas of similar habitat are closed to scallop dredging, we expect the effects of the fishery on the GOA and Bering Sea ecosystems to be minor.

Commercial concentrations of weathervane scallops occur along the Alaska coast in elongated beds oriented in the same direction as prevailing currents. Image data from ADF&G camera sled tows show that benthic habitats where scallop fishing occurs in the Bering Sea, eastern GOA, and Shelikof Strait, consist predominately of fine sediments (silt, mud, and sand), with sediments regularly suspended by tidal currents. Areas of harder bottom with larger sediment sizes are found alongside scallop fishing areas, particularly inshore from where fishing occurs. ADF&G is beginning to use camera sled data to document and map habitat in the vicinity of scallop fishing areas. ADF&G hopes to study habitat in closed areas inhabited by scallops in the future as well.

Essential Fish Habitat (EFH) descriptions for weathervane scallops are being revised under Amendment 9 to the Scallop FMP. There is no available life history information for other scallop species (pink, spiny and rock scallops). More information on EFH designations may be found at: http://www.fakr.noaa.gov/habitat/efh.htm.

4.2 Bycatch

Scallop fishery bycatch is closely monitored by the onboard observer program (2.3). Bycatch in the scallop fishery includes prohibited species such as red king crab, Tanner crab, snow crab, and Pacific Halibut, other commercially important species of fish and invertebrates, miscellaneous non-commercial species, and natural and man-made debris. Although a variety of marine vertebrates, invertebrates, and debris are caught incidentally in scallop dredges, weathervane scallops predominate catches.

During the 1996/97–2004/05 seasons, the five most frequently caught species or items, statewide, by percent weight, from haul composition sampling were: weathervane scallops 77%, numerous species of starfish 5%, natural debris (kelp, wood, etc.) 5%, empty bivalve shells 4%, and several species of skates 2%. Gorgonian (hard) corals are infrequently encountered by scallop observers; since 1996, corals have been observed in only 11 of the 15,836 tows sampled for catch composition and bycatch. Summaries of haul composition sampling are presented in observer reports prepared by ADF&G (e.g., Barnhart and Rosenkranz 2003).

4.3 Trawl Survey Information on Scallop Stocks

Trawl surveys for fisheries stock assessment are conducted annually in the Gulf of Alaska and the Bering Sea by NMFS and ADF&G. Although these surveys target crab and groundfish and the gear is not designed to efficiently capture scallops, weathervane scallops are caught in some areas and survey data provide information on the range of the species.

In the eastern GOA (Figure 18), weathervane scallops have been captured during trawl surveys offshore from traditional scallop fishing grounds and in closed waters adjacent to Prince William Sound. Around Kodiak Island (Figure 19), trawl surveys have captured scallops in closed waters south of the island and in many bays and inlets. Along the south side of the Alaska Peninsula, trawl survey data indicate that most scallop habitat lies in coastal waters that are closed to scallop fishing, while scallops have been captured during trawl surveys over a large swath of the eastern Bering Sea shelf (Figure 20).

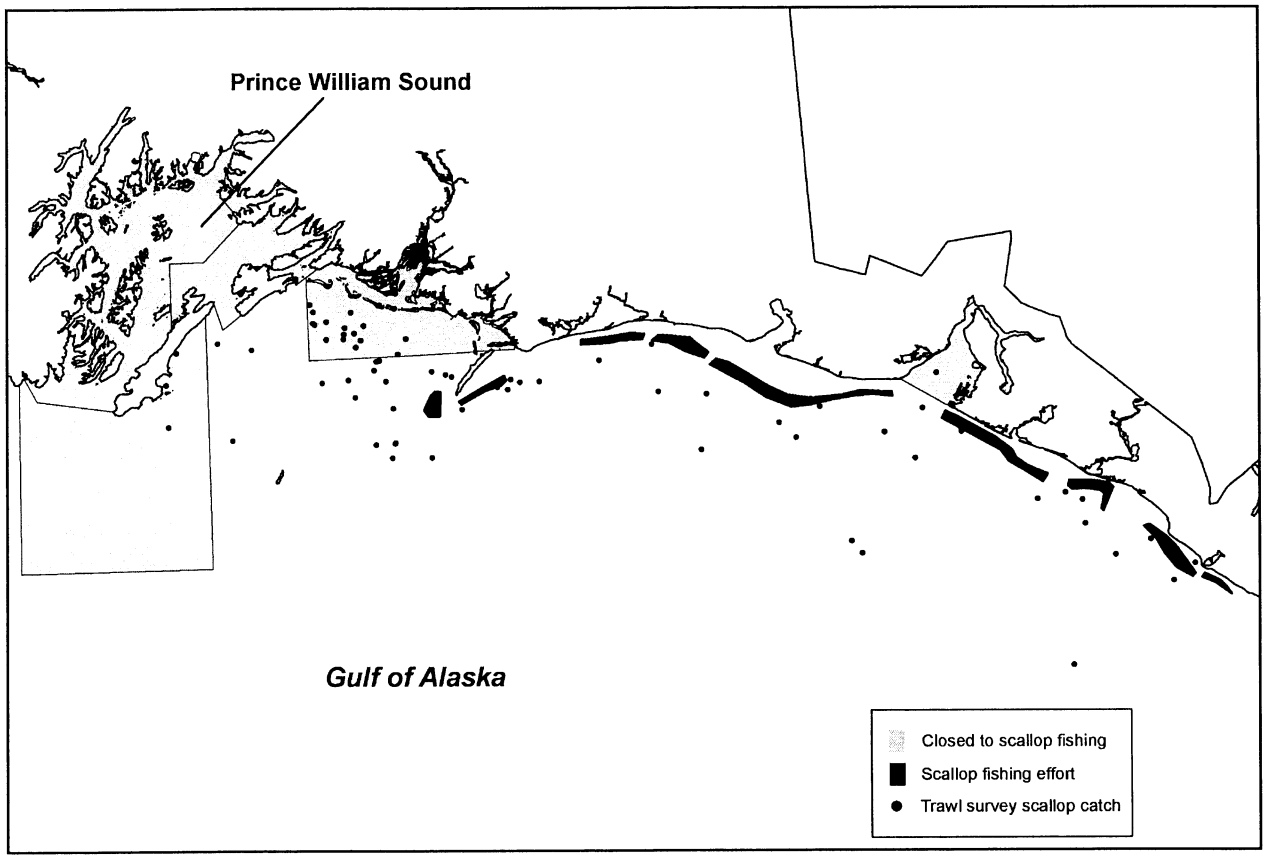

Figure 18 Map showing scallop fishing areas, areas closed to scallop fishing by regulation, and locations where weathervane scallops were captured during NMFS trawl surveys in the eastern Gulf of Alaska

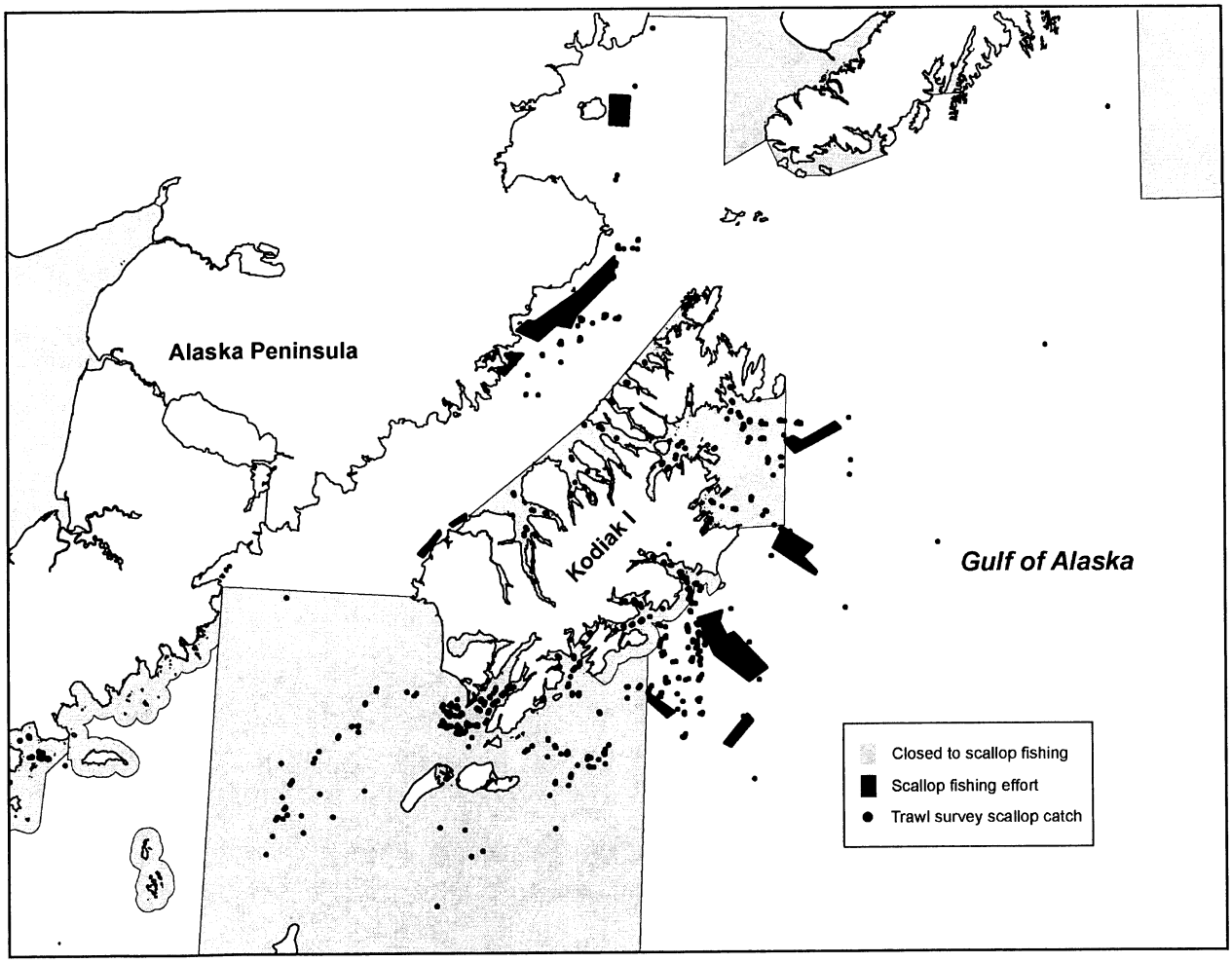

Figure 19 **Map showing scallop fishing areas, areas closed to scallop fishing by regulation, and locations where weathervane scallops were captured during NMFS and ADF&G trawl surveys in the Kodiak Area.**

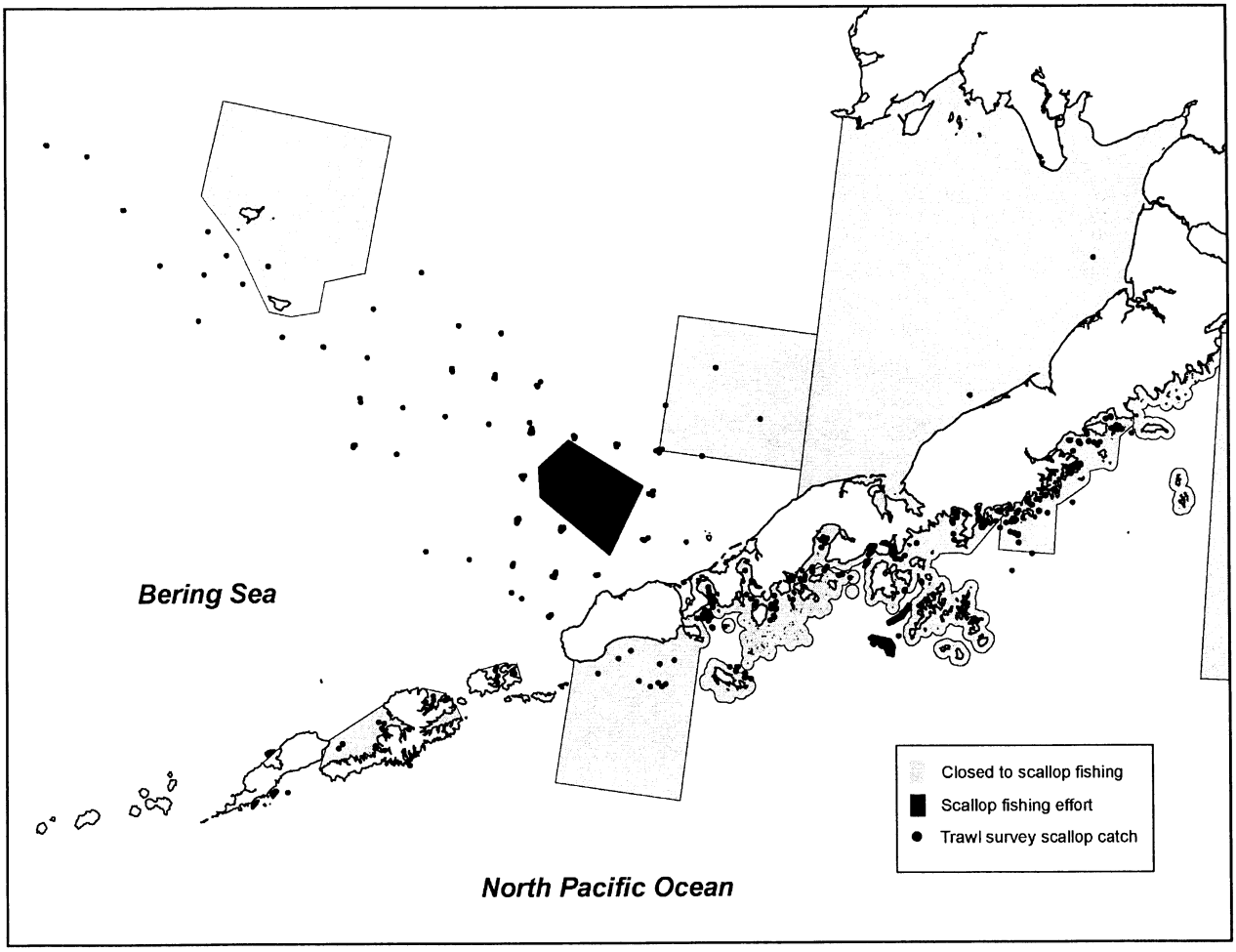

Figure 20 Map showing scallop fishing areas, areas closed to scallop fishing by regulation, and locations where weathervane scallops were captured during NMFS and ADF&G trawl

5 Recent Regulatory Actions

Recent Alaska Legislative action and Alaska Board of Fisheries Proposal 402

Passage of the vessel permit bill during the 2002 legislative session resulted in significant changes to the state's limited entry statutes. In the hair crab and weathervane scallop fisheries, for the very first time in state history, permits were issued to vessels rather than real persons. This was done for conservation and management purposes to more effectively limit effort targeting these resources. Vessel entry permits will expire at the end of December 2008 unless this legislature approves an extension.

House Bill 16, filed by Representative Paul Seaton delays the repeal of CFEC's authority to maintain the vessel-based limited entry systems for Bering Sea Hair Crab & weathervane scallop fisheries. The delay would last through 2013. This bill was referred to the Fisheries and Resource Committees, and it was heard and held by the Fisheries Committee April 4, 2007, May 4, 2007, and January 30, 2008. It is being held in committee and is not expected to move. A parallel bill was introduced in Senate Resources by Senator Donny Olson in January 2008. Senate Bill 251 passed out of Senate Resources February 13, 2008. It goes now to the floor for a vote.

In the event that neither bill succeeds in extending the sunset, there is a problem in managing scallops because the state-federal boundary crosses several of the commercial scallop beds. Scallops are currently managed without regard to this boundary. The existing federal LLP fishery from 3-200 miles will continue to be managed by the state. The state will create an open access scallop fishery in waters from 0-3 miles of shore. The Department of Fish and Game has submitted a proposal (number 402) that will develop new management measures to prevent overharvest and ensure accurate accounting, biological sampling and enforcement of state-waters scallop harvest. The Alaska Board of Fisheries will take action on this proposal during their March 3-9, 2008 meeting in Anchorage.

Vessel Monitoring Systems (VMS) requirements

Federal regulations require scallop vessels to use vessel monitoring systems (VMS) while fishing in Federal waters in the Aleutian Islands and Gulf of Alaska. These VMS requirements were adopted in conjunction with enforcing the Essential Fish Habitat and Habitat Areas of Particular Concern restrictions. In the Aleutian Islands, regulations prohibit operation of a federally permitted vessel without using VMS. In the Gulf of Alaska, regulations require mobile bottom contact gear vessels to use VMS. The regulations define scallop dredges as a mobile bottom contact gear. Additional information on Federal VMS regulations be found at: http://www.fakr.noaa.gov/habitat/efhvmsrequirements.pdf

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Appendix 1 Summary and Analysis of Onboard Observer-Collected Data from the 2003/04 to 2005/06 Statewide Commercial Weathervane Scallop Fisheries

Fishery Management Report No. 07-67

Summary and Analysis of Onboard Observer-Collected Data from the 2003/04 to 2005/06 Statewide Commercial Weathervane Scallop Fisheries

by

Jeffrey P. Barnhart

and

Gregg E. Rosenkranz

December 2007

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)

Measures (fisheries)

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

Mathematics, statistics

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

FISHERY MANAGEMENT REPORT NO. 07-67

SUMMARY AND ANALYSIS OF ONBOARD OBSERVER-COLLECTED DATA FROM THE 2003/04 TO 2005/06 STATEWIDE COMMERCIAL WEATHERVANE SCALLOP FISHERIES

by

Jeffrey P. Barnhart
and
Gregg E. Rosenkranz
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, 99518-1599

December 2007

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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
and
Gregg E. Rosenkranz
Alaska Department of Fish and Game, Division of Commercial Fisheries,
211 Mission Road, Kodiak, Alaska , USA

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ABSTRACT

The Alaska Scallop Fishery Management Plan, 5 AAC 38.076 (g), gives the Alaska Department of Fish and Game (ADF&G) the authority to require observers on board scallop vessels. Observers on board fishing vessels enhance management, primarily by facilitating information gathering and by improving regulatory compliance. ADF&G staff rely on observer-collected data to manage the weathervane scallop fishery.

The Alaska commercial weathervane scallop *Patinopecten caurinus* fishery occurs in waters of the Alaska Territorial Sea and the Exclusive Economic Zone (EEZ) bounded by Cape Spencer (58° 12' 45" N lat., 136° 39' 45" W long.) in Southeast Alaska through the Gulf of Alaska to the western boundary; the U.S.-U.S.S.R. Maritime Boundary Agreement Line of 1990 in the Bering Sea.

This report summarizes data collected by onboard observers in the Alaska weathervane scallop fishery including fishing effort, area fished, number of vessels, observer coverage, crab and halibut bycatch estimates, catch composition, crab mortality, and discarded and retained scallop catch.

Key words: Weathervane scallop fishery, *Patinopecten caurinus*, fishery observer, Kodiak, Alaska Peninsula, Bering Sea, Dutch Harbor, Aleutian Islands, Yakutat, Prince William Sound, bycatch

INTRODUCTION

In 1953, Alaskan weathervane scallop *Patinopecten caurinus* populations were identified during resource surveys conducted by the U.S. Bureau of Commercial Fisheries, later named the National Marine Fisheries Service (NMFS) (Haynes and Powell 1968).

As the abundance of red king crab *Paralithodes camtschaticus* began to decline in Kodiak during the 1960s, a few fishermen considered diversify into other fisheries (Turk 2000). However, it was not until 1967 that a loss of fishing opportunities associated with the decline of red king crab led to initial efforts to establish a weathervane scallop fishery (Kruse et al. 2005)

In 1967, Kodiak-based vessels the F/V Cloverleaf and the F/V Virginia Santos, were converted to scallop dredging (Turk 2000). At this same time, scallop catches were declining in the U.S. and Canadian fisheries on Georges Bank and by 1968, a number of east coast vessels began fishing scallops in Alaska. The fishery expanded to 19 vessels consisting of New Bedford type scallop vessels, converted Alaska crab boats, salmon seiners, halibut longliners, and shrimp trawlers (Kaiser 1986).

The fishery developed from 1967 through 1973 as virgin scallop beds were identified and harvested (Shirley and Kruse 1995). This was followed by a period of declining scallop harvests from 1974 to the end of the decade. A smaller, more stable fishery followed through the 1980s.

After implementation of the passive management measures in the early 1970s, there were virtually no new regulations developed until the weathervane scallop fishery was designated a high impact emerging fishery on May 21, 1993 in response to increased fishing effort and was closed until a conservative management plan could be developed by the ADF&G (Barnhart 1997). The resulting Interim Management Plan for Commercial Scallop Fisheries in Alaska was approved by the ADF&G commissioner in 1993 and finalized as regulation 5 AAC 38.076 Alaska Scallop Fishery Management Plan by the Alaska Board of Fisheries (BOF) in 1994. It 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 (Barnhart 2006)

There are nine scallop registration areas in Alaska (Figure 1). These include scallop Registration Area A (Southeastern Alaska), Area D (Yakutat), Area E (Prince William Sound), Area H (Cook Inlet), Area K (Kodiak), Area M (Alaska Peninsula), Area Q (Bering Sea), Area O (Dutch Harbor) and Area R (Adak). In all registration areas except Cook Inlet (Area H), the weathervane scallop regulatory fishing season is July 1 through February 15. State waters to three miles offshore and federal waters, three to 200 miles offshore, were open concurrently to weathervane scallop fishing. In this report, for simplicity, registration areas will be referred to as areas. Districts are subsets of registration areas.

Information contained in this report was collected from the 2003/04 to 2005/06 regulatory scallop fishing seasons in scallop registration areas D, E, K, M, and Q. It does not include the Cook Inlet Area (Area H), where onboard observer coverage is currently waived by ADF&G staff and the Southeastern Area, where there is no open season. This report also includes a summary of statewide weathervane scallop commercial fishery harvest statistics and observer data since inception of the observer program in 1993.

METHODS

OBSERVER TRAINING AND DATA COLLECTION PROCEDURES

Training

In 2003, to accommodate independent contracting agents requests for additional training classes, two observer training classes for the weathervane scallop fishery were conducted at the University of Alaska Anchorage, North Pacific Fisheries Observer Training Center. The first class was held between June 16 and June 25, and a second class was held between September 2 and September 12. Due to provider companies enrolling less then the minimum requirement of five students during the September 2003 class, the number of training classes was reduced to one the following year. In 2004, one scallop observer training class was held between June 14 and June 24. The same approach was used in 2005, when a single scallop observer training class was held between June 13 and June 23. Observers were trained in data collection following the sampling protocols described in the weathervane scallop observer manuals (Barnhart 2001, Barnhart 2004). Course material included:

1. history of the scallop observer program;
2. Alaska scallop fishery;
3. scallop and crab biology and identification;
4. finfish and invertebrate identification;
5. sampling procedures;
6. sampling forms;
7. use of vernier calipers;
8. safety;
9. onboard observer conduct;
10. shellfish regulations; and
11. documentation of violations.

Observers were trained in data collection following the sampling protocols described in the weathervane scallop observer manuals (Barnhart 2001, Barnhart 2004).

At-Sea Catch Sampling

Scallop observers collected a variety of biological data on a daily basis. Observers were instructed to select tows for sampling as randomly as practical throughout each day, with the decision to sample the port or starboard dredge made prior to viewing its contents. Alaska scallop vessels usually tow two dredges simultaneously, but may tow a single dredge when fishing in unfamiliar areas, repairing a dredge, or when a winch is inoperable. Typically, fishing operations occur 24 hours/day and each vessel makes 15–20 tows/day. For haul composition (species) sampling, the daily goal was to sample a single dredge from one tow. For crab and Pacific halibut bycatch and discarded/retained scallop catch monitoring, the daily goal was to sample a single dredge from five different tows.

Haul Composition Sampling

The purpose of the haul composition sampling was to document dredge contents by species weight from one dredge per day. Dredge contents were sorted into baskets by species and weighed. Small quantities were weighed entirely; large amounts were subsampled to estimate weight.

To estimate the weight of retained scallops in the haul composition sample, three baskets of scallops retained by the crew were weighed, and the weights were averaged. The total weight of retained scallops in the sampled dredge was then calculated by multiplying the average basket weight by the total number of baskets retained. All scallops not retained by the crew (discarded scallops) were weighed. Discarded and retained scallop weights were added together to obtain the total weight of scallops captured in the sampled dredge.

The protocol for estimating large volumes of other species encountered was similar to that for scallops, except the average weight of three baskets was multiplied by the observer's visual estimation of the number of baskets on deck.

All Pacific halibut *Hippoglossus stenolepis* were measured to the nearest centimeter (cm) from the tip of the nose to the end of the central rays of the caudal fin. Halibut weights were then determined from a length/weight conversion table.

Wood, rocks, and man-made debris items were collected and weighed. Man-made debris was counted and classified as plastics, fishing gear (including line), cans, or other.

Crab and Pacific Halibut Bycatch and Discarded/Retained Scallop Sampling

From a single dredge sampled in five selected tows, observers identified, counted, and recorded the number and condition of crabs and Pacific halibut; collected/examined the discarded scallop catch; and examined the retained commercial scallop catch. In all sampled dredges, priority was given to return halibut as quickly as possible to the sea, after sampling.

For each sampled dredge, after the crew selected and removed the commercial scallop catch from the deck, observers were instructed to begin at one end of the remaining pile of dredge contents and select the first 20 each of red king crabs *Paralithodes camtschaticus*, Tanner *Chionoecetes* spp. (Tanner, snow, and *C. bairdi x C. opilio* (hybrid) crabs combined), and Dungeness crabs *Cancer magister*, for detailed examination. If a sampled dredge contained in excess of 20 crabs of a species or in the case of *Chionoecetes* in the Bering Sea, a genus, observers were instructed to count and identify them. From each crab selected for detailed

examination, carapace measurements, shell condition, sex, injuries, and mortality data were collected. Crabs that were crushed, dismembered, or exhibited no movement of body parts were considered dead. Moribund crabs which were nearly dead or severely injured and not likely to survive were also coded as dead. Carapace length (CL) was measured on all king crabs; carapace width (CW) was measured on all other crab species.

Observers examined the discarded scallop catch associated with each bycatch sampled tow. After the crew sorted and removed the retained scallop catch from the dredge contents on deck, observers collected all remaining scallops regardless of size. This discarded scallop catch consisted of small and/or broken scallops and larger scallops that were overlooked by the crew. One basket was further subdivided into intact scallops and broken/crushed scallops. If a broken/crushed scallop shell had 50% or more of the body tissue attached to it, it was counted as one scallop. Small pieces of crushed shell and soft body tissue were not counted. The broken/crushed sample was weighed to the nearest whole pound and the individuals were counted. The intact sample was also weighed to the nearest pound, all individuals were counted and shell heights (SH) were collected from 20 randomly selected scallops. The SH was measured to the nearest millimeter in a perpendicular line from the umbo to the most distant point on the outer shell margin using vernier calipers (Figure 2). Any additional baskets of unsorted discarded scallops were weighed to the nearest pound.

Observers also examined the retained scallop catch associated with each bycatch sampled tow. Twenty scallops from the retained catch in each of the sampled bycatch tows were randomly selected and measured. Observers collected the dorsal (left) valve of every tenth scallop examined, following the shell sampling protocol contained in the scallop observer manual (Barnhart 2004). Shells were cleaned of mud, flora, and fauna, then dried. The haul (tow) number, shell number from the scallop size frequency form, statistical area number, vessel ADF&G number, and date were written with a permanent black marker on the inside of each shell. Dried shells were stored in muslin bags. Observers were instructed to collect 10 to 15 dorsal valves from scallops <100 mm SH from each statistical area fished. These small shells typically have distinguishable first and second year annuli on the shell surface that are frequently worn away and less visible on older shells. These small shells help department staff confirm placement of the first and second annuli on older scallop shells. Typically, scallop fishermen do not retain scallops <100 mm SH, so these shells were collected from the discarded catch. Again, pertinent collection information similar to that associated with the retained scallop shell collection was recorded on the inside of each shell.

Vessel Operator Logbook

Vessel operators maintained a fishing logbook provided by ADF&G. For each tow, the operator recorded the combined width of dredges towed, gear performance, date, haul number, set position, tow duration, average depth, average speed, estimated retained round weight in pounds of whole/live scallops, estimated discarded scallop catch in pounds, and ADF&G statistical area.

Data Collection Forms

Examples of the data collection forms used during the 2003/04 season can be found in the 2001 scallop observer manual (Barnhart 2001). Examples of those forms used during the 2004/05 and 2005/06 seasons can be found in the 2004 scallop observer manual (Barnhart 2004).

SCALLOP FISHING LOCATION MAPPING

Fishing locations were determined from data reported by vessel operators in the fishing logbook. Major fishing areas were plotted by outlining the highest concentration of fishing activity within a registration area. Specific fishing locations where fewer than three vessels participated remain confidential and were not mapped.

ESTIMATION OF CRAB AND PACIFIC HALIBUT BYCATCH, AND DISCARDED SCALLOP CATCH

Bycatch of Dungeness crabs, red king crabs, snow crabs *Chionoecetes opilio,* Tanner crabs *Chionoecetes bairdi* and Pacific halibut was estimated from the observer data. The observer's daily goal was to randomly sample bycatch in a single dredge from each of five tows. The number of dredges sampled ranged from zero to five on each day when fishing occurred, due to weather conditions, observer health, and the vessel's daily fishing schedule.

For each fishing area, total bycatch ($\hat{B}$) of each species was estimated by summing all daily bycatch estimates from each vessel, calculated as:

$$\hat{B} = \frac{c}{t} \cdot T \cdot D, \tag{1}$$

where:

c = number counted in sampled dredges,

t = sampled dredge·hours (dredge·hr = one dredge towed 60 minutes),

T = total dredge·hours, and

D = average number of dredges fished.

For days when no dredges were sampled, bycatch was estimated by multiplying the average catch rate (number/hour) for the same vessel in the same area by total dredge·hours and average number of dredges fished during the day for which no samples were taken. Ninety-five percent confidence intervals for the bycatch estimates were calculated by percentile-method bootstrapping (Barnhart et al. 1996).

Sampling effort for scallops discarded by the fleet also ranged from 0 to 5 dredges per day. Methods for estimating the number and weight of discarded scallops in each fishing area were similar to those used for crab and Pacific halibut bycatch. Number or weight ($\hat{x}$) of intact (or broken) scallops in the sampled dredges on each vessel each fishing day were estimated by:

$$\hat{X} = \frac{x}{W}(W + R), \tag{2}$$

where:

x = number (or weight) of intact (or broken) scallops in subsampled baskets,

W = weight of subsampled baskets, and

R = weight of remaining scallops in sampled dredges.

Estimates for each day were obtained by substituting $\hat{X}$ for c in equation (1), and area estimates were obtained by summing over all vessels and days. Days with no sampling were handled as

above, using average catch rates (number or weight per hour) by the same vessel in the same area. Again, confidence intervals were calculated by percentile-method bootstrapping.

Scallop Catch Per Unit Effort

Scallop catch-per-unit-effort (CPUE) is expressed as either, round weight or shucked meat weight, per dredge-hour (drg-hr). Round weight represents the weight in pounds of live/whole scallops retained by the crew. The round weight of retained scallops was estimated by the vessel operator for each tow by counting the number of retained scallop bushels and multiplying by an estimated weight per bushel. Shucked meat weight represents the actual, not estimated, weight in pounds of shucked scallop meats at the time of processing.

Shell Height Frequency Distributions Of The Scallop Catch

For areas with sufficiently large sample sizes (at least 200) of both retained and discarded scallop SHs, estimated SH distributions were obtained by resampling with replacement from the observer measurements. Resamples were drawn from either the retained or discarded SH measurements based on the estimated proportion of discards in the total catch for the area. After resampling 10,000 SH measurements, histograms based on 5 mm bins were created to depict the SH distribution.

RESULTS AND DISCUSSION

During the 2003/04 season, five observers were deployed aboard two vessels for a total of 362 vessel days (total days from briefing to debriefing for all observers). A total of 34 briefings and debriefings were conducted by ADF&G staff statewide. One or more tows were sampled on 252 of the 288 vessel days on which fishing occurred. Of the 4,765 tows recorded in vessel operator logbooks, 1,216 (26%) were sampled.

During the 2004/05 season, five observers were deployed aboard three vessels for a total of 330 vessel days. A total of 30 briefings and debriefings were conducted by ADF&G staff statewide. One or more tows were sampled on 249 of the 283 vessel days on which fishing occurred. Of the 4,241 tows recorded in vessel operator logbooks, 1,157 (27%) were sampled.

During the 2005/06 season, five observers were deployed aboard four vessels for a total of 487 vessel days. A total of 43 briefings and debriefings were conducted by ADF&G staff statewide. One or more tows were sampled on 387 of the 487 vessel days on which fishing occurred. Of the 5,733 tows recorded in vessel operator logbooks, 1,460 (25%) were sampled.

Commercial Scallop Fishery

Catch and Effort 2003/04 Season

The scallop fleet fished 26 statistical areas extending from Yakutat to the Bering Sea (Figure 3).

Scallop dredges were towed a total of 24,846 nautical miles (nmi) and swept a maximum of 120.8 nmi^2 of the bottom during the 2003/04 season (Table 1). Dredges were towed 11,071 nmi in the Kodiak Area (54.0 nmi^2 swept), 8,291 nmi in the Yakutat Area (40.2 nmi^2 swept), 4,965 nmi in the Bering Sea Area (24.0 nmi^2 swept), and 519 nmi in the Prince William Sound Area (2.6 nmi^2 swept).

Average depth fished during the 2003/04 season was 45 fathoms and ranged from a minimum of 30 fathoms in Yakutat Area D to a maximum of 80 fathoms in the Shelikof District of the

Kodiak Area (Table 2). Average depth fished was greater in the Kodiak and Bering Sea Areas then in the Yakutat and Prince William Sound Areas.

Fishing effort during the 2003/04 season totaled 9,120 drg-hr (Table 3). The highest effort occurred in the Kodiak Area with 4,506 drg-hr followed by the Yakutat Area with 3,378 drg-hr, Bering Sea Area with 1,020 drg-hr, and the Prince William Sound Area with 216 drg-hr (Figure 4).

Total round weight of retained scallops during the 2003/04 season, as recorded in vessel operator's logbooks, was 5,227,071 lb (Table 3; Figure 5). The Kodiak Area accounted for the largest catch with 2,472,015 lb, followed by the Yakutat Area with 1,955,784 lb, Bering Sea Area with 537,552 lb, and Prince William Sound Area with 261,720 lb.

Scallop CPUE expressed in round weight of retained scallops per dredge-hour (lb/drg-hr), was highest in the Prince William Sound Area at 1,212 lb/drg-hr, followed by Yakutat District 16 with 839 lb/drg-hr, Northeast District of the Kodiak Area with 599 lb/drg-hr, Yakutat Area D with 577 lb/drg-hr, Shelikof District of the Kodiak Area at 529 lb/drg-hr and the Bering Sea Area with 527 lb/drg-hr. Statewide CPUE was 573 lb/drg-hr (Table 3; Figure 6)

Retained (shucked) scallop meats reported on fish tickets totaled 484,536 lb. The Kodiak Area harvest of 259,976 lb was the highest in the state followed by the Yakutat Area harvest of 161,990 lb, Bering Sea Area harvest of 42,590 lb, and the Prince William Sound Area harvest of 19,980 lb.

Scallop CPUE expressed in pounds of shucked (retained) scallop meats per dredge-hour (lb meat/drg-hr) was highest in the Prince William Sound Area at 93 lb meat/drg-hr, followed by 64 lb meat/drg-hr in the Northeast District of the Kodiak Area, 55 lb meat/drg-hr in the Shelikof District, 54 lb meat/drg-hr in Yakutat District 16, 48 lb meat/drg-hr in Yakutat Area D, and 42 lb meat/drg-hr in the Bering Sea Area. Statewide, CPUE averaged 53 meat lb/drg-hr.

Catch and Effort 2004/05 Season

The scallop fleet fished 29 statistical areas extending from Yakutat to the Bering Sea during the 2004/05 season.

Scallop dredges were towed a total of 19,916 nmi and swept a maximum of 98.2 nmi^2 of the bottom (Table 1). Dredges were towed 11,576 nmi in the Kodiak Area (57.0 nmi^2 swept), 6,187 nmi in the Yakutat Area (30.6 nmi^2 swept), 1,491 nmi in the Prince William Sound Area (7.3 nmi^2 swept), and 662 nmi in the Bering Sea Area (3.3 nmi^2 swept).

Average depth fished during the 2004/05 season was 45 fathoms and ranged from a minimum of 25 fathoms in the Shelikof District of the Kodiak Area to a maximum of 75 fathoms, also in the Shelikof District (Table 2). The 2004/05 statewide average depth fished of 45 fathoms was the same as the 2003/04 season.

Effort totaled 8,135 drg-hr during the 2004/05 season (Table 4). Similar to the 2003/04 season, the highest effort occurred in the Kodiak Area with 4,694 drg-hr and the Yakutat Area with 2,552 drg-hr. This was followed by the Prince William Sound Area with 614 drg-hr and the Bering Sea Area with 275 drg-hr (Figure 4).

Total round weight of retained scallops during the 2004/05 season, as recorded in vessel operator's logbooks was 4,912,699 lb, approximately 314,000 lb less then the 2003/04 season catch (Table 4; Figure 5). This was a result of reduced scallop harvests in the Bering Sea Area

due to increased crab bycatch and in the Yakutat Area due to soft market conditions for the small-sized scallop meats commonly found in that area. The Kodiak Area accounted for the largest catch with 2,490,135 lb, followed by the Yakutat Area with 1,588,727 lb, Prince William Sound Area with 704,617 lb, and the Bering Sea Area with 129,220 lb.

Similar to the 2003/04 season, CPUE expressed in round weight of retained scallops per dredge-hour, continued to be highest in the Prince William Sound Area at 1,148 lb/drg-hr during the 2004/05 season. Prince William Sound was followed by Yakutat District 16 with 780 lb/drg-hr, Northeast District of the Kodiak Area with 692 lb/drg-hr, Yakutat Area D with 592 lb/drg-hr, Shelikof District of the Kodiak Area at 473 lb/drg-hr, and the Bering Sea Area with 470 lb/drg-hr. Statewide CPUE was 604 lb/drg-hr, similar to the 2003/04 season (Table 4; Figure 6)

Retained scallop meats as reported on fish tickets totaled 425,477 lb for the 2004/05 season. The Kodiak Area harvest of 254,727 lb was the highest in the state followed by the Yakutat Area harvest of 111,380 lb, Prince William Sound Area harvest of 49,320 lb, and the Bering Sea Area harvest of 10,050 lb.

Scallop CPUE expressed in pounds of shucked (retained) scallop meats per dredge-hour continued to be highest in the Prince William Sound Area at 80 lb meat/drg-hr. This was followed by a CPUE of 65 lb/ meat/drg-hr in the Northeast District of the Kodiak Area, 58 lb meat/drg-hr in Yakutat District 16, 50 lb meat/drg-hr in the Shelikof District of the Kodiak Area, 41 lb meat/drg-hr in Yakutat Area D, and 37 lb meat/drg-hr in the Bering Sea Area. Statewide, CPUE was 52 lb meat/drg-hr.

Catch and Effort 2005/06 Season

The scallop fleet fished 26 different statistical areas extending from Yakutat to the Bering Sea. Scallop dredges were towed a total of 26,968 nmi and swept a maximum of 123.1 nmi^2 of the bottom during the 2005/06 season (Table 1). Dredges were towed 13,342 nmi in the Yakutat Area (65.8 nmi^2 swept), 10,302 nmi in the Kodiak Area (47 nmi^2 swept), 1,827 nmi in the Prince William Sound Area (2.9 nmi^2 swept), and 1,497 nmi in the Bering Sea Area (7.4 nmi^2 swept).

Average depth fished during the 2005/06 season was 46 fathoms and ranged from a minimum of 26 fathoms in Yakutat Area D to a maximum of 78 fathoms in the Shelikof District of the Kodiak Area (Table 2). The statewide average depth fished during the 2005/06 season was similar to the 2003/04 and 2004/05 seasons.

Total effort during the 2005/06 season was 10,620 drg-hr (Table 5). The highest effort occurred in the Yakutat Area with 5,496 drg-hr followed by the Kodiak Area with 4,039 drg-hr, Bering Sea Area with 602 drg-hr and the Prince William Sound Area with 491 drg-hr (Figure 4).

Total round weight of retained scallops for the season, as recorded in vessel operator's logbooks was 6,208,143 lb, an increase of 1.29 million pounds from the 2004/05 season (Table 5; Figure 5). This is a result of increased fishing effort in response to record setting first-wholesale prices for Alaska weathervane scallops. The Yakutat Area accounted for the largest catch with 2,871,518 lb, followed by the Kodiak Area with 2,286,184 lb, Prince William Sound Area with 818,741 lb, and the Bering Sea Area with 231,700 lb.

Similar to the 2003/04 and 2004/05 seasons, scallop CPUE expressed in round weight of retained scallops per dredge-hour (lb/drg-hr), was highest in the Prince William Sound Area at 1,667 lb/drg-hr. This was followed by the Shelikof District of the Kodiak Area at 638 lb/drg-hr, Yakutat Area D with 523 lb/drg-hr, Yakutat District 16 with 515 lb/drg-hr, Northeast District of

the Kodiak Area with 473 lb/drg-hr, and the Bering Sea Area with 385 lb/drg-hr. Statewide, CPUE was 584 lb/drg-hr, similar to the 2003/04 and 2004/05 seasons (Table 5; Figure 6).

Retained scallop meats as reported on fish tickets totaled 525,357 lb. The Kodiak Area harvest of 239,931 lb was the highest in the state followed by the Yakutat Area harvest of 213,001 lb, Prince William Sound Area harvest of 49,205 lb and the Bering Sea Area harvest of 23,220 lb.

Scallop CPUE, expressed in pounds of shucked (retained) scallop meats per dredge-hour (lb meat/drg-hr) was highest in the Prince William Sound Area at 100 lb meat/drg-hr, an increase from 80 lb meat/drg-hr during the 2004/05 season. This was followed by 70 lb meat/drg-hr in the Shelikof District of the Kodiak Area, 45 lb meat/drg-hr in the Northeast District of the Kodiak Area, 39 lb meat/drg-hr in the Bering Sea Area and Yakutat Area D, and 34 lb meat/drg-hr in Yakutat District. Statewide CPUE was 49 meat lb/drg-hr.

Discarded Scallop Catch 2003/04 Season

During the 2003/04 season, observers counted and weighed a total of 196,039 discarded scallops consisting of 143,248 intact scallops and 52,791 broken scallops (Table 6). Estimates for the 2003/04 season indicate that a combined total of 3.9 million intact and broken-shell scallops weighing 0.997 million pounds were discarded (Table 7). Intact discards numbered 2.9 million scallops with a weight of 0.675 million pounds and the broken discards numbered 1.0 million scallops with a weight of 0.322 million pounds. Of the total statewide scallop catch by round weight, 16% was discarded. Nearly 68% of the discarded scallops by weight were intact.

Further examination of estimated weights of discarded scallops indicates that 52% of the total discards by weight were from the Kodiak Area, 40% from the Yakutat Area, 5% from the Prince William Sound Area, and 3% from the Bering Sea Area.

Average weight of individual discarded scallops (intact and broken scallops combined) for the 2003/04 season ranged from 0.24 lb in Yakutat District 16 to 0.38 lb in the Bering Sea Area (Table 6). Statewide average weight for combined broken and intact shell discards was 0.26 lb.

Of the 19,816 measured intact discarded scallops, average SHs ranged from 100 mm in the Shelikof District of the Kodiak Area to 113 mm in the Bering Sea Area (Table 8). Scallops larger then 100-110 mm SH are typically retained in the commercial fishery.

Discarded Scallop Catch 2004/05 Season

During the 2004/05 season, observers counted and weighed a total of 143,714 discarded scallops consisting of 94,619 intact scallops and 49,095 broken scallops (Table 6). This is a decrease from the 2003/04 season total of 196,039 scallops counted and weighed. Estimates for the 2004/05 season indicate that a combined total of 3.64 million intact and broken-shell scallops weighing 1.02 million pounds were discarded (Table 9). Intact discards numbered 2.56 million scallops with a weight of 0.671 million pounds and the broken discards numbered 1.09 million scallops with a weight of 0.351 million pounds. Of the total statewide scallop catch by round weight, 17% was discarded. By weight, 66% of the discarded scallops were intact.

Further examination of estimated weights of discarded scallops indicates that 68% of the total discards by weight were from the Kodiak Area, 23% from the Yakutat Area, 8% from the Prince William Sound Area, and <1% from the Bering Sea Area.

Average weight of individual discarded scallops (intact and broken scallops combined) for the 2004/05 season ranged from 0.26 lb in Yakutat Area D to 0.37 lb in the Bering Sea Area (Table 6). Statewide average weight for combined broken and intact shell discards was 0.28 lb.

Of the 19,119 measured intact discarded scallops, average SHs ranged from 104 mm in Yakutat Area D, to 112 mm in Yakutat District 16 (Table 10).

Discarded Scallop Catch 2005/06 Season

Observers counted and weighed a total of 178,410 discarded scallops consisting of 86,731 intact scallops and 91,679 broken scallops during the 2005/06 season (Table 6). This is an increase from the 143,714 discarded scallops sampled in 2004/05, but less than the 196,039 discarded scallops sampled in the 2003/04 season. Estimates from the 2005/06 season indicate that a combined total of 3.3 million intact and broken-shell scallops weighing 0.896 million pounds were discarded (Table 11). Intact discards numbered 1.76 million scallops with a weight of 0.432 million pounds and the broken discards numbered 1.52 million scallops with a weight of 0.464 million pounds. Of the total statewide scallop catch by round weight, 13% was discarded. Of the discarded scallops by weight, 48% were intact.

Further examination of estimated weights of discarded scallops indicates that 48% of the total discards by weight were from the Yakutat Area, 43% from the Kodiak Area, 7% from the Prince William Sound Area, and 2% from the Bering Sea Area.

Average weight of individual discarded scallops (intact and broken scallops combined) for the 2005/06 season ranged from 0.25 lb in Yakutat District 16 to 0.47 lb in the Bering Sea Area (Table 6). Statewide average weight for combined broken and intact shell discards was 0.28 lb.

Of the 19,791 measured intact discarded scallops, average SHs ranged from 92 mm in the Prince William Sound Area to 117 mm in the Bering Sea Area (Table 12).

Retained Scallop Catch 2003/04–2005/06 Seasons

During the 2003/04 season, observers measured over 20,000 scallops from the retained catch (Table 8). Average SH was 135 mm statewide and ranged from 121 mm in Yakutat District 16 to 148 mm in the Bering Sea.

Statistics for the 2004/05 season were similar to the 2003/04 season. Observers again measured over 20,000 scallops from the retained catch (Table 10). Average SH was 134 mm statewide and ranged from 120 mm in Yakutat District 16 to 146 mm in the Bering Sea.

In the 2005/06 season, observers measured nearly 26,000 scallops from the retained catch (Table 12). The average statewide SH was 131 mm, a 3 mm decrease from the 2004/05 season. Similar to the 2003/04 and 2004/05 seasons, the smallest average SH was in Yakutat District 16 and the largest in the Bering Sea. Shell height ranged from 119 mm in Yakutat District 16 to 154 mm in the Bering Sea.

Combined Retained and Discarded Scallop Catch 2003/04–2005/06 Seasons

Estimated shell height distributions for retained and discarded scallops caught in each management area/district where at least 200 measurements were available are depicted in Figures 7-12. Alaska weathervane scallop vessels are required to use scallop dredges with rings having an inside diameter of four inches (102 mm) or larger. The top of the ring bag is constructed of six-inch twine mesh. So, scallops <102 mm SH are presumably captured with lower efficiency

than larger scallops. Typically, scallops <100 mm SH are discarded, but decisions to retain or discard scallops are made by the individual operators and their crews.

Observers measured over 20,000 retained scallops and nearly 20,000 discarded scallops during the 2003/04 season (Table 8). In the 2004/05 season observers measured approximately 20,000 retained scallops and 19,000 discarded scallops (Table 10). During the 2005/06 season, observers measured nearly 26,000 retained scallops and 20,000 discarded scallops (Table 12).

Histograms of Yakutat District 16 SH distributions show that a large proportion of the catch in the 2004/05 and 2005/06 seasons was comprised of scallops ≤ 125 mm SH (Figure 7). In the 2004/05 season, the average sized scallop retained in the commercial catch was 120 mm SH compared to 119 mm SH in the 2005/06 season. The majority of the commercial catch in the 2004/05 and 2005/06 seasons was comprised of scallops in a limited size range between 105 to 135 mm SH. A cohort of scallops from 98 to 107 mm SH indicates there was some recruitment to the harvested population. Yakutat Area D SH distributions, show that a large proportion of the commercial catch was comprised of scallops ≤ 135 mm SH (Figure 8). The average size of scallops retained in the commercial catch declined from 126 mm SH in the 2003/04 season to 123 mm SH in the 2005/06 season. Commercial catches of scallops during the 2003/04 through 2005/06 seasons suggest continued recruitment to the harvested population as indicated by scallops <110 mm SH.

Histograms of Prince William Sound SH distributions show that fewer scallops were discarded in this fishery during the 2004/05 and 2005/06 seasons then in the 2003/04 season (Figure 9). Retained catches over the three seasons were predominated by scallops ≥ 118 mm SH. During the 2003/04 and 2004/05 seasons, the majority of the commercial catch was between 115 to 145 mm SH. However, in the 2005/06 season, the SH distribution of the commercial catch showed a narrowing in the sizes with the majority of the catch ranging from 125 to 140 mm SH. The average scallop retained in the commercial catch during the 2005/06 season was 131 mm SH compared to 134 mm SH for the 2004/05 season and 129 mm SH for the 2003/04 season. In the 2003/04 season, there was modest recruitment to the harvested population as evidenced by scallops ≤110 mm SH; however, recruitment appears to have declined during the 2004/05 and 2005/06 seasons.

Estimated SH distributions in the Kodiak Area show a wider range of scallop sizes than were found in the Yakutat and Prince William Sound Areas. Shell height distributions from the Northeast District of the Kodiak Area during the 2003/04 - 2005/06 seasons show wide size distributions each year (Figure 10). There appears to be recruitment each year as evidenced by scallops <110 mm SH. Average SH in the retained commercial catch during the 2003/04 season was 145 mm SH compared to 144 mm SH in the 2004/05 season. In the 2005/06 season, the average size declined to 139 mm SH. In the Shelikof District of the Kodiak Area, a wide range of scallop sizes supports the commercial fishery, and substantial recruitment to the harvested population in the 2003/04 and 2004/05 seasons was evidenced by scallops ≤ 110 mm SH (Figure 11). However, during the 2005/06 season, the estimated proportion of scallops <115 mm SH decreased substantially. This decrease is likely a result of scallop growth combined with reduced recruitment.

Bering Sea SH histograms from the 2003/04 to 2005/06 seasons show that catch was comprised of large scallops >130 mm SH with few discards (Figure 12). Average shell-heights were 148 mm in the 2003/04 season, 146 mm for the 2004/05 season, and 154 mm for the 2005/06 season.

A small proportion of scallops <130 mm is evident each season, indicating minor annual recruitment to the harvestable population.

SCALLOP FISHERY BYCATCH 2003/04–2005/06 SEASONS

Detailed rankings of the top twenty species or items by percent weight of the total catch from sampled dredges for each registration area or district fished during the 2003/04–2005/06 seasons are presented in Tables 13-18. Although a variety of marine vertebrates, invertebrates, and natural or man-made debris (e.g., plastics and derelict fishing gear) are caught incidentally in scallop dredges, weathervane scallops predominated catches. In the Prince William Sound Area, weathervane scallops comprised the largest percentage of the catch by weight of any registration area in Alaska, ranging from 92 to 94% during the 2003/04–2005/06 seasons. In contrast, weathervane scallops comprised between 61 and 69% of the catch by weight over the same time period in the Northeast District of the Kodiak Area. Sunflower sea stars *Pycnopodia helianthoides*, a predator of weathervane scallops, generally ranked as the second most frequently caught species, and was never lower then the sixth most frequently caught species in the Gulf of Alaska during the 2003/04–2005/06 seasons.

Summaries of the 36 most frequently caught species, species groups, or items, by percent weight of the total catch in sampled dredges during the 2003/04–2005/06 seasons for each registration area or district are presented in Tables 19 – 21. In addition to weathervane scallops, other species or groups of species or items are categorized as (1) prohibited species bycatch, (2) other commercial species, and (3) miscellaneous species or items. Although sunflower sea stars are commonly caught by scallop gear in the Gulf of Alaska, they did not appear in Bering Sea catches. Yakutat District 16 had the least species diversity of any area over the three fishing seasons, with an average of 17 species or species groups represented in the table annually.

Crab Bycatch Estimates 2003/04–2005/06 Seasons

The highest bycatch of *Chionoecetes* crabs during the 2003/04–2005/06 seasons occurred in the Kodiak Area, averaging 56,726 crabs per season. Tanner crab bycatch estimates for the Kodiak Area were 58,805 crabs in 2003/04, 64,055 crabs in 2004/05, and 47,319 crabs in the 2005/06 season (Tables 22 – 24).

Estimated annual average bycatch of *Chionoecetes* crabs in the Bering Sea during the 2003/04–2005/06 seasons was 29,136 crabs, about half that of the Kodiak Area. Approximately 71% of the estimated *Chionoecetes* crabs were Tanner crab and 29% were snow and *C. bairdi x C. opilio* (hybrid) crabs.

Estimated bycatch of Tanner crabs in other areas was much lower than in the Kodiak and Bering Sea Areas. Bycatch estimates in the Prince William Sound Area varied widely with 8 crabs in 2003/04, 524 crabs in 2004/05, and 465 crabs in 2005/06. Tanner crab bycatch estimates for the Yakutat Area were 1,650 crabs in the 2003/04 season, 863 crabs in the 2004/05 season and 5,364 crabs in the 2005/06 season.

Dungeness crabs were recorded in the bycatch from Yakutat District 16, Yakutat Area D, Prince William Sound, and the Shelikof District of the Kodiak Area. Total estimated Dungeness bycatch by area for the combined 2003/04, 2004/05, and 2005/06 seasons was 8 crabs in Prince William Sound, 191 crabs in Yakutat District 16, 1,522 crabs in Yakutat Area D, and 3,818 crabs in the Shelikof District of the Kodiak Area

Few red king crabs *Paralithodes camtschaticus* were reported taken as bycatch by the scallop fleet. During the 2004/05 season, one red king crab was caught in the Northeast District of the Kodiak Area and one in the Shelikof District of the Kodiak Area. During the 2005/06 season, two red king crabs were caught in the Bering Sea. As a condition of registering to participate in the weathervane scallop fishery, the vessel operator must agree to show every king crab caught to the observer for sampling, so king crab bycatch data presented in reports are counts rather than estimates.

Chionoecetes Crab Bycatch Mortality 2003/04–2005/06 Seasons

Observed on-deck mortality of *Chionoecetes* crabs recorded by observers during the 2003/04 season ranged from 0% for Tanner crabs in the Prince William Sound Area, to 72% for Bering Sea snow and hybrid crabs. During the 2004/05 season, mortality ranged from 34% for Bering Sea Tanner crabs to 76% for Bering Sea snow and hybrid crabs. In the 2005/06 season, observed mortality ranged from 30% for Tanner crabs in the Prince William Sound Area to 58% for Tanner crabs in the Kodiak Area (Table 25).

Statewide, on-deck mortality of Tanner crabs recorded by observers averaged 48% in 2003/04, 65% in 2004/05, and 54% in 2005/06.

Size of *Chionoecetes* crabs incidentally caught in scallop dredges was shown to affect mortality rates (Urban et al., 1994; Barnhart et al., 1996). Incidence of observed mortality varied with crab size in a roughly "U-shaped" trend, with the highest observed-mortality rates occurring in crabs less than 35 mm CW, and larger than 100 mm CW while the lowest rates occurred in the intermediate size range, 80 – 100 mm CW.

Size Distribution of Tanner and Snow/hybrid Crab Bycatch 2003/04–2005/06 Seasons

Size frequency plots of Gulf of Alaska Tanner crab bycatch between the 2003/04 and 2005/06 seasons indicate crab bycatch was comprised predominately of small immature males <70 mm CW and females, both immature <60 mm CW, and mature >60 mm CW (Figures 13-17). Note that sample sizes were too small to plot Yakutat District 16 for the 2003/04 and 2004/05 seasons. There were few documented legal-sized (≥140 mm CW) male Tanner crab in the bycatch. Size frequency plots of Tanner crabs in the eastern Gulf of Alaska (Yakutat District 16, Yakutat Area D, and the Prince William Sound Area) show few Tanner crabs >70 mm CW. However, that is not the case in the western Gulf of Alaska (Northeast and Shelikof Districts of the Kodiak Area) where Tanner crab >70 mm CW are well represented in the plots.

Plots of incidentally caught Tanner crabs during the 2003/04 and 2005/06 Bering Sea Area scallop seasons show that few crabs <50 mm CW were caught (Figure 18). However, in 2004/05 a strong mode of both male and female Tanner crabs around 30 mm CW appear in the plots. The 2003/04 and 2004/05 plots show commercially legal (≥ 140 mm CW) male Tanner crabs that do not appear in the 2005/06 season plot. Mature female Tanner crabs ≥ 80 mm CW are well represented in the 2003/04 and 2004/05 seasons and to a lesser extent in the 2005/06 season.

Size frequency plots of snow and hybrid crabs incidentally caught in the Bering Sea Area show a discrepancy between male and female sample sizes, with males predominating the bycatch (Figure 19). The number of female crabs identified ranged from 14 to 26 individuals per season, while the number of males ranged from 428 to 1,883 individuals.

Tanner and Snow Crab Bycatch Relative to the Scallop Harvest 2003/04–2005/06 Seasons
The bycatch rate of *Chionoecetes* crabs per pound of retained scallop meats (crab/lb meat) is reported in Tables 26–37. For the 2003/04–2005/06 seasons the rate was highest in the Bering Sea Area, ranging from 0.9 to 1.9 crab/lb meat. Bycatch rates for Yakutat District 16, Yakutat Area D, and the Prince William Sound Area were all <0.1 crab/lb meat. The crab bycatch rate in the Northeast District of the Kodiak Area ranged from 0.2 to 0.4 crab/lb meat over the three seasons while the rate in the Shelikof District of the Kodiak Area ranged from 0.1 to 0.2 crab/lb meat.

Pacific Halibut Bycatch Estimates and Release Conditions 2003/04–2005/06 Seasons
Estimated Pacific halibut bycatch in the 2003/04 season totaled 1,160 halibut and ranged from 2 in the Prince William Sound Area to 574 in the Shelikof District of the Kodiak Area (Table 3). Of 136 halibut in sampled tows, 22 (16%) were released in excellent condition, 39 (29%) were released in good condition, 24 (18%) were released in fair condition, 20 (15%) were released in poor condition, 22 (16%) were released dead, 6 (4%) were previously dead when caught (obviously not killed in the current haul) and 3 (2%) were not examined (Table 38).

Estimated Pacific halibut bycatch during the 2004/05 season totaled 1,135 halibut, ranging from 0 in the Bering Sea Area to 579 in the Shelikof District of the Kodiak Area (Table 4). Of 147 halibut in sampled tows, 22 (15%) were released in excellent condition, 54 (37%) were released in good condition, 19 (13%) were released in fair condition, 13 (9%) were released in poor condition, 33 (22%) were released dead, 4 (3%) were previously dead when caught (obviously not killed in the current haul) and 2 (1%) were not examined.

Estimated Pacific halibut bycatch during the 2005/06 season totaled 991 halibut and ranged from 0 in Yakutat District 16 to 518 in Yakutat Area D (Table 5). Of 128 halibut in sampled tows, 22 (17%) were released in excellent condition, 40 (31%) were released in good condition, 20 (16%) were released in fair condition, 17 (13%) were released in poor condition, 25 (19%) were released dead, 2 (2%) were previously dead when caught (obviously not killed in the current haul) and 2 (2%) were not examined.

SUMMARY TABLES
Statewide commercial fishery statistics and observer data from the 1993 through the 2005/06 seasons are summarized in Tables 26-37 for all scallop registration areas and districts. The tables include season dates, effort levels, crab bycatch limits, crab and halibut bycatch estimates, scallop harvest, estimated number and weight of the discarded scallop catch, average size of the retained scallop catch, and observed Tanner crab mortality.

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TABLES AND FIGURES

Table 1.–Distance towed and bottom area dredged, 2003/04-2005/06 weathervane scallop fishing seasons.

	2003/04		2004/05		2005/06	
Registration Area	Tow Miles[a]	Area Dredged[b]	Tow Miles[a]	Area Dredged[b]	Tow Miles[a]	Area Dredged[b]
Yakutat						
District 16	52	0.2	525	2.6	983	4.8
Area D	8,239	40.0	5,662	28.0	12,359	61.0
Yakutat Area Total	8,291	40.2	6,187	30.6	13,342	65.8
Prince William Sound	519	2.6	1,491	7.3	1,827	2.9
Kodiak						
Northeast District	3,117	15.0	3,041	15.0	4,744	20.0
Shelikof District	7,954	39.0	8,535	42.0	5,558	27.0
Semidi Island District	No Fishing		No Fishing		No Fishing	
Kodiak Area Total	11,071	54.0	11,576	57.0	10,302	47.0
Alaska Peninsula	No Fishing		No Fishing		No Fishing	
Bering Sea	4,965	24.0	662	3.3	1,497	7.4
Dutch Harbor	Season Closed		Season Closed		Season Closed	
Statewide Total	24,846	120.8	19,916	98.2	26,968	123.1

[a] Total distance towed in nautical miles (nmi).

[b] Maximum area dredged in square nautical miles (nmi^2) if each tow was spatially separate from all others.

Table 2.–Minimum, maximum, and average depth fished, 2003/04-2005/06 weathervane scallop fishing seasons.

	2003/04			2004/05			2005/06		
	Depth (fathoms)								
	Range			Range			Range		
Registration Area	Minimum	Maximum	Average	Minimum	Maximum	Average	Minimum	Maximum	Average
Yakutat									
District 16	32	39	36	30	42	34	31	42	37
Area D	30	59	39	30	58	37	26	75	40
Yakutat Area Average	30	59	38	30	58	37	26	75	40
Prince William Sound	34	40	38	31	65	39	29	55	49
Kodiak									
Northeast District	40	80	48	40	74	50	37	76	51
Shelikof District	31	76	50	25	75	50	32	78	54
Semidi Island District	No Fishing			No Fishing			No Fishing		
Kodiak Area Average	31	80	49	25	75	50	32	78	53
Alaska Peninsula	No Fishing			No Fishing			No Fishing		
Bering Sea	50	58	52	49	53	52	37	61	54
Dutch Harbor	Season Closed			Season Closed			Season Closed		
Statewide Total	30	80	45	25	75	45	26	78	46

Table 3.–Summary of commercial fishery statistics and scallop observer data from the 2003/04 weathervane scallop fishing season.

Registration Area	Season Dates[a]	Number of Vessels[b]	Number of Days Fishing Observed[c]	Dredge Hours[d]	lb of Retained Scallops[e] (Round lb)	CPUE[f]	lb of Retained Scallop Meats	CPUE[g]	Estimated Bycatch		% Scallops (by weight) in Samples[h]	Number of Tanners per lb of Retained Scallop Meats
									Tanner	Halibut		
Yakutat												
District 16	July 1-Feb 15	2	1	20	16,780	839	1,072	54	0	10	92	0.00
Area D	July 1-Feb 15	2	85	3,358	1,939,004	577	160,918	48	1,650	316	83	0.01
Yakutat Area Total		2	86	3,378	1,955,784	579	161,990	48	1,650	326	83	0.01
Prince William Sound	July 1-Jan 24	1	13	216	261,720	1,212	19,980	93	8	2	92	<0.01
Kodiak												
Northeast District	July 1-Nov 15	2	40	1,248	747,517	599	79,965	64	18,230	197	61	0.23
Shelikof District	July 1-Jan 13	2	88	3,258	1,724,498	529	180,011	55	40,575	574	80	0.23
Semidi Isl. District	July 1-Feb 15						No Fishing					
Kodiak Area Total		2	128	4,506	2,472,015	549	259,976	58	58,805	771	73	0.23
Alaska Peninsula	July 1-Feb 15						No Fishing					
Bering Sea	July 1-July 15	2	26	1,020	537,552	527	42,590	42	47,522[i]	61	72	1.12
Dutch Harbor	Season Closed											
Statewide Total (excluding Cook Inlet)	July 1-Feb 15	2	252	9,120	5,227,071	573	484,536	53	107,985	1,160	78	0.22

[a] The regulatory season date is July 1-February 15 unless closed by emergency order.

[b] Vessel operators voluntarily released their confidential data.

[c] An observed day is a day with at least one sampled tow. Fishing may occur in several areas or districts within a registration area on the same day.

[d] Dredge hour = one dredge towed for 60 minutes.

[e] Vessel operator estimates.

[f] CPUE = lb (round weight) of retained scallops per dredge-hour.

[g] CPUE = lb of retained (shucked) scallop meats per dredge-hour.

[h] From direct haul composition samples only, not estimated.

[i] Includes 31,316 Tanner and 16,206 snow/*C. bairdi x C. opilio* (hybrid) crabs.

Table 4.–Summary of commercial fishery statistics and scallop observer data from the 2004/05 weathervane scallop fishing season.

Registration Area	Season Dates[a]	Number of Vessels[b]	Number of Days Fishing Observed[c]	Dredge Hours[d]	lb of Retained Scallops[e] (Round lb)	CPUE[f]	lb of Retained Scallop Meats	CPUE[g]	Estimated Bycatch		% Scallops (by weight) in Samples[h]	Number of Tanners per lb of Retained Scallop Meats
									Tanner	Halibut		
Yakutat												
District 16	July 1-Feb 15	2	18	418	326,228	780	24,430	58	0	110	77	0.00
Area D	July 1-Feb 15	2	74	2,134	1,262,499	592	86,950	41	863	247	75	0.01
Yakutat Area Total	July 1-Feb 15	2	78	2,552	1,588,727	623	111,380	44	863	357	75	0.01
Prince William Sound	July 1-Feb 15	2	26	614	704,617	1,148	49,320	80	524	90	91	0.01
Kodiak												
Northeast District	July 1-Aug 10	2	42	1,227	848,527	692	80,105	65	30,717	109	69	0.38
Shelikof District	July 1-Dec 9	2	96	3,467	1,641,608	473	174,622	50	33,338	579	74	0.19
Semidi Isl. District	July 1-Feb 15						No Fishing					
Kodiak Area Total	July 1-Feb 15	2	138	4,694	2,490,135	530	254,727	54	64,055	688	72	0.25
Alaska Peninsula	July 1-Feb 15						No Fishing					
Bering Sea	July 1-Feb 15	1	7	275	129,220	470	10,050	37	19,146[i]	0	67	1.91
Dutch Harbor	Season Closed											
Statewide Total (excluding Cook Inlet)	July 1-Feb 15	2	249	8,135	4,912,699	604	425,477	52	84,588	1,135	76	0.20

[a] The regulatory season date is July 1 - February 15 unless closed by emergency order.

[b] Vessel operators voluntarily released their confidential data.

[c] An observed day is a day with at least one sampled tow. Fishing may occur in several areas or districts within a registration area on the same day.

[d] Dredge hour = one dredge towed for 60 minutes.

[e] Vessel operator estimates.

[f] CPUE = lb (round weight) of retained scallops per dredge-hour.

[g] CPUE = lb of retained (shucked) scallop meats per dredge-hour.

[h] From direct haul composition samples only, not estimated.

[i] Includes 15,303 Tanner and 3,843 snow/*C. bairdi x C. opilio* (hybrid) crabs.

Table 5.–Summary of commercial fishery statistics and scallop observer data from the 2005/06 weathervane scallop fishing season.

Registration Area	Season Dates[a]	Number of Vessels[b]	Number of Days Fishing Observed[c]	Dredge Hours[d]	lb of Retained Scallops[e] (Round lb)	CPUE[f]	lb of Retained Scallop Meats	CPUE[g]	Estimated Bycatch		% Scallops (by weight) in Samples[h]	Number of Tanners per lb of Retained Scallop Meats
									Tanner	Halibut		
Yakutat												
District 16	July 1-Feb 15	2	15	407	209,487	515	13,650	34	175	0	83	0.01
Area D	July 1-Jan 25	2	137	5,089	2,662,031	523	199,351	39	5,189	518	83	0.03
Yakutat Area Total	July 1-Feb 15	2	147	5,496	2,871,518	522	213,001	39	5,364	518	83	0.03
Prince William Sound	July 1-Aug 22	3	51	491	818,741	1,667	49,205	100	465	32	94	0.01
Kodiak												
Northeast District	July 1-Jan 17	3	53	1,759	831,378	473	79,990	45	29,264	211	65	0.37
Shelikof District	July 1-Dec 11	2	65	2,280	1,454,806	638	159,941	70	18,055	177	81	0.11
Semidi Isl. District	July 1-Feb 15						No Fishing					
Kodiak Area Total	July 1-Feb 15	3	118	4,039	2,286,184	566	239,931	59	47,319	388	74	0.20
Alaska Peninsula	July 1-Feb 15						No Fishing					
Bering Sea	July 1-Feb 15	1	18	602	231,700	385	23,220	39	20,770[i]	53	72	0.89
Dutch Harbor	Season Closed											
Statewide Total (excluding Cook Inlet)	July 1-Feb 15	4	334	10,628	6,208,143	584	525,357	49	73,918	991	82	0.14

[a] The regulatory season date is July 1 - February 15 unless closed by emergency order.

[b] Vessel operators voluntarily released their confidential data.

[c] An observed day is a day with at least one sampled tow. Fishing may occur in several areas or districts within a registration area on the same day.

[d] Dredge hour = one dredge towed for 60 minutes.

[e] Vessel operator estimates.

[f] CPUE = lb (round weight) of retained scallops per dredge-hour.

[g] CPUE = lb of retained (shucked) scallop meats per dredge-hour.

[h] From direct haul composition samples only, not estimated.

[i] Includes 15,529 Tanner and 5,211 snow/ *C. bairdi x C. opilio* (hybrid) crabs.

Table 6.–Number and weight (lb) of discarded scallops sampled by observers, 2003/04–2005/06 weathervane scallop fishing seasons.

		Number Sampled		Weight of Sample (lb)		Average Weight		
Registration Area	Season	Intact	Broken	Intact	Broken	Intact	Broken	Overall
Yakutat								
District 16	2003/04	26	234	6	57	0.23	0.24	0.24
	2004/05	696	3,521	194	1,107	0.28	0.31	0.31
	2005/06	2,318	4,455	581	1,121	0.25	0.25	0.25
Area D	2003/04	57,142	21,919	12,758	6,167	0.22	0.28	0.24
	2004/05	21,699	19,268	4,924	5,852	0.23	0.30	0.26
	2005/06	35,236	53,478	7,903	15,282	0.22	0.29	0.26
Yakutat Area Total	2003/04	57,168	22,153	12,764	6,224	0.22	0.28	0.24
	2004/05	22,395	22,789	5,118	6,959	0.23	0.31	0.27
	2005/06	37,554	57,933	8,484	16,403	0.23	0.28	0.26
Prince William Sound	2003/04	744	2,225	297	936	0.40	0.42	0.42
	2004/05	5,101	5,509	1,532	1,995	0.30	0.36	0.33
	2005/06	669	10,366	209	3,904	0.31	0.38	0.37
Kodiak								
Northeast District	2003/04	11,620	9,695	2,972	3,698	0.26	0.38	0.31
	2004/05	15,806	6,876	4,150	2,350	0.26	0.34	0.29
	2005/06	15,143	10,383	4,253	3,553	0.28	0.34	0.31
Shelikof District	2003/04	67,720	13,171	15,495	4,366	0.23	0.33	0.25
	2004/05	50,678	12,752	13,361	4,579	0.26	0.36	0.28
	2005/06	31,342	10,795	7,128	3,703	0.23	0.34	0.26
Semidi Isl. District	2003/04	No Effort						
	2004/05	No Effort						
	2005/06	No Effort						
Kodiak Area Total	2003/04	79,340	22,866	18,467	8,064	0.23	0.35	0.26
	2004/05	66,484	19,628	17,511	6,929	0.26	0.35	0.28
	2005/06	46,485	21,178	11,381	7,256	0.24	0.34	0.28
Alaska Peninsula	2003/04	No Effort						
	2004/05	No Effort						
	2005/06	No Effort						

-continued-

Table 6.–Page 2 of 2.

Registration Area	Season	Number Sampled		Weight of Sample (lb)		Average Weight		
		Intact	Broken	Intact	Broken	Intact	Broken	Overall
Bering Sea	2003/04	5,996	5,547	1,906	2,448	0.32	0.44	0.38
	2004/05	639	1,169	213	463	0.33	0.40	0.37
	2005/06	2,023	2,202	811	1,172	0.40	0.53	0.47
Dutch Harbor	2003/04			Season Closed				
	2004/05			Season Closed				
	2005/06			Season Closed				
Statewide Total	2003/04	143,248	52,791	33,434	17,672	0.23	0.33	0.26
	2004/05	94,619	49,095	24,374	16,346	0.26	0.33	0.28
	2005/06	86,731	91,679	20,885	28,735	0.24	0.31	0.28

Table 7.–Estimated number and weight of discarded intact and broken scallops during the 2003/04 weathervane scallop fishing season.

	Intact Number		Intact Weight[a]		Broken Number		Broken Weight[a]		Total	Total
Registration Area	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Number	Weight[a]
Yakutat										
District 16	516	58 - 1,057	116	19 - 230	4,312	1,115 - 7,867	1,020	327 - 1,617	4,828	1,136
Area D	1,224,049	1,111,770 - 1,335,334	272,151	246,367 - 294,550	451,768	405,475 - 508,682	125,353	112,717 - 141,623	1,675,817	397,504
Yakutat Area Total	1,224,565	1,111,828 - 1,336,391	272,267	246,386 - 294,780	456,080	406,590 - 516,549	126,373	113,044 - 143,240	1,680,645	398,640
Prince William Sound	22,578	17,835 - 28,878	9,262	7,454 - 11,869	100,453	76,566 - 173,379	40,701	32,597 - 67,472	123,031	49,963
Kodiak										
Northeast District	217,377	167,767 - 245,928	58,141	44,970 - 64,899	147,171	126,064 - 168,334	54,882	46,175 - 63,451	364,548	113,023
Shelikof District	1,400,563	1,295,551 - 1,517,663	320,336	296,697 - 348,032	253,923	231,853 - 276,767	80,610	73,870 - 87,778	1,654,486	400,946
Kodiak Area Total	1,617,940	1,463,318 - 1,763,591	378,477	341,667 - 412,931	401,094	357,917 - 445,101	135,492	120,045 - 151,229	2,019,034	513,969
Bering Sea	48,497	41,863 - 55,996	15,178	13,136 - 17,458	44,199	38,706 - 50,593	19,424	16,874 - 21,885	92,696	34,602
Dutch Harbor					Season Closed					
Statewide Total	2,913,580	2,634,844 - 3,184,856	675,184	608,643 - 737,038	1,001,826	879,779 - 1,185,622	321,990	282,560 - 383,826	3,915,406	997,174

[a] Weight in pounds (lb) of unshucked scallops.

Table 8.–Mean shell height from observer-sampled retained and intact discarded scallop catch during the 2003/04 weathervane scallop fishing season.

	Retained Sample		Intact Discarded Sample	
Registration Area	Number Measured	Mean Shell Height (mm)	Number Measured	Mean Shell Height (mm)
Yakutat				
District 16	40	121	23	108
Area D	6,961	126	6,942	101
Yakutat Area Total	**7,001**		**6,965**	
Prince William Sound	460	129	377	108
Kodiak				
Northeast District	3,026	145	2,869	107
Shelikof District	7,627	135	7,533	100
Semidi Island District	No Fishing			
Kodiak Area Total	**10,653**		**10,402**	
Alaska Peninsula	No Fishing			
Bering Sea	2,481	148	2,072	113
Dutch Harbor	Season Closed			
Statewide	20,595	135	19,816	103

Table 9.–Estimated number and weight of discarded intact and broken scallops during the 2004/05 weathervane scallop fishing season.

	Intact Number		Intact Weight[a]		Broken Number		Broken Weight[a]		Total	Total
Registration Area	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Number	Weight[a]
Yakutat										
District 16	12,588	6,095 - 24,295	3,312	1,761 - 6,293	60,090	37,678 - 83,566	17,229	12,354 - 21,929	72,678	20,541
Area D	447,261	393,071 - 537,272	103,888	93,396 - 122,094	384,637	339,008 - 456,108	113,381	101,454 - 133,266	831,898	217,269
Yakutat Area Total	459,849	339,166 - 561,567	107,200	95,157 - 128,387	444,727	376,686 - 539,674	130,610	113,808 - 155,195	904,576	237,810
Prince William Sound	131,457	96,630 - 169,658	38,950	29,806 - 49,804	122,030	100,939 - 144,087	43,844	36,429 - 52,316	253,487	82,794
Kodiak										
Northeast District	669,053	540,333 - 820,908	180,451	148,230 - 219,632	240,526	201,301 - 291,422	81,061	67,736 - 96,347	909,579	261,512
Shelikof District	1,291,397	1,172,815 - 1,404,275	342,549	309,695 - 374,222	272,297	245,589 - 295,011	92,258	83,706 - 101,320	1,563,694	434,807
Kodiak Area Total	1,960,450	1,713,148 - 2,225,183	523,000	457,925 - 593,854	512,823	446,890 - 586,433	173,319	151,442 - 197,667	2,473,273	696,319
Bering Sea	5,364	3,914 - 6,695	1,792	1,273 - 2,259	9,712	7,710 - 12,010	3,830	3,019 - 4,697	15,076	5,622
Dutch Harbor					Season Closed					
Statewide Total	2,557,120	2,212,858 - 2,963,103	670,942	584,161 - 774,304	1,089,292	932,225 - 1,282,204	351,603	304,698 - 409,875	3,646,412	1,022,545

[a] Weight in pounds (lb) of unshucked scallops.

Table 10.–Mean shell height from observer-sampled retained and intact discarded scallop catch during the 2004/05 weathervane scallop fishing season.

	Retained Sample		Intact Discarded Sample	
Registration Area	Number Measured	Mean Shell Height (mm)	Number Measured	Mean Shell Height (mm)
Yakutat				
District 16	603	120	475	112
Area D	5,646	124	5,539	104
Yakutat Area Total	**6,249**		**6,014**	
Prince William Sound	1,680	134	1,519	111
Kodiak				
Northeast District	3,180	144	3,007	110
Shelikof District	8,370	137	8,147	107
Semidi Island District	No Fishing			
Kodiak Area Total	**11,550**		**11,154**	
Alaska Peninsula	No Fishing			
Bering Sea	633	146	432	110
Dutch Harbor	Season Closed			
Statewide	20,112	134	19,119	107

Table 11.–Estimated number and weight of discarded intact and broken scallops during the 2005/06 weathervane scallop fishing season.

Registration Area	Intact Number		Intact Weight[a]		Broken Number		Broken Weight[a]		Total Number	Total Weight[a]
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI		
Yakutat										
District 16	34,528	19,593 - 76,241	9,054	5,205 - 20,254	59,360	36,087 - 99,528	15,331	8,962 - 25,644	93,888	24,385
Area D	761,094	636,368 - 924,288	167,801	141,203 - 202,940	872,867	800,136 - 978,708	239,640	216,914 - 265,326	1,633,961	407,441
Yakutat Area Total	795,622	655,961 - 1,000,529	176,855	146,408 - 223,194	932,227	836,223 - 1,078,236	254,971	225,876 - 290,970	1,727,849	431,826
Prince William Sound	6,970	5,327 - 9,266	1,822	1,366 - 2,558	164,932	139,750 - 188,608	62,270	52,772 - 70,304	171,902	64,092
Kodiak										
Northeast District	453,976	374,909 - 538,555	128,429	105,678 - 151,911	262,172	215,099 - 300,377	88,926	73,766 - 100,312	716,148	217,355
Shelikof District	485,323	426,821 - 562,780	117,691	104,473 - 137,070	136,691	122,133 - 155,846	47,209	42,105 - 54,257	622,014	164,900
Kodiak Area Total	939,299	801,730 - 1,101,335	246,120	210,151 - 288,981	398,863	337,232 - 456,223	136,135	115,871 - 154,569	1,338,162	382,255
Bering Sea	17,964	14,466 - 22,643	7,201	5,841 - 9,050	19,146	15,951 - 23,148	10,181	8,199 - 12,422	37,110	17,382
Dutch Harbor	Season Closed									
Statewide Total	1,759,855	1,477,484 - 2,133,773	431,998	363,766 - 523,783	1,515,168	1,329,156 - 1,746,215	463,557	402,718 - 528,265	3,275,023	895,555

[a] Weight in pounds (lb) of unshucked scallops.

Table 12.–Mean shell height from observer-sampled retained and intact discarded scallop catch during the 2005/06 weathervane scallop fishing season.

	Retained Sample		Intact Discarded Sample	
Registration Area	Number Measured	Mean Shell Height (mm)	Number Measured	Mean Shell Height (mm)
Yakutat				
District 16	840	119	674	104
Area D	11,148	123	9,190	100
Yakutat Area Total	**11,988**		**9,864**	
Prince William Sound	3,499	131	542	92
Kodiak				
Northeast District	3,668	139	3,405	109
Shelikof District	5,183	136	4,922	100
Semidi Island District	No Fishing			
Kodiak Area Total	**8,851**		**8,327**	
Alaska Peninsula	No Fishing			
Bering Sea	1,491	154	1,058	117
Dutch Harbor	Season Closed			
Statewide	25,829	131	19,791	102

Table 13.–Twenty most frequently caught species by percent weight of total catch as recorded by scallop observers during the 2003/04-2005/06 Yakutat, District 16 weathervane scallop fishing seasons.

2003/04			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	91.57%
2	sunflower sea star	*Pycnopodia helianthoides*	1.83%
3	sand sea star	*Luidia foliolata*	1.55%
4	English sole	*Parophrys vetulus*	1.11%
5	weathervane scallop shell	*P. caurinus*	1.05%
6	debris - natural	NA	0.78%
7	big skate	*Raja binoculata*	0.72%
8	wolf-eel	*Anarrhichthys ocellatus*	0.44%
9	big skate egg case	*R. binoculata*	0.11%
10	Pacific sanddab	*Citharichthys sordidus*	0.06%
11	rex sole	*Glyptocephalus zachirus*	0.06%
12	Atka mackerel	*Pleurogrammus monopterygius*	0.06%
13	snake prickleback	*Lumpenus sagitta*	0.06%
14	Tanner crab	*Chionoecetes bairdi*	0.06%
15	Alaska hermit crab	*Pagurus ochotensis*	0.06%
16	sea anemone, unidentified	Order Actinaria	0.06%
17	sea mouse, unidentified	Family Aphroditidae	0.06%
18	longnose skate egg case	*Raja rhina*	0.06%
19	scarlet sea star	*Pseudarchaster parelii*	0.06%
20	arrowtooth flounder	*Atheresthes stomias*	0.06%

2004/05			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	76.93%
2	sunflower sea star	*Pycnopodia helianthoides*	5.69%
3	big skate	*Raja binoculata*	4.71%
4	sand sea star	*Luidia foliolata*	4.51%
5	weathervane scallop shell	*P. caurinus*	4.19%
6	butter sole	*Isopsetta isolepis*	0.66%
7	Pacific halibut	*Hippoglossus stenolepis*	0.66%
8	longnose skate	*Raja rhina*	0.53%
9	debris - natural	NA	0.35%
10	Pacific cod	*Gadus macrocephalus*	0.29%
11	arrowtooth flounder	*Atheresthes stomias*	0.24%
12	lingcod	*Ophiodon elongatus*	0.23%
13	English sole	*Parophrys vetulus*	0.18%
14	big skate egg case	*R. binoculata*	0.16%
15	starry flounder	*Platichthys stellatus*	0.13%
16	Pacific sanddab	*Citharichthys sordidus*	0.09%
17	sea anemone, unidentified	Order Actinaria	0.08%
18	hermit crab, unidentified	Family Paguridae	0.06%
19	debris - plastics	NA	0.06%
20	vermilion sea star	*Mediaster aequalis*	0.05%

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Table 13.–Page 2 of 2.

		2005/06	
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	82.79%
2	weathervane scallop shell	*P. caurinus*	4.09%
3	sunflower sea star	*Pycnopodia helianthoides*	3.94%
4	big skate	*Raja binoculata*	2.13%
5	big skate egg case	*R. binoculata*	1.98%
6	sand sea star	*Luidia foliolata*	1.38%
7	debris - natural	NA	1.27%
8	arrowtooth flounder	*Atheresthes stomias*	0.36%
9	longnose skate	*Raja rhina*	0.31%
10	English sole	*Parophrys vetulus*	0.28%
11	spiny dogfish	*Squalus acanthias*	0.28%
12	flathead sole	*Hippoglossoides elassodon*	0.27%
13	Pacific halibut	*Hippoglossus stenolepis*	0.14%
14	rock sole, unidentified	*Lepidopsetta* sp.	0.13%
15	notched brittle star	*Ophiura sarsi*	0.09%
16	Pacific cod	*Gadus macrocephalus*	0.06%
17	sea pen/sea whip, unidentified	*Halipteris* sp.	0.06%
18	sea anemone, unidentified	Order Actinaria	0.05%
19	vermilion sea star	*Mediaster aequalis*	0.04%
20	Dover sole	*Microstomus pacificus*	0.04%

Table 14.–Twenty most frequently caught species by percent weight of total catch as recorded by scallop observers during the 2003/04-2005/06 Yakutat, Area D weathervane scallop fishing seasons.

2003/04			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	83.12%
2	sunflower sea star	*Pycnopodia helianthoides*	4.38%
3	weathervane scallop shell	*P. caurinus*	3.62%
4	debris - natural	NA	2.14%
5	big skate	*Raja binoculata*	1.59%
6	sand sea star	*Luidia foliolata*	0.63%
7	big skate egg case	*R. binoculata*	0.59%
8	majestic sea star	*Pedicellaster magister*	0.57%
9	sea anemone, unidentified	Order Actinaria	0.33%
10	longnose skate	*Raja rhina*	0.30%
11	English sole	*Parophrys vetulus*	0.29%
12	notched brittle star	*Ophiura sarsi*	0.26%
13	spiny dogfish	*Squalus acanthias*	0.25%
14	Bathyraja skate, unidentified	*Bathyraja* sp.	0.21%
15	butter sole	*Isopsetta isolepis*	0.15%
16	arrowtooth flounder	*Atheresthes stomias*	0.12%
17	octopus, unidentified	Family Octopodidae	0.11%
18	rex sole	*Glyptocephalus zachirus*	0.11%
19	sea whip, unidentified	Family Virgularidae	0.11%
20	Pacific halibut	*Hippoglossus stenolepis*	0.09%

2004/05			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	75.03%
2	weathervane scallop shell	*P. caurinus*	5.14%
3	debris - natural	NA	4.94%
4	sunflower sea star	*Pycnopodia helianthoides*	4.48%
5	sand sea star	*Luidia foliolata*	2.30%
6	big skate	*Raja binoculata*	2.30%
7	big skate egg case	*R. binoculata*	2.10%
8	lingcod	*Ophiodon elongatus*	0.40%
9	longnose skate	*Raja rhina*	0.36%
10	Evasterias sea star, unidentified	*Evasterias* sp.	0.34%
11	notched brittle star	*Ophiura sarsi*	0.33%
12	sea anemone, unidentified	Order Actinaria	0.23%
13	spiny dogfish	*Squalus acanthias*	0.23%
14	Bathyraja skate, unidentified	*Bathyraja* sp.	0.23%
15	butter sole	*Isopsetta isolepis*	0.15%
16	Pacific halibut	*Hippoglossus stenolepis*	0.12%
17	English sole	*Parophrys vetulus*	0.12%
18	starry flounder	*Platichthys stellatus*	0.10%
19	arrowtooth flounder	*Atheresthes stomias*	0.09%
20	Pacific cod	*Gadus macrocephalus*	0.07%

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Table 14.–Page 2 of 2.

		2005/06	
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	83.07%
2	weathervane scallop shell	*P. caurinus*	4.10%
3	sunflower sea star	*Pycnopodia helianthoides*	3.40%
4	big skate	*Raja binoculata*	2.06%
5	debris - natural	NA	1.82%
6	sand sea star	*Luidia foliolata*	1.18%
7	notched brittle star	*Ophiura sarsi*	0.55%
8	spiny dogfish	*Squalus acanthias*	0.39%
9	lingcod	*Ophiodon elongatus*	0.38%
10	longnose skate	*Raja rhina*	0.37%
11	English sole	*Parophrys vetulus*	0.30%
12	arrowtooth flounder	*Atheresthes stomias*	0.30%
13	sea pen/sea whip, unidentified	*Halipteris* sp.	0.28%
14	sea anemone, unidentified	Order Actinaria	0.19%
15	Bering skate	*Bathyraja interrupta*	0.17%
16	sea mouse	*Aphrodita negligens*	0.12%
17	big skate egg case	*R. binoculata*	0.11%
18	Tanner crab	*Chionoecetes bairdi*	0.08%
19	longnose skate egg case	*R. rhina*	0.07%
20	Pacific halibut	*Hippoglossus stenolepis*	0.07%

Table 15.–Twenty most frequently caught species by percent weight of total catch as recorded by scallop observers during the 2003/04-2005/06 Prince William Sound Registration Area weathervane scallop fishing seasons.

2003/04			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	91.63%
2	sunflower sea star	*Pycnopodia helianthoides*	3.99%
3	weathervane scallop shell	*P. caurinus*	1.89%
4	big skate	*Raja binoculata*	0.75%
5	debris - natural	NA	0.48%
6	majestic sea star	*Pedicellaster magister*	0.42%
7	sea mouse, unidentified	Family Aphroditidae	0.15%
8	Bathyraja skate, unidentified	*Bathyraja* sp.	0.09%
9	English sole	*Parophrys vetulus*	0.09%
10	notched brittle star	*Ophiura sarsi*	0.07%
11	Pacific halibut	*Hippoglossus stenolepis*	0.04%
12	starfish, unidentified	Class Stelleroidea	0.04%
13	hermit crab, unidentified	Family Paguridae	0.04%
14	big skate egg case	*R. binoculata*	0.04%
15	snail shells, unidentified	Class Gastropoda	0.03%
16	spiny dogfish	*Squalus acanthias*	0.03%
17	arrowtooth flounder	*Atheresthes stomias*	0.03%
18	sea anemone, unidentified	Order Actinaria	0.03%
19	skate egg case, unidentified	Family Rajidae	0.02%
20	snail eggs, unidentified	Class Gastropoda	0.02%

2004/05			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	90.60%
2	sunflower sea star	*Pycnopodia helianthoides*	2.72%
3	weathervane scallop shell	*P. caurinus*	2.49%
4	ubiquitous brittle star	*Ophiopholis aculeata*	1.23%
5	big skate	*Raja binoculata*	0.67%
6	debris - natural	NA	0.25%
7	Evasterias sea star, unidentified	*Evasterias* sp.	0.24%
8	English sole	*Parophrys vetulus*	0.18%
9	sand sea star	*Luidia foliolata*	0.17%
10	spiny dogfish	*Squalus acanthias*	0.11%
11	Dover sole	*Microstomus pacificus*	0.10%
12	arrowtooth flounder	*Atheresthes stomias*	0.10%
13	Pacific halibut	*Hippoglossus stenolepis*	0.10%
14	barnacle, unidentified	Order Thoracica	0.10%
15	rex sole	*Glyptocephalus zachirus*	0.09%
16	notched brittle star	*Ophiura sarsi*	0.07%
17	Bathyraja skate, unidentified	*Bathyraja* sp.	0.07%
18	sea anemone, unidentified	Order Actinaria	0.06%
19	sea mouse	*Aphrodita negligens*	0.06%
20	big skate egg case	*R. binoculata*	0.05%

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Table 15.–Page 2 of 2.

		2005/06	
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	93.63%
2	sunflower sea star	*Pycnopodia helianthoides*	1.93%
3	weathervane scallop shell	*P. caurinus*	1.81%
4	debris - natural	NA	0.94%
5	basket star	*Gorgonocephalus eucnemis*	0.31%
6	notched brittle star	*Ophiura sarsi*	0.21%
7	Dover sole	*Microstomus pacificus*	0.20%
8	sand sea star	*Luidia foliolata*	0.10%
9	sea anemone, unidentified	Order Actinaria	0.06%
10	Bathyraja skate, unidentified	*Bathyraja* sp.	0.06%
11	Arctic moonsnail	*Natica clausa*	0.05%
12	big skate egg case	*R. binoculata*	0.05%
13	sea mouse	*Aphrodita negligens*	0.04%
14	Tanner crab	*Chionoecetes bairdi*	0.03%
15	arrowtooth flounder	*Atheresthes stomias*	0.03%
16	hermit crab, unidentified	Family Paguridae	0.03%
17	big skate	*Raja binoculata*	0.03%
18	Oregon triton	*Fusitriton oregonensis*	0.03%
19	common mud star	*Ctenodiscus crispatus*	0.03%
20	debris - fishing gear	NA	0.03%

Table 16.–Twenty most frequently caught species by percent weight of total catch as recorded by scallop observers during the 2003/04-2005/06 Kodiak Registration Area, Northeast District weathervane scallop fishing seasons.

2003/04			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	61.30%
2	sunflower sea star	*Pycnopodia helianthoides*	20.09%
3	debris - natural	NA	4.82%
4	weathervane scallop shell	*P. caurinus*	3.43%
5	starfish, unidentified	Class Stelleroidea	1.80%
6	sea anemone, unidentified	*Order Actinaria*	1.61%
7	longnose skate	*Raja rhina*	1.51%
8	rock sole, unidentified	*Lepidopsetta* sp.	0.71%
9	Bathyraja skate, unidentified	*Bathyraja* sp.	0.51%
10	arrowtooth flounder	*Atheresthes stomias*	0.38%
11	Dover sole	*Microstomus pacificus*	0.33%
12	Tanner crab	*Chionoecetes bairdi*	0.27%
13	octopus, unidentified	Family Octopodidae	0.25%
14	notched brittle star	*Ophiura sarsi*	0.20%
15	basket star	*Gorgonocephalus eucnemis*	0.18%
16	striped sun sea star	*Solaster stimpsoni*	0.16%
17	Pacific halibut	*Hippoglossus stenolepis*	0.16%
18	Pacific cod	*Gadus macrocephalus*	0.15%
19	big skate	*Raja binoculata*	0.14%
20	sand sea star	*Luidia foliolata*	0.14%

2004/05			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	68.89%
2	sunflower sea star	*Pycnopodia helianthoides*	16.49%
3	debris - natural	NA	5.04%
4	weathervane scallop shell	*P. caurinus*	1.99%
5	sea anemone, unidentified	*Order Actinaria*	1.73%
6	notched brittle star	*Ophiura sarsi*	1.52%
7	arrowtooth flounder	*Atheresthes stomias*	0.53%
8	rock sole, unidentified	*Lepidopsetta* sp.	0.50%
9	Bathyraja skate, unidentified	*Bathyraja* sp.	0.43%
10	longnose skate	*Raja rhina*	0.42%
11	Tanner crab	*Chionoecetes bairdi*	0.41%
12	rex sole	*Glyptocephalus zachirus*	0.26%
13	Pacific halibut	*Hippoglossus stenolepis*	0.18%
14	sand sea star	*Luidia foliolata*	0.15%
15	Dover sole	*Microstomus pacificus*	0.14%
16	Oregon triton	*Fusitriton oregonensis*	0.13%
17	flathead sole	*Hippoglossoides elassodon*	0.11%
18	Pacific cod	*Gadus macrocephalus*	0.11%
19	butter sole	*Isopsetta isolepis*	0.10%
20	sun sea star, unidentified	*Solaster* sp.	0.09%

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Table 16.–Page 2 of 2.

		2005/06	
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	65.29%
2	sunflower sea star	*Pycnopodia helianthoides*	14.76%
3	debris - natural	NA	7.42%
4	weathervane scallop shell	*P. caurinus*	3.25%
5	sea anemone, unidentified	Order Actinaria	1.14%
6	longnose skate	*Raja rhina*	0.98%
7	spiny red sea star	*Hippasteria spinosa*	0.91%
8	rock sole, unidentified	*Lepidopsetta* sp.	0.77%
9	Bering skate	*Bathyraja interrupta*	0.71%
10	basket star	*Gorgonocephalus eucnemis*	0.37%
11	big skate	*Raja binoculata*	0.34%
12	evening sun sea star	*Solaster paxillatus*	0.30%
13	flathead sole	*Hippoglossoides elassodon*	0.29%
14	arrowtooth flounder	*Atheresthes stomias*	0.28%
15	Tanner crab	*Chionoecetes bairdi*	0.25%
16	Dover sole	*Microstomus pacificus*	0.22%
17	Pacific halibut	*Hippoglossus stenolepis*	0.21%
18	northern sun sea star	*Solaster endeca*	0.15%
19	Oregon triton	*Fusitriton oregonensis*	0.15%
20	rex sole	*Glyptocephalus zachirus*	0.12%

Table 17.–Twenty most frequently caught species by percent weight of total catch as recorded by scallop observers during the 2003/04-2005/06 Kodiak Registration Area, Shelikof District weathervane scallop fishing seasons.

2003/04			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	79.56%
2	debris - natural	NA	4.74%
3	weathervane scallop shell	*P. caurinus*	4.47%
4	Bathyraja skate, unidentified	*Bathyraja* sp.	2.33%
5	big skate	*Raja binoculata*	1.54%
6	sunflower sea star	*Pycnopodia helianthoides*	1.36%
7	sea anemone, unidentified	Order Actinaria	0.60%
8	longnose skate	*Raja rhina*	0.53%
9	Oregon triton	*Fusitriton oregonensis*	0.51%
10	Pacific halibut	*Hippoglossus stenolepis*	0.48%
11	Alaska plaice	*Pleuronectes quadrituberculatus*	0.47%
12	flathead sole	*Hippoglossoides elassodon*	0.39%
13	arrowtooth flounder	*Atheresthes stomias*	0.35%
14	octopus, unidentified	Family Octopodidae	0.29%
15	hermit crab, unidentified	Family Paguridae	0.16%
16	starry flounder	*Platichthys stellatus*	0.15%
17	Pacific lyre crab	*Hyas lyratus*	0.12%
18	sea mouse, unidentified	Family Aphroditidae	0.10%
19	Tanner crab	*Chionoecetes bairdi*	0.09%
20	Pacific cod	*Gadus macrocephalus*	0.08%

2004/05			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	73.74%
2	debris - natural	NA	8.27%
3	weathervane scallop shell	*P. caurinus*	4.02%
4	sunflower sea star	*Pycnopodia helianthoides*	2.84%
5	Bathyraja skate, unidentified	*Bathyraja* sp.	2.78%
6	big skate	*Raja binoculata*	1.24%
7	sea anemone, unidentified	Order Actinaria	0.83%
8	longnose skate	*Raja rhina*	0.78%
9	arrowtooth flounder	*Atheresthes stomias*	0.65%
10	flathead sole	*Hippoglossoides elassodon*	0.54%
11	longnose skate egg case	*R. rhina*	0.50%
12	Alaska plaice	*Pleuronectes quadrituberculatus*	0.49%
13	Oregon triton	*Fusitriton oregonensis*	0.45%
14	Pacific halibut	*Hippoglossus stenolepis*	0.31%
15	starry flounder	*Platichthys stellatus*	0.24%
16	Tanner crab	*Chionoecetes bairdi*	0.16%
17	debris - fishing gear	NA	0.14%
18	Pacific cod	*Gadus macrocephalus*	0.13%
19	spiny dogfish	*Squalus acanthias*	0.13%
20	hermit crab, unidentified	Family Paguridae	0.10%

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Table 17.–Page 2 of 2.

		2005/06	
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	81.01%
2	weathervane scallop shell	*P. caurinus*	3.76%
3	debris - natural	NA	3.02%
4	sunflower sea star	*Pycnopodia helianthoides*	1.84%
5	arrowtooth flounder	*Atheresthes stomias*	1.24%
6	longnose skate	*Raja rhina*	1.21%
7	Alaska plaice	*Pleuronectes quadrituberculatus*	0.90%
8	flathead sole	*Hippoglossoides elassodon*	0.87%
9	Bering skate	*Bathyraja interrupta*	0.83%
10	Oregon triton	*Fusitriton oregonensis*	0.75%
11	big skate	*Raja binoculata*	0.72%
12	sea anemone, unidentified	Order Actinaria	0.58%
13	Bathyraja skate, unidentified	*Bathyraja* sp.	0.48%
14	debris - fishing gear	NA	0.35%
15	Pacific halibut	*Hippoglossus stenolepis*	0.31%
16	Pacific cod	*Gadus macrocephalus*	0.20%
17	rock sole, unidentified	*Lepidopsetta sp.*	0.15%
18	sea mouse	*Aphrodita negligens*	0.13%
19	Tanner crab	*Chionoecetes bairdi*	0.10%
20	green sea urchin	*Strongylocentrotus droebachiensis*	0.09%

Table 18.–Twenty most frequently caught species by percent weight of total catch as recorded by scallop observers during the 2003/04-2005/06 Bering Sea Registration Area weathervane scallop fishing seasons.

2003/04			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	71.67%
2	Bathyraja skate, unidentified	*Bathyraja* sp.	5.10%
3	Tanner crab	*Chionoecetes bairdi*	2.92%
4	weathervane scallop shell	*P. caurinus*	2.60%
5	debris - natural	NA	1.96%
6	snail shells, unidentified	Class Gastropoda	1.88%
7	snow crabs and hybrids	*Chionoecetes opilio*	1.78%
8	hermit crab, unidentified	Family Paguridae	1.47%
9	Oregon triton	*Fusitriton oregonensis*	1.39%
10	yellowfin sole	*Limanda aspera*	1.14%
11	arrowtooth flounder	*Atheresthes stomias*	1.07%
12	sea anemone, unidentified	Order Actinaria	0.77%
13	snail, unidentified	Class Gastropoda	0.68%
14	basket star	*Gorgonocephalus eucnemis*	0.65%
15	flathead sole	*Hippoglossoides elassodon*	0.54%
16	sponge, unidentified	Phylum Porifera	0.49%
17	jellyfish, unidentified	Class Scyphozoa	0.44%
18	big skate	*Raja binoculata*	0.37%
19	Neptune whelk, unidentified	*Neptunea* sp.	0.30%
20	Aleutian hermit crab	*Pagurus aleuticus*	0.28%

2004/05			
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	67.35%
2	Bathyraja skate, unidentified	*Bathyraja* sp.	8.18%
3	Tanner crab	*Chionoecetes bairdi*	4.74%
4	snail shells, unidentified	Class Gastropoda	2.12%
5	weathervane scallop shell	*P. caurinus*	1.90%
6	hermit crab, unidentified	Family Paguridae	1.82%
7	Oregon triton	*Fusitriton oregonensis*	1.74%
8	snow crabs and hybrids	*Chionoecetes opilio*	1.65%
9	arrowtooth flounder	*Atheresthes stomias*	1.38%
10	sea anemone, unidentified	Order Actinaria	1.07%
11	sea pen/sea whip, unidentified	*Halipteris* sp.	0.99%
12	yellowfin sole	*Limanda aspera*	0.96%
13	basket star	*Gorgonocephalus eucnemis*	0.94%
14	lyre whelk	*Neptunea lyrata*	0.85%
15	jellyfish, unidentified	Class Scyphozoa	0.58%
16	flathead sole	*Hippoglossoides elassodon*	0.52%
17	sculpin, unidentified	Family Cottidae	0.44%
18	rex sole	*Glyptocephalus zachirus*	0.41%
19	barrel sponge	*Halichondria panicea*	0.25%
20	Pacific lyre crab	*Hyas lyratus*	0.25%

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Table 18.–Page 2 of 2.

		2005/06	
Rank	Species	Scientific Name	Total Catch
1	weathervane scallop	*Patinopecten caurinus*	72.18%
2	Tanner crab	*Chionoecetes bairdi*	3.52%
3	debris - fishing gear	NA	3.00%
4	weathervane scallop shell	*P. caurinus*	2.40%
5	debris - natural	NA	2.29%
6	sponge, unidentified	Phylum Porifera	2.10%
7	Bathyraja skate, unidentified	*Bathyraja* sp.	1.66%
8	hermit crab, unidentified	Family Paguridae	1.24%
9	sea anemone, unidentified	Order Actinaria	1.22%
10	sea pen/sea whip, unidentified	*Halipteris* sp.	1.19%
11	snail, unidentified	Class Gastropoda	1.18%
12	arrowtooth flounder	*Atheresthes stomias*	1.15%
13	snow crabs and hybrids	*Chionoecetes opilio*	0.93%
14	flathead sole	*Hippoglossoides elassodon*	0.84%
15	big skate	*Raja binoculata*	0.76%
16	Oregon triton	*Fusitriton oregonensis*	0.67%
17	octopus, unidentified	Family Octopodidae	0.60%
18	snail shells, unidentified	Class Gastropoda	0.49%
19	Aleutian skate	*Bathyraja aleutica*	0.47%
20	Alaska skate	*Bathyraja parmifera*	0.31%

Table 19.–Summary of the most frequently caught species, by percent weight, in sampled dredges during the 2003/04 weathervane scallop fishing season.

	Registration Area / District								
	Yakutat Area			Kodiak Area			Alaska	Bering	Dutch
Species Catergory	District 16	Area D	PWS	Northeast	Shelikof	Semidi	Peninsula	Sea	Harbor
weathervane scallops	91.57	83.12	91.63	61.30	79.56			71.67	
PROHIBITED SPECIES BYCATCH									
Dungeness crab	0	<0.1	<0.1	0	<0.1	No	No	0	Season
king crab	0	0	0	0	0	Fishing	Fishing	0	Closed
Snow crab[a], *C. opilio*	0	0	0	0	0			1.78	
Tanner crab, *C. bairdi*	<0.1	<0.1	<0.1	0.27	<0.1			2.92	
Pacific halibut	0	<0.1	<0.1	0.16	0.48			<0.1	
OTHER COMMERCIAL SPECIES									
Alaska plaice	0	0	0	0	0.47			<0.1	
arrowtooth flounder	<0.1	0.12	<0.1	0.38	0.35			1.07	
bay scallops	0	<0.1	0	<0.1	<0.1			<0.1	
butter sole	0	0.15	0	<0.1	<0.1			0	
Dover sole	<0.1	<0.1	0	0.33	<0.1			0	
English sole	1.11	0.29	<0.1	<0.1	<0.1			0	
flathead sole	<0.1	<0.1	0	0.12	0.39			0.54	
Greenland turbot	0	0	0	0	0			0	
lingcod	0	<0.1	0	0	0			0	
octopus	0	0.11	0	0.25	0.29			0.24	
petrale sole	0	0	0	0	0			0	
Pacific cod	0	<0.1	0	0.15	<0.1			0.17	
rex sole	<0.1	0.11	0	0.12	0			0.25	
rock sole	0	<0.1	0	0.71	<0.1			0.12	
rock fish	0	<0.1	0	0	0			0	
sablefish	0	<0.1	0	0	0			0	
sea cucumber	0	0	0	<0.1	<0.1			0	
sea urchins	0	0	0	<0.1	<0.1			<0.1	
shrimp	0	<0.1	<0.1	<0.1	<0.1			0	
skates	0.72	2.1	0.84	2.28	4.41			5.47	
spiny dogfish	0	0.25	<0.1	0	<0.1			0	
starry flounder	0	<0.1	0	0	0.15			0	
walleye pollock	0	<0.1	0	0	<0.1			0.16	
yellowfin sole	0	0	0	0	<0.1			1.14	
MISCELLANEOUS									
brittle star	<0.1	<0.1	<0.1	0.27	<0.1			0	
sunflower sea star	1.83	4.38	3.99	20.09	1.36			0	
kelp, rocks, etc.	0.78	2.14	0.48	4.82	4.74			1.96	
man-made debris	<0.1	<0.1	<0.1	<0.1	<0.1			0.26	
starfish, misc	1.67	1.21	0.47	2.59	1.08			0.81	
weathervane shells	1.05	3.62	1.89	3.43	4.47			2.60	

[a] Includes all hybrid *Chionoecetes* crab.

Table 20.–Summary of the most frequently caught species, by percent weight, in sampled dredges during the 2004/05 weathervane scallop fishing season.

	Registration Area / District								
	Yakutat Area			Kodiak Area			Alaska	Bering	Dutch
Species Catergory	District 16	Area D	PWS	Northeast	Shelikof	Semidi	Peninsula	Sea	Harbor
weathervane scallops	76.93	75.03	90.60	68.89	73.74			67.35	
PROHIBITED SPECIES BYCATCH									
Dungeness crab	<0.1	<0.1	0	0	0	No	No	0	Season
king crab	0	0	0	0	0	Fishing	Fishing	0	Closed
Snow crab[a], *C. opilio*	0	0	0	0	0			1.65	
Tanner crab, *C. bairdi*	0	<0.1	<0.1	0.41	0.16			4.74	
Pacific halibut	0.66	0.12	0.1	0.18	0.31			0	
OTHER COMMERCIAL SPECIES									
Alaska plaice	0	0	0	0	0.49			<0.1	
arrowtooth flounder	0.24	<0.1	0.1	0.53	0.65			1.38	
bay scallops	0	0	<0.1	<0.1	<0.1			<0.1	
butter sole	0.66	0.15	0	0.1	<0.1			0	
Dover sole	0	<0.1	0.1	0.14	<0.1			0	
English sole	0.18	0.12	0.18	0	<0.1			0	
flathead sole	0	<0.1	<0.1	0.11	0.54			0.52	
Greenland turbot	0	0	0	0	0			0	
lingcod	0.23	0.4	0	0	0			0	
octopus	0	<0.1	0	0	<0.1			<0.1	
petrale sole	0	0	<0.1	0	0			0	
Pacific cod	0.29	<0.1	<0.1	0.11	0.13			0.17	
rex sole	<0.1	<0.1	<0.1	0.26	<0.1			0.41	
rock sole	0	<0.1	0	0.5	0			0.22	
rock fish	0	<0.1	0	<0.1	<0.1			0	
sablefish	0	0	0	0	<0.1			0	
sea cucumber	0	0	0	<0.1	0			0	
sea urchins	0	0	0	<0.1	<0.1			<0.1	
shrimp	0	<0.1	<0.1	<0.1	<0.1			0	
skates	1.17	2.94	0.74	0.85	4.80			8.18	
spiny dogfish	0	0.23	0.11	0	0.13			0	
starry flounder	0.13	0.1	<0.1	0	0.24			0	
walleye pollock	<0.1	<0.1	0	0	<0.1			0.14	
yellowfin sole	0	0	0	0	<0.1			0.96	
MISCELLANEOUS									
brittle star	<0.1	0.33	1.3	1.52	<0.1			0	
sunflower sea star	5.69	4.48	2.72	16.49	2.84			0	
kelp, rocks, etc.	0.35	4.94	0.25	5.04	8.27			<0.1	
man-made debris	<0.1	<0.1	<0.1	<0.1	0.18			0.93	
starfish, misc	4.51	2.99	0.41	0.38	0.23			1.02	
weathervane shells	4.19	5.14	2.49	1.99	4.02			1.90	

[a] Includes all hybrid *Chionoecetes* crab.

Table 21.–Summary of the most frequently caught species, by percent weight, in sampled dredges during the 2005/06 weathervane scallop fishing season.

	Registration Area / District								
	Yakutat Area			Kodiak Area					
Species Catergory	District 16	Area D	PWS	Northeast	Shelikof	Semidi	Alaska Peninsula	Bering Sea	Dutch Harbor
weathervane scallops	82.79	83.07	93.63	65.29	81.01			72.18	
PROHIBITED SPECIES BYCATCH									
Dungeness crab	0	<0.1	0	0	<0.1	No	No	0	Season
king crab	0	0	0	0	0	Fishing	Fishing	0	Closed
Snow crab[a], *C. opilio*	0	0	0	0	0			0.93	
Tanner crab, *C. bairdi*	0	<0.1	<0.1	0.25	0.1			3.52	
Pacific halibut	0.14	<0.1	<0.1	0.21	0.31			0.1	
OTHER COMMERCIAL SPECIES									
Alaska plaice	0	0	0	0	0.9			0.15	
arrowtooth flounder	0.36	0.3	<0.1	0.28	1.24			1.15	
bay scallops	<0.1	<0.1	<0.1	<0.1	<0.1			0	
butter sole	0	<0.1	0	<0.1	0			0	
Dover sole	<0.1	<0.1	0.2	0.22	<0.1			<0.1	
English sole	0.28	0.3	<0.1	<0.1	0			0	
flathead sole	0.27	<0.1	<0.1	0.29	0.87			0.84	
Greenland turbot	0	0	0	0	0			0	
lingcod	0	0.38	<0.1	0	0			0	
octopus	<0.1	<0.1	<0.1	<0.1	<0.1			0.6	
petrale sole	0	0	<0.1	0	0			0	
Pacific cod	<0.1	<0.1	0	<0.1	0.2			0	
rex sole	<0.1	<0.1	<0.1	0.12	0			<0.1	
rock sole	0.13	<0.1	0	0.77	0.15			0	
rock fish	<0.1	<0.1	0	<0.1	0			0	
sablefish	0	0	0	0	0			0	
sea cucumber	0	0	0	0	0			0	
sea urchins	0	0	0	<0.1	<0.1			<0.1	
shrimp	0	<0.1	<0.1	<0.1	<0.1			<0.1	
skates	2.44	2.60	<0.1	2.1	3.24			3.2	
spiny dogfish	0.28	0.39	<0.1	<0.1	<0.1			0	
starry flounder	0	<0.1	0	0	<0.1			0	
walleye pollock	0	<0.1	0	<0.1	<0.1			0.12	
yellowfin sole	0	0	0	0	0			<0.1	
MISCELLANEOUS									
brittle star	<0.1	0.55	0.22	0.15	<0.1			0	
sunflower sea star	3.94	3.4	1.93	14.76	1.84			0	
kelp, rocks, etc.	1.27	1.82	0.94	17.42	3.02			2.29	
man-made debris	<0.1	<0.1	<0.1	<0.1	0.38			3.08	
starfish, misc	1.42	1.23	0.46	2.01	0.10			0.18	
weathervane shells	4.09	4.1	1.81	3.25	3.76			2.40	

[a] Includes all hybrid *Chionoecetes* crab.

Table 22.–Estimated bycatch and associated confidence intervals for snow, *C. bairdi* x *C. opilio* (hybrid), Tanner, Dungeness, red king crabs and Pacific halibut from the 2003/04 weathervane scallop fishing season.

		Snow and hybrid crab		Tanner crab		Dungeness crab		King crab	Halibut	
		Estimated		Estimated		Estimated			Estimated	
Registration Area	n[a]	Number	95% CI	Number	95% CI	Number	95% CI	Number[b]	Number	95% CI
Yakutat										
District 16	3	NA	NA	0	NA	21	2 - 45	0	10	1 - 23
Area D	105	NA	NA	1,650	797 - 2,837	905	617 - 1,157	0	316	161 - 477
Yakutat Area Total	105	NA	NA	1,650	797 - 2,837	926	619 - 1,202	0	326	162 - 500
Prince William Sound	15	NA	NA	8	1 - 29	8	1 - 29	0	2	1 - 39
Kodiak										
Northeast District	42	NA	NA	18,230	13,134 - 23,463	0	NA	0	197	83 - 318
Shelikof District	95	NA	NA	40,575	30,361 - 54,303	904	634 - 1,256	0	574	401 - 798
Semidi Island District	0			No Fishing						
Kodiak Area Total	137			58,805	43,495 - 77,766	904	634 - 1,256	0	771	484 - 1,116
Alaska Peninsula	0			No Fishing						
Bering Sea	28	16,206	14,630 - 17,832	31,316	27,619 - 35,228	0	NA	0	61	15 - 127
Dutch Harbor	0			Season Closed						

[a] Number of days fishing occurred. Fishing may occur in several areas or districts within a registration area on the same day.

[b] Actual number caught, not an estimate.

NA = Not Applicable

Table 23.–Estimated bycatch and associated confidence intervals for snow, *C. bairdi* x *C. opilio* (hybrid), Tanner, Dungeness, red king crabs and Pacific halibut from the 2004/05 weathervane scallop fishing season.

		Snow and hybrid crab		Tanner crab		Dungeness crab		King crab	Halibut	
		Estimated		Estimated		Estimated			Estimated	
Registration Area	n[a]	Number	95% CI	Number	95% CI	Number	95% CI	Number[b]	Number	95% CI
Yakutat										
District 16	18	NA	NA	0	NA	170	90 - 265	0	110	48 - 155
Area D	88	NA	NA	863	341 - 1,950	223	122 - 379	0	247	133 - 355
Yakutat Area Total	88	NA	NA	863	341 - 1,950	393	212 - 644	0	357	181 - 510
Prince William Sound	28	NA	NA	524	98 - 1,293	0	NA	0	90	21 - 164
Kodiak										
Northeast District	42	NA	NA	30,717	19,891 - 41,072	0	NA	1	109	45 - 193
Shelikof District	100	NA	NA	33,338	25,978 - 42,471	1,647	1,188 - 2,274	1	579	377 - 837
Semidi Island District	0			No Fishing						
Kodiak Area Total	142			64,055	45,869 - 83,543	1,647	1,188 - 2,274	2	688	422 - 1,030
Alaska Peninsula	0	NA	NA	No Fishing						
Bering Sea	7	3,843	2,947 - 4,713	15,303	11,165 - 18,888	0	NA	0	0	NA
Dutch Harbor	0			Season Closed						

[a] Number of days fishing occurred. Fishing may occur in several areas or districts within a registration area on the same day.

[b] Actual number caught, not an estimate.

NA = Not Applicable

Table 24.–Estimated bycatch and associated confidence intervals for snow, *C. bairdi* x *C. opilio* (hybrid), Tanner, Dungeness, red king crabs and Pacific halibut from the 2005/06 weathervane scallop fishing season.

		Snow and hybrid crab		Tanner crab		Dungeness crab		King crab	Halibut	
		Estimated		Estimated		Estimated			Estimated	
Registration Area	n[a]	Number	95% CI	Number	95% CI	Number	95% CI	Number[b]	Number	95% CI
Yakutat										
District 16	16	NA	NA	175	32 - 633	0	NA	0	0	NA
Area D	162	NA	NA	5,189	3,198 - 7,595	394	207 - 648	0	518	306 - 862
Yakutat Area Total	171	NA	NA	5,364	3,230 - 8,228	394	207 - 648	0	518	306 - 862
Prince William Sound	56	NA	NA	465	184 - 927	0	NA	0	32	12 - 72
Kodiak										
Northeast District	63	NA	NA	29,264	21,399 - 40,473	0	NA	0	211	75 - 339
Shelikof District	70	NA	NA	18,055	13,809 - 23,931	1,267	674 - 2,444	0	177	100 - 278
Semidi Island District	0			No Fishing						
Kodiak Area Total	132			47,319	35,208 - 64,404	1,267	674 - 2,444	0	388	175 - 617
Alaska Peninsula	0			No Fishing						
Bering Sea	21	5,211	4,426 - 6,052	15,529	11,580 - 20,814	0	NA	2	53	21 - 105
Dutch Harbor	0			Season Closed						

[a] Number of days fishing occurred. Fishing may occur in several areas or districts within a registration area on the same day.

[b] Actual number caught, not an estimate.

NA = Not Applicable

Table 25.–Tanner crab bycatch mortality, 2003/04-2005/06 weathervane scallop fishing seasons.

	NUMBER OF TANNER[a] CRABS MEASURED AND EXAMINED								
	2003/04			2004/05			2005/06		
Registration Area	Dead	Alive	Percent Dead	Dead	Alive	Percent Dead	Dead	Alive	Percent Dead
Yakutat									
District 16	0	0	0	0	0	0	5	10	33
Area D	53	98	35	60	40	60	223	312	42
Yakutat Area Total	53	98	35	60	40	60	228	322	41
Prince William Sound	0	1	0	32	21	60	22	51	30
Kodiak									
Northeast District	438	689	39	833	358	70	974	693	58
Shelikof District	1,249	1,049	54	1,908	930	67	850	653	57
Semidi Island District	No Fishing			No Fishing			No Fishing		
Kodiak Area Total	1,687	1,738	49	2,741	1,288	68	1,824	1,346	58
Alaska Peninsula	No Fishing			No Fishing			No Fishing		
Bering Sea, snow and hybrid	1,034	394	72	107	34	76	215	225	49
Bering Sea, Tanner	531	1,327	29	147	283	34	432	409	51
Bering Sea, combined species	1,565	1,721	48	254	317	44	647	634	51
Dutch Harbor	Season Closed			Season Closed			Season Closed		
Statewide Total	3,305	3,558	48	3,087	1,666	65	2,721	2,353	54

[a] Tanner crab, except snow crab and *C. bairdi* x *C. opilio* (hybrid) are reported in the Bering Sea Area.

Table 26.–Summary of weathervane scallop commercial fishery statistics from Yakutat, District 16 and Yakutat, Area D, 1993-2005/06 fishing seasons.

Registration Area	Season Dates		Number of				lb Retained Scallops (round weight)[d]	lb Retained Scallop Meats	% Retained Scallop Meat Recovery	Dredge Hours[e]	CPUE[f]	No. of Tanner Crab Per lb of Retained Scallop Meats
	Beginning	Ending	Vessels	Vessel Days[a]	Days Fishing Occurred[b]	Days Fishing Observed[c]						
Yakutat, District 16												
1993	Fishing by Permit only		1	[a]	[g]	[g]	[g]	[g]	NA	[g]	[g]	[g]
1994	1/20/94	1/20/94	8	[a]	7	7	150,962	13,301	NA	276	547	<0.1
1994	7/1/94	10/31/94	2[h]	[a]	4	3	[h]	[h]	NA	[h]	[h]	0
1995	1/10/95	2/13/95	7	[a]	42	35	447,469	33,302	NA	1,095	409	<0.1
1996	1/10/96	1/20/96	1	[a]	6	5	85,086	8,090	NA	167	509	<0.1
1996	8/1/96	11/29/96	2	[a]	23	21	336,978	25,970	9.0[i]	750	449	<0.1
1997	1/10/97	2/23/97	4	[a]	27	20	265,882	22,890	9.9[i]	561	474	<0.1
1998/99	7/1/98	10/6/98	3	[a]	33	24	384,286	34,153	8.5[i]	702	547	<0.1
1999/2000	7/1/99	9/27/99	2	[a]	23	16	292,625	34,624	10.1[i]	674	434	<0.1
2000/01	7/1/00	2/15/01	3	[a]	29	23	310,370	30,904	9.0[i]	476	652	<0.1
2001/02	7/1/01	2/15/02	2	[a]	21	17	245,319	20,398	NA	417	588	<0.1
2002/03	7/1/02	2/15/03	2	[a]	6	4	60,928	3,685	NA	100	609	<0.1
2003/04	7/1/03	2/15/04	2	[a]	3	1	16,780	1,072	NA	20	839	<0.1
2004/05	7/1/04	2/15/05	2	[a]	18	18	326,228	24,430	NA	418	780	<0.1
2005/06	7/1/05	2/15/06	2	[a]	16	15	209,487	13,650	NA	407	515	<0.1
Yakutat, Area D												
1993	7/1/93	7/11/93	8	96	77	75	2,082,824	141,423	NA	1,999	1,042	<0.1
1994	1/10/94	1/18/94	11	119	88	83	2,085,942	158,660	NA	2,547	819	<0.1
1994	7/1/94	7/12/94	4	82	60	60	1,713,094	94,400	NA	1,715	999	<0.1
1995	1/10/95	2/2/95[j]	10	235	166	134	3,214,968	242,491	NA	4,712	682	<0.1
1996	1/10/96	1/25/96	3	54	47	43	832,756	53,310	NA	1,142	721	<0.1
1996	8/1/96	9/4/96	3	116	82	80	2,362,498	185,426	9.0[i]	2,840	832	<0.1
1997	1/10/97	2/18/97	4	172	144	129	3,282,860	242,940	9.0[i]	3,956	830	<0.1
1998/99	7/1/98	7/29/98	8	232	160	148	3,475,996	241,678	7.8[i]	4,192	829	<0.1
1999/2000	7/1/99	9/1/99	3	182	132	123	3,119,103	249,681	9.5[i]	3,840	812	<0.1
2000/01	7/1/00	2/15/01	3	249	170	134	2,734,559	195,699	8.1[i]	4,241	645	<0.1
2001/02	7/1/01	2/15/02	2	114	86	81	1,521,537	103,800	NA	2,406	632	<0.1
2002/03	7/1/02	2/15/03	2	117	83	77	1,541,867	122,718	NA	2,439	632	<0.1
2003/04	7/1/03	2/15/04	2	129	105	85	1,939,004	160,918	NA	3,358	577	<0.1
2004/05	7/1/04	2/15/05	2	113	88	74	1,262,499	86,950	NA	2,134	592	<0.1
2005/06	7/1/05	1/25/06	2	213	162	137	2,662,031	199,351	NA	5,089	523	<0.1

-continued-

Table 26.–Page 2 of 2.

[a] All days between observer briefing and debriefing, District 16 vessel days included with Yakutat vessel days, because it is a single registration area.
[b] All days with at least one tow made by the vessel.
[c] All days with at least one sampled tow.
[d] Vessel operator estimates.
[e] Dredge-hour = one dredge towed for 60 minutes.
[f] CPUE = round weight of retained scallops per dredge-hour.
[g] Data not available because an observer waiver was granted.
[h] 2 vessels fished. One was granted an observer wavier (no data collected). Confidential data from the other vessel is combined with the Yakutat, Area D data.
[i] Five-year special observer project. Recovery rates determined by observer.
[j] Reopened February 13 (12 Noon) to February 14 (12 Noon).
NA = Not Available

Table 27.–Summary of weathervane scallop observer data statistics from Yakutat, District 16 and Yakutat, Area D, 1993-2005/06 fishing seasons.

Registration Area	% of Scallops In Catch Samples (by weight)	Est. Number Of Discarded Scallops	Est. Weight Of Discarded Scallops	Retained Scallops		Crab Bycatch Limits		Bycatch Estimates				Observed Tanner Crab Mortality %
				Avg. Shell Height (mm)	Sample Size	Tanner	King	Tanner	King[a]	Dungeness	Halibut	
Yakutat, District 16												
1993	[b]	NA	NA	[b]	[b]	NE	NE	[b]	[b]	[b]	[b]	[b]
1994	72	NA	NA	147	196	NE	NE	10	0	4	48	67
1994	55	NA	NA	151	218	NE	NE	0	0	11	236	0
1995	65	NA	NA	132	2,347	NE	NE	469	0	93	719	28
1996	92	NA	NA	126	430	NE	NE	39	0	140	108	0
1996	81	707,236	159,899	133	1,821	NE	NE	669	0	1	68	47
1997	73	143,392	32,764	128	1,020	NE	NE	129	0	0	160	65
1998/99	79	119,414	25,292	123	2,198	NE	NE	273	0	0	24	8
1999/2000	83	216,600	57,718	125	1,276	NE	NE	48	0	0	111	20
2000/01	86	203,946	51,221	118	1,735	NE	NE	627	0	22	86	58
2001/02	79	164,073	48,879	119	1,171	NE	NE	833	0	32	86	50
2002/03	79	55,090	14,084	120	202	NE	NE	185	0	0	9	47
2003/04	92	4,828	1,136	121	40	NE	NE	0	0	21	10	0
2004/05	77	77,678	20,541	120	603	NE	NE	0	0	170	110	0
2005/06	83	93,888	24,385	119	840	NE	NE	175	0	0	0	33
Yakutat, Area D												
1993	78	NA	NA	118	5,651	NE	NE	1,700	40	351	99	54
1994	78	NA	NA	121	2,488	NE	NE	1,767	0	10	129	31
1994	81	NA	NA	122	4,903	NE	NE	603	0	169	522	56
1995	78	NA	NA	124	10,824	NE	NE	3,751	0	2,379	1,361	26
1996	82	NA	NA	121	4,310	NE	NE	2,591	0	2,320	237	27
1996	85	1,166,422	295,933	122	8,253	NE	NE	6,872	0	38	150	59
1997	81	1,575,369	299,843	119	7,790	NE	NE	5,884	0	277	353	32
1998/99	79	1,175,158	271,506	123	14,846	NE	NE	8,891	0	177	293	47
1999/2000	87	2,165,570	533,172	124	11,989	NE	NE	4,993	0	584	80	42
2000/01	88	2,129,885	588,981	123	10,237	NE	NE	17,395	0	313	65	56
2001/02	80	1,070,516	272,300	121	6,447	NE	NE	6,770	0	1,150	155	57
2002/03	80	1,366,856	359,010	123	6,679	NE	NE	8,423	0	779	291	56
2003/04	83	1,675,817	397,504	126	6,961	NE	NE	1,650	0	905	316	35
2004/05	75	831,898	217,269	124	5,646	NE	NE	863	0	223	247	60
2005/06	83	1,633,961	407,441	123	11,148	NE	NE	5,189	0	394	518	42

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Table 27.–Page 2 of 2.

[a] Actual count, not an estimate, beginning with the 1995/96 season.

[b] Data not available because an observer wavier was granted.

NA = Not Available, NE = Not Established

Table 28.–Summary of weathervane scallop commercial fishery statistics from the Prince William Sound Registration Area, 1993-2005/06 fishing seasons.

Registration Area	Season Dates		Number of				lb Retained Scallops (round weight)[d]	lb Retained Scallop Meats	% Retained Scallop Meat Recovery	Dredge Hours[e]	CPUE[f]	No. of Tanner Crab Per lb. of Retained Scallop Meats
	Beginning	Ending	Vessels	Vessel Days[a]	Days Fishing Occurred[b]	Days Fishing Observed[c]						
Prince William Sound												
1993	7/15/93	7/18/93	7	58	29	27	850,718	63,068	NA	638	1,333	<0.1
1994	Season Closed											
1995	1/10/95	1/26/95	2	29	21	21	Confidential	108,000[g]	NA	Confidential		NA
1996	Season Closed											
1997	1/10/97	1/19/97	1	12	8	7	257,230	18,000	9.6[h]	171	1,504	0
1998/99	7/1/98	7/4/98	2	22	8	8	334,152	19,650	7.9[h]	179	1,867	0
1999/2000	7/1/99	7/4/99	2	14	8	6	211,140	20,410	9.4[h]	149	1,417	<0.1
2000/01	7/1/00	8/2/00	3	43	30	28	361,032	30,266	9.0[h]	221	1,634	<0.1
2001/02	7/1/01	2/11/02	1	29	21	18	511,761	30,090	NA	263	1,946	<0.1
2002/03	7/1/02	2/15/03	2	26	17	16	231,140	15,641	NA	122	1,895	<0.1
2003/04	7/1/03	1/24/04	1	22	15	13	261,720	19,980	NA	216	1,212	<0.1
2004/05	7/1/04	2/1/05	2	38	28	26	407,617	49,320	NA	614	1,148	<0.1
2005/06	7/1/05	8/22/06	3	87	56	51	818,741	49,205	NA	491	1,667	<0.1

[a] All days between observer briefing and debriefing.

[b] All days with at least one tow made by the vessel.

[c] All days with at least one sampled tow.

[d] Vessel operator estimates.

[e] Dredge-hour = one dredge towed for 60 minutes.

[f] CPUE = round weight of retained scallops per dredge-hour.

[g] Includes estimated illegal harvest of 59,720 lb.

[h] Four-year special observer project. Recovery rates determined by observer.

NA = Not Available

Table 29.–Summary of weathervane scallop observer data statistics from the Prince William Sound Registration Area, 1993-2005/06 fishing seasons.

Registration Area	% of Scallops In Catch Samples (by weight)	Est. Number Of Discarded Scallops	Est. Weight Of Discarded Scallops	Retained Scallops		Crab Bycatch Limits		Bycatch Estimates				Observed Tanner Crab Mortality %
				Avg. Shell Height (mm)	Sample Size	Tanner	King	Tanner	King[a]	Dungeness	Halibut	
Prince William Sound												
1993	90	NA	NA	124	1,628	500	NE	200	0	0	27	58
1994	Season Closed											
1995	98	NA	NA	125	1,010	500	NE	271	0	0	153	0
1996	Season Closed											
1997	97	NA	NA	123	743	500	NE	0	0	0	8	0
1998/99	91	15,457	12,789	132	540	500	NE	20	0	0	0	0
1999/2000	93	46,502	18,500	132	360	500	NE	6	0	0	0	0
2000/01	93	42,931	13,826	131	1,429	500	NE	467	0	3	9	56
2001/02	94	68,454	23,824	136	699	11,400	NE	43	0	0	5	50
2002/03	93	21,909	7,560	131	1,080	11,400	NE	369	0	0	10	97
2003/04	92	123,031	49,963	136	460	11,400	NE	8	0	8	2	0
2004/05	91	253,487	82,794	134	1,680	11,400	NE	524	0	0	90	60
2005/06	94	171,902	64,092	131	3,499	11,400	NE	465	0	0	32	30

[a] Actual count, not an estimated, beginning with the 1995/96 season.

NA = Not Available, NE = Not Established

Table 30.–Summary of weathervane scallop commercial fishery statistics, Northeast and Shelikof Districts of the Kodiak Registration Area, 1993/94- 2005/06 fishing seasons.

Registration Area	Season Dates		Number of				lb Retained Scallops (round weight)[d]	lb Retained Scallop Meats	% Retained Scallop Meat Recovery	Dredge Hours[e]	CPUE[f]	No. of Tanner Crab Per lb. of Retained Scallop Meats
	Beginning	Ending	Vessels	Vessel Days[a]	Days Fishing Occurred[b]	Days Fishing Observed[c]						
Kodiak												
Northeast District												
1993/94	7/1/93	11/24/93	10	[g]	272	237	2,214,427	155,122	NA	6,940	319	0.2
1994/95	7/1/94	2/15/95	7	[g]	77	68	389,202	35,207	NA	1,773	220	<0.1
1995/96	Season Closed											
1996/97	8/1/96	2/15/97	3	[g]	29	19	147,269	11,430	10.0[h]	581	253	2.4
1997/98	7/1/97	11/19/97	3	[g]	95	86	1,143,926	95,858	10.1[h]	2,603	439	0.1
1998/99	7/1/98	10/2/98	4	[g]	90	80	1,365,836	120,010	10.8[h]	2,747	497	0.1
1999/2000	7/1/99	9/9/99	3	[g]	40	38	952,972	77,119	10.7[h]	1,383	689	0.2
2000/01	7/1/00	9/26/00	4	[g]	40	37	681,192	79,965	11.2[h]	1,101	619	0.2
2001/02	7/1/01	1/18/02	3	[g]	45	39	822,110	80,470	NA	1,142	720	0.3
2002/03	7/1/02	2/10/03	2	[g]	46	42	871,918	80,000	NA	1,350	646	0.3
2003/04	7/1/03	11/15/03	2	[g]	42	40	747,517	79,965	NA	1,248	599	0.2
2004/05	7/1/04	8/10/04	2	[g]	42	42	848,527	80,105	NA	1,227	692	0.4
2005/06	7/1/05	1/17/06	3	[g]	63	53	831,378	79,990	NA	1,757	473	0.4
Shelikof District												
1993/94	7/1/93	8/5/93	5	[g]	83	79	1,169,664	105,017	NA	2,504	467	0.5
1994/95	7/1/94	10/1/94	11	[g]	263	257	3,522,517	314,051	NA	8,720	404	0.2
1995/96	Season Closed											
1996/97	8/1/96	10/18/96	4	[g]	104	99	1,878,268	219,305	12.0[h]	3,497	537	<0.1
1997/98	7/1/97	8/10/97	4	[g]	153	150	3,101,152	258,346	9.4[h]	5,490	565	0.1
1998/99	7/1/98	8/21/98	8	[g]	121	112	2,129,025	179,870	9.3[h]	4,081	522	0.1
1999/2000	7/1/99	9/6/99	6	[g]	117	111	1,903,345	187,963	11.1[h]	4,304	442	0.2
2000/01	7/1/00	10/2/00	5	[g]	90	81	1,768,376	180,087	11.1[h]	2,907	608	<0.1
2001/02	7/1/01	12/8/01	4	[g]	103	97	1,830,265	177,112	NA	3,398	539	0.2
2002/03	7/1/02	2/9/03	3	[g]	115	110	1,857,466	180,580	NA	3,799	489	<0.1
2003/04	7/1/03	1/13/04	2	[g]	95	88	1,724,498	180,011	NA	3,258	529	0.2
2004/05	7/1/04	12/9/04	2	[g]	100	96	1,641,608	174,622	NA	3,467	473	0.2
2005/06	7/1/05	12/11/05	2	[g]	70	65	1,454,806	159,941	NA	2,280	638	0.1

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Table 30.-Page 2 of 2.

[a] All days between observer briefing and debriefing.
[b] All days with at least one tow made by the vessel.
[c] All days with at least one sampled tow.
[d] Vessel operator estimates.
[e] Dredge-hour = one dredge towed for 60 minutes.
[f] CPUE = round weight of retained scallops per dredge-hour.
[g] Included in Kodiak Area Combined, Table 32.
[h] Five-year special observer project. Recovery rates determined by observer.
NA = Not Available

Table 31.–Summary of weathervane scallop observer data statistics, Northeast and Shelikof Districts of the Kodiak Registration Area, 1993/94-2005/06 fishing seasons.

Registration Area	% of Scallops In Catch Samples (by weight)	Est. Number Of Discarded Scallops	Est. Weight Of Discarded Scallops	Retained Scallops		Crab Bycatch Limits		Bycatch Estimates				Observed Tanner Crab Mortality %
				Avg. Shell Height (mm)	Sample Size	Tanner	King	Tanner	King[a]	Dungeness	Halibut	
Kodiak												
Northeast District												
1993/94	46	NA	NA	144	12,221	[b]	[b]	33,511	9	5	1,513	23
1994/95	44	NA	NA	151	4,171	143,000	123	2,054	190	0	577	34
1995/96	Season Closed											
1996/97	54	22,076	8,355	144	1,252	130,000	66	27,722	0	0	704	16
1997/98	58	193,776	41,615	140	7,300	91,600	50	11,914	0	0	58	28
1998/99	57	800,629	190,480	127	7,961	46,500	21	13,887	1	0	309	44
1999/2000	62	410,193	113,349	132	3,969	66,500	150	13,886	0	0	158	41
2000/01	80	351,100	113,422	136	3,302	81,000	200	13,311	0	0	47	24
2001/02	76	305,047	108,835	140	3,240	425,000	15	20,362	0	100	94	24
2002/03	71	486,634	165,976	140	3,593	1,100,000	15	22,821	0	0	175	27
2003/04	61	364,548	113,023	145	3,026	606,991	17	18,230	0	0	197	39
2004/05	69	909,579	261,512	144	3,180	527,388	40	30,717	1	0	109	70
2005/06	65	716,148	217,355	139	3,668	449,403	45	29,264	0	0	211	58
Shelikof District												
1993/94	71	NA	NA	128	6,599	[b]	[b]	51,560	0	122	226	13
1994/95	64	NA	NA	131	20,426	98,000	219	64,444	29	1,097	851	14
1995/96	Season Closed											
1996/97	77	753,292	197,174	136	10,615	16,100	22	11,285	0	515	440	37
1997/98	78	427,756	93,221	139	16,378	51,000	35	36,744	0	4,359	448	22
1998/99	78	1,054,711	216,354	137	11,967	33,500	196	22,707	0	33	502	40
1999/2000	64	1,144,593	289,867	130	12,353	42,500	250	38,893	0	100	493	45
2000/01	80	569,722	128,614	134	7,559	49,000	125	15,133	2	54	366	38
2001/02	78	722,636	239,459	140	9,057	59,000	50	29,114	1	451	247	33
2002/03	76	1,827,306	492,954	138	9,195	67,500	50	51,165	0	2,704	301	36
2003/04	80	1,654,486	400,946	135	7,627	93,139	25	40,575	0	904	574	54
2004/05	74	1,563,694	434,807	137	8,371	35,069	25	33,338	1	1,647	579	67
2005/06	81	622,014	164,900	136	5,183	51,822	1,345	18,055	0	1,267	177	57

[a] Actual count, not an estimate, beginning with the 1995/96 season.

[b] Included in Kodiak Area combined, Table 33.

NA = Not Available

Table 32.–Summary of weathervane scallop commercial fishery statistics from the Semidi Island District and Kodiak Registration Area combined, 1993/94-2005/06 fishing seasons.

Registration Area	Season Dates		Number of				lb Retained Scallops (round weight)[d]	lb Retained Scallop Meats	% Retained Scallop Meat Recovery	Dredge Hours[e]	CPUE[f]	No. of Tanner Crab Per lb. of Retained Scallop Meats
	Beginning	Ending	Vessels	Vessel Days[a]	Days Fishing Occurred[b]	Days Fishing Observed[c]						
Kodiak												
Semidi Island District												
1993/94	7/1/93	2/11/94	7	[g]	75	70	579,836	55,487	NA	1,819	319	1.1
1994/95	7/1/94	2/15/95	2	[g]	10	10	[h]	[h]	[h]	[h]	[h]	[h]
1995/96	Season Closed											
1996/97	8/1/96	2/15/97	3	[g]	37	32	288,117	37,810	12.0[i]	1,017	283	0.2
1997/98	7/10/97	2/15/98	1	[g]	14	14	61,320	6,315	11.4[i]	349	176	1.3
1998/99	7/1/98	10/2/98	2	[g]	5	5	15,806	1,720	11.8[i]	106	149	0.5
1999/2000	7/1/99	2/15/00	1	[g]	4	1	11,310	930	NA	45	251	<0.1
2000/01	7/1/00	2/15/01	No Fishing									
2001/02	7/1/01	2/15/02	No Fishing									
2002/03	7/1/02	2/15/03	No Fishing									
2003/04	7/1/03	2/15/04	No Fishing									
2004/05	7/1/04	2/15/05	No Fishing									
2005/06	7/1/05	2/15/06	No Fishing									
Kodiak Area combined												
1993/94	7/1/93	2/11/94	10	597	430	386	3,963,927	315,626	NA	11,236	353	0.5
1994/95	7/1/94	2/15/95	11	474	350	333	3,911,719	355,628	NA	10,765	363	0.2
1995/96	Season Closed											
1996/97	7/1/96	2/15/97	5	237	170	150	2,313,654	268,545	12.0[i]	5,095	454	0.2
1997/98	7/1/97	2/15/98	5	335	262	250	4,306,399	360,339	9.4[i]	8,442	510	0.2
1998/99	7/1/98	10/2/98	8	316	216	197	3,510,667	301,600	9.9[i]	6,934	506	0.1
1999/2000	7/1/99	2/15/00	6	203	159	150	2,867,627	266,012	10.9[i]	5,732	500	0.2
2000/01	7/1/00	2/15/01	5	170	129	118	2,449,574	260,052	11.1[i]	4,008	611	0.1
2001/02	7/1/01	2/15/02	4	191	148	136	2,652,375	257,582	NA	4,540	584	0.2
2002/03	7/1/02	2/15/03	3	200	161	152	2,729,384	260,580	NA	5,149	530	0.3
2003/04	7/1/03	2/15/04	2	169	137	128	2,472,015	259,976	NA	4,506	549	0.2
2004/05	7/1/04	2/15/05	2	166	142	138	2,490,135	254,727	NA	4,694	530	0.3
2005/06	7/1/05	2/15/06	3	152	132	118	2,286,184	239,931	NA	4,039	566	0.2

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Table 32.-Page 2 of 2.

[a] All days between observer briefing and debriefing.
[b] All days with at least one tow made by the vessel.
[c] All days with at least one sampled tow.
[d] Vessel operator estimates.
[e] Dredge-hour = one dredge towed for 60 minutes.
[f] CPUE = round weight of retained scallops per dredge-hour.
[g] Included in Kodiak Area Combined, Table 32.
[h] Confidential, combined with Shelikof, Table 30.
[i] Five-year special observer project. Recovery rates determined by observers.
NA = Not Available

Table 33.–Summary of weathervane scallop observer data statistics from the Semidi Island District and Kodiak Registration Area combined, 1993/94-2005/06 fishing seasons.

Registration Area	% of Scallops In Catch Samples (by weight)	Est. Number Of Discarded Scallops	Est. Weight Of Discarded Scallops	Retained Scallops Avg. Shell Height (mm)	Retained Scallops Sample Size	Crab Bycatch Limits Tanner	Crab Bycatch Limits King	Bycatch Estimates Tanner	Bycatch Estimates King[a]	Bycatch Estimates Dungeness	Bycatch Estimates Halibut	Observed Tanner Crab Mortality %
Kodiak												
Semidi Island District												
1993/94	38	NA	NA	145	3,713	NE	NE	62,726	29	12,905	136	21
1994/95	49	NA	NA	153	767	NE	NE	984	22	64	21	28
1995/96	Season Closed											
1996/97	52	11,211	6,000	154	2,529	NE	NE	8,902	9	0	79	37
1997/98	21	5,831	2,716	147	1,066	NE	NE	8,500	1	856	21	43
1998/99	35	1,453	508	151	252	NE	NE	780	0	37	17	23
1999/2000	38	929	375	152	120	NE	NE	66	0	0	0	29
2000/01	No Fishing					NE	NE					
2001/02	No Fishing					NE	NE					
2002/03	No Fishing					NE	NE					
2003/04	No Fishing					NE	NE					
2004/05	No Fishing					NE	NE					
2005/06	No Fishing					NE	NE					
Kodiak Area combined												
1993/94	50	NA	NA	143	22,533	199,500	283	147,797	38	13,032	1,875	18
1994/95	60	NA	NA	135	25,364	241,000	342	67,482	241	1,161	1,449	15
1995/96	Season Closed											
1996/97	71	786,579	211,529	139	14,396	146,100	88	47,909	9	515	721	28
1997/98	73	1,727,874	308,719	139	24,744	142,600	85	57,158	1	5,215	157	26
1998/99	69	1,856,793	407,342	134	20,180	80,000	217	37,374	1	70	828	40
1999/2000	69	1,555,715	403,591	131	16,344	109,000	400	52845	0	100	651	44
2000/01	80	920,722	242,036	135	10,858	130,000	325	28,444	0	54	413	33
2001/02	77	1,027,683	348,294	140	12,297	484,000	65	49,476	0	451	341	29
2002/03	73	2,313,940	658,930	139	12,788	1,167,500	65	73,986	0	2,704	476	31
2003/04	73	2,019,034	513,969	138	10,653	700,130	42	58,805	0	904	771	49
2004/05	72	2,473,273	696,319	139	11,551	562,457	65	64,055	2	1,647	688	68
2005/06	74	1,338,162	382,255	137	8,851	501,225	1,390	47,319	0	1,267	388	58

[a] Actual count, not an estimate, beginning with the 1995/96 season.

NA = Not Available, NE = Not Established

Table 34.–Summary of weathervane scallop commercial fishery statistics from the Alaska Peninsula and Bering Sea Registration Areas, 1993/94-2005/06 fishing seasons.

Registration Area	Season Dates		Number of				lb Retained Scallops (round lb)[d]	lb Retained Scallop Meats	% Retained Scallop Meat Recovery	Dredge Hours[e]	CPUE[f]	No. of Tanner Crab Per lb of Retained Scallop Meats
	Beginning	Ending	Vessels	Vessel Days[a]	Days Fishing Occurred[b]	Days Fishing Observed[c]						
Alaska Peninsula												
1993/94	7/1/93	10/21/93	8	136	75	69	1,061,925	112,152	NA	1,847	575	1.3
1994/95	7/1/95	9/22/95	7	137	80	70	619,473	65,282	NA	1,664	372	0.4
1995/96	Season Closed											
1996/97	8/1/96	10/31/96	2	34	13	12	130,235	12,560	11.0[g]	327	398	1.5
1997/98	7/1/97	2/15/98	4	100	68	64	654,960	51,616	8.7[g]	1,752	374	0.4
1998/99	7/1/98	9/19/98	4	65	48	46	617,120	63,290	11.0[g]	1,612	383	0.8
1999/2000	7/1/99	9/29/99	5	108	73	65	781,596	75,535	10.3[g]	2,025	386	0.4
2000/01	7/1/00	2/15/01	3	25	14	9	95,510	7,660	9.4[g]	320	298	0.3
2001/02	Season Closed											
2002/03	Season Closed											
2003/04	7/1/03	2/15/04	No Fishing									
2004/05	7/1/04	2/15/05	No Fishing									
2005/06	7/1/05	2/15/06	No Fishing									
Bering Sea												
1993/94	7/1/93	9/5/93	9	275	174	168	3,447,681	284,414	NA	5,763	598	1.0
1994/95	7/1/94	9/7/94	8	382	312	309	5,942,912	505,439	NA	11,113	535	0.5
1995/96	Season Closed											
1996/97	8/1/96	2/15/97	1	79	63	54	1,432,160	150,295	10.0[g]	2,313	619	0.8
1997/98	7/1/97	8/11/97	2	81	66	64	1,082,825	97,002	8.8[g]	2,246	482	2.3
1998/99	7/1/98	9/4/98	4	106	73	64	1,193,071	96,795	8.7[g]	2,319	514	2.8
1999/2000	7/1/99	8/30/99	2	120	94	81	1,851,620	164,929	9.1[g]	3,294	562	1.4
2000/01	7/1/00	8/23/00	3	112	91	87	2,376,601	205,520	9.3[g]	3,355	708	0.8
2001/02	7/1/01	10/31/01	3	106	84	82	1,700,578	140,871	NA	3,072	554	0.8
2002/03	7/1/02	2/15/03	2	106	61	56	952,958	92,240	NA	2,038	468	1.3
2003/04	7/1/03	2/15/04	2	42	28	26	537,552	42,590	NA	1,020	527	1.1
2004/05	7/1/04	2/15/05	1	13	7	7	129,220	10,050	NA	275	470	1.9
2005/06	7/1/05	2/15/06	1	35	21	18	231,700	23,220	NA	602	385	0.9

-continued-

Table 34.–Page 2 of 2.

[a] All days between observer briefing and debriefing.
[b] All days with at least one tow made by the vessel.
[c] All days with at least one sampled tow.
[d] Vessel operator estimates.
[e] Dredge-hour = one dredge towed for 60 minutes.
[f] CPUE = round weight of retained scallops per dredge-hour.
[g] Five-year special observer project. Recovery rates determined by observer.
NA = Not Available

Table 35.–Summary of weathervane scallop observer data statistics from the Alaska Peninsula and Bering Sea Registration Areas, 1993/94-2005/06 fishing seasons.

Registration Area	% Scallops In Catch Samples (by weight)	Est. Number Of Discarded Scallops	Est. lb Of Discarded Scallops	Retained Scallops Avg. Shell Height (mm)	Retained Scallops Sample Size	Crab Bycatch Limits Snow	Crab Bycatch Limits Tanner	Crab Bycatch Limits King	Bycatch Estimates Snow[a]	Bycatch Estimates Tanner	Bycatch Estimates King[b]	Bycatch Estimates Dungeness	Bycatch Estimates Halibut	Observed Tanner Crab Mortality %
Alaska Peninsula														
1993/94	75	NA	NA	119	5,183	NA	52,530	85	NA	180,319	25	0	329	35
1994/95	73	NA	NA	127	4,069	NA	44,000	119	NA	25,287	0	73	157	29
1995/96						Season Closed								
1996/97	70	33,684	7,384	126	769	NA	22,000	435	NA	19,045	0	4	25	32
1997/98	56	56,654	38,219	135	5,604	NA	45,300	79	NA	21,971	0	0	347	21
1998/99	71	212,152	43,129	128	4,276	NA	48,500	900	NA	47,780	0	140	226	20
1999/2000	66	256,592	59,077	129	6,046	NA	75,500	300	NA	28,160	1	2,349	178	32
2000/01	73	18,633	4,538	119	699	NA	42,000	100	NA	2,636	1	0	8	28
2001/02						Season Closed								
2002/03						Season Closed								
2003/04						No Fishing								
2004/05						No Fishing								
2005/06						No Fishing								
Bering Sea														
1993/94	NA	NA	NA	146	12,169	NA	260,000	17,000	15,000	290,913	207	0	165	12
1994/95	77	NA	NA	147	26,451	NA	260,000	17,000	34,867	220,710	22	0	3,513	24
1995/96						Season Closed								
1996/97	88	34,412	16,188	147	4,039	275,000	257,000	500	106,935	16,642	0	0	124	16
1997/98	74	114,614	38,262	151	4,726	172,000	238,000	500	195,345	28,446	0	0	98	53
1998/99	70	403,121	127,607	147	5,479	130,000	215,000	500	232,911	39,363	146	12	98	44
1999/2000	69	157,289	68,406	145	8,751	300,000	65,000	500	159,656	62,268	2	0	106	22
2000/01	81	298,483	97,994	142	8,418	150,000	65,000	500	103,350	52,505	2	0	50	30
2001/02	80	180,075	76,261	141	7,316	300,000	65,000	500	68,458	48,718	2	0	76	41
2002/03	78	135,276	55,165	149	4,807	300,000	65,000	500	70,795	48,053	2	0	85	35
2003/04	72	92,696	34,602	148	2,481	150,000	65,000	500	16,206	31,316	0	0	61	48
2004/05	67	15,076	5,622	146	633	150,000	65,000	500	3,843	15,303	0	0	0	44
2005/06	72	37,110	17,382	154	1,491	150,000	65,000	500	5,211	15,529	2	0	53	51

[a] Snow and *C. bairdi* x *C. opilio* (hybrid) crabs combined.

[b] Actual count, not an estimate, beginning with the 1995/96 season.

NA = Not Available

Table 36.–Summary of weathervane scallop commercial fishery statistics from the Dutch Harbor and Adak Registration Areas, 1993/94-2005/06 fishing seasons.

Registration Area	Season Dates		Number of				lb Retained Scallops (round lb)[d]	lb Retained Scallop Meats	% Retained Scallop Meat Recovery	Dredge Hours[e]	CPUE[f]	No. of Tanner Crab Per lb of Retained Scallop Meats
	Beginning	Ending	Vessels	Vessel Days[a]	Days Fishing Occurred[b]	Days Fishing Observed[c]						
Dutch Harbor												
1993/94	7/1/93	9/18/93	2	46	36	24	432,970	38,731	NA	838	517	1.8
1994/95	7/1/94	2/15/95	3	21	6	6	23,590	1,931	NA	81	291	0.4
1995/96	7/1/95	2/15/96	1	62	38	35	289,398	26,950	NA	1,047	276	0.2
1996/97	8/1/96	2/15/97	No Fishing									
1997/98	7/1/97	8/25/97	1	15	8	8	55,725	5,790	10.6[g]	171	326	2.2
1998/99	7/1/98	2/15/99	4	84	37	34	427,422	46,432	10.5[g]	1,025	417	0.1
1999/2000	7/1/99	10/1/99	1	16	13	10	68,070	6,465	11.8[g]	273	249	0.7
2000/01	Season Closed											
2001/02	Season Closed											
2002/03	7/1/02	2/15/03	1	10	8	7	59,116	6,000	NA	184	321	0.5
2003/04	Season Closed											
2004/05	Season Closed											
2005/06	Season Closed											
Adak												
1993/94	Not established as a separate area, included with Bering Sea Area.											
1994/95	7/1/94	2/15/95	No Fishing									
1995/96	7/1/95	2/15/96	1	7	4	4	Confidential					
1996/97	8/1/96	2/15/97	No Fishing									
1997/98	7/1/97	2/15/98	No Fishing									
1998/99	7/1/98	2/15/99	No Fishing									
1999/2000	7/1/99	2/15/00	No Fishing									
2000/01	7/1/00	2/15/01	No Fishing									
2001/02	7/1/01	2/15/02	No Fishing									
2002/03	7/1/02	2/15/03	No Fishing									
2003/04	7/1/03	2/15/04	No Fishing									
2004/05	7/1/04	2/15/05	No Fishing									
2005/06	7/1/05	2/15/06	No Fishing									

Table 36.-Page 2 of 2.

[a] All days between observer briefing and debriefing.
[b] All days with at least one tow made by the vessel.
[c] All days with at least one sampled tow.
[d] Vessel operator estimates.
[e] Dredge-hour = one dredge towed for 60 minutes.
[f] CPUE = round weight of retained scallops per dredge-hour.
[g] Three-year special observer project. Recovery rates determined by observer.
NA = Not Available

Table 37.–Summary of weathervane scallop observer data statistics from the Dutch Harbor and Adak Registration Areas, 1993/94-2005/06 fishing seasons.

Registration Area	% Scallops In Catch Samples (by weight)	Est. Number Of Discarded Scallops	Est. lb Of Discarded Scallops	Retained Scallops Avg. Shell Height (mm)	Retained Scallops Sample Size	Crab Bycatch Limits Snow	Crab Bycatch Limits Tanner	Crab Bycatch Limits King	Bycatch Estimates Snow[a]	Bycatch Estimates Tanner	Bycatch Estimates King[b]	Bycatch Estimates Dungeness	Bycatch Estimates Halibut	Observed Tanner Crab Mortality %
Dutch Harbor														
1993/94	NA	NA	NA	128	1,948	NA	50,500	45	NA	69,354	35	0	270	50
1994/95	56	NA	NA	158	105	NA	87,000	47	NA	757	7	0	0	54
1995/96	NA	NA	NA	134	3,026	NA	NA	NA	NA	5,980	0	0	37	22
1996/97	No Fishing					NA	10,700							
1997/98	36	67,742	18,561	127	267	NA	10,700	10	NA	12,582	1	0	22	44
1998/99	71	92,270	29,348	128	2,850	NA	10,700	10	NA	6,479	0	23	35	8
1999/2000	54	11,459	4,284	135	1,008	NA	10,700	10	NA	4,274	0	0	39	47
2000/01	Season Closed													
2001/02	Season Closed													
2002/03	60	12,705	4,346	133	537	NA	10,700	50	NA	2,744	0	29	0	31
2003/04	Season Closed													
2004/05	Season Closed													
2005/06	Season Closed													
Adak														
1993/94	Not established as a separate area, included with Bering Sea Area.													
1994/95	No Fishing					NA	NA	NA						
1995/96	Confidential					NA	NA	NA			Confidential			
1996/97	No Fishing					NA	10,000	50						
1997/98	No Fishing					NA	10,000	50						
1998/99	No Fishing					NA	10,000	50						
1999/2000	No Fishing					NA	10,000	50						
2000/01	No Fishing					NA	10,000	50						
2001/02	No Fishing					NA	10,000	50						
2002/03	No Fishing					NA	10,000	50						
2003/04	No Fishing					NA	10,000	50						
2004/05	No Fishing					NA	10,000	50						
2005/06	No Fishing					NA	10,000	50						

[a] Snow and *C. bairdi* x *C. opilio* (hybrid) crabs combined.

[b] Actual count, not an estimated, beginning with the 1995/96 season.

NA = Not Available

Table 38.–Number and condition of Pacific halibut in bycatch samples, 2003/04-2005/06 weathervane scallop fishing seasons.

		Number of Halibut[a]						
Registration Area	Season	Excellent	Good	Fair	Poor	Dead	Previously dead	Total
Yakutat								
District 16	2003/04	1	0	0	0	0	0	1
	2004/05	1	9	2	1	1	0	14
	2005/06	0	0	0	0	0	0	0
Area D	2003/04	6	10	12	3	4	0	36[b]
	2004/05	2	15	5	0	7	0	29
	2005/06	11	20	6	15	8	1	61
Prince William Sound	2003/04	0	0	0	0	1	0	1
	2004/05	4	5	0	2	3	1	15
	2005/06	2	5	2	0	0	0	9
Kodiak								
Northeast District	2003/04	3	5	3	2	4	6	23
	2004/05	0	5	0	2	8	0	15
	2005/06	3	1	5	1	15	1	26
Shelikof District	2003/04	12	21	5	15	13	0	68[c]
	2004/05	15	20	12	8	14	3	74[c]
	2005/06	5	12	3	1	2	0	24[b]
Semidi District	2003/04	No Fishing						
	2004/05	No Fishing						
	2005/06	No Fishing						
Alaska Peninsula	2003/04	No Fishing						
	2004/05	No Fishing						
	2005/06	No Fishing						
Bering Sea	2003/04	0	3	4	0	0	0	7
	2004/05	0	0	0	0	0	0	0
	2005/06	1	2	4	0	0	0	8[b]
Dutch Harbor	2003/04	Season Closed						
	2004/05	Season Closed						
	2005/06	Season Closed						
Statewide Total	2003/04	22	39	24	20	22	6	136
	2004/05	22	54	19	13	33	4	147
	2005/06	22	40	20	17	25	2	128

-continued-

Table 38.-Page 2 of 2.

[a] Condition Codes:

Excellent: Vigorous body movement before and after release; could close operculum tightly; minor external injuries, if any.

Good: Feeble body movements; could close operculum tightly; minor external injuries, if any.

Fair: No body movement; could close operculum tightly; minor external injuries, if any.

Poor: No body movement; could move operculum but not tightly; severe injuries (eg. bleeding).

Dead: No body or opercular movement; probably killed in sampled haul.

Previously dead: Obviously not killed in the current haul (incidentally caught).

[b] Includes 1 halibut that was not examined.

[c] Includes 2 halibut that were not examined.

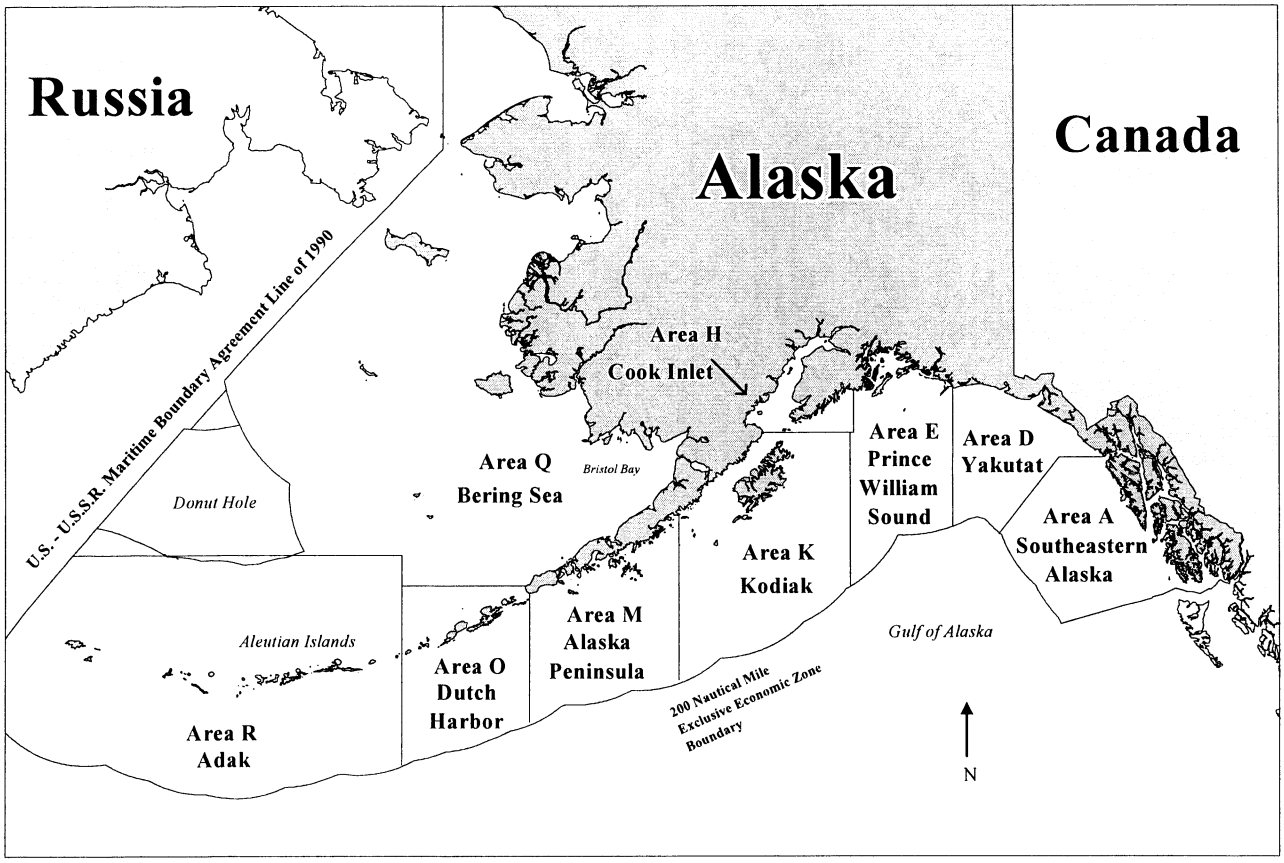

Figure 1.–State of Alaska weathervane scallop fishing registration areas.

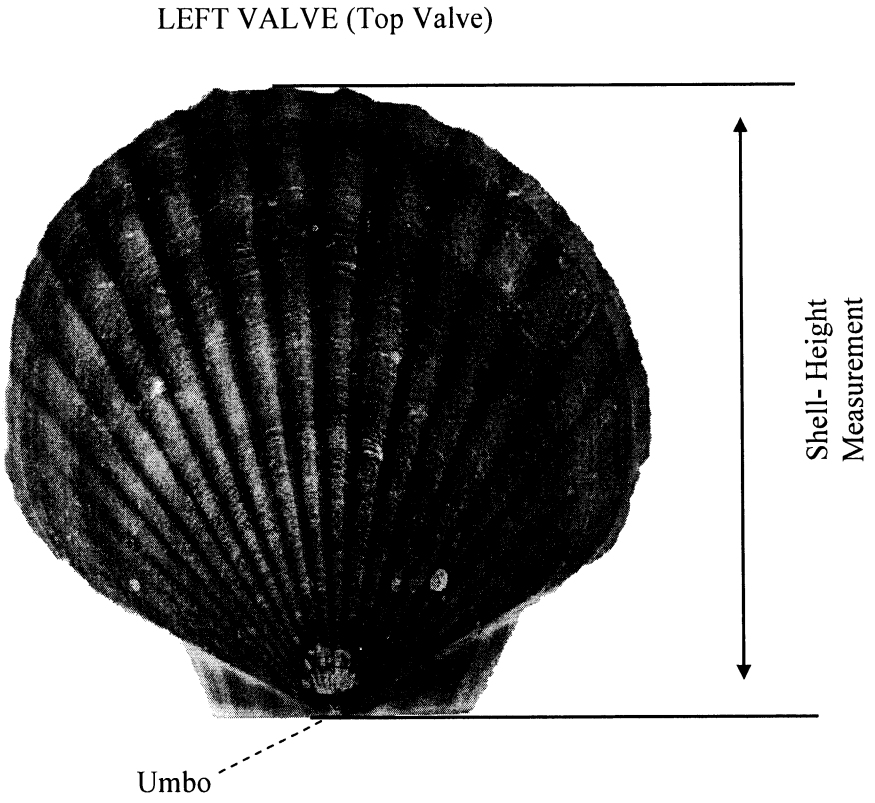

Figure 2.–Scallop shell height measurement.

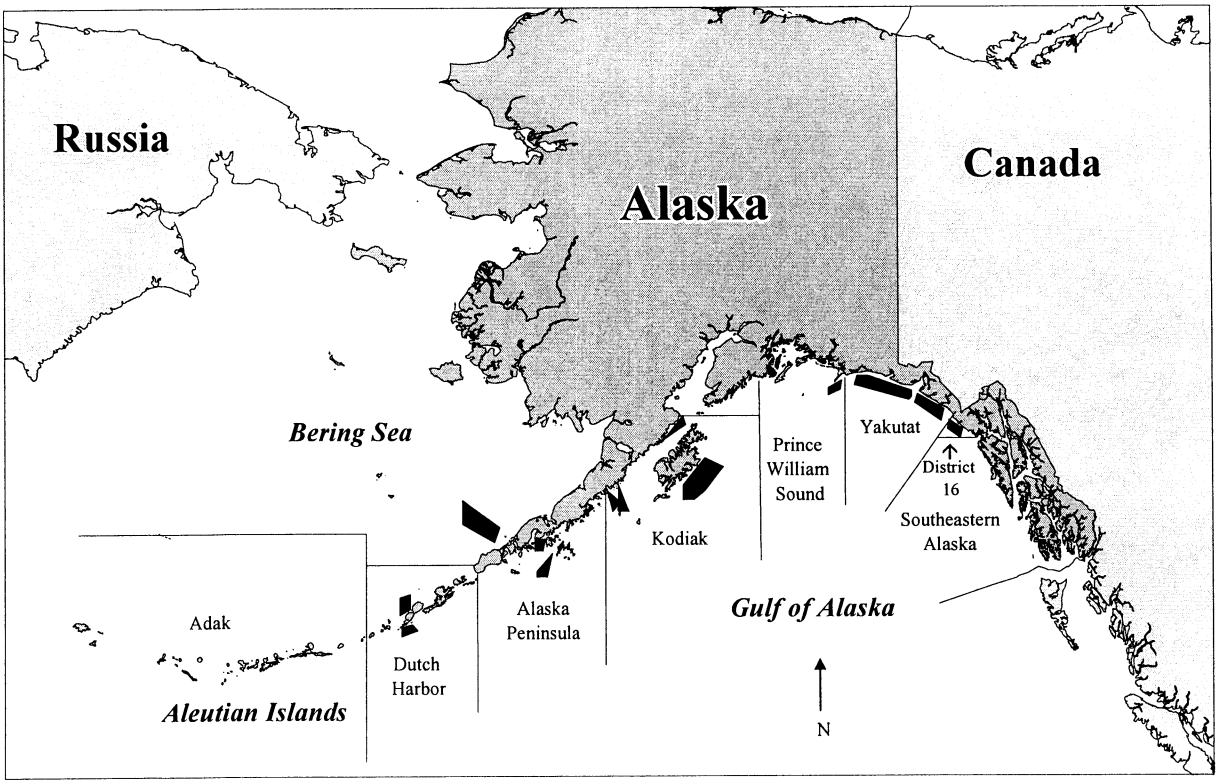

Figure 3.–Major weathervane scallop fishing locations in coastal waters of Alaska.

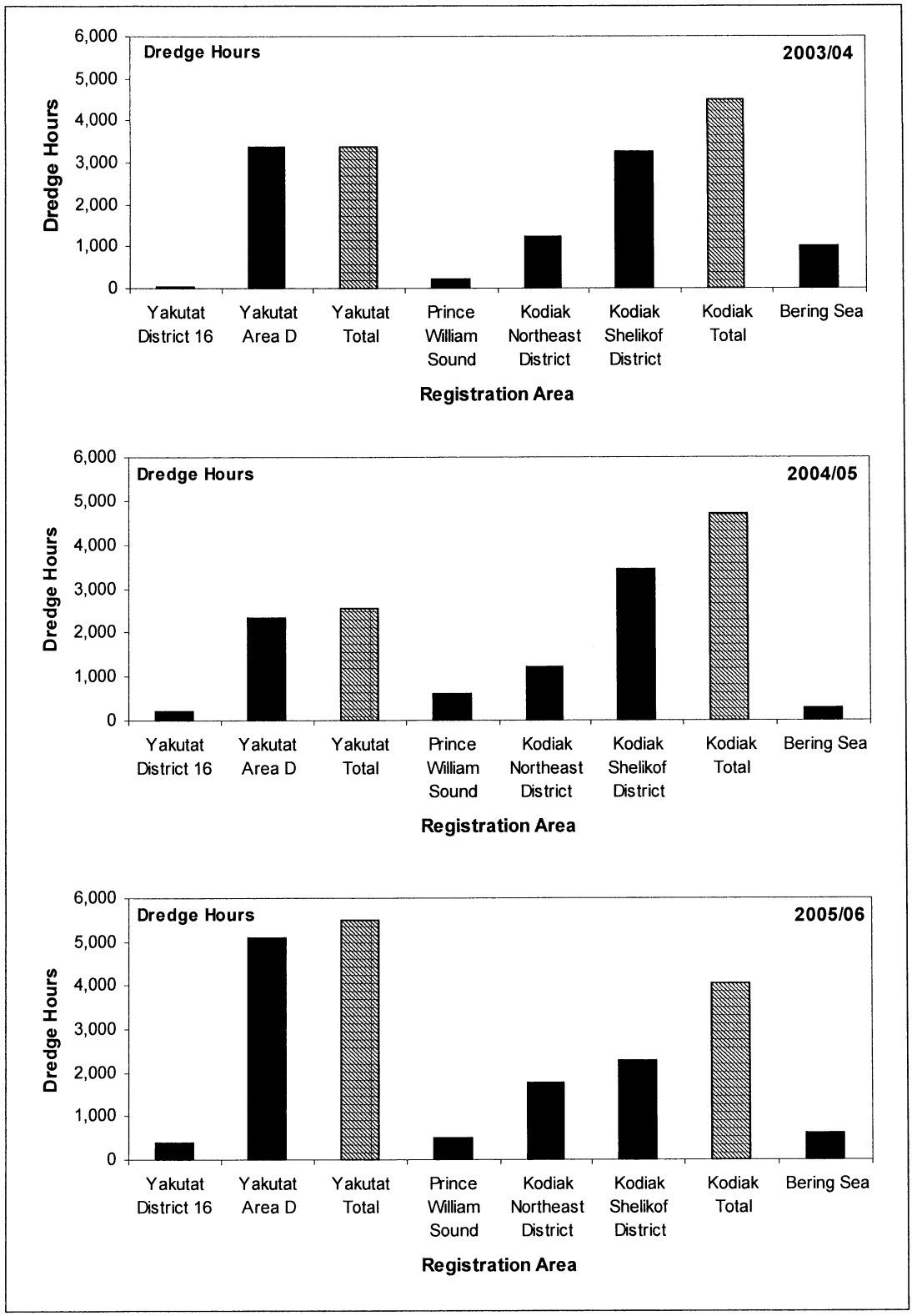

Figure 4.–Fishing effort in dredge-hours by registration area and district, 2003/04-2005/06 weathervane scallop fishing seasons.

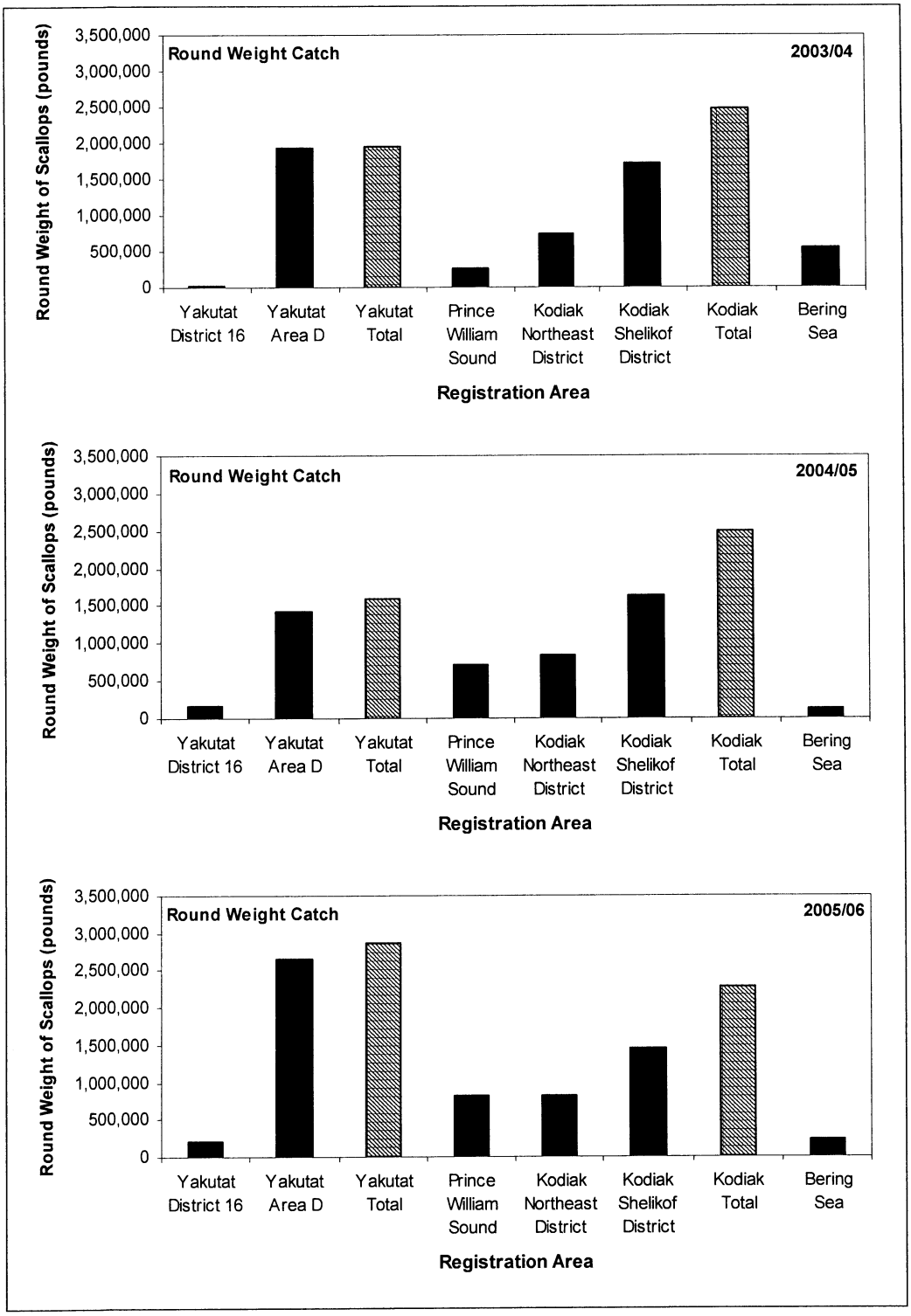

Figure 5.–Round weight of retained scallops by registration area and district, 2003/04-2005/06 weathervane scallop fishing seasons.

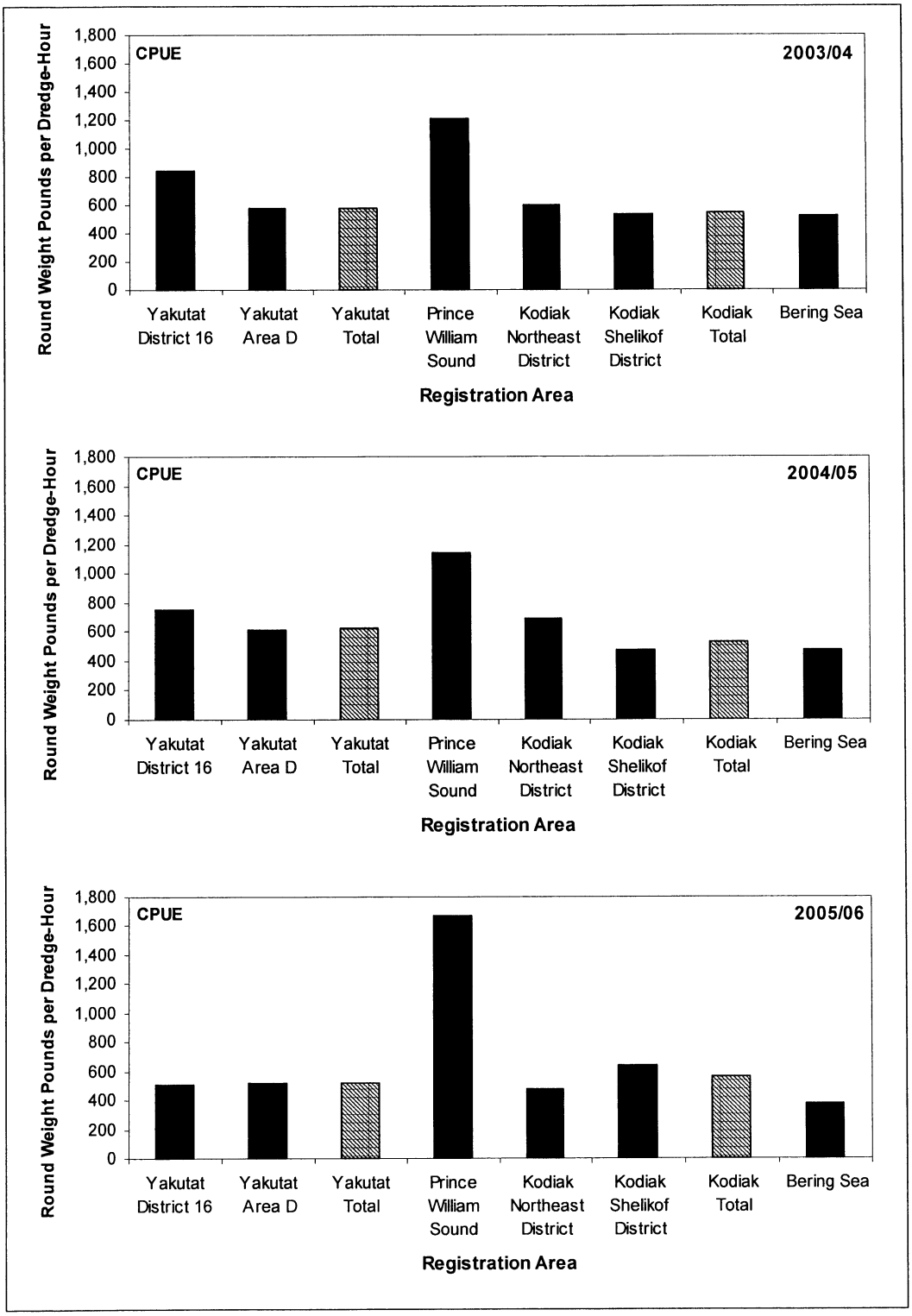

Figure 6.–Round weight of retained scallops per dredge-hour by registration area and district, 2003/04-2005/06 weathervane scallop fishing seasons.

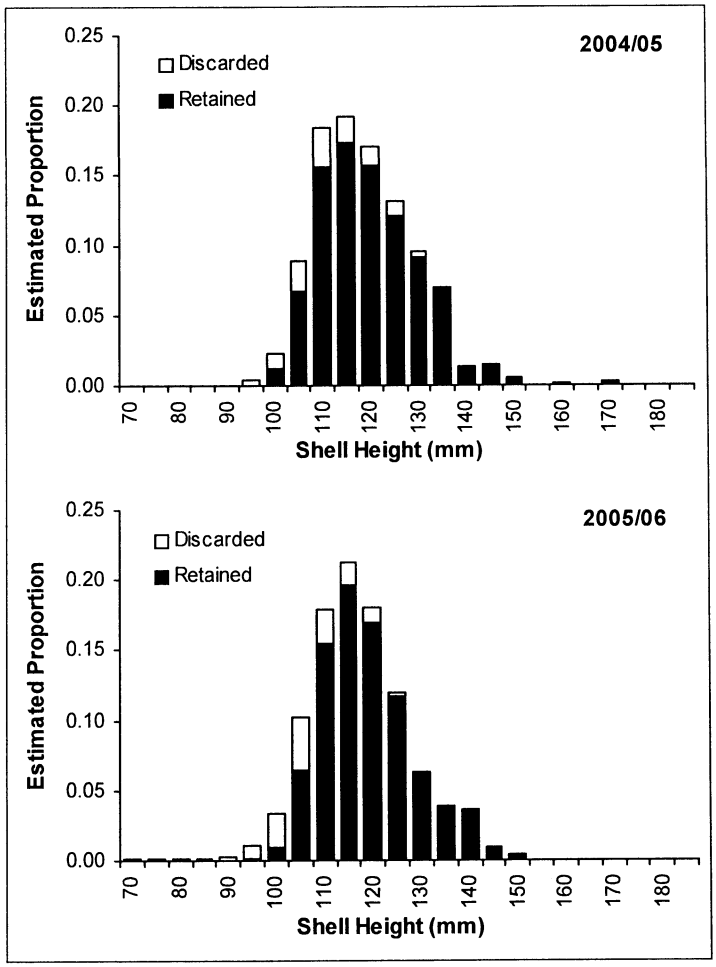

Figure 7.–Estimated shell height distribution from resampling observer-collected scallop measurements, Yakutat, District 16, 2004/05 and 2005/06 weathervane scallop fishing seasons.

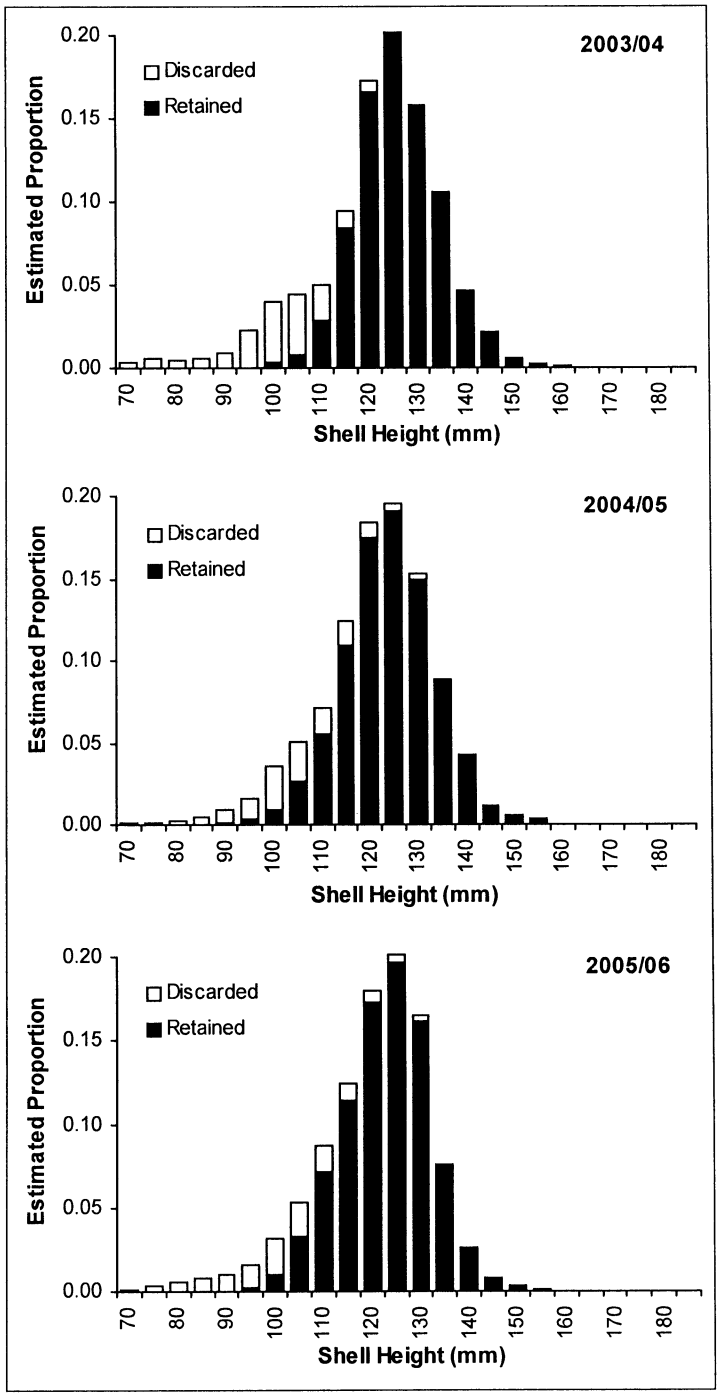

Figure 8.–Estimated shell height distribution from resampling observer-collected scallop measurements, Yakutat, Area D, 2003/04-2005/06 weathervane scallop fishing seasons.

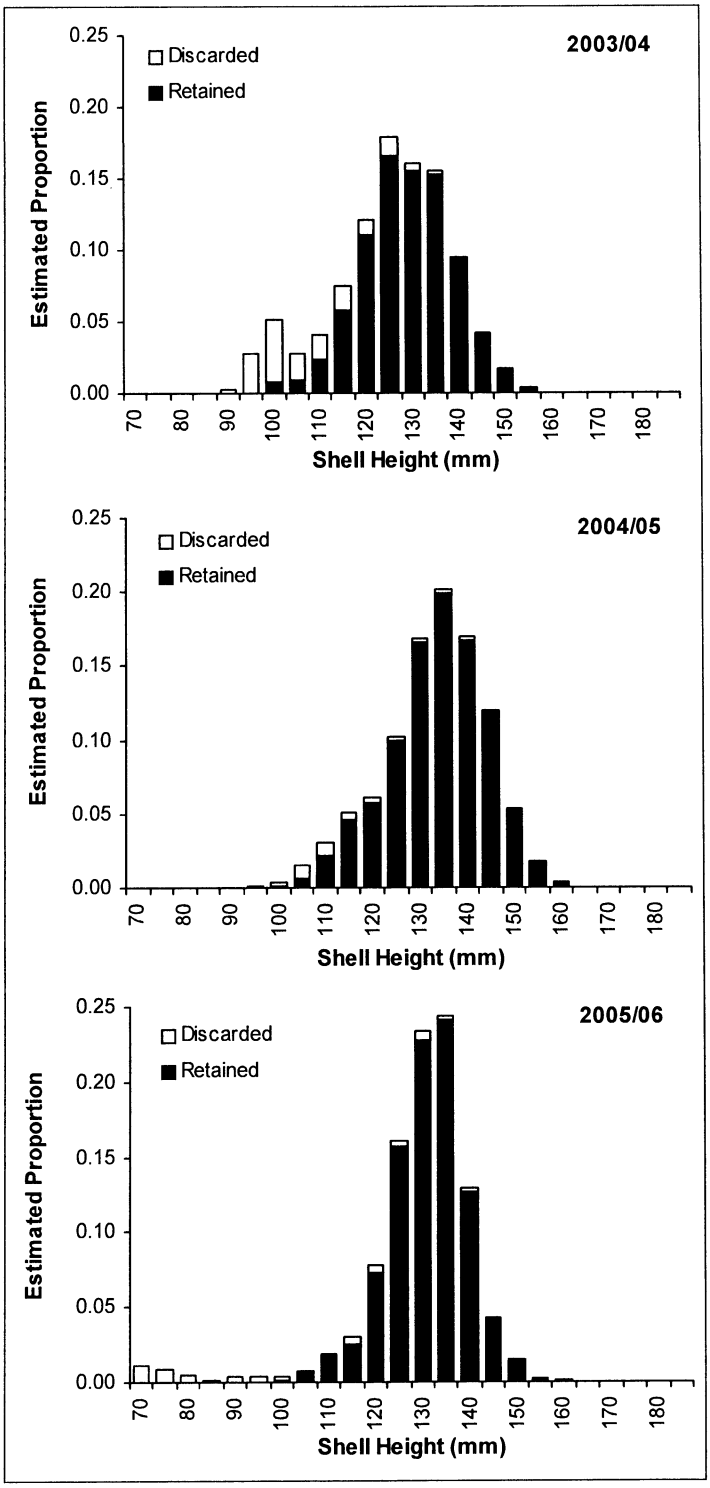

Figure 9.–Estimated shell height distribution from resampling observer-collected scallop measurements, Prince William Sound Registration Area, 2003/04-2005/06 weathervane scallop fishing seasons.

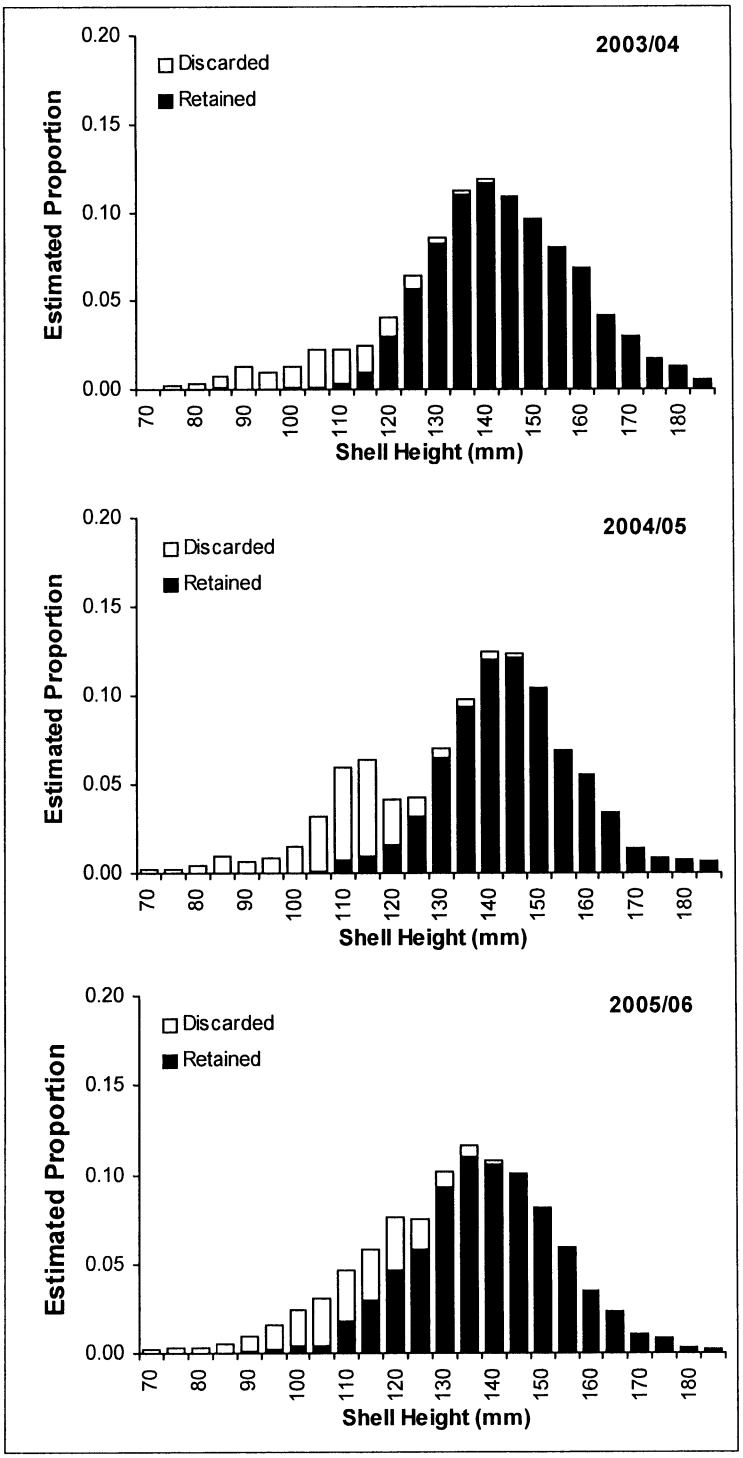

Figure 10.–Estimated shell height distribution from resampling observer-collected scallop measurements, Kodiak Registration Area, Northeast District, 2003/04-2005/06 weathervane scallop fishing seasons.

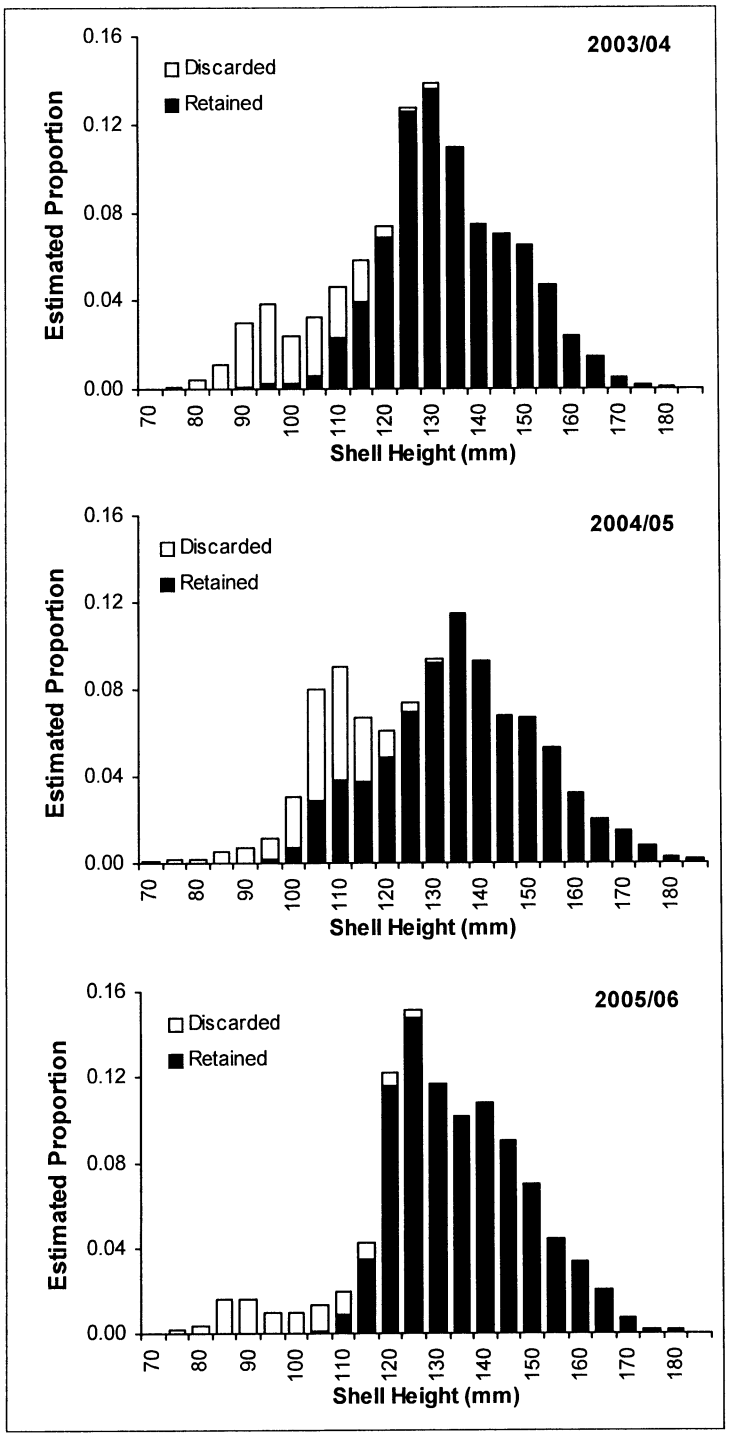

Figure 11.–Estimated shell height distribution from resampling observer-collected scallop measurements, Kodiak Registration Area, Shelikof District, 2003/04-2005/06 weathervane scallop fishing seasons.

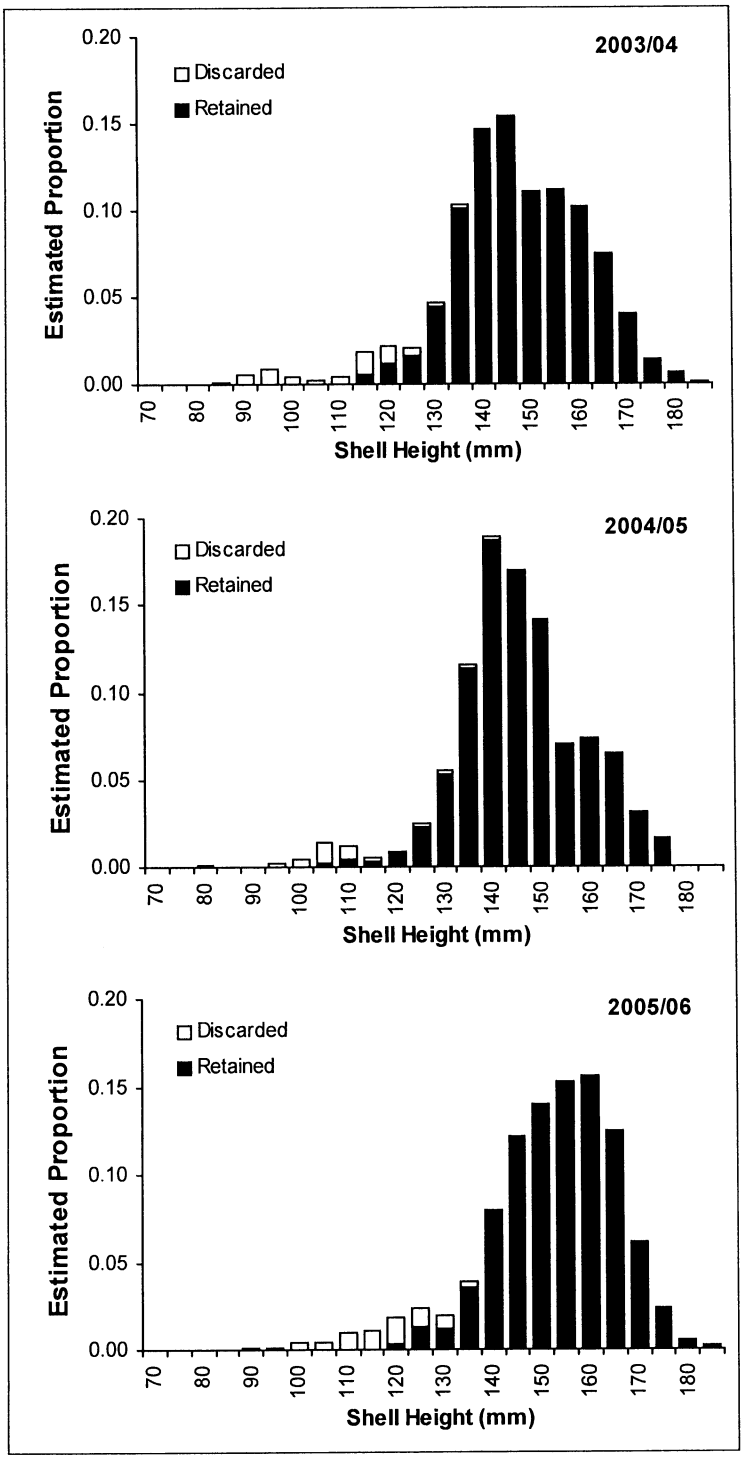

Figure 12.–Estimated shell height distribution from resampling observer-collected scallop measurements, Bering Sea Registration Area, 2003/04-2005/06 weathervane scallop fishing seasons.

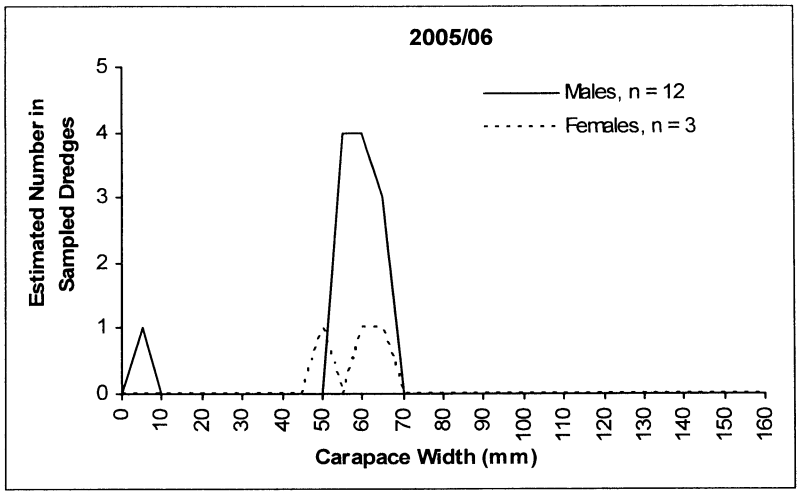

Figure 13.–Tanner crab carapace width distributions observed in bycatch sampling, Yakutat, District 16, 2005/06 weathervane scallop fishing season.

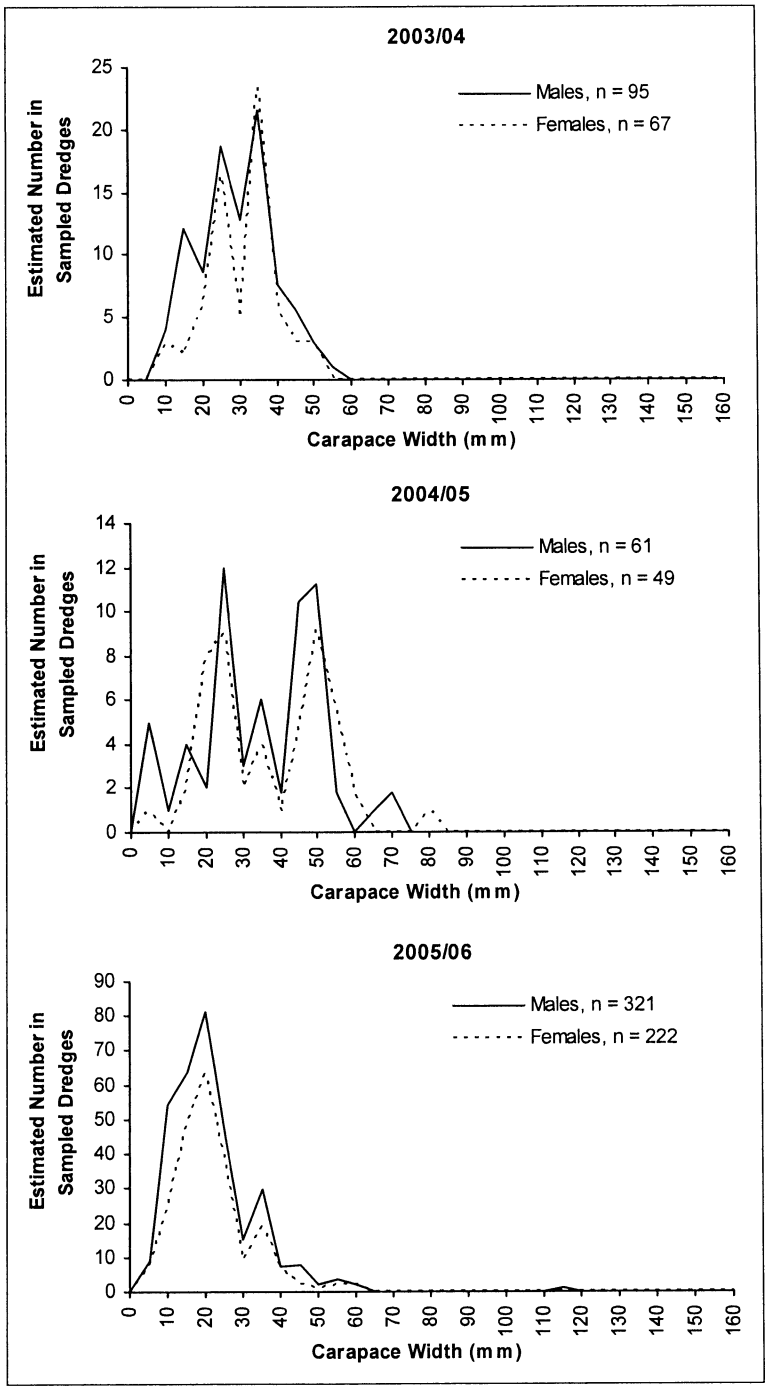

Figure 14.–Tanner crab carapace width distributions observed in bycatch sampling, Yakutat, Area D, 2003/04-2005/06 weathervane scallop fishing seasons.

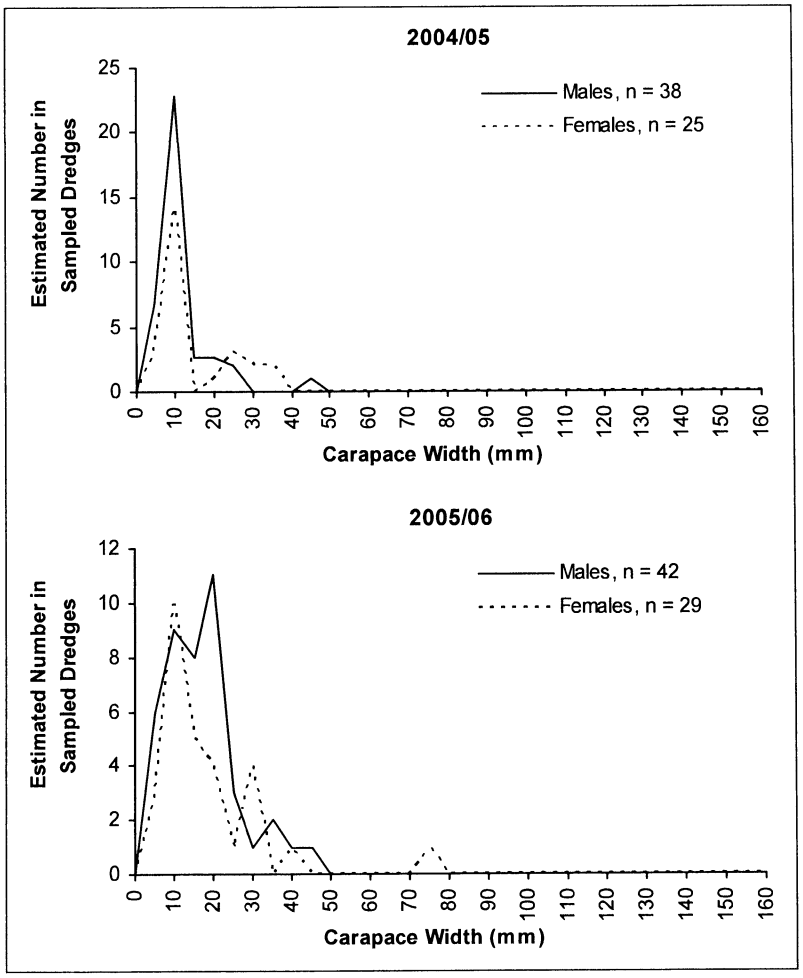

Figure 15.–Tanner crab carapace width distributions observed in bycatch sampling, Prince William Sound Registration Area, 2004/05 and 2005/06 weathervane scallop fishing seasons.

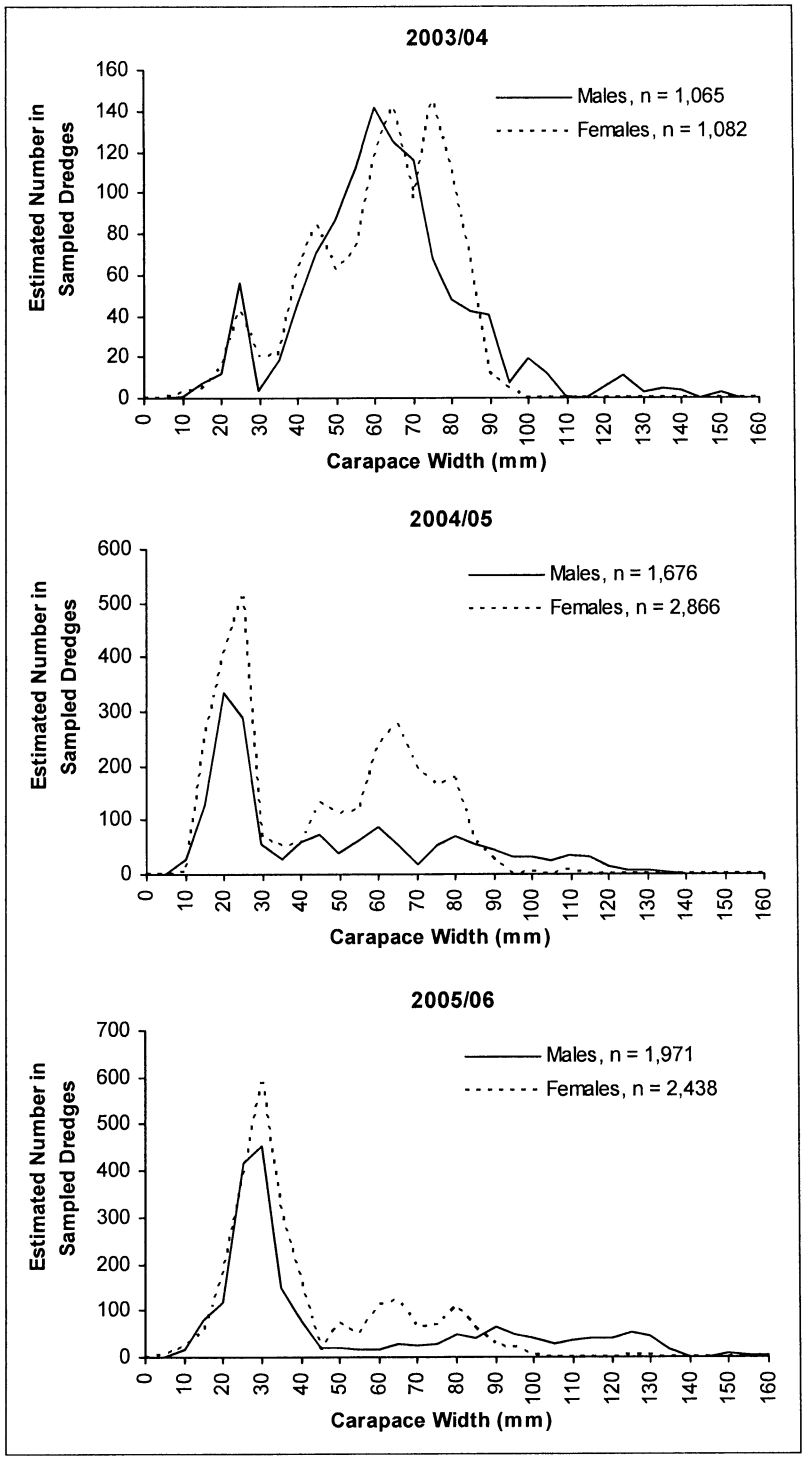

Figure 16.–Tanner crab carapace width distributions observed in bycatch sampling, Kodiak Registration Area, Northeast District, 2003/04-2005/06 weathervane scallop fishing seasons.

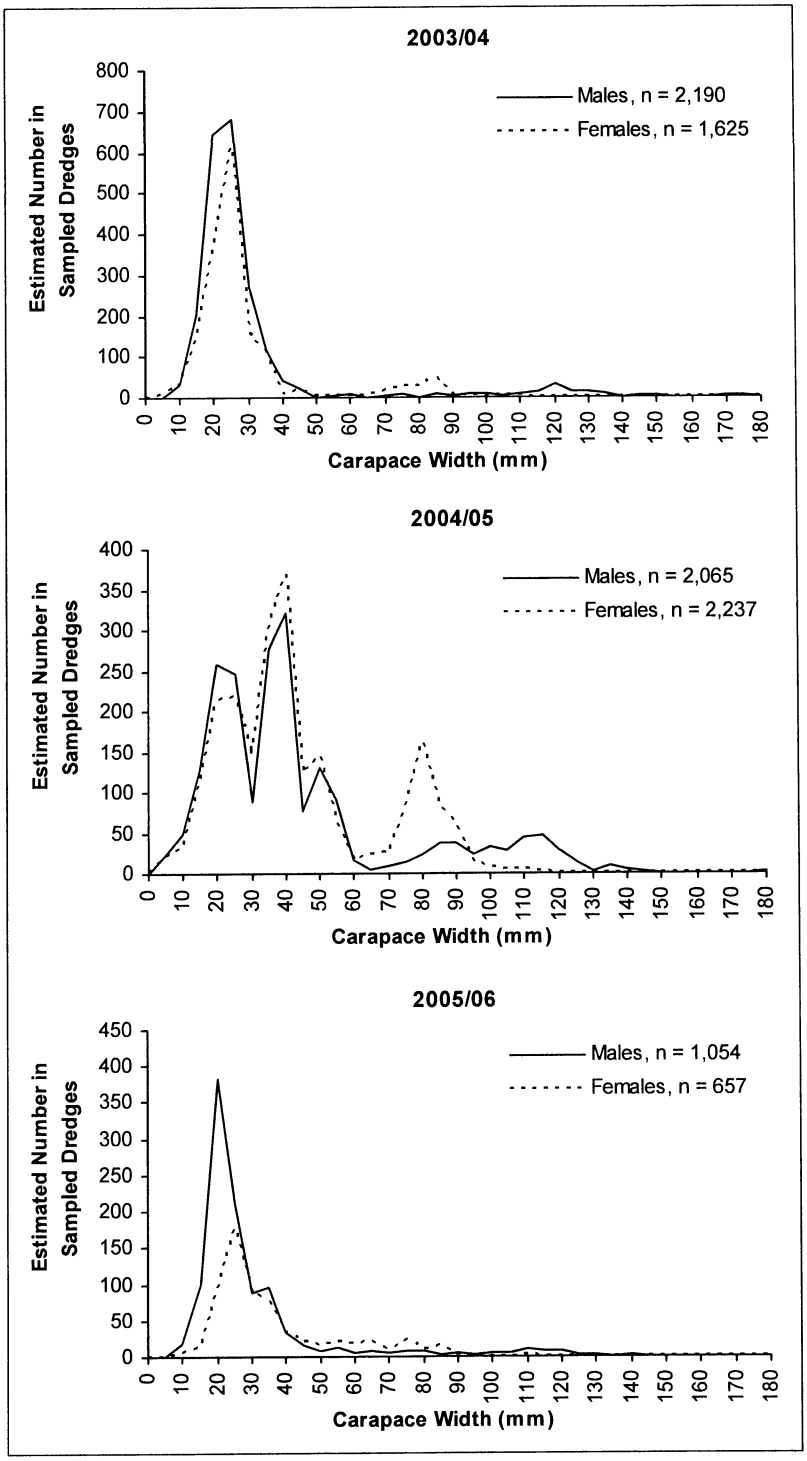

Figure 17.–Tanner crab carapace width distributions observed in bycatch sampling, Kodiak Registration Area, Shelikof District, 2003/04-2005/06 weathervane scallop fishing seasons.

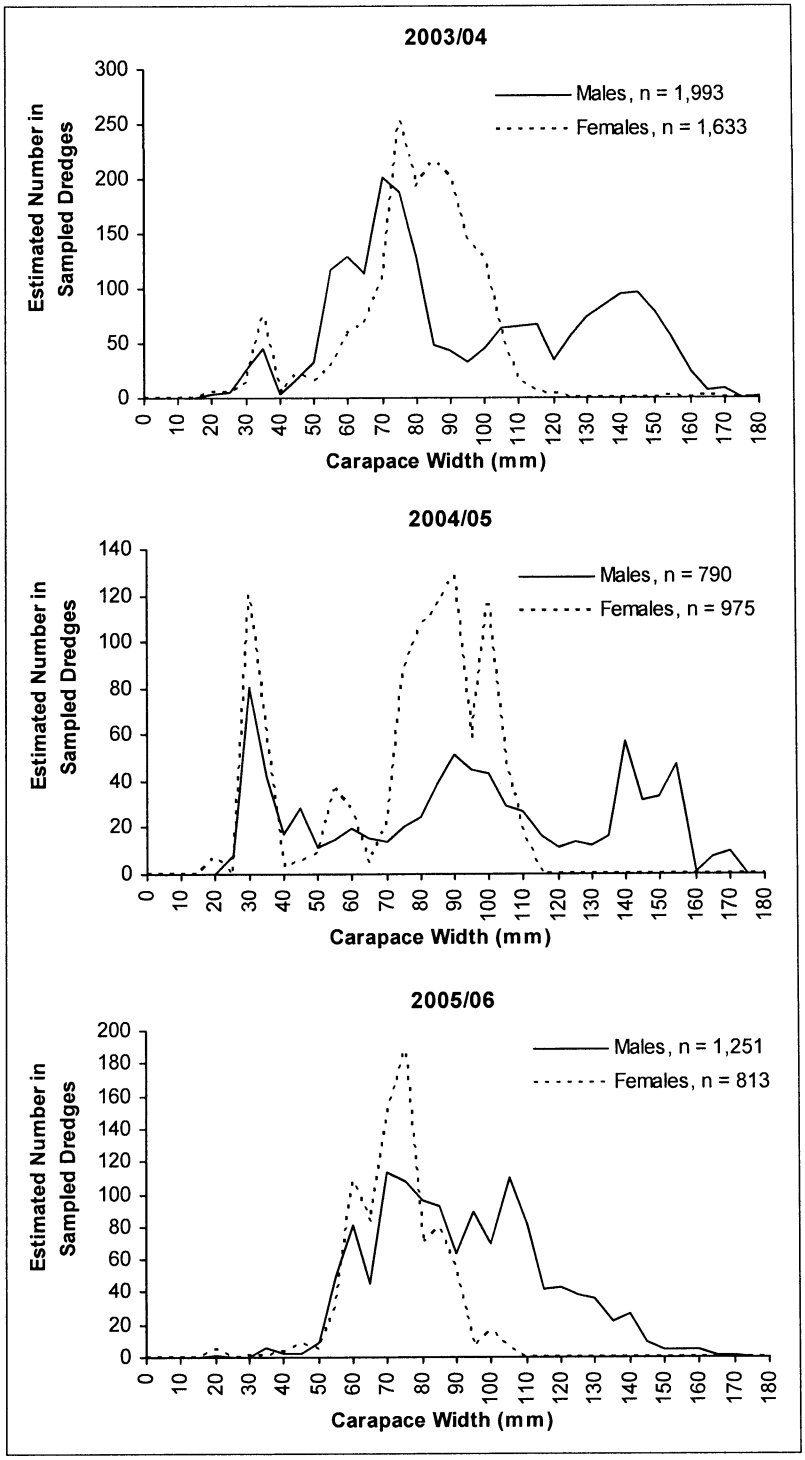

Figure 18.–Tanner crab carapace width distributions observed in bycatch sampling, Bering Sea Registration Area, 2003/04-2005/06 weathervane scallop fishing seasons.

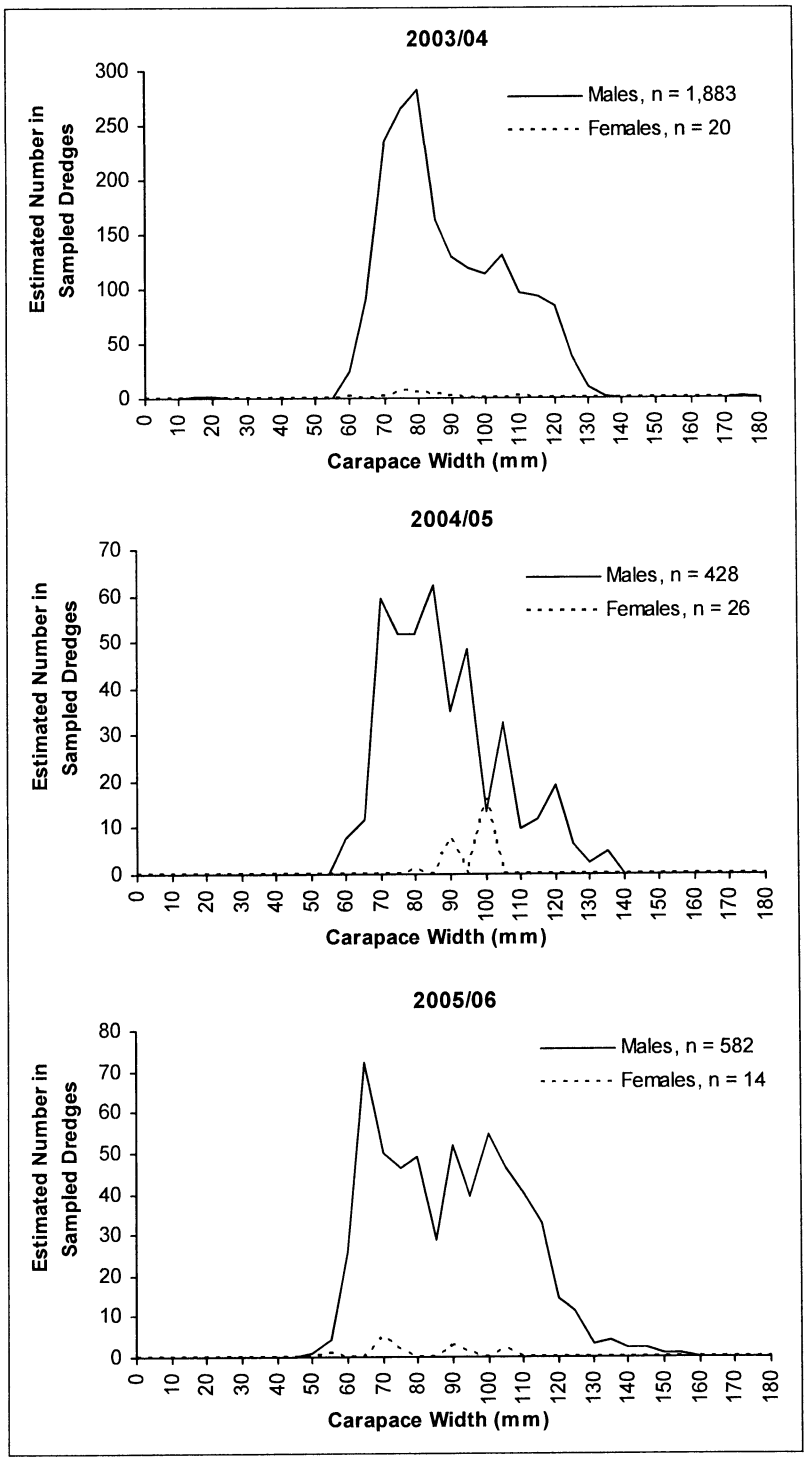

Figure 19.–*Chionoecetes opilio* and *C. opilio* x *C. bairdi* hybrid crab carapace width distributions observed in bycatch sampling, Bering Sea Registration Area, 2003/04-2005/06 weathervane scallop fishing seasons.

Appendix 2 Annual Management Report for the Commercial Weathervane Fisheries in Alaska, 2005/06

Fishery Management Report No. 08-01

Annual Management Report for the Commercial Weathervane Scallop Fisheries in Alaska, 2005/06

by

Jeffrey P. Barnhart

Nicholas H. Sagalkin

Gregg E. Rosenkranz

Robert S. Berceli

Joseph P. Stratman

and

Charles E. Trowbridge

February 2008

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)

Measures (fisheries)	
fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

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

FISHERY MANAGEMENT REPORT NO. 08-01

ANNUAL MANAGEMENT REPORT FOR THE COMMERCIAL WEATHERVANE SCALLOP FISHERIES IN ALASKA, 2005/06

by

Jeffrey P. Barnhart,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

Nicholas H. Sagalkin,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

and
Gregg E. Rosenkranz,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Kodiak

and

Robert S. Berceli,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Cordova

Joseph P. Stratman,
Alaska Department of Fish and Game, Division of Commercial Fisheries, Petersburg

and
Charles E. Trowbridge
Alaska Department of Fish and Game, Division of Commercial Fisheries, Homer

Alaska Department of Fish and Game
Division of Sport Fish, Research and Technical Services
333 Raspberry Road, Anchorage, Alaska, 99518-1599

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, AK 99615, USA

Nicholas H. Sagalkin
Alaska Department of Fish and Game, Division of Commercial Fisheries,
211 Mission Road, Kodiak, AK 99615, USA

and
Gregg E. Rosenkranz,
Alaska Department of Fish and Game, Division of Commercial Fisheries,
211 Mission Road, Kodiak, AK 99615, USA

and
Robert S. Berceli
Alaska Department of Fish and Game, Division of Commercial Fisheries,
401 Railroad Avenue, Cordova, AK 99574, USA

and
Joseph P. Stratman
Alaska Department of Fish and Game, Division of Commercial Fisheries,
16 Sing Lee Alley, Petersburg, AK, 99833, USA

and
Charles E. Trowbridge
Alaska Department of Fish and Game, Division of Commercial Fisheries,
3298 Douglas Place, Homer, AK 99603, USA

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ABSTRACT

The Alaska commercial weathervane scallop *Patinopecten caurinus* fishery occurs in waters of the Alaska Territorial Sea and the Exclusive Economic Zone (EEZ) bound by Cape Spencer in Southeast Alaska through the Gulf of Alaska to the western boundary at the U.S.-U.S.S.R. Maritime Boundary Agreement Line of 1990 in the Bering Sea. This report describes historic and present-day fishery management for the commercial weathervane scallop fishery occurring in the Yakutat, Prince William Sound, Cook Inlet, Kodiak, Alaska Peninsula, Bering Sea, Dutch Harbor, and Adak Registration Areas. A synopsis of the 2005/06 fishing season and stock status is discussed for each scallop registration area.

Key words: Weathervane scallop, *Patinopecten caurinus*, Southeastern Region, Central Region, Westward Region, fishery observer, Yakutat, Prince William Sound, Cook Inlet, 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 identified in 1953 by the U.S. Bureau of Commercial Fisheries during one of their surveys (Kaiser 1986). However, it was not until 1967 when declines of red king crab *Paralithodes camtschaticus* catches led to the first efforts to establish a weathervane scallop fishery (Kruse et al. 2005). In 1967, two Kodiak-based vessels, were converted to scallop dredging (Turk 2000). At this same time, scallop catches were declining in the eastern U.S. and Canadian fisheries on Georges Bank. By 1968, scallop vessels arrived in Alaska from the east coast. The scallop fishery expanded to 19 vessels consisting of New Bedford type scallop vessels, converted Alaska crab boats, salmon seiners, halibut longliners, and shrimp trawlers (Kaiser 1986).

The fishery developed from 1967 through 1973 as previously unfished scallop beds were identified and harvested (Shirley and Kruse 1995). This was followed by a period of declining scallop harvests from 1974 to the end of the decade. A smaller, more stable fishery followed through the 1980s.

By 1993, the fishery was again expanding with an influx of scallop vessels from the east coast of the United States (Table 1). The influx of vessels into the weathervane scallop fishery concerned the Alaska Department of Fish and Game (ADF&G) about crab bycatch and overharvest of the scallop resource. As a result of the increased effort, the weathervane scallop fishery was designated by the state of Alaska as a high impact emerging fishery on May 21, 1993, and was closed until a conservative management plan could be developed by the ADF&G (Kruse et al. 2005). The resulting Interim Management Plan for Commercial Scallop Fisheries in Alaska was approved by the ADF&G Commissioner in 1993 and finalized as regulation 5 AAC 38.076 Alaska Scallop Fishery Management Plan by the Alaska Board of Fisheries (BOF) in 1994. It 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 (Barnhart 2003).

In 1997, participation in the Alaska weathervane scallop fishery was limited by vessel moratoria in both federal and state waters. In 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 ADF&G, has been a reduction in the statewide scallop harvest since the late 1990s (Table 1).

In the 1990s the fishery changed from short trips with numerous deliveries each season to long trips with fewer deliveries, as the majority of the fleet converted from icing to freezing of product onboard vessels (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.

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. Scallop beds typically occur in mud, clay, silt, sand, or pebble substrates. Major scallop fishing locations in Alaska coastal waters are shown in Figure 1. Scallops are typically found at depths of 20–125 fathoms, with the majority of the fishing effort occurring between 40 and 60 fathoms (Barnhart and Rosenkranz 2006).

There are nine scallop fishing registration areas within Alaska (Figure 2). This report describes fisheries within the ADF&G Southeastern Region (Yakutat, Registration Area D), Central Region (Prince William Sound, Registration Area E and Cook Inlet, Registration Area H), and Westward Region, including Kodiak (Area K), Alaska Peninsula (Area M), Bering Sea (Area Q), Dutch Harbor (Area O), and Adak (Area R) scallop registration areas. Waters of the Territorial Sea and the EEZ are encompassed within each registration area. Registration Area D includes those waters in the Gulf of Alaska (GOA) north of Cape Spencer (58° 12.27' N lat., 136° 39.75' W long.) and east of the longitude of Cape Suckling at 144° W. long. Registration Area E includes those GOA waters west of the longitude of Cape Suckling at 144° W. long. and east of the longitude of Cape Fairfield (148° 50.25' W long). Registration Area H includes those GOA waters east of Cape Fairfield (148° 50.25' W long) and north of the latitude of Cape Douglas (58° 51.10' N. Lat.). Registration Area J includes GOA waters south of Cape Douglas (58° 51.10' N lat.), west of 148° 50.25' 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

From inception of the fishery in 1967 until the early 1990s when scallop vessels arrived from the east coast of the United States to Alaska, the fishery was open year-round in many parts of the state, without harvest restrictions. All vessels participating in the scallop fishery 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. Because vessels were registered with the state of Alaska, the state regulated the fishery in federal waters. In 1993, because of increased effort, the scallop fishery was declared 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 Management Plan for Commercial Scallop Fisheries in Alaska (5 AAC 38.076) included measures designed to

limit efficiency and slow the pace of fishing, gear regulations that reduce the capture rate of small scallops, onboard observer coverage and crab bycatch limits (Kruse et al. 1992).

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 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 state of Alaska 1995 scallop interim use permit card to the Commercial Fisheries Entry Commission (CFEC) 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 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 11 amendments to the scallop FMP.

In 1997, the Alaska legislature approved legislation (AS 16.43.906) enacting a temporary state waters (0-3 nautical miles) vessel moratorium. In 2001, the legislature authorized a 3-year extension of the moratorium, with an expiration date of July 1, 2004. During the 2002 legislative session, passage of House Bill (HB) 206 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-based limited entry permit system for the statewide weathervane scallop fishery prior to the moratorium expiration on July 1, 2004. Eight vessel owners received permits to fish for weathervane scallops in state waters. However, the program has a sunset provision. Weathervane scallop fishing in state waters will revert to an open access fishery and vessel entry permits issued for the statewide weathervane scallop fishery will expire on December 31, 2008 unless statutory authority is extended.

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 statewide regulatory fishing season for weathervane scallops, outside of the Cook Inlet Registration Area, is July 1 through February 15, while the regulatory fishing season in the Cook Inlet Registration Area is August 15 through October 31. Fisheries may be closed at any time by emergency order. Scallop guideline harvest ranges (GHRs) and crab bycatch limits (CBLs) for the 2005/06 season, excluding Cook Inlet, were announced by news release on June 3, 2005. The scallop GHR and CBLs for Cook Inlet were announced by news release on June 22, 2005. The upper limit of the combined GHRs in the Westward Region totaled 395,000 lb of scallop meats, in the Southeastern Region combined GHRs totaled 235,000 lb of scallop meats, Prince William Sound GHR limit was 50,000 lb of scallop meats, and in Cook Inlet the GHR limit was 7,000 lb of scallop meats.

CBLs for red red king crabs, 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. Annual CBLs are established preseason 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 t 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 estimated from the 2000 scallop assessment survey. This resulted in bycatch limits of 2,700 and 8,700 for the east and west harvest areas.

CBLs in the Bering Sea (Scallop 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 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 population estimate of snow crab and 0.13542% of the best available population estimate of Tanner crab abundance in the Bering Sea. 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 Scallop 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 pounds 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.

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.

YAKUTAT REGISTRATION AREA

The Yakutat Registration Area is defined as Area D, described in 5 AAC 38.160, and all waters of District 16 as described in 5 AAC 31.105(p). These descriptions include those waters in the GOA north of the latitude of Cape Spencer (58° 12.27' N lat., 136° 39.75' W long.) and east of the longitude of Cape Suckling at 144° W. long. For management purposes these waters are divided into two management areas – Area D and District 16 (Figure 3). The waters of Yakutat Bay east of a line from the easternmost tip of Ocean Cape at 59°32.05' N. lat., 139°52.03' W. long. to the southernmost tip of Point Manby at 59°41.07' N. lat., 140°18.06' W. long. are closed to the taking of scallops (Figure 3).

HISTORIC BACKGROUND

The earliest years of the fishery occurred in Area D and were very productive. Previously unfished biomass supported harvests of over 900,000 pounds in 1968 and over 800,000 pounds in 1969 (Table 5). These years were followed by two decades of reduced effort and harvests. In late spring of 1991, Yakutat Bay was closed to commercial scallop dredging by the Board of Fisheries. A statewide trend of increasing interest and participation in scallop fisheries in the early 1990s culminated in a peak harvest of over one million pounds in Area D in 1992 (Table 5). In 1993, guideline harvest ranges were first established under the Interim Management Plan for Commercial Scallop Fisheries in Alaska for registration areas where scallop fishing traditionally occurred. This included the Yakutat Registration Area.

Season closures also went into effect in 1993, with separate winter and summer fisheries in 1993 and 1994 (Table 5). 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. At the Board of Fisheries meeting in 1997 the regulatory season was changed to July 1-February 15.

The fisheries in District 16 started in 1980 as stocks in Area D to the north and west were fished down (Table 5). 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 ASFMP in 1993. Only a few vessels fished each season, with a maximum of eight vessels in 1994 (Table 5). The peak harvest of 162,888 pounds occurred in 1990 (Table 5), with an overall historical average of approximately 31,000 pounds in years when effort did occur. 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. 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, regulations changed so that the season was opened on July 1 and extended to February 15 (Bishop and Stratman 2006).

Mandatory observers are required on each vessel fishing for scallops in the Yakutat Registration Area. The observer program has two main goals: to monitor bycatch and to collect biological and commercial fishing information about the weathervane scallop. Observer sampling of the scallop catch and discarded scallops allows determination of the stock size composition. In addition, shells are collected for ageing in order to determine the age structure population dynamics of Yakutat Registration Area weathervane scallop populations (Bishop and Stratman 2006).

Dungeness and Tanner crab are captured incidentally in scallop dredges in the Yakutat fishery; however, there are no crab bycatch caps established. Although the Alaska State Fishery Management Plan states that bycatch limits may be required for scallop fisheries opened by permit, no bycatch limits have been established to date for the scallop fishery in the Yakutat Registration Area since there is yet no annual survey in existence to estimate the population of Tanner crab (Barnhart and Rosenkranz 2000).

2005/06 FISHERY

The 2005/06 scallop fishing season in the Yakutat Registration Area was open July 1, 2005 through February 15, 2006. Two catcher-processors fished in the Yakutat Registration Area. Recent increases in scallop prices led to increased effort and harvest during the 2005/06 Yakutat scallop fishery, with a total of about 214,000 lbs of scallop meats landed from Area D and District 16 combined (Tables 6 and 7). Yakutat Registration Area-wide CPUE, which averaged 46 lbs meat/dredge hr during the 2000/01–2004/05 seasons, fell to 39 lbs meat/dredge hr for 2005/06.

Based on inseason observer reports, estimated Tanner crab bycatch increased from less than 1,000 crabs during the 2004/05 season to 5,364 crabs during the 2005/06 Yakutat scallop fishery for Area D and District 16 combined. The Tanner crab bycatch rate also increased, moving from about 1/3 crab/dredge hr during 2004/05 to about 1 crab/dredge hr during 2005/06. These rates remain low compared to other scallop fishing areas in the state. An estimated 394 Dungeness crabs and 518 halibut were also incidentally caught in the 2005/06 Yakutat Registration Area scallop fishery.

Area D

Area D has as its western boundary the longitude of Cape Suckling (144° W. long.) and as its southern boundary a line extending seaward from the western tip of Cape Fairweather, at 58°47.89' N. lat., 137°56.68' W. long., to the intersection with the seaward limit of the three-nautical-mile territorial sea at 58°45.91' N. lat., 138°01.53 W. long (Figure 3).

The GHR for Area D was set at zero to 200,000 pounds of scallop meats (Table 7). Two catcher processors participated in the fishery in Area D. Based on indications from observer reports that upper-end harvest caps would be met, Area D was closed by emergency order on January 25, 2006. The Area D scallop harvest as reported on fish tickets totaled 199,351 pounds of scallop meats (Table 7).

Figure 6 depicts the estimated shell height (SH) distributions of the retained and discarded scallop catch in Area D, based on statistical resampling of the discarded and retained SH measurements in equal proportion. The histograms depict annual recruitment to the Area D

scallop population. Recruitment to the harvestable population (scallops >100 mm SH) appears to continue. Histograms of shell height distributions for Area D show few changes between the 2004/05 and 2005/06 seasons. Scallops in the 120–130 mm SH range continue to dominate harvests, with few larger animals taken. The average SH of retained scallops in Area D during the 2005/06 season was 123 mm as compared to 124 mm SH during the previous season (Table 7).

A summary of the scallop catch in round weight (lb) of retained scallops, meat weight (lb) of retained scallops, dredge hours, and CPUE expressed in lb of scallop meats per dredge-hour (meat lb/drg-hr) from the 1993/94 through 2005/06 seasons is depicted in Figure 7. The graphs depicting round weight of retained scallops, meat weight of retained scallops, and total dredge hours demonstrate the increased effort seen in the 2005/06 fishery. The graph depicting CPUE shows little change in CPUE from the 2004/05 fishery, and relatively stable catch rates for the previous six seasons.

Stock Status

The weathervane scallop population in Area D of the Yakutat Registration Area is not annually surveyed and no estimate of abundance has been made. As scallop survey technology is advanced, this population will likely be surveyed. The 199,351 pounds of scallop meats harvested in the 2005/06 fishery was the highest harvest taken in the past six seasons (Table 7). However, due to fairly constant catch rates and a large increase in dredge hours (Table 7), it is more likely the increased harvest was due to an increase in effort, rather than an increased abundance of marketable sized scallops.

District 16

District 16 is defined in regulation as waters that are north of a line running west from the southernmost tip of Cape Spencer (58° 12.27' N lat., 136° 39.75' W long.) and south of a line extending seaward from the western tip of Cape Fairweather, at 58°47.89' N. lat., 137°56.68' W. long., to the intersection with the seaward limit of the three-nautical-mile territorial sea at 58°45.91' N. lat., 138°01.53 W. long (Figure 3).

The GHR for District 16 was set at zero to 35,000 pounds of scallop meats (Table 6). Two catcher processors participated in the fishery in District 16. The upper end of the GHR was not reached in District 16 during the 2005/06 season and the fishery was closed by regulation on February 15, 2006. The District 16 scallop harvest as reported on fish tickets totaled 13,650 pounds of scallop meats (Table 6).

Figure 4 depicts the estimated shell height (SH) distributions of the retained and discarded scallop catch in District 16, based on statistical resampling of the discarded and retained SH measurements in equal proportion. The histograms depict annual recruitment to the District 16 scallop population. Recruitment to the harvestable population (scallops >100 mm SH) appears to continue. Histograms of shell height distributions for District 16 show slight changes from the 2004/05 to 2005/06 seasons, with a slightly higher percentage of smaller scallops taken in the 2005/06 season. Scallops in the 110–120 mm SH range continue to dominate harvests, with few larger animals taken. The average SH of retained scallops in District 16 during the 2005/06 season was 119 mm as compared to 120 mm SH during the previous season (Table 6).

A summary of the scallop catch in round weight (lb) of retained scallops, meat weight (lb) of retained scallops, dredge hours, and CPUE expressed in lb of scallop meats per dredge-hour

(meat lb/drg-hr) from the 1993/94 through 2005/06 seasons is depicted in Figure 5. The graphs depicting round weight of retained scallops, meat weight of retained scallops, and CPUE show a decrease in harvest and CPUE from 2004/05 to the 2005/06 season. The graph depicting total dredge hours in the 2005/06 season shows little change in total effort from the 2004/05 season.

Stock Status

The weathervane scallop population in District 16 of the Yakutat Registration Area is not annually surveyed and no estimate of abundance has been made. As scallop survey technology is advanced, this population will likely be surveyed. The 13,650 pounds of scallop meats harvested in the 2005/06 fishery was a 45% reduction in harvest from the previous season (Table 6). With dredge hours remaining relatively stable between the 2004/05 and 2005/06 seasons, and a corresponding drop in harvest and CPUE between those same seasons (Table 6), it is possible that there was a decrease in abundance of marketable sized scallops in District 16.

PRINCE WILLIAM SOUND REGISTRATION AREA

Prince William Sound (PWS) Registration Area E includes territorial waters of Alaska from 144° 00' W. long. near Cape Suckling, to Cape Fairfield at 148°50.25' W. long. (Figure 8). The PWS Area is comprised of the Inside and Outside Districts. The Outside District is subdivided into the Eastern and Western Sections at 147° W. long. Only the Eastern Section of the Outside District is open to scallop fishing.

HISTORIC BACKGROUND

The commercial fishery for weathervane scallops in the PWS Area occurs in the proximity of Kayak Island and typically more than 3 miles from shore (Figure 8). From 1992 through 2004 total scallop harvests in the PWS area have ranged 18,000 lb in 1997-98 to 208,000 lb in 1992, while participation has ranged from 1 to 7 vessels (Table 8).

The initial scallop fishery in the PWS Area occurred in 1992. A harvest level of 64,000 lb for waters east of 147° 00' W. long. was determined in season using area-swept methods and a 10% harvest rate (unpublished survey data). The fishery began in February and closed in April with a harvest total of approximately 209,000 lb of meats by 4 vessels (Table 9). The discrepancy between the 1992 intended harvest level and actual harvest was attributed to a lack of timely and accurate catch reporting and insufficient data about the scallop biomass.

In 1993, the Interim Management Plan for Commercial Scallop Fisheries in Alaska established the GHR for weathervane scallops in Area E as 0-50,000 lb of scallop meats. The 1993 season opened July 15 with a 50,000 lb GHR cap and closed July 18 with seven vessels landing 63,068 lb of meats.

The Alaska Scallop Fishery Management Plan (BOF adopted in 1994) changed the season opening date from July 1 to January 10 with closure by emergency order. In addition, closure areas in eastern PWS and along the Copper River Delta to protect depressed Tanner crab and Dungeness crab stocks were identified. The 1994 commercial scallop season did not open due to the change in the season opening date as it would have resulted in doubling the harvest in a single cycle.

The 1995 weathervane scallop fishery opened January 10 and closed January 26 when the 50,000 lb GHR cap was attained. Subsequent to the closure, an unlicensed vessel fished in federal waters off of Kayak Island and harvested an additional 58,000 lb of scallop meats. Federal

fisheries managers subsequently closed all scallop fisheries in federal waters off Alaska. In August 1995, ADF&G initiated a fishery-independent scallop survey in waters east of Kayak Island to assess stock condition and effects of the postseason harvest.

The January 1996 commercial scallop season remained closed while federal fisheries regulations were restructured. However, ADF&G conducted a systematic area-swept assessment survey in the proximity of Kayak Island using an 8-ft New Bedford style dredge donated by the scallop industry. The dredge was equipped with a liner to maximize retention of scallops of all sizes to facilitate sampling for age, size, and sex. This initial effort established the precedent of a biennial survey to establish GHRs for two consecutive fishing seasons. In March of 1997, the BOF adopted a regulation changing season opening date from January 10 back to July 1.

In 1998, ADF&G expanded its assessment survey to include waters located west of Kayak Island and used these data to establish separate GHRs for waters east and west of Cape Saint Elias (Figure 9). Scallops beds were determined to occupy fairly discrete and limited areas with the highest concentrations occurring in federal waters. Based on results of this survey ADF&G announced a GHR of 6,000 and 14,000 lb of scallop meats for east and west areas respectively.

In March 2000, the BOF adopted regulations restricting the scallop fishery to the Eastern Section of the Outside District. This measure provided the opportunity for some exploration while protecting areas ADF&G did not assess. Based on improved results of the May 2000 assessment survey, GHRs were increased to 9,000 and 21,000 lb of scallop meats for areas east and west of Cape Saint Elias

The GHR for the 2002/03 and 2003/04 season scallop seasons was set at 6,000 lb and 14,000 lb for the east and west harvest areas respectively. During the 2002/03 season the west side closed on February 14 and the east side closed by regulation on February 15 with a harvest total of 15,641 lb from two vessels. Failure of the fishery to achieve the GHR was attributed to scheduling by participants. Catch rates in the fishery were comparable to previous seasons. During the 2003/04 season the west side closed on January 23 and the eastside closed on January 24 with a fishery harvest total of 19,980 lb from a single vessel.

Following the May 2004 assessment survey, The GHRs for the 2004/05 season were established at 26,000 lb and 24,000 lb for waters east and west of Cape Saint Elias. The east side closed on October 22 and the west side closed by regulation on February 15 with a fishery harvest total of 49,320 lb from two vessels.

2005/06 FISHERY

The 2005/06 scallop season opened July 1 with GHRs of 26,000 and 24,000 lb of scallop meats for harvest areas east and west of Cape Saint Elias. Waters west of the longitude of Cape Saint Elias were closed to commercial scallop fishing on August 13. Waters east of the longitude of Cape Saint Elias closed to commercial scallop fishing on August 22. The total harvest from three vessels was 49,205 lb, Tanner crab bycatch estimates were 173 and 234 for the east and west areas.

Figure 10 depicts the estimated shell height (SH) distributions of the retained and discarded scallop catch in the PWS fishery based on statistical resampling of the discarded and retained SH measurements in equal proportion. The 2005/06 histogram depicts a fairly narrow range of scallop sizes that supported the fishery with scallop SH of 125–140 mm comprising

approximately 77% of the catch sample. However, recruitment to the scallop population SH < 120 mm is better represented by a broader range of sizes than in other years.

A summary of the scallop catch in round weight (lb) of retained scallops, meat weight (lb) of retained scallops, dredge-hours, and CPUE expressed in lb of scallop meats per dredge hour (meat lb/drg-hr) from the 1993/94 through 2005/06 seasons is depicted in Figure 11. The 2005/06 fishery CPUE of 100 meat lb/drg-hr is slightly below average. However, a decline in CPUE was anticipated as two vessels each fished with a single six-ft dredge.

STOCK STATUS

The Central Region commercial fisheries research staff conducts scallop surveys via a systematic area-swept assessment. The survey conducts 1 nautical mile tows with an 8-foot scallop dredge equipped with a fine mesh liner to maximize retention of scallop samples that are used for assessing age and size composition and sexual maturity. Central Region staff is also conducting a dredge catchability study using cameras on the dredge and combining it with some preliminary video scallop work. Fishery-independent surveys of the east and west scallop beds adjacent to Kayak Island (Figure 9) were conducted in 1996, 1998, 2000, 2002 and 2004.

The 2002 assessment survey yielded poor results. Available age composition data indicated poor recruitment for this population. A decline in stock biomass would be expected given the relatively poor recruitment observed in recent years. However, it is likely that population biomass estimates were artificially low due to difficulties with the survey gear. As a precaution, ADF&G applied the GHR from the 1998 assessment levels to the 2002/03 and 2003/04 season scallop seasons.

Results of the 2004 assessment survey were substantially improved and GHRs of 26,000 lb and 24,000 lb for waters east and west of Cape Saint Elias were established by applying harvest rates of 5.2% and 5.3% to the respective population estimates. The combined GHRs are currently at the limit of the guideline harvest range cap established in regulation (0 - 50,000 lb). The GHL established in regulation appears to be appropriate for a long-lived species such as weathervane scallops with a maximum age in excess of 20 years.

Survey age composition has ranged from age-1 zero to age-20. The progression of strong cohorts is somewhat difficult to see in the data. The dominant age classes in most years are between seven and 12 years old, but the full range of age and size classes are observed in the survey data (Table 10). In 67% of the surveys, weighted age composition data indicated that well over ½ of the surveyed population was between ages seven and 12; however the catch of younger and older scallops is still good (Table 10). Such diversity in the age composition of the survey catch as well as in the fishery indicates relatively strong resilience to population disturbances.

COOK INLET REGISTRATION AREA

The Cook Inlet Management Area (Area H) as it applies to the commercial scallop fishery, is defined as those waters of Cook Inlet and the outer Kenai Peninsula located north of the latitude of Cape Douglas (58° 51.10' N. lat.) on the Alaska Peninsula and west of the longitude of Cape Fairfield (148° 50.25' W. long.) (Figure 12). The management area is divided into seven shellfish districts: Northern, Central, Kamishak, Southern, Barren Islands, Outer, and Eastern.

HISTORIC BACKGROUND

The commercial Pacific weathervane scallop fishery in the Cook Inlet Management Area dates to 1983 when the department first issued commissioner's permits for fishing (Table 11). Permits stipulated fishing in the Kamishak District only, with a single 6-foot dredge with 4-inch rings, logbooks, contact with ADF&G prior to and at the completion of each trip, and accommodation of a department observer upon request. By 1984, the dredge and ring size restrictions and a Southern District scallop closure were in regulation. In 1985, the BOF established an August 15 through October 31 regulatory season in the Kamishak District and a GHR of 10,000 to 20,000 pounds of scallop meats. Currently, the Southern District is closed to scallop fishing by regulation to protect crab stocks, while the Outer and Eastern Districts are open to exploratory fishing under a permit issued by ADF&G.

With the exception of a single landing from the Outer District in 1987, the "north" scallop bed, located east of Augustine Island in the Kamishak District produced all harvests from 1983 through 2001 (Table 11; Figure 13). Beginning in 2002 the "south bed" accounted for some or all of a given year's harvest.

2005 FISHERY

The 2005 scallop season in the Cook Inlet Area opened at noon August 15 with a 7,000 lb GHR. Fishing was restricted to the north bed based upon the May 2005 survey results that indicated a stable biomass for this area from the previous survey. The south bed remained closed due to a sharp decline in biomass apparent from the 2005 survey. Bycatch caps of 35,000 Tanner crab and 60 king crab were set based upon the dredge survey's Tanner crab catches and a static king crab bycatch level. Two vessels participated and catch data are confidential. The season closed at 0730 hours August 31 based upon catch projections indicating the GHR would be achieved at that time.

Kamishak District

The Kamishak Bay District is defined as all waters enclosed by a line from 59° 46.15' N. lat., 153° 00.70' W. long., then east to 59° 46.15' N. lat., 152° 20.00' W. long., then south to 59° 03.42' N lat., 152° 20.00' W. long., then southwesterly to Cape Douglas (58° 51.10' N. lat.; Figure 12).

Initial fishing in the Kamishak District began in 1983. In 1987, ADF&G closed the Kamishak scallop fishery by emergency order when the stock declined dramatically. Although the fishery reopened in 1988, no commercial effort occurred in Cook Inlet from 1988 through 1992 because fishermen anticipated poor fishery performance would result in further closure of the fishery. In 1993, the fishery "redeveloped" when three boats harvested 20,115 lb. Logbooks, shell samples, and fishery performance data revealed a small, but healthy, stock of scallops in the Kamishak District.

In early 1995, efforts of a single vessel commercially fishing scallops off the Prince William Sound Management Area exposed a regulatory loophole that resulted in a scallop fishing closure in all federal waters for the balance of 1995. This action effectively closed the Kamishak Bay fishery, which occurs almost exclusively in federal waters. Based on the 1995 closure and results of a 1996 survey, ADF&G set a 1996 fishery GHR of 28,000 lb. Subsequent fishery GHRs from 1997 to 2002 remained at the maximum 20,000 lb level and with the exception of 1998, when inclement weather restricted fishing by the single participating vessel, have been achieved prior to the regulatory

closure date (Table 12). ADF&G has monitored the fishery via logbooks, shell samples, onboard observations, and skipper interviews. Fishery CPUE in pounds of scallop meats caught per hour towed (lb/hr), increased steadily from approximately 50 lb/hr in 1996 to 1998 to a high of 73 lb/hr in 2000 and declined again in 2001. Effort has ranged from one to five vessels. Tanner crab bycatch caps, equal to 0.5% of the estimated Tanner crab abundance, have been set annually and have ranged from 20,000 to 35,000 crab. For king crab, the annual bycatch level has been set at 60, due to continued depression of those stocks. Annual crab bycatch has ranged from 205 to 10,200 Tanner crab and 9 to 53 king crab.

During the 2002 fishery, CPUE declined dramatically to 25 lb/hr and the incidence of "cluckers", dead scallops with the valves connected but lacking soft tissues, increased to a level previously unobserved in Cook Inlet. Ages of cluckers sampled in the commercial fishery ranged from 2 to 16 years with the majority being age 6 to 8 years. Although age distributions of cluckers compared to live samples appeared similar, a Chi-square test showed a statistically significant difference (X^2 <.01, 15 d.f.). This difference may be partially attributable to the small sample size of cluckers (n = 110) relative to the live scallop sample size (n = 476) and natural mortality.

Scallops sampled from the 2002 fishery and analyzed by ADF&G's pathology laboratory provided no conclusive explanation for the increased mortality in the stock but did suggest infestation by a polychaete worm *Polydora sp.* that can burrow through the scallop shell and cause toxic mortality. Typically, this occurs through formation of a "mud blister" or pustular abscess along the inner layer of the shell. Anecdotal information suggests that fishermen observed a greater incidence of mud blisters during the 2002 season. Salinity, water temperature, and substrate composition appear to be the determining factors in worm abundance.

Due to a low fishery CPUE and the time-intensive process of sorting live from dead scallops, fishery participants shifted to the "south" bed, located southeast of Augustine Island (Figure 13). Still within the Kamishak District, but previously unsurveyed by ADF&G, the new bed yielded a slightly higher CPUE of 33 lb/hr and a lower incidence of cluckers, reducing the catch sorting time. Age structure in the newly fished area was older with 50% of the scallop fishery samples being older than age 11. In response to the decline in CPUE, the unexplained mortality in the traditional fishing area, and the lack of assessment data for the new bed, ADF&G reduced the 2002 fishery GHL to 9,000 lb.

Following a survey and stock assessment of both beds in May 2003, ADF&G announced the entire 20,000 lb GHL would be harvested from the south bed (Table 12). This harvest level equated to approximately a 5.5% harvest rate. Although harvest data are confidential, catch rates in the fishery were approximately half those observed in 2002. In 2004, the fishery was also managed for a 20,000 lb GHL. Although both beds were open to fishing, a maximum allowable harvest of 6,500 lb of meat was set for the north bed. In the preseason news release, ADF&G announced intent to use this opportunity to assess the status of scallops in the north bed. Catch rates in the north bed were less than half those observed in 2002 and fishing closed on August 19, approximately 4 days after opening. Fishing in the south bed closed September 9 due to catch rates below those observed in the 2003 fishery.

STOCK STATUS

Fishery-independent surveys of the north and south scallop beds in Kamishak Bay (Figure 13) were conducted in 2003, and 2005. In the years prior to 2003 (1984, 1996, 1998, 1999 and

2001), the survey covered only the north scallop bed (as the south bed had not yet been detected).

The survey conducts 1 nautical mile tows with an 8-foot scallop dredge equipped with a fine mesh liner to maximize retention of scallop samples that are used for assessing age and size composition and sexual maturity (Bechtol and Gustafson 2002). The survey involves a quasi-adaptive systematic sampling design using a grid of 1.0 by 1.0 nautical mile squares placed over a chart of the northern and southern weathervane scallop beds located directly east of Augustine Island (Figure 13). This survey is now conducted on a biennial basis with the next survey in 2007, and upcoming modifications to the sampling design will allow extrapolation of dredge tow data to be expanded to a standardized area.

The 2005 scallop biomass estimate for the north bed was 2.7 million lb and for the south bed, 1.37 million lb. Meat recoveries were 6.9% of whole scallop weight. The steep decline in biomass experienced by Kamishak District scallops has been reflected in both ADF&G's survey and fishery CPUE. The north bed declined by approximately 67% between the 2001 and 2003 surveys and appeared to stabilize based upon the 2005 survey. Similarly, the south bed declined by approximately 75% between the 2003 and 2005 surveys.

Survey age composition has ranged from young-of-the-year age zero to age 24 (Bechtol 2000; Bechtol and Gustafson 2002). The progression of strong cohorts can be seen growing across some calendar years, and young age classes tend to be the most abundant age classes in the survey. In 56% of the surveys, weighted age composition data indicated that over ½ of the surveyed population were between ages zero and seven; however the catch of older scallops is still quite good (Table 13). Such diversity in the age composition of the survey catch as well as in the fishery indicates relatively strong resilience to population disturbances. This is likely due to the fact that: (1) the population is supported by a wide range of age classes; and (2) the fishery is not strictly dependent upon recruitment pulses. Size-at-age indicates asymptotic growth for the Kamishak Bay scallop population. The greatest annual growth in height occurs during the first 5 years of life, with growth rates decreasing rapidly to less than 1% per year after about age 13. Annual growth in weight is greatest from about age 2 to age 5.

The regulatory maximum GHL for the Kamishak Bay scallop fishery is 20,000 lb of meats. A retrospective analysis using a preliminary age-structured model suggested that harvest rates of the Kamishak Bay population ranged from 2.6 to 4.7% of the estimated population (Bechtol 2000). These harvest rates are substantially less than the instantaneous natural mortality rate of 14% estimated by the age-structured model, and also less than the median natural mortality estimate of 15% calculated by several methods for weathervane scallops off Alaska. Thus, the 20,000 lb GHL established in regulation is moderately conservative, which is probably appropriate for a long-lived species such as weathervane scallops with a maximum age in excess of 20 years.

All other Districts

Aside from some exploratory fishing in the Outer District in 1987, there has been no interest in fishing for scallops in districts other than the Kamishak District. No concentrations of scallops have been identified during either department surveys or in anecdotal reports from fishermen. Although regulations provide for a permit fishery in the Outer and Eastern Districts, including an observer requirement, it is unlikely ADF&G would issue a permit for exploratory fishing without first

obtaining information on scallop abundance. ADF&G does not anticipate any interest in fishing these districts.

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 16). 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 originated in Alaska, vessel operators targeted fishing grounds along the east side of Kodiak Island. By 1968, 734,084 lb of scallop meats were landed from eight vessels (Table 14). 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 all federal waters within Alaska were closed to scallop fishing by federal emergency rule and state waters of the Kodiak Registration Area were 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 interim Alaska Scallop Fishery Management Plan in 1993, crab bycatch limits were developed for the Kodiak Area. In 1994, with passage of the Alaska Scallop Fishery Management Plan, the regulatory season for weathervane scallops in the Westward Region was established by the BOF as July 1 through February 15.

2005/06 FISHERY

The 2005/06 scallop fishing season was open July 1, 2005 through February 15, 2006. 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 16) 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 scallop meats (Table 15). 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 30,000 lb of scallop meats while the harvest cap in statistical area 525630 was 25,000 lb of scallop meats. The remaining 25,000 lb of the overall GHR was allocated to any other waters open to scallop fishing in the Northeast District.

Three catcher-processors participated in the fishery with initial effort in early July. Based on inseason observer reports, an estimated 28,543 Tanner crabs and no red king crabs were caught from a bycatch limit of 449,403 Tanner crabs and 45 red king crabs. Based on indications from observer reports that upper-end harvest caps would be met, statistical area 525630 was closed on December 11, 2005, the remainder of the Northeast District except statistical area 525702 was closed on December 19, 2005, and statistical area 525702 was closed on January 17, 2006. The Northeast District scallop harvest as reported on fish tickets, totaled 79,990 lb of scallop meats (Table 15).

Figure 17 depicts the estimated 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 histograms depict annual recruitment to the Northeast District scallop population with above average recruitment in 2005/06, based on the estimated frequency of scallops <115 mm SH in the size distribution. A broad range of scallop sizes supports the fishery. The average SH of retained scallops in the Northeast District during the 2005/06 season was 139 mm as compared to 144 mm SH during the previous season (Table 16).

A summary of the scallop catch in round weight (lb) of retained scallops, meat weight (lb) of retained scallops, dredge hours, and CPUE expressed in lb of scallop meats per dredge-hour (meat lb/drg-hr) from the 1993/94 through 2005/06 seasons is depicted in Figure 18. Between the 1999/2000 and 2004/05 seasons, the fishery in this district was characterized by relatively steady effort (dredge hours), level harvest of meats, and stable to increasing fishery performance as measured by CPUE in meat lb/drg-hr. However, during the 2005/06 season, dredge hours increased and CPUE decreased with the entry of a participant unfamiliar with the fishing grounds.

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. As scallop survey technology is advanced, this population will likely be surveyed. Since the 1999/2000 season, the commercial catch has remained level, ranging from 77,119 to 80,470 lb of scallop meats (Table 16). Over the same time period, the estimated round weight of the retained scallop catch ranged from 681,192 lb to 952,972 lb (Table 17).

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 16).

The GHR for the Shelikof District was set at zero to 160,000 lb of scallop meats (Table 18). The district was divided into north and south zones at the latitude of Cape Chiniak, 58° 30′ N lat., with a harvest cap in the north zone of 130,000 lb of scallop meats and a harvest cap in the south zone of 30,000 lb of scallop meats. Two catcher-processors participated in the fishery with initial effort in early-July. Based on inseason observer reports, an estimated 17,149 Tanner crabs and no red king crabs were caught from a bycatch limit of 51,822 Tanner crabs and 1,345 red king crabs. Based on indications from observer reports that upper-end harvest caps would be met, the north zone was closed on December 9, 2005. The remainder of the district including the south zone, closed on December 11, 2005. The Shelikof District scallop harvest as reported on fish tickets, totaled 159,941 lb of scallop meats (Table 16, 18).

Figure 19 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. The histograms depict annual recruitment to the Shelikof District scallop population with below average recruitment in 2005/06 based on the estimated frequency of scallops <115 mm SH in the size distribution. A broad range of scallop sizes has historically supported the fishery. The average SH of retained scallops in the Shelikof District during the 2005/06 season of 136 mm was similar to the average SH of 137mm recorded during the previous season. Since the 1993/94 season, the average annual SH has ranged from 128 mm to 140 mm (Table 16).

A summary of the scallop catch in round weight (lb) of retained scallops, meat weight (lb) of retained scallops, dredge hours, and CPUE (meat lb/drg-hr) in the Shelikof District from 1994/95 through 2005/06 is depicted in Figure 20. CPUE increased from 50 meat lb/drg-hr during the 2004/05 season to 70 meat lb/drg-hr in 2005/06 season (Table 18).

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 remained level, as the department allowed the annual harvest to reach the upper limit of the GHR, set at 180,000 lb of scallop meats. However, in 2004/05, the season was closed prior to reaching the GHR cap due to the attainment of the CBL, and in the 2005/06 season, the GHR cap was lowered from 180,000 lb of scallop meats to 160,000 lb of scallop meats. The estimated round weight of the retained scallop catch between 1998/1999 and 2005/06 ranged from 1,454,806 lb to 2,129,025 lb, averaging 1,788,673 lb each season (Table 17).

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 16). 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 2005/06 fishing season, although it was open from July 1, 2005 to February 15, 2006.

Since the 1993/94 season, harvest has ranged from zero to 55,487 lb of scallop meats (Table 16, 19). 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 16, 19).

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 21).

Areas closed to fishing include all state waters and offshore waters of Unimak Bight and Mitrofania 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 Mitrofania 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 scallop meats were landed from six vessels (Table 18). Since the 1993/94 season, CPUE has ranged from 24 to 61 meat lb/drg-hr (Table 19). 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.

2005/06 FISHERY

In the Alaska Peninsula Registration Area, the historically important scallop grounds between 160° W long. and 161° W long. were open for a small exploratory fishery with a GHR of 0 to 10,000 lb of scallop meat (Table 19). The GHR for the remainder of the registration area, outside of 160° W long. and 161° W long. was 0 to 10,000 lb of scallop meat, for a total GHR of 0 to 20,000 lb for the area (Table 21).

There was no effort in this fishery during the 2005/06 season (Table 20).

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 22). 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 22). 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 scallop 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 scallop meats were landed from eight different vessels. The 1995/96 fishery was closed by federal emergency rule which closed all federal waters within Alaska. 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 scallop meats per season. Since the 2000/01 season, the Bering Sea fishery has not been constrained by CBLs.

2005/06 FISHERY

The GHR for the Bering Sea Registration Area was set at zero to 50,000 lb of scallop meat (Table 23). One catcher-processor participated in the Bering Sea fishery during December 2005. Inseason observer reports showed that an estimated 16,618 Tanner crabs, 5,532 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 2005/06 fishery closed by regulation on February 15, 2006. The Bering Sea scallop harvest as reported on fish tickets, totaled 23,220 lb of scallop meats (Table 22, 23).

Figure 23 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, average scallop SH has ranged from 141 mm to 154 mm (Table 16). The 2005/06 average SH of 154 mm is the largest since record keeping began in 1993. Bering Sea scallops are among the largest scallops harvested in the Westward Region.

A summary of the scallop catch in round weight (lb) of retained scallops, scallop meat weight (lb) of retained scallops, dredge hours, and CPUE (meat lb/drg-hr) is depicted in Figure 24. The 2005/06 season CPUE of 39 meat lb/drg-hr was slightly higher then the previous season's CPUE of 36 meat lb/drg-hr, the lowest since onboard data collection was initiated during the 1993/94 season (Table 23).

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; however, 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.

The 2005/06 harvest of 23,220 lb of scallop meats was double that of the previous season, when the harvest was the lowest since observers began collecting data (Table 23). 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 22).

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 17).

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 25).

HISTORIC BACKGROUND

In the Dutch Harbor Registration Area, closed waters were established in 1986 to protect crab nursery areas (Figure 25). 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 24). 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 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 25). Scallop fishing was limited to state waters during the 1995/96 season because federal waters statewide were closed to scallop fishing by federal emergency rule.

2005/06 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 six seasons (Table 24, 25). 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.- Russia Convention Line of 1867 and south of 55° 30′ N. lat. (Figure 26).

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 pink scallop *Chlamys* fishery (Figure 26). 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.

2005/06 Fishery

The 2005/06 fishery opened July 1, 2005 and closed by regulation on February 15, 2006. The GHR for the Adak Registration Area was set at zero to 75,000 lb of scallop meat. No vessels participated in the fishery during 2005/06 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.

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TABLES AND FIGURES

Table 1.–Historic statewide commercial weathervane scallop number of vessels, number of landings, and harvest, 1967–2005/06.

Year	Number Vessels	Number Landings[a]	Harvest[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[c]
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	1,229,384
1995/96	10	29	410,753[d]
1996/97	9	30	732,424
1997/98	9	31	818,913
1998/99	8	35	820,845
1999/2000	10	22	838,046

-continued-

Table 1.–Page 2 of 2

Year	Number Vessels	Number Landings[a]	Harvest[b]
2000/01	8	20	750,617[c]
2001/02	6	26	572,838
2002/03	6	28	509,455
2003/04	4	32	500,379
2004/05	5	22	431,594
2005/06	4	23	532,741

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

[a] Prior to and including 1994/95, reported number of landings 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.

[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 of 59,720 pounds.

[e] January 1 through June 30.

Table 2.–Federal and State Weathervane Scallop Permits, 2005/06.

Federal Scallop License Limitation Permits

License Holder	Vessel Name	MLOA[a]	Dredge-Size Restriction
Ocean Fisheries, LLC[b]	Ocean Hunter	102	None
Alaska Scallop, LLC[c]	Provider	96	None
Forum Star, Inc.	Forum Star	97	None
Hogan, Thomas C.	Kilkenny	75	2 scallop dredges combined width less than or equal to 20 feet (6.1m)
Hulse, Max et al.	Wayward Wind	79	2 scallop dredges combined width less than or equal to 20 feet (6.1m)
Gilmartin, Thomas[d]	Arctic Storm	70	None
Provider, Inc	Provider	124	None
Pursuit, Inc	Pursuit	101	None

State Scallop Limited Entry Vessel Permits[e]

License Holder	Vessel Name	Vessel Length	Permited Vessel Size
Ocean Fisheries, LLC	Ocean Hunter	102	Over 80'
Provider, Inc	Provider	123	Over 80'
Carolina Boy, Inc	Carolina Boy	95	Over 80'
Forum Star, LLC	Forum Star	96	Over 80'
Future Fisheries	Pursuit	101	Permit Cancelled
La Brisa, Inc	Wayward Wind	79	80' or less
Hogan, Thomas C.	Kilkenny	75	80' or less
Gilmartin, Thomas	Arctic Storm	57	80' or less

[a] Maximum length overall measured in feet

[b] Original permit holder was Carolina Boy, Inc.

[c] Original permit holder was Carolina Girl, Inc.

[d] Original permit holder was Oceanic Research Services

[e] State limited entry vessel permits do not have gear restrictions. Gear restrictions are contained in Alaska Administrative Code Chapter 38.

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	[a]	[a]	NA
Remainder of Area D	[a]	[a]	NA
Prince William Sound (E)			
Eastern Section of outside District	[a]	East = 2,700; West = 8,700	NA
Cook Inlet (H)			
Kamishak District	60 crabs[b]	0.5%	NA
Outer/Easter/Barren Island Districts	[a]	[a]	NA
Kodiak (K)			
Northeast District	0.5% or 1.0%	0.5% or 1.0%	NA
Shelikof District	0.5% or 1.0%	0.5% or 1.0%	NA
Semidi District	Regulated inseason	Regulated inseason	NA
Alaska Peninsula (M)	0.5% or 1.0%	0.5% or 1.0%	NA
Bering Sea (Q)	500 crabs[b]	3 Tier Approach	3 Tier Approach
Dutch Harbor (O)	0.5% or 1.0%	0.5% or 1.0%	NA
Adak (R)	50[c]	10,000[c]	NA

[a] Bycatch caps not established.

[b] Based on 0.5% of the Tanner crab population estimated from the 2000 scallop assessment survey

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

NA = Not applicable

Table 4.– Historic commercial catch, effort, and value of weathervane scallops, Yakutat, Area D, 1969–2005/06.

Season	Number Vessels	Number Landings[a]	Commercial Catch (lb)[b]	Average Landing (lb)[c]	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows[d]
1969	14	59	837,087	14,188	0.85	711,524	[e]
1970	2	2	22,726	11,363	1.00	22,726	[e]
1971	3	10	84,948	8,475	1.05	89,195	[e]
1972	4	6	128,241	21,374	1.15	147,477	[e]
1973	4	4	173,700	43,425	1.20	208,440	[e]
1974	2	15	356,493	23,766	1.30	463,441	[e]
1975	6	11	122,853	11,168	1.40	171,994	[e]
1976	6	15	189,543	12,636	1.59	301,373	[e]
1977	2	3	22,121	7,374	[e]	[e]	[e]
1978				No Effort			
1979	1	1	30	30	2.78	83	[e]
1980	6	22	255,667	18,262	3.60	920,401	[e]
1981	10	36	455,858	12,663	4.00	1,823,432	[e]
1982	6	26	181,939	7,015	3.25	591,302	[e]
1983				No Effort			
1984	2			Confidential			
1985	2			Confidential			
1986	2			Confidential			
1987	1			Confidential			
1988	1			Confidential			
1989	1			Confidential			
1990	8	48	428,046	8,918	3.43	1,468,198	3,203
1991	5	55	402,571	7,319	3.82	1,537,821	3,849
1992	7	60	1,063,838	17,731	3.96	4,212,798	8,023
1993[f]	5	7	122,770	17,539	5.15	632,266	1,039
1993[g]	8	9	141,423	15,714	5.15	728,328	1,160
1994	11	18	253,060	14,059	5.79	1,465,217	2,096
1995	10	18	242,491	13,472	[e]	[e]	2,597
1996	4	15	238,736	15,916	6.30	1,504,037	2,102
1997	4	8	242,940	30,368	6.50	1,579,110	1,958
1998/99	8	49	241,678	4,932	6.40	1,546,739	2,193
1999/2000	3	22	249,681	11,349	6.25	1,560,506	1,720
2000/01	3	34	195,699	5,756	5.50	1,076,345	2,111

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Season	Number Vessels	Number Landings[a]	Commercial Catch (lb)[b]	Average Landing (lb)[c]	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows[d]
2001/02	2 [h]	20	103,800	5,190	5.50	570,900	1,096
2002/03	2 [h]	20	122,718	6,136	5.20	638,134	1,243
2003/04	2 [h]	23	160,918	6,996	5.25	844,820	1,716
2004/05	2 [h]	16	86,950	5,434	5.50	478,225	1,194
2005/06	2 [h]	38	199,351	5,246	8.50	1,694,484	2,585

[a] Reported number of landings equals number of fish tickets.

[b] Pounds of scallop meats as reported on fish tickets.

[c] Pounds of scallop meats.

[d] July 1, 1993-2005/06, number of tows are from vessel logbook data contained in the observer database.

[e] Not available.

[f] January 1, 1993-June 30, 1993, prior to onboard observer requirement.

[g] July 1, 1993-December 31, 1993.

[h] Confidential data voluntarily released by vessel operators.

Table 5.–Historic commercial catch, effort, and value of weathervane scallops, Yakutat, District 16, 1980–2005/06.

Season	Number Vessels	Number Landings[a]	Commercial Catch (lb)[b]	Average Landing (lb)[c]	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows[d]
1980	2	2	5,850	2,925	[e]	[e]	[e]
1981	1	1	7,693	7,693	[e]	[e]	[e]
1982	2	3	26,915	8,972	[e]	[e]	[e]
1983	1			Confidential			
1984	2			Confidential			
1985				No Effort			
1986				No Effort			
1987				No Effort			
1988				No Effort			
1989				No Effort			
1990	4	9	162,888	18,099	3.43	558,706	718
1991	3	9	39,817	4,424	3.82	152,101	665
1992	2			Confidential			
1993[f]	1			Confidential			
1993	1			Confidential			
1994	8	10	27,613	2,761	5.79	159,879	241
1995	7	8	33,302	4,163	[e]	[e]	599
1996	2[g]	4	34,060	8,515	6.30	214,578	554
1997	4	5	22,890	4,578	6.50	148,785	299
1998/99	3	6	34,153	5,692	6.40	218,579	359
1999/2000	2[g]	5	34,624	6,925	6.25	216,400	291
2000/01	3	11	30,904	2,809	5.50	169,972	244
2001/02	2[g]	7	20,398	2,914	5.50	112,189	193
2002/03	2[g]	3	3,685	1,228	5.20	19,162	55
2003/04	2[g]	2	1,072	536	5.25	5,628	12
2004/05	2[g]	6	24,430	4,072	5.50	134,365	213
2005/06	2[g]	4	13,650	3,413	8.50	116,025	197

[a] Reported number of landings equals number of fish tickets.

[b] Pounds of shucked scallop meats as reported on fish tickets.

[c] Pounds of shucked scallop meats.

[d] 1994-2005/06, number of tows are from vessel operator logbook/observer database.

[e] Not available.

[f] January 1, 1993-June 30, 1993, prior to onboard observer requirement.

[g] Confidential data voluntarily released by vessel operators.

Table 6.–Yakutat, District 16 scallop fishery summary statistics, 1993–2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Commercial Catch (lb meat)[c]	CPUE (lb meat per dredge hr)	Estimated round weight of scallop catch	CPUE (Estimated round weight of scallops per dredge hr)	Average Shell Height[d]
1993	1	35,000				Confidential		
1994	7[e]	35,000	408	27,613	68	239,867	587	147[f]/151[g]
1995	6[e]	35,000	1,095	33,302	30	447,469	409	132
1996	2[h]	35,000	917	34,060	37	422,064	460	126[f]/133[g]
1997	4	35,000	561	22,890	41	265,882	474	128
1998/99	3	35,000	702	34,153	49	384,286	547	123
1999/2000	2[h]	35,000	674	34,624	51	292,625	434	125
2000/01	3	35,000	476	30,904	65	310,370	652	118
2001/02	2[h]	35,000	417	20,398	49	245,319	588	119
2002/03	2[h]	35,000	100	3,685	37	60,928	609	120
2003/04	2[h]	35,000	18	1,072	59	16,780	839	121
2004/05	2[h]	35,000	419	24,430	58	326,228	780	120
2005/06	2[h]	35,000	407	13,650	34	209,487	515	119

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Average scallop shell heights (SH) in mm.

[e] One additional vessel fished by waiver without an observer; data not included.

[f] Winter season.

[g] Summer season.

[h] Confidential data voluntarily released by vessel operator.

Table 7.–Yakutat, Area D scallop fishery summary statistics, 1993–2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Commercial Catch (lb meat)[c]	CPUE (lb meat per dredge hr)	Estimated round weight of scallop catch	CPUE (Estimated round weight of scallops per dredge hr)	Average Shell Height[d]
1993[e]	7[f]	250,000	1,999	141,423	71	2,082,824	1,042	118
1994	10[f]	250,000	4,130	253,060	61	3,337,283	808	121[g]/122[h]
1995	8[i]	250,000	4,730	242,491	51	3,214,968	680	124
1996	4	250,000	4,438	238,736	54	3,195,254	720	121[g]/122[h]
1997	4	250,000	3,956	242,940	61	3,282,860	830	119
1998/99	8	250,000	4,192	241,678	58	3,475,996	829	123
1999/2000	3	250,000	3,840	249,681	65	3,119,103	812	124
2000/01	3	250,000	4,241	195,699	46	2,734,559	645	123
2001/02	2[j]	200,000	2,406	103,800	43	1,521,537	632	121
2002/03	2[j]	200,000	2,439	122,718	50	1,541,867	632	123
2003/04	2[j]	200,000	3,358	160,918	48	1,939,004	577	126
2004/05	2[j]	200,000	2,134	86,950	41	1,262,499	592	124
2005/06	2[j]	200,000	5,089	199,351	39	2,662,031	523	123

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Average scallop shell height (SH) in mm.

[e] July 1, 1993-December 31, 1993, after onboard observer requirement.

[f] One additional vessel fished by waiver without an observer; data not included.

[g] Winter season.

[h] Summer season.

[i] Two additional vessels fished by waiver without observers; data not included.

[j] Confidential data voluntarily released by vessel operators.

Table 8.–Historic commercial catch, effort, and value of weathervane scallops, Prince William Sound Registration Area, 1992–2005/06.

Season	Number Vessels	Number Landings[a]	Commercial Catch (lb)[b]	Average Landing (lb)[c]	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows[d]
1992	4	14	208,836	52,209	3.96	826,991	1,925
1993[e]				No Effort			
1993[f]	7	7	63,068	9,009	5.15	324,800	379
1994/95			Season closed due to regulatory change				
1995/96	3	5	108,000 [g]	21,600	[h]	[h]	243
1996/97			Season closed due to overharvest in 1995/96 from illegal fishing				
1997/98	1 [i]	1	18,000	18,000	6.50	117,000	99
1998/99	2 [i]	2	19,650	9,825	6.40	125,760	104
1999/2000	2 [i]	2	20,410	10,205	6.25	127,562	65
2000/01	3	8	30,266	3,783	5.50	166,463	201
2001/02	1 [i]	7	30,090	4,299	5.50	165,495	138
2002/03	2 [i]	5	15,641	3,128	5.20	81,333	150
2003/04	1 [i]	4	19,980	4,995	5.25	104,895	114
2004/05	2 [i]	6	49,320	8,220	5.50	271,260	336
2005/06	3	9	49,205	5,467	8.50	418,242	549

[a] Reported number of landings equals number of fish tickets.

[b] Pounds of scallop meats as reported on fish tickets.

[c] Pounds of scallop meats.

[d] July 1, 1993-2005/06, number of tows are from vessel logbook data contained in the observer database.

[e] January 1, 1993-June 30, 1993, prior to onboard observer requirement.

[f] July 1, 1993-December 31, 1993.

[g] Catch includes illegal harvest by one vessel; effort data not available for that vessel.

[h] Not available.

[i] Confidential data voluntarily released by vessel operators.

Table 9.–Prince William Sound Registration Area scallop fishery summary statistics, 1992–2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Commercial Catch (lb meat)[c]	CPUE (lb meat per dredge hr)	Estimated round weight of scallop catch	CPUE (Estimated round weight of scallops per dredge hr)	Average Shell Height[d]
1992[e]	4	[f]	[g]	208,836	[g]	[g]	[g]	[g]
1993[h]	1	No Effort						
1993[i]	7	50,000	638	63,068	99	850,718	1,333	124
1994/95	Season closed due to regulatory change							
1995/96	3	50,000	[j]	108,000[k]	[j]	[j]	[j]	125
1996/97	Season closed due to overharvest in 1995/96 from illegal fishing							
1997/98	1[l]	17,200	171	18,000	105	257,230	1,504	123
1998/99	2[l]	20,000	179	19,650	110	334,152	1,867	132
1999/2000	2[l]	20,000	149	20,410	137	211,140	1,417	132
2000/01	3	30,000	221	30,266	137	361,032	1,634	131
2001/02	1[l]	30,000	263	30,090	114	511,761	1,946	136
2002/03	2[l]	20,000	122	15,641	121	231,140	1,895	131
2003/04	1[l]	20,000	216	19,980	93	261,720	1,212	136
2004/05	2[l]	50,000	614	49,320	80	407,617	664	134
2005/06	3	50,000	491	49,205	100	818,741	1,667	131

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Average scallop shell height (SH) in mm.

[e] Prior to onboard observer requirement.

[f] Not established.

[g] Not available.

[h] January 1, 1993-June 30, 1993, prior to onboard observer requirement.

[i] July 1, 1993-December 31, 1993

[j] Confidential.

[k] Catch includes illegal harvest by one vessel.

[l] Confidential data voluntarily released by vessel operators.

Table 10.–Assigned ages of weathervane scallops from research surveys at Kayak Island, Prince William Sound Management Area, 1996-2004.

		Number	Number of scallops at age (years)[a]															
Year	Bed	Aged	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16+
1996	East	5,050	198	7	13	115	24	149	682	1,609	1,844	177	72	66	31	25	12	26
1998	East	2,564	290	8	12	3	11	15	37	77	405	707	529	175	113	59	65	58
1998	West	2,953	47	8	40	42	144	264	277	392	687	598	312	63	45	13	9	12
2000	East	5,240	418	58	165	94	25	28	71	123	203	791	1,339	1,090	566	114	109	46
2000	West	9,701	32	43	140	69	101	186	513	899	1,467	1,607	2,196	1,835	494	61	17	41
2002	East	697	4	34	10	12	19	7	1	6	3	33	43	123	126	161	100	15
2002	West	3,168	7	8	6	19	124	28	63	105	111	353	588	601	619	378	129	29
2004	East	593	12	24	12	53	54	12	19	9	13	24	29	42	60	63	85	82
2004	West	465	57	26	3	5	14	3	9	5	22	23	50	57	63	57	33	38

[a] Survey ages were assigned to all measured scallops using a height-at-age matrix developed from aged shells, except for scallops in 2004. Scallops in 2004 are only those that were aged.

Table 11.–Historic commercial catch, effort, value of weathervane scallops, Cook Inlet Registration Area, 1983–2005.

Season	Number Vessels	Number Landings[a]	Commercial Catch (lb)[b]	Estimated deadloss discarded at sea (lb)[c]	Average Landing (lb)[d]	Average Price/lb	Est. Value (dollars)	Number Tows
1983				Confidential				
1984	3	9	6,305	[e]	701	3.64	22,950	[e]
1985				Confidential				
1986	3	12	15,364	[e]	1,280	6.34	97,408	[e]
1987				Confidential				
1988				No Effort				
1989				No Effort				
1990				No Effort				
1991				No Effort				
1992				No Effort				
1993	3	15	20,115	[e]	1,341	4.63	93,132	543
1994	4	11	20,431	[e]	1,857	5.85	119,521	467
1995			Federal waters closed - no effort in State waters					
1996	5	21	28,228	[e]	1,344	7.00	197,596	514
1997	3	10	20,336	[e]	2,034	6.16	125,270	[e]
1998				Confidential				
1999	3	14	20,086	229	1,435	7.82	157,072	304
2000	3	5	20,030	486	4,006	3.94	78,918	249
2001				Confidential				
2002	3	5	8,383	208	1,677	6.39	53,567	219
2003				Confidential				
2004	3	6	5,891	226	982	9.58	56,436	180
2005				Confidential				

[a] Reported number of landings equals number of fish tickets.

[b] Pounds of scallop meats as reported on fish tickets.

[c] Estimated pounds of scallop meats based on an estimate of broken-shell scallops discarded at sea, not included in Commercial Catch column.

[d] Pounds of scallop meats.

[e] Not available.

Table 12.–Cook Inlet Registration Area scallop fishery summary statistics, 1993–2005.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c,d]	Estimated deadloss discarded at sea (lb meat)[e]	CPUE (lb meat per dredge hr)
1993	3	[f]	529	20,115	[e]	38
1994	4	[f]	454	20,431	[e]	45
1995	Federal waters closed, no effort in State waters					
1996	5	28,000	534	28,228	[e]	53
1997	3	20,000	394	20,336	[e]	52
1998	1	20,000			Confidential	
1999	3	20,000	333	20,086	229	60
2000	3	20,000	276	20,030	486	73
2001	2	20,000			Confidential	
2002	3	20,000	311	8,383	208	27
2003	2	20,000			Confidential	
2004	3	20,000	364	5,891	226	16
2005	2	7,000			Confidential	

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Does not include estimated deadloss discarded at sea.

[d] Pounds of scallop meats as reported on fish tickets.

[e] Estimated pounds of scallop meats based on an estimate of broken-shell scallops discarded at sea.

[f] Not available.

Table 13.–Assigned ages of weathervane scallops from research surveys in Kamishak Bay, Cook Inlet Management Area, 1984-2005.

	Heights			Number of scallops at age (years)[a]																
Year	No. measured	Mean (mm)	No.Aged	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18+
1984	1,989	not calculated	1,999	256	302	787	91	3	13	82	65	18	41	62	99	86	58	18	15	2	1
1996	1,942	120.6	798	769	227	846	948	341	70	129	197	231	316	473	692	507	178	74	38	55	83
1998	2,770	139.8	323	32	69	481	381	306	360	236	123	62	87	89	99	155	105	95	44	16	30
1999	7,424	144.3	565	250	154	272	1,228	781	1,090	713	396	183	282	288	302	464	352	322	167	66	114
2001	5,402	153.3	588	60	129	201	110	156	1,128	364	825	443	323	152	252	321	242	245	217	138	96
2003-North	1,874	144.6	518	105	145	52	81	69	82	150	250	193	125	84	100	130	127	59	44	47	20
2003-South	3,388	136.6	552	306	568	115	345	187	147	208	416	307	248	311	219	146	329	326	344	213	225
2005-North	2,234	149.0	600	22	63	134	273	88	128	92	189	291	334	270	152	116	68	87	59	76	74
2005-South	2,194	110.5	420	131	838	189	295	80	88	51	62	80	87	81	85	65	40	59	58	54	85

[a] In the 1984 survey all scallops caught less 4" (age1-3) were aged, with up to 20 greater than 4" (age 4 and older) shells per tow were aged. Between 1996-2005 surveys ages were assigned to all measured scallops using height-at-size matrix developed from aged shells.

Table 14.–Historic commercial catch, effort, and value of weathervane scallops, Kodiak Registration Area, 1967–2005/06.

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	10	32	355,628	11,113	5.79	2,052,543	6,449
1995/96				Closed			
1996/97	4	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

-continued-

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Year	Number Vessels	Number Landings[a]	Commercial Catch (lb)[b]	Average Landing (lb)[b]	Average Price/lb	First Wholesale Est. Value (dollars)	Number Tows
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[g]	13	259,976	19,998	5.25	1,364,874	2,397
2004/05	2[g]	9	254,727	28,303	5.50	1,400,998	2,454
2005/06	3	12	239,931	19,994	5.50	1,319,620	2,101

[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 scallop meats as reported on fish tickets.

[c] Deliveries of unshucked scallops were converted to scallop meats using a 10% conversion factor.

[d] Not available.

[e] January 1-June 30.

[f] Includes harvest from exploratory fishery.

[g] Confidential data voluntarily released by vessel operators.

Table 15.–Kodiak Registration Area, Northeast District, scallop fishery summary statistics, 1993/94-2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c]	CPUE (lb meat per dredge hr)
1993/94	10	[d]	6,940	155,122	22
1994/95	7	[d]	1,773	35,207	20
1995/96			Closed		
1996/97	3	[d]	581	11,430	20
1997/98	3	[d]	2,604	95,858	37
1998/99	4	[d]	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[e]	80,000	1,350	80,000	59
2003/04	2[e]	80,000	1,248	79,965	64
2004/05	2[e]	80,000	1,227	80,105	65
2005/06	3	80,000	1,759	79,990	45

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Not established.

[e] Confidential data voluntarily released by vessel operators.

Table 16.–Commercial harvest, average shell height from retained catch, and catch per unit effort from observer data, Westward Region, 1993/94–2005/06.

	REGISTRATION AREA/DISTRICT[a]																	
	Kodiak Area																	
	Northeast District			Shelikof District			Semidi District			Alaska Peninsula			Bering Sea			Dutch Harbor		
Year	Harvest[b]	SH[c]	CPUE[d]	Harvest[b]	SH[c]	CPUE[d]	Harvest[b]	SH[c]	CPUE[d]	Harvest[b]	SH[c]	CPUE[d]	Harvest[b]	SH[c]	CPUE[d]	Harvest[b]	SH[c]	CPUE[d]
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	313,741	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		
2005/06	79,990	139	45	159,941	136	70	No Effort			No Effort			23,220	154	39	Closed		

[a] Confidential data voluntarily released by vessel operators.

[b] Harvest in pounds of scallop meats.

[c] Average scallop shell height (SH) in mm.

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

[e] Confidential.

Table 17.–Estimated round weight of the retained commercial scallop catch and catch per unit effort, Westward Region, 1993/94–2005/06.

	REGISTRATION AREA/DISTRICT[a]												
	Kodiak Area												
	Northeast District		Shelikof District		Semidi District		Alaska Peninsula		Bering Sea		Dutch Harbor		Total
Year	Harvest[b]	CPUE[c]	Harvest[b]	CPUE[c]	Harvest[b]	CPUE[c]	Harvest[b]	CPUE[c]	Harvest[b]	CPUE[c]	Harvest[b]	CPUE[c]	Harvest[b]
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
2005/06	831,378	473	1,454,806	638	No Effort		No Effort		231,700	385	Closed		2,517,884

[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 18.–Kodiak Registration Area, Shelikof District, scallop fishery summary statistics, 1993/94–2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c]	CPUE (lb meat per dredge hr)
1993/94	5	[d]	2,491	105,017	42
1994/95	11	[d]	8,662	314,051	36
1995/96			Closed		
1996/97	3[e]	[d]	3,491	219,305	63
1997/98	4	[d]	5,492	258,346	47
1998/99	8	[d]	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[f]	180,000	3,258	180,011	55
2004/05	2[f]	180,000	3,467	174,622	50
2005/06	2[f]	160,000	2,280	159,941	70

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Not established.

[e] One additional vessel fished but data are not available.

[f] Confidential data voluntarily released by vessel operators.

Table 19.–Kodiak Registration Area, Semidi Island District, scallop fishery summary statistics, 1993/94–2004/05.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c]	CPUE (lb meat per dredge hr)
1993/94	6[d]	[e]	1,819	55,487	32
1994/95	2	[e]	272	Confidential	
1995/96				Closed	
1996/97	3	[e]	1,017	37,810	37
1997/98	1[f]	[e]	349	6,135	18
1998/99	2[f]	[e]	106	1,720	16
1999/2000	1[f]	[e]	45	930	21
2000/01		[e]		No Effort	
2001/02		[e]		No Effort	
2002/03		[e]		No Effort	
2003/04		[e]		No Effort	
2004/05		[e]		No Effort	
2005/06		[e]		No Effort	

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meants as reported on fish tickets.

[d] Two additional vessels registered but did not fish.

[e] Not established.

[f] Confidential data voluntarily released by vessel operators.

Table 20.–Historic commercial catch, effort and value of weathervane scallops, Alaska Peninsula Registration Area, 1975–2005/06.

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	15,122	6.25	472,563	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				
2005/06			No Effort				

-continued-

Table 20.–Page 2 of 2

[a] Prior to 1995/96, the reported number of landings equals number of fish tickets. After 1995/96, the reported number of landings equals number of offloads.

[b] Pounds of scallop meats.

[c] Not available.

[d] January 1-June 30.

[e] Confidential data voluntarily released by vessel operators.

Table 21.–Alaska Peninsula Registration Area scallop fishery summary statistics.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c]	CPUE (lb meat per dredge hr)
1993/94	8	[d]	1,847	112,152	61
1994/95	7	[d]	1,664	65,282	39
1995/96			Closed		
1996/97[e]	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[f]		10,000	No Effort		
2004/05[f]		10,000	No Effort		
2005/06[g]		20,000	No Effort		

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Not established.

[e] Confidential data voluntarily released by vessel operators.

[f] The area between 160° W long. and 161° W long. was closed. The remainder of the registration area was open to fishing.

[g] The area between 160° W long. and 161° W long. was open for 0 to 10,000 pounds. The remainder of the district was open to an additional 0 to 10,000 pounds.

Table 22.–Historic commercial catch, effort and value of weathervane scallops, Bering Sea Registration Area, 1987–2006/07.

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[e]	2	150,295	75,147	[d]	[d]	952
1997/98	2[e]	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[e]	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[e]	5	92,240	18,448	5.20	479,648	1,012
2003/04	2[e]	3	42,590	14,197	5.25	223,597	517
2004/05	2[e]	2	10,050	5,025	5.25	52,762	145
2005/06	1[e]	1	23,220	23,220	8.50	197,370	303

[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 scallop meats.

[c] January 1- June 30.

[d] Not available.

[e] Confidential data voluntarily released by vessel operators.

Table 23.–Bering Sea Registration Area scallop fishery summary statistics, 1993/94–2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c]	CPUE (lb meat per dredge hr)
1993/94	9	[d]	5,764	284,414	49
1994/95	8	[d]	11,113	505,439	45
1995/96			Closed		
1996/97	1[e]	600,000	2,313	150,295	65
1997/98	2[e]	600,000	2,246	97,002	43
1998/99	4	400,000	2,319	96,795	42
1999/2000	2[e]	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[e]	105,000	2,038	92,240	45
2003/04	2[e]	105,000	1,020	42,590	42
2004/05	1[e]	50,000	275	10,050	37
2005/06	1[e]	50,000	602	23,220	39

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Not established.

[e] Confidential data voluntarily released by vessel operators.

Table 24.–Historic commercial catch, effort, and value of weathervane scallops, Dutch Harbor Registration Area, 1982–2005/06.

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			
1993/94	3	6	38,731	6,558	5.15	199,465	572
1994/95	3	3	1,931	644	5.79	11,180	52
1995/96	1[d]	2	26,950	13,475	[c]	[c]	747
1996/97				No Effort			
1997/98	1[d]	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[d]	1	6,465	6,465	6.25	40,500	167
2000/01				Closed			
2001/02				Closed			
2002/03	1[d]	1	6,000	6,000	5.20	31,200	115
2003/04				Closed			
2004/05				Closed			
2005/06				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 scallop meats.

[c] Not available.

[d] Confidential data voluntarily released by vessel operators.

Table 25.–Dutch Harbor Registration Area scallop fishery summary statistics, 1993/94–2005/06.

Season	Number vessels	GHR ceiling (lb meat)[a]	Dredge hours[b]	Catch (lb meat)[c]	CPUE (lb meat per dredge hr)
1993/94	3	170,000	838	38,731	46
1994/95	3	170,000	81	1,931	24
1995/96	1[d]	170,000	1,047	26,950	26
1996/97		170,000		No Effort	
1997/98	1[d]	170,000	171	5,790	34
1998/99	4	110,000	1,025	46,432	45
1999/2000	1[d]	110,000	273	6,465	24
2000/01				Closed	
2001/02				Closed	
2002/03	1[d]	10,000	184	6,000	33
2003/04				Closed	
2004/05				Closed	
2005/06				Closed	

[a] Pounds of scallop meats.

[b] Dredge-hour is one dredge fished for 60 minutes.

[c] Pounds of scallop meats as reported on fish tickets.

[d] Confidential data voluntarily released by vessel operators.

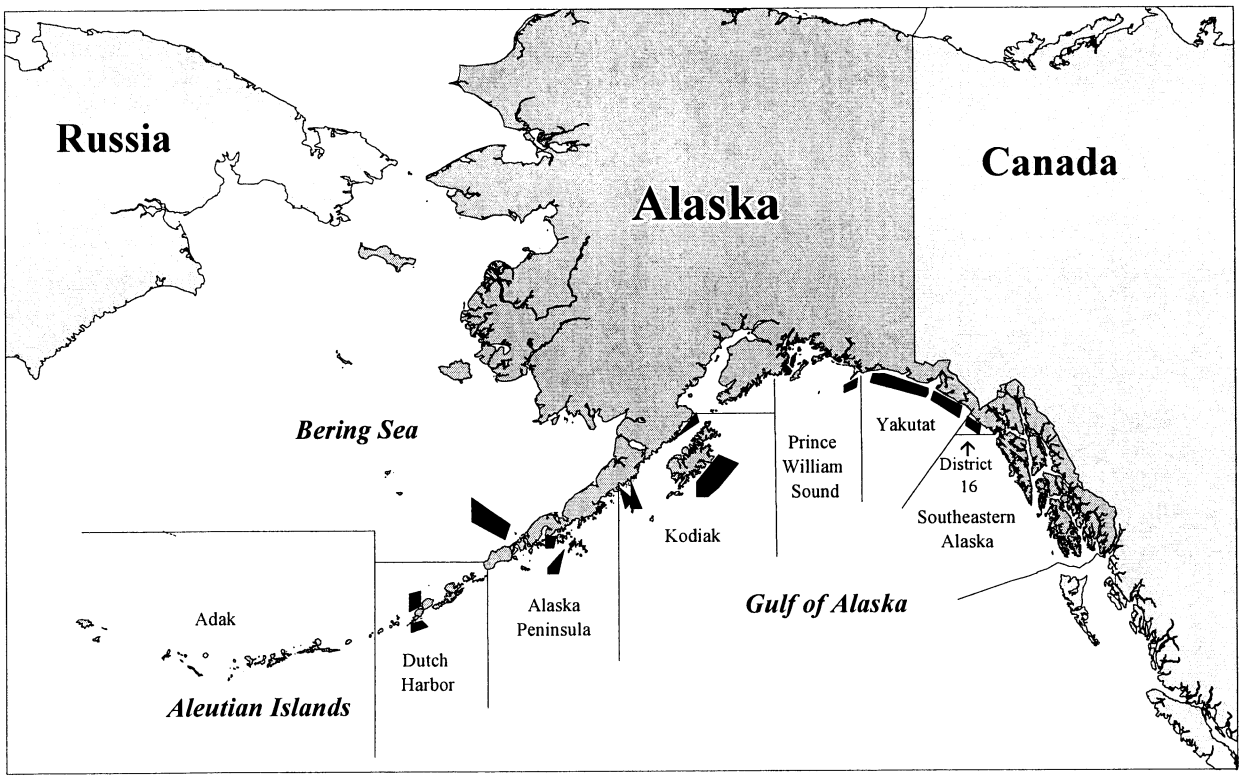

Figure 1.–Major weathervane scallop fishing locations in coastal waters of Alaska.

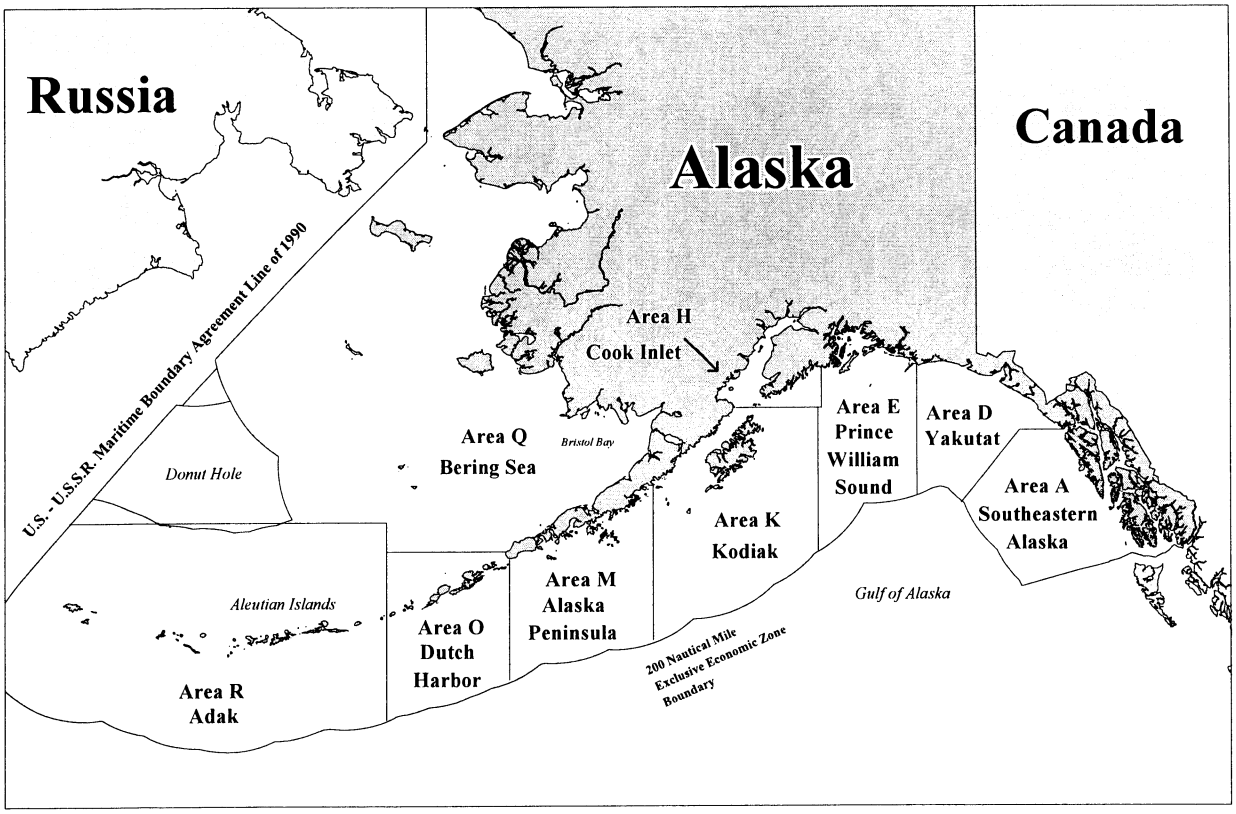

Figure 2.–State of Alaska weathervane scallop fishing registration areas.

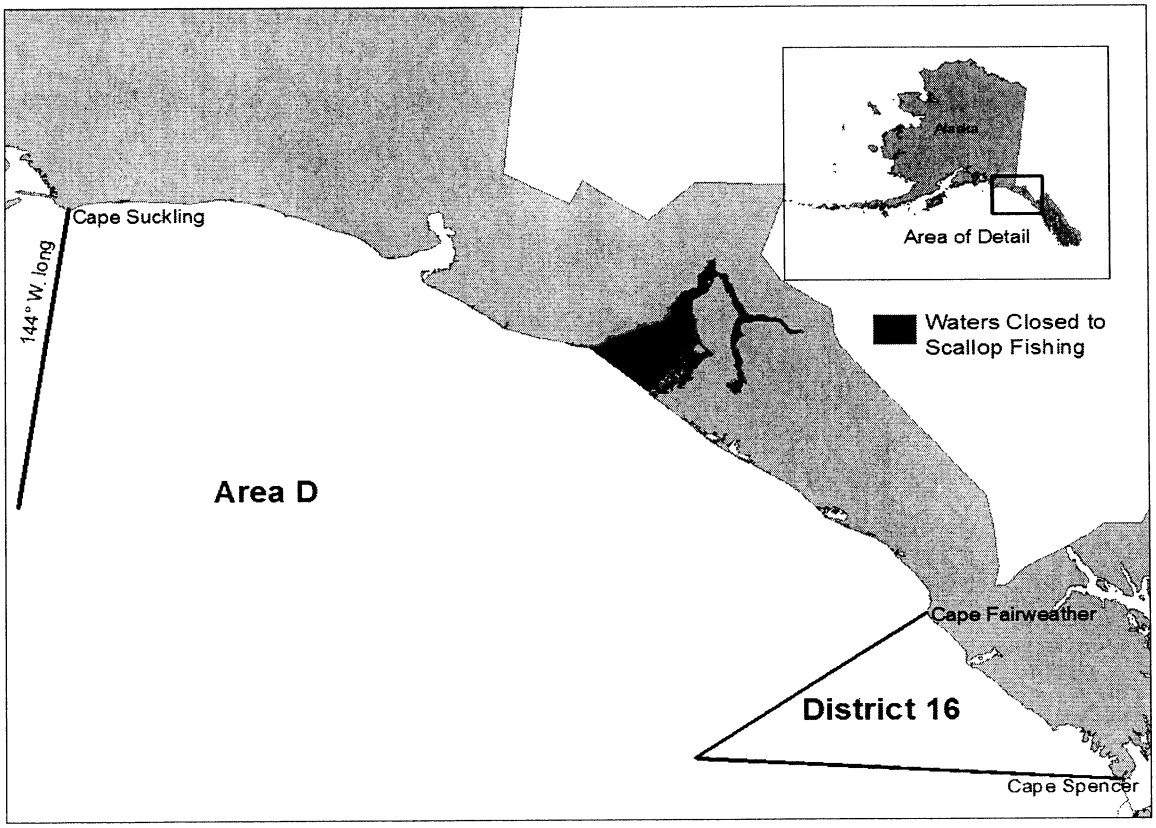

Figure 3.–Yakutat weathervane scallop fishing registration area and closed waters.

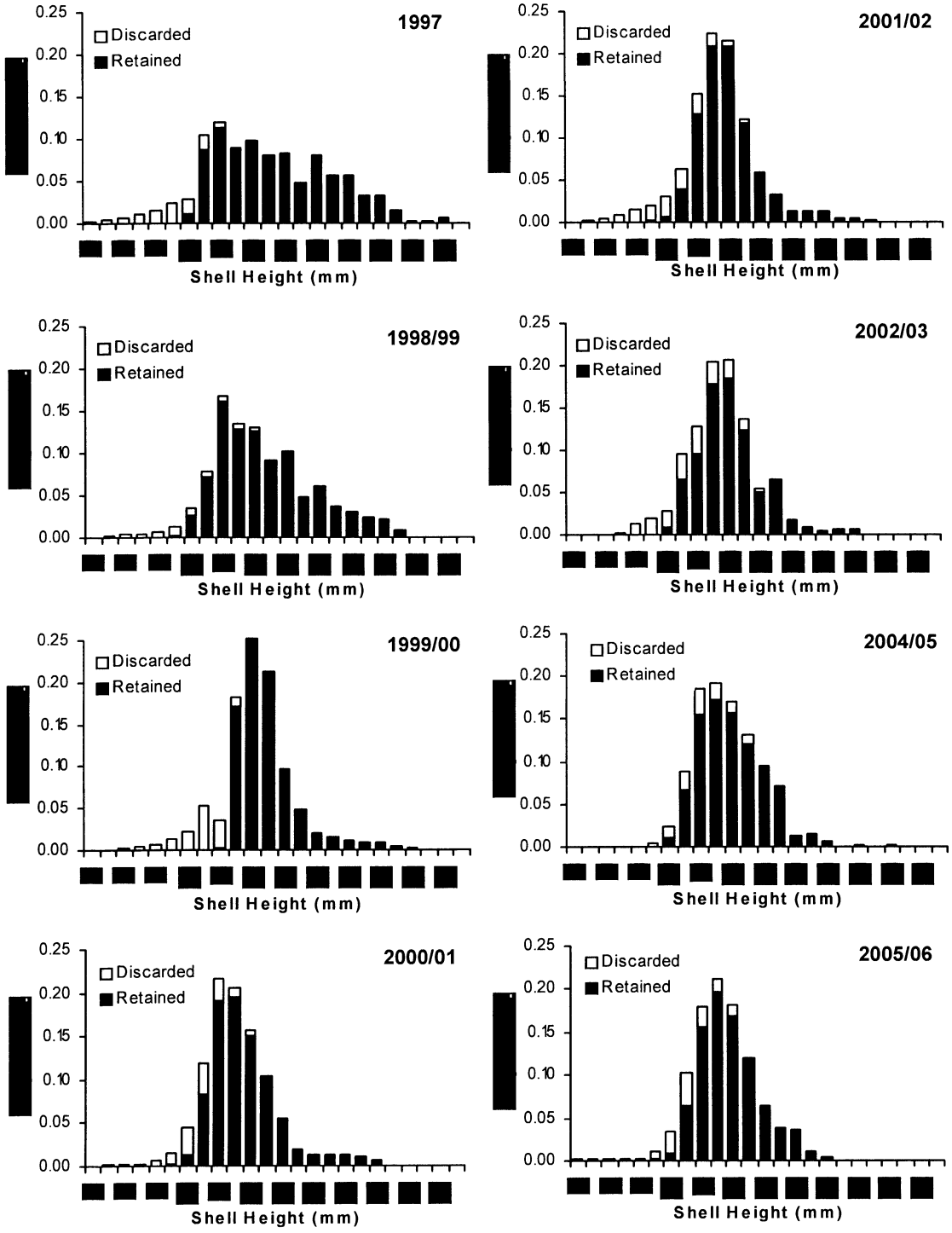

Figure 4.–Yakutat, District 16, scallop shell heights from resampling observer data, 1997–2005/06.

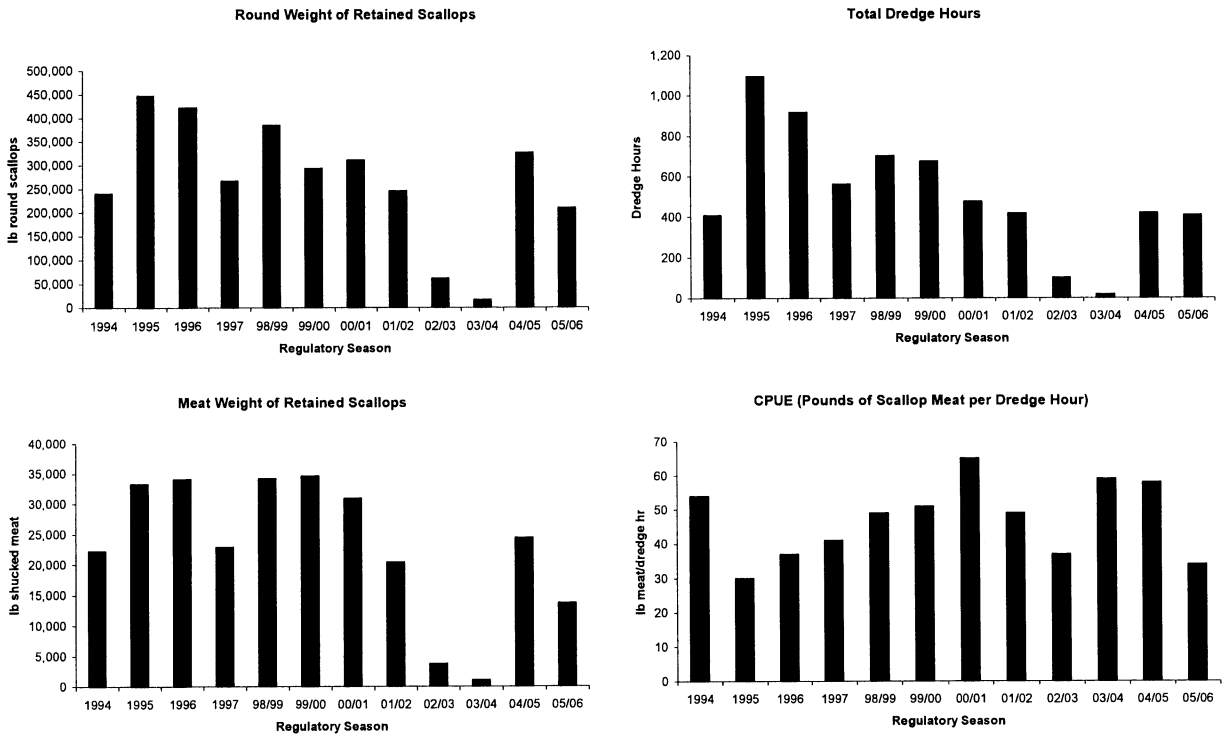

Figure 5.–Weathervane scallop harvest by round weight, dredge hours, and CPUE, District 16, Yakutat Registration Area, 1994–2005/06.

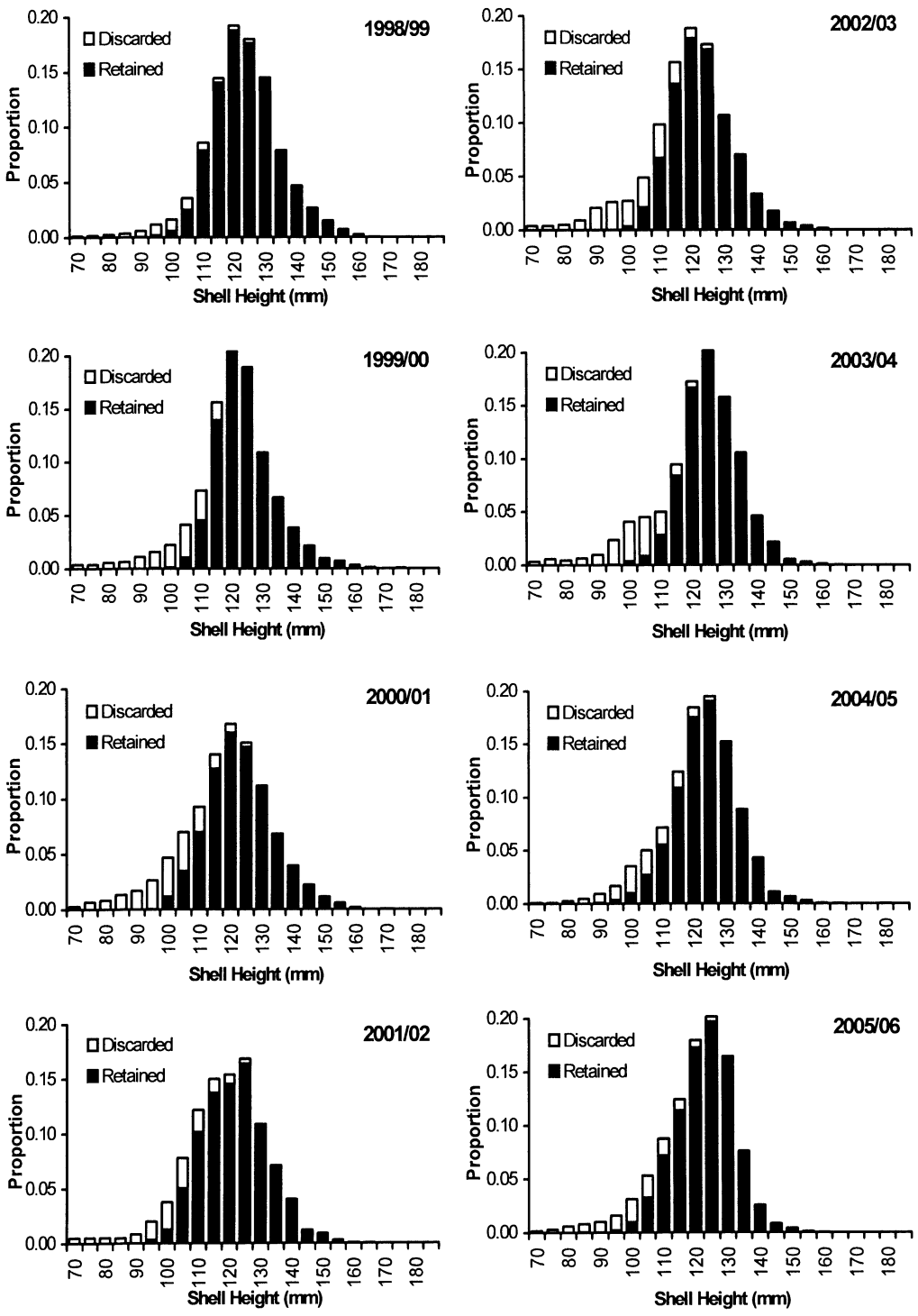

Figure 6.–Yakutat Area D, Scallop shell heights from resampling observer data, 1998/99–2005/06.

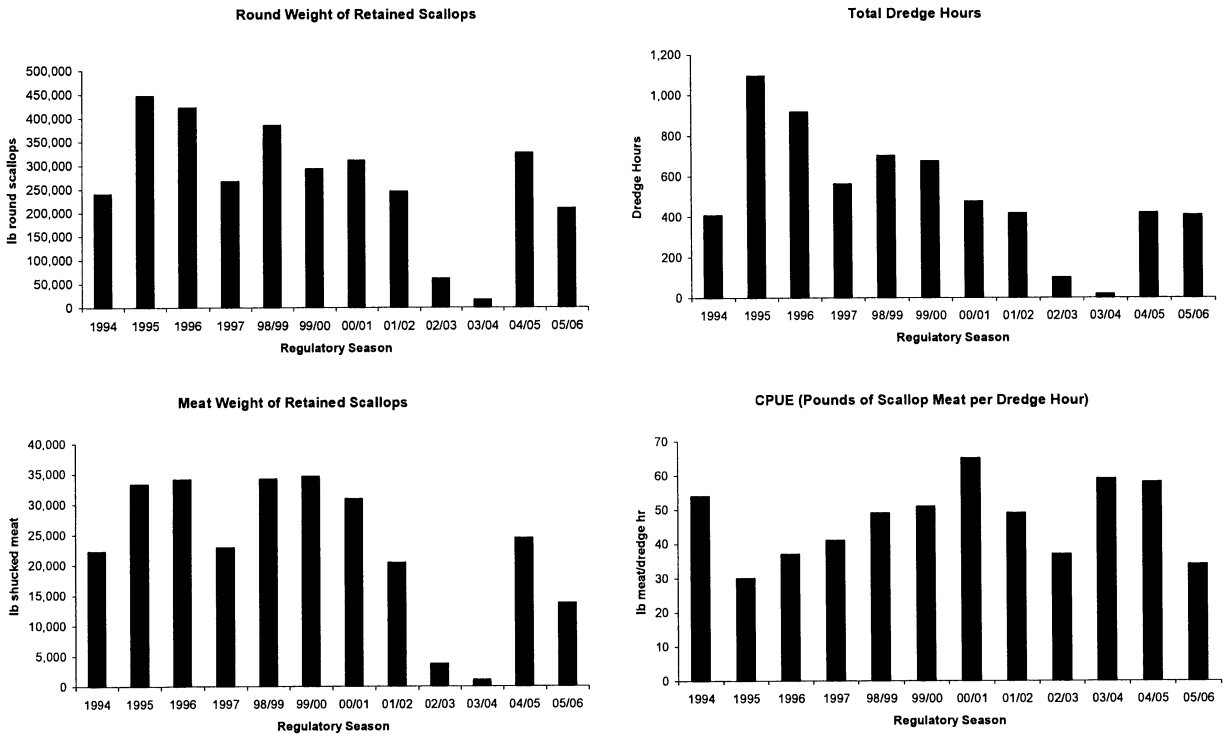

Figure 7.–Weathervane scallop harvest by round weight, scallop meat weight, dredge hours, and CPUE, Area D, Yakutat Registration Area, 1993–2005/06.

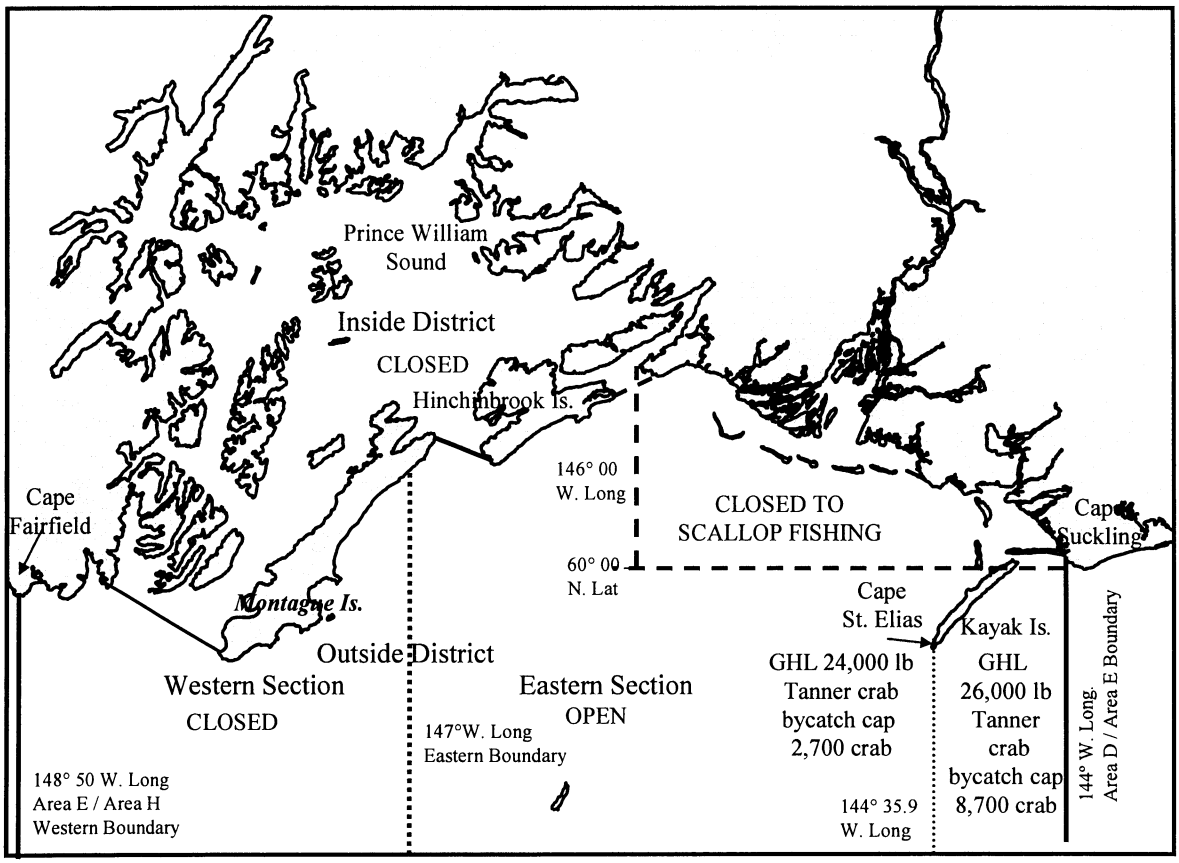

Figure 8.-Prince William Sound scallop fishing registration area and closed waters, 2005/06.

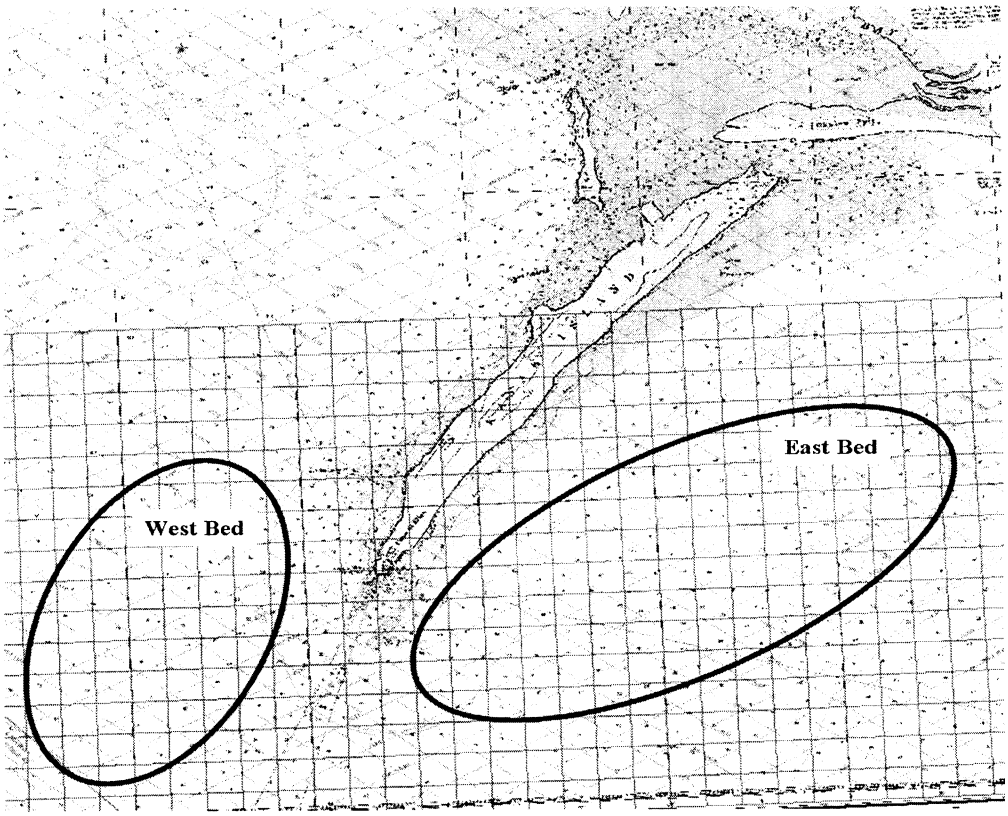

Figure 9.–Approximate location of weathervane scallop beds located east and west of Kayak Island, Prince William Sound Management Area.

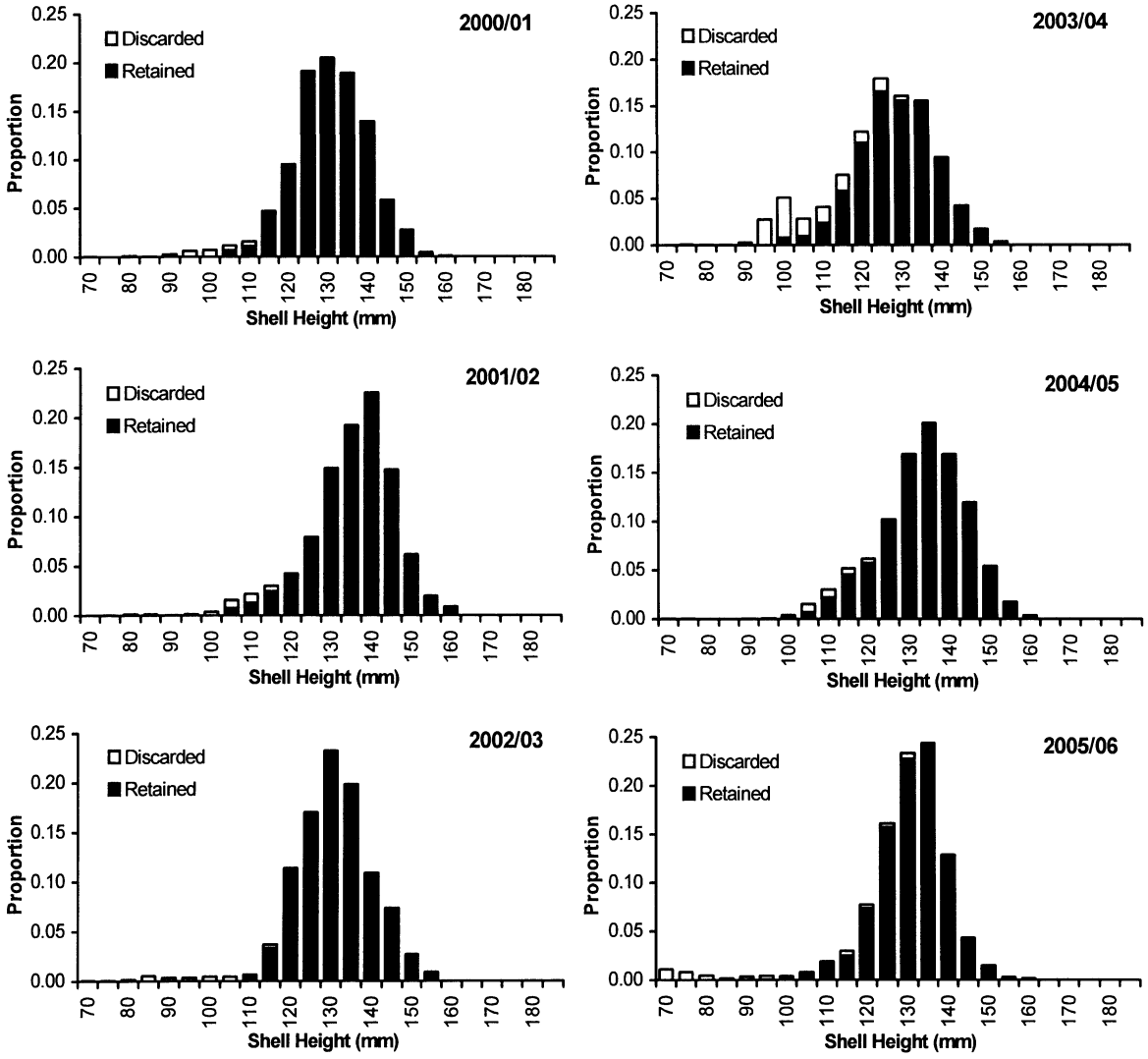

Figure 10.–Prince William Sound Registration Area scallop shell heights from resampling observer data, 2000/01–2005/06.

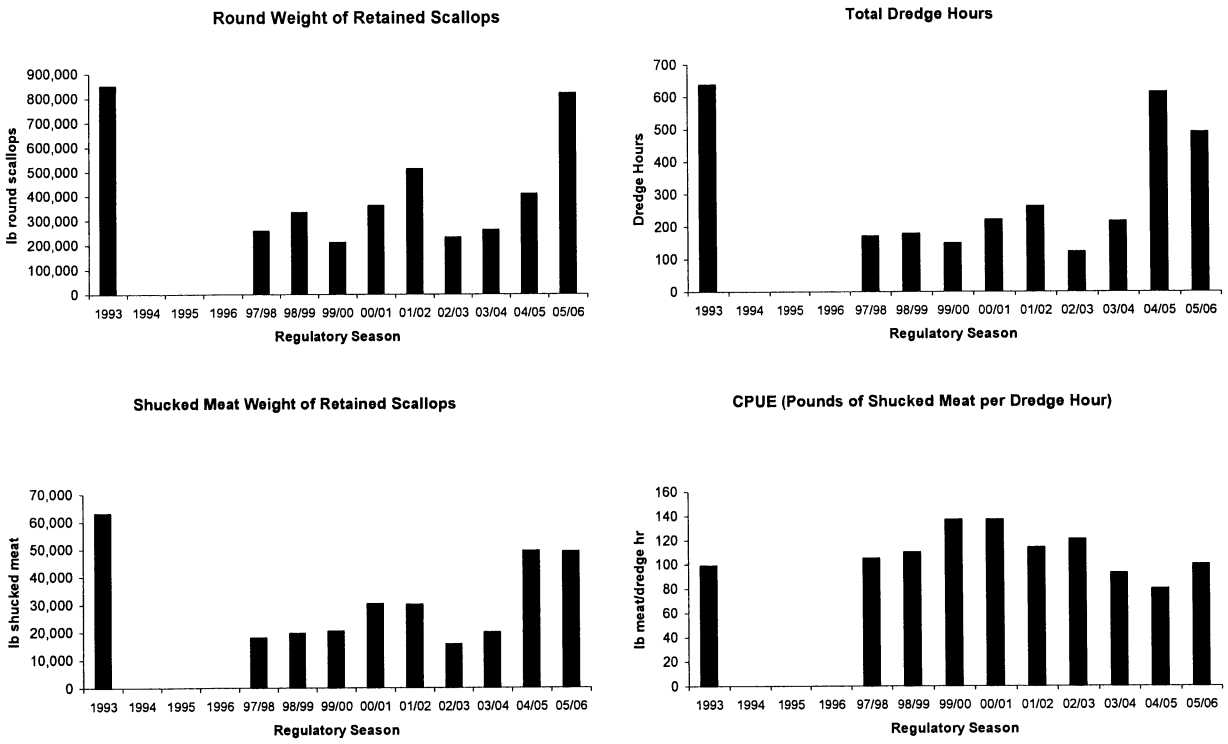

Figure 11.–Weathervane scallop harvest by round weight, scallop meat weight, dredge hours, and CPUE, Prince William Sound Registration Area, 1993–2005/06.

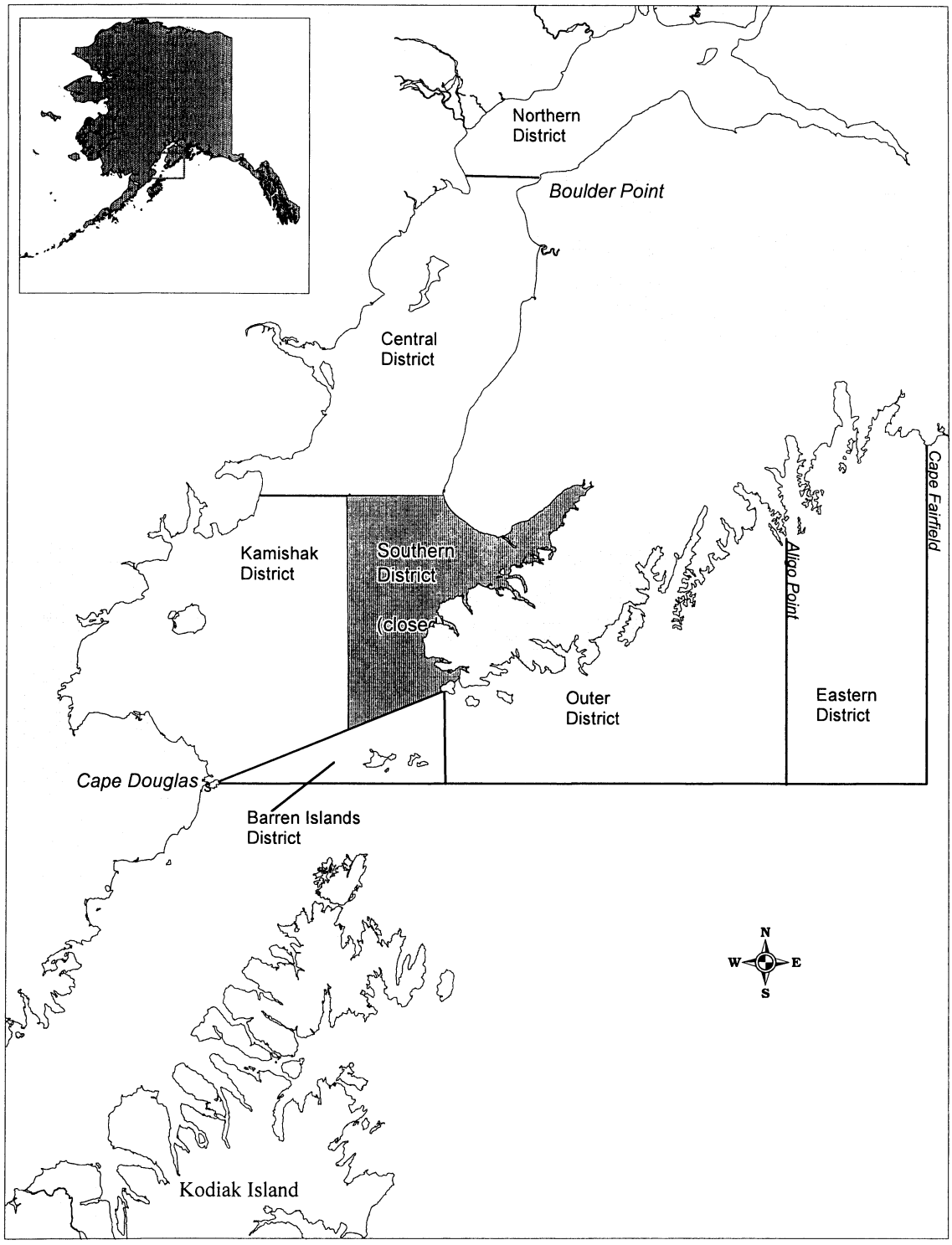

Figure 12.–Cook Inlet weathervane scallop registration area.

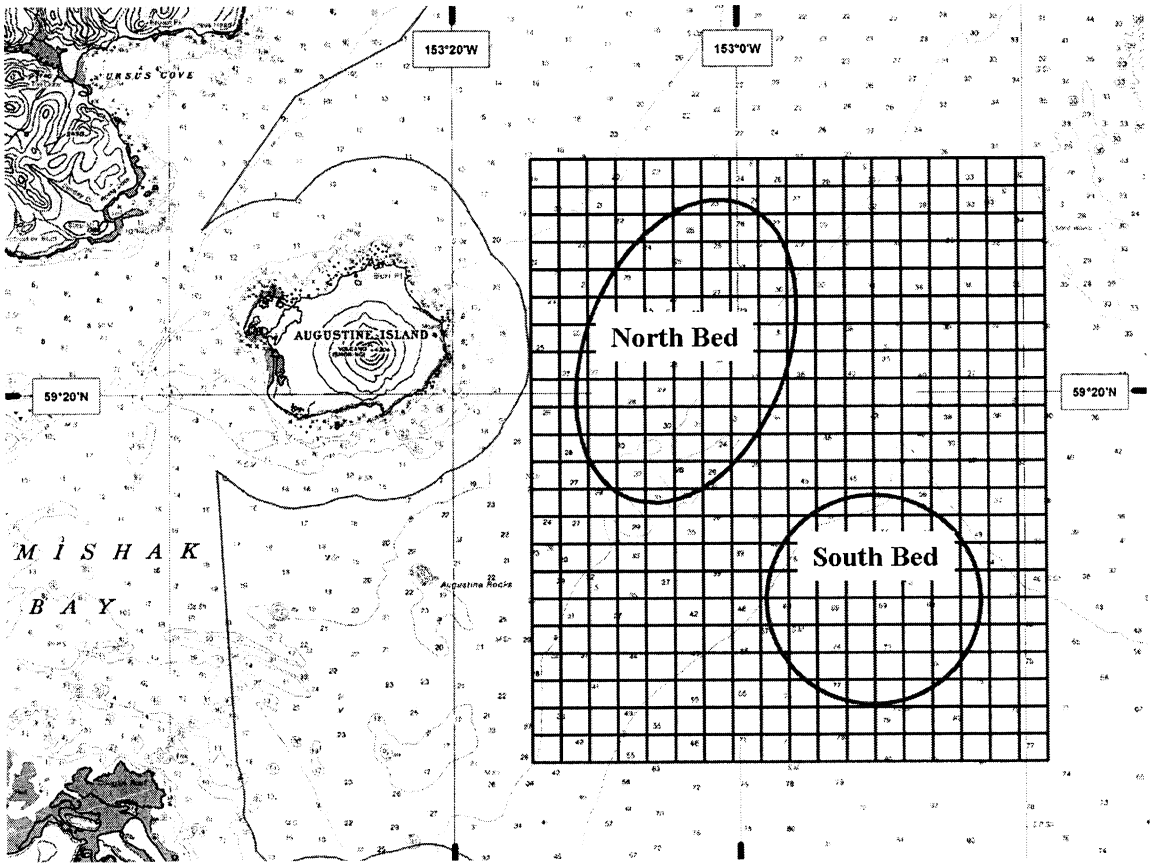

Figure 13.–Approximate locations of the north and south weathervane scallop beds in the Kamishak District of Cook Inlet.

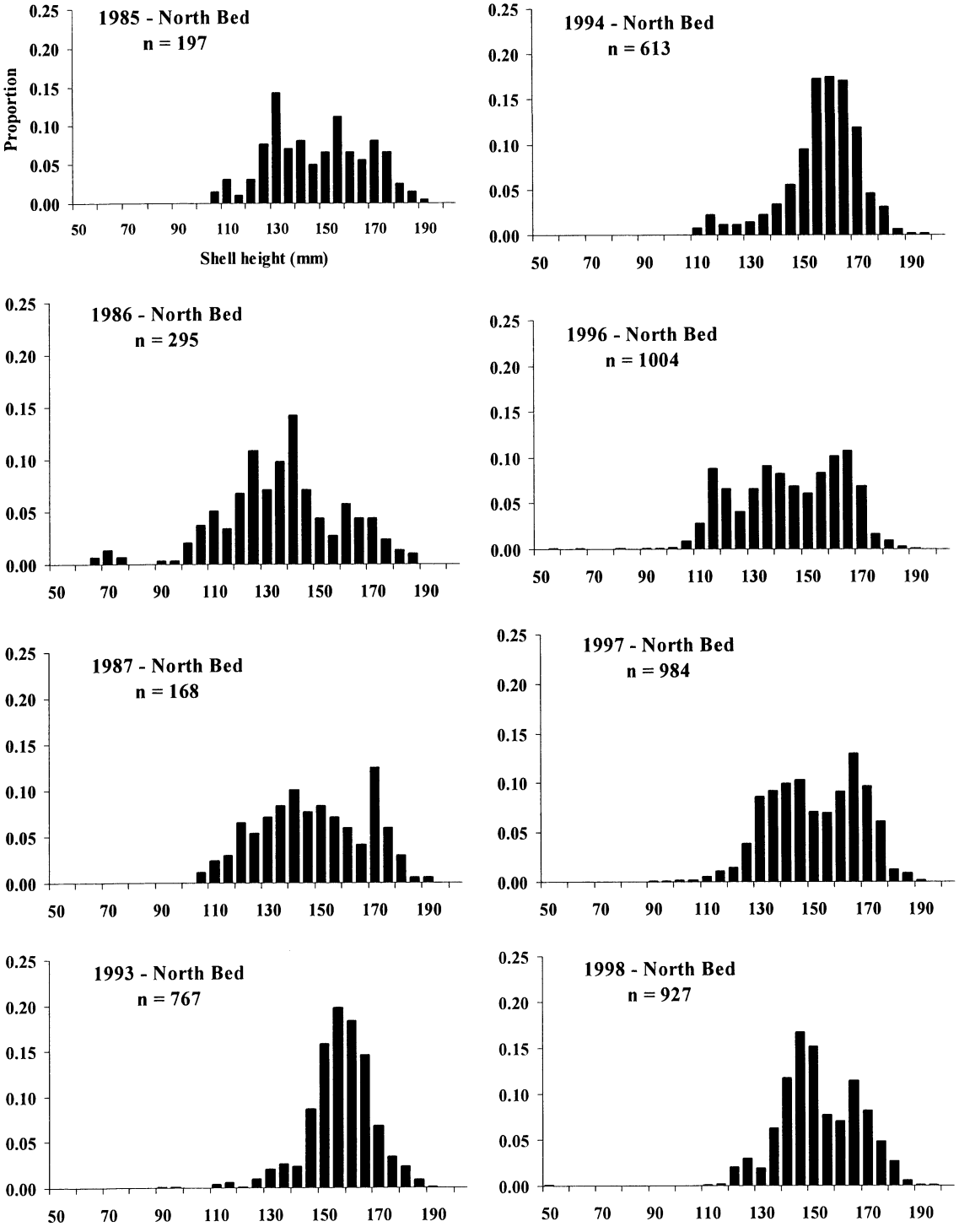

Figure 14.–Shell height frequencies of commercial weathervane scallop harvest samples from the north bed Kamishak District of Cook Inlet, 1983 - 2005.

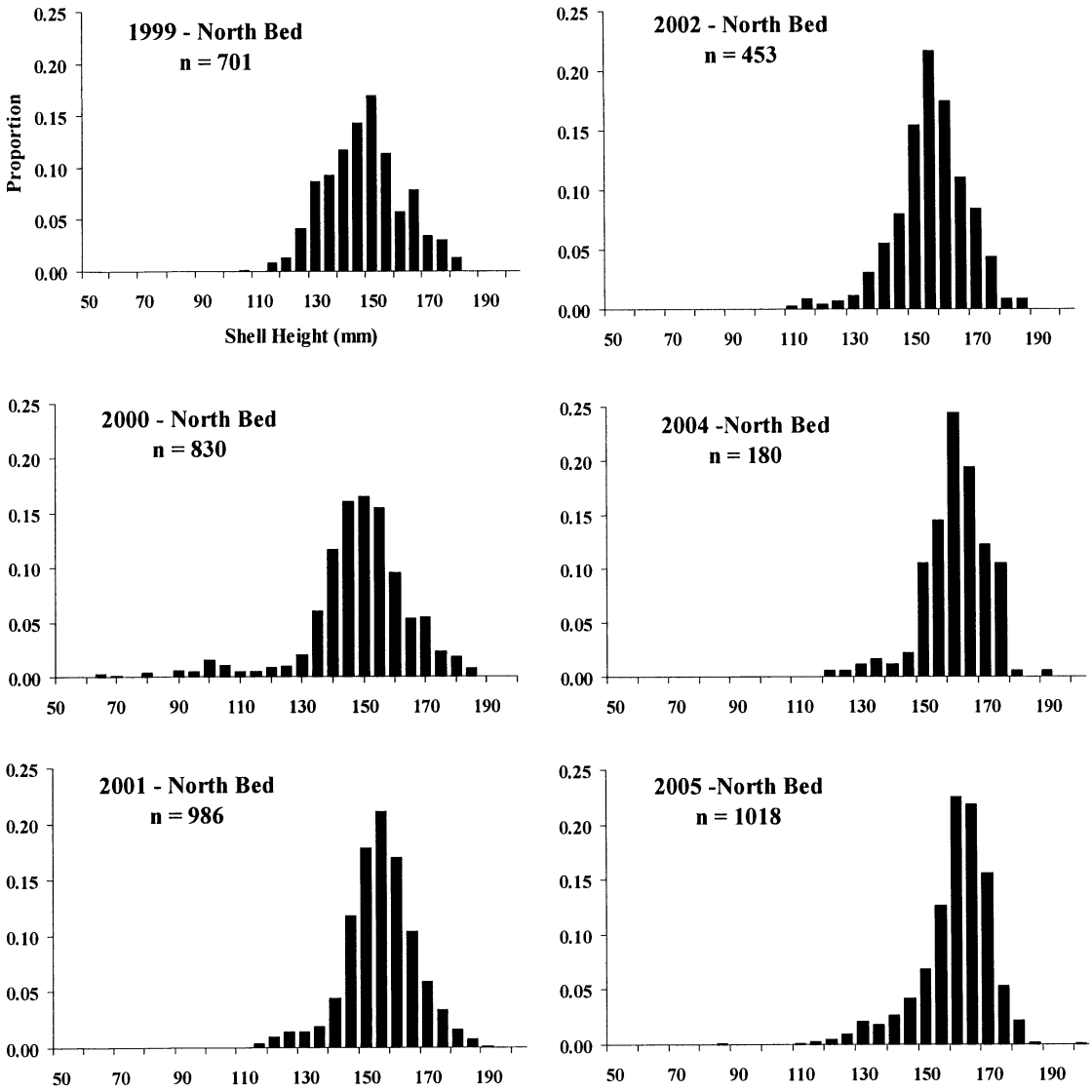

Figure 14.—Page 2 of 2.

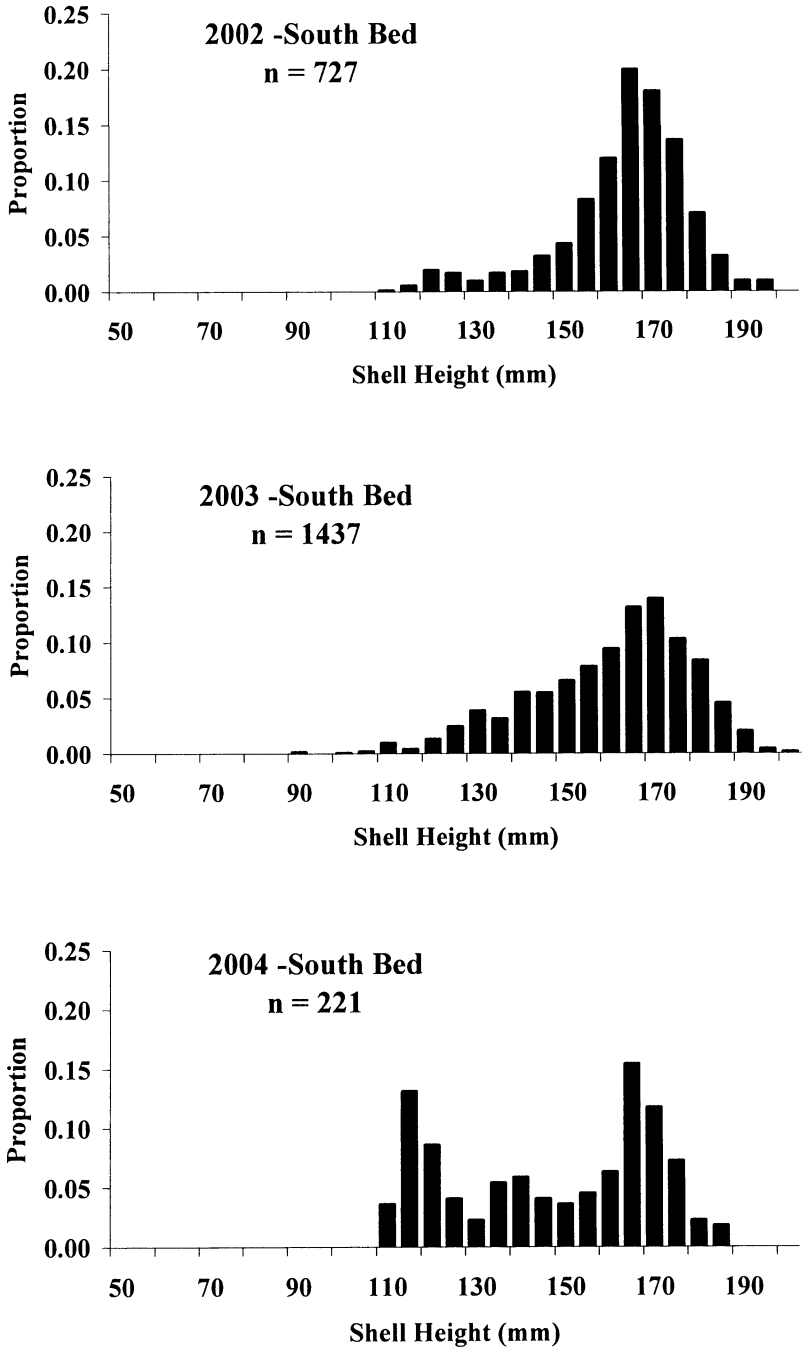

Figure 15.–Shell height frequencies of commercial weathervane scallop harvest samples from the south bed, Kamishak District of Cook Inlet, 2002 - 2004.

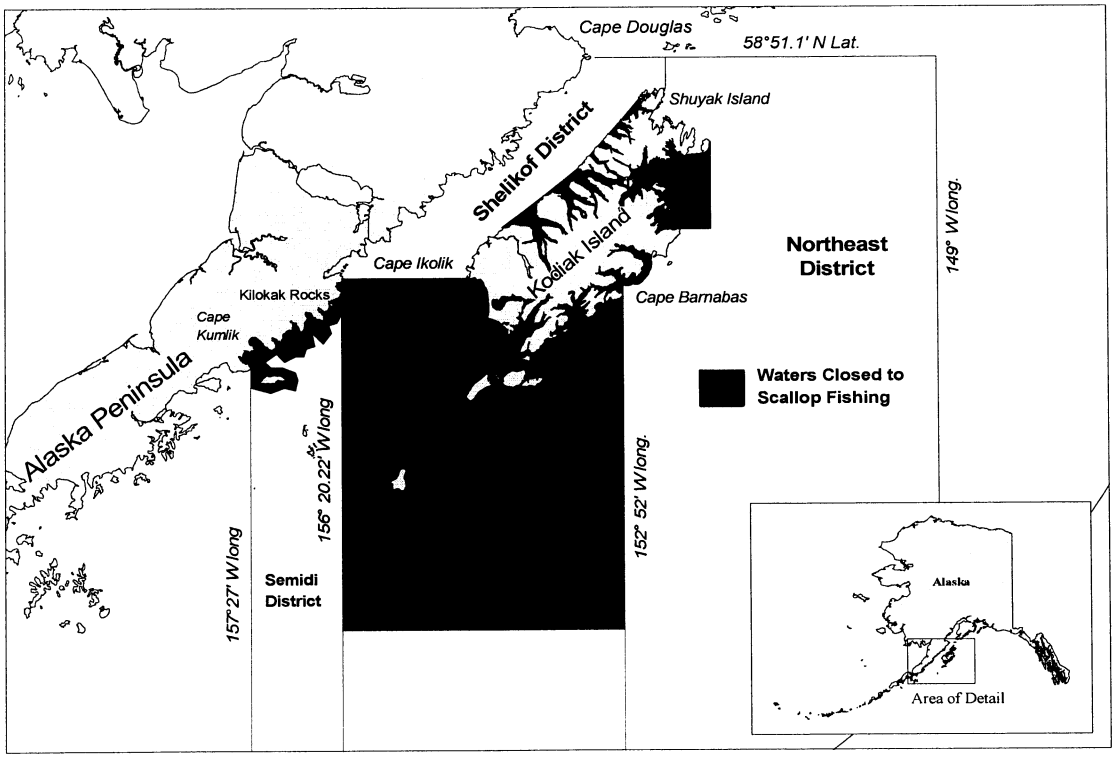

Figure 16.–Kodiak weathervane scallop registration area and closed waters.

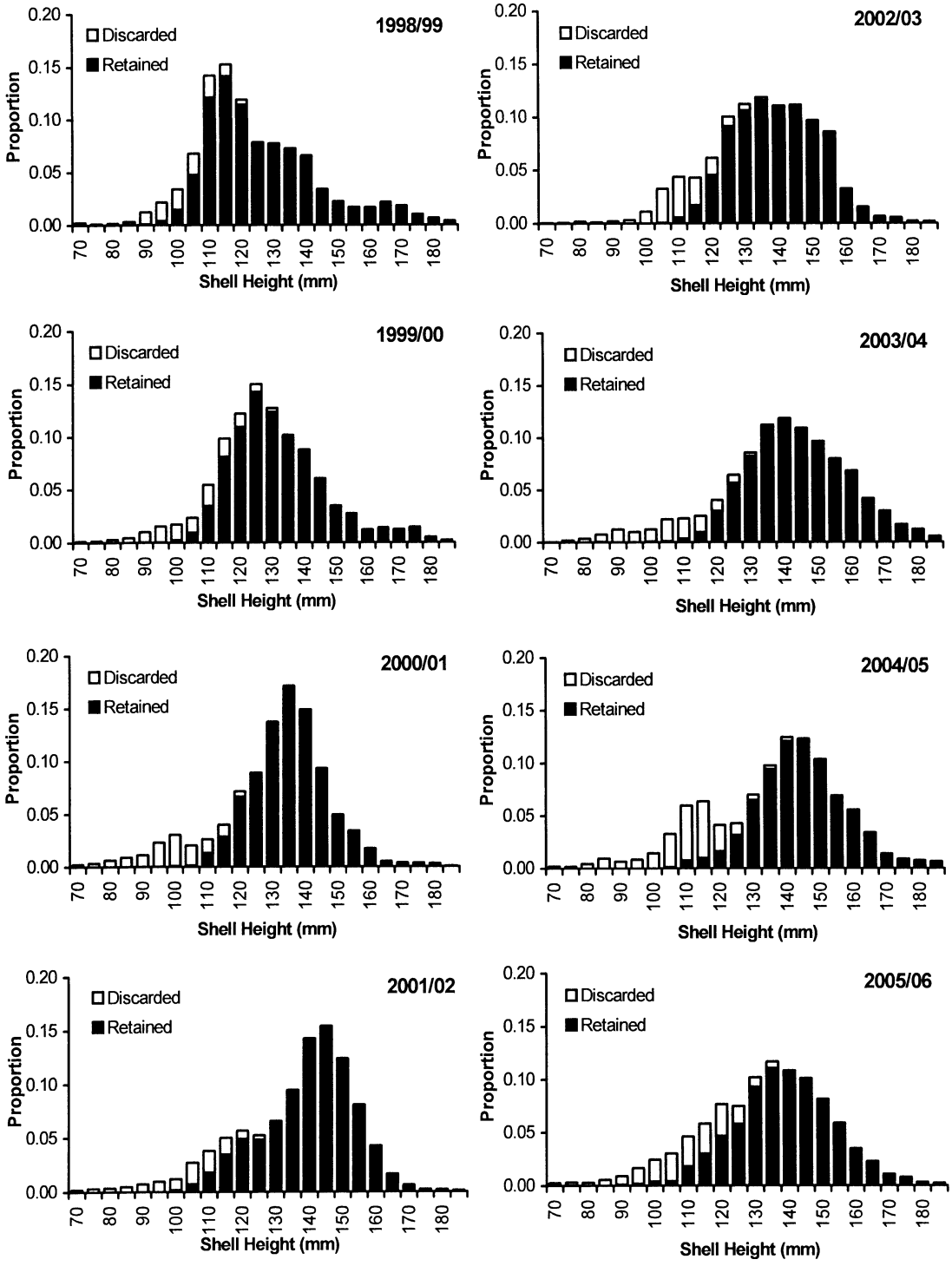

Figure 17.–Kodiak Northeast District scallop shell heights from resampling observer data, 1998/99–2005/06.

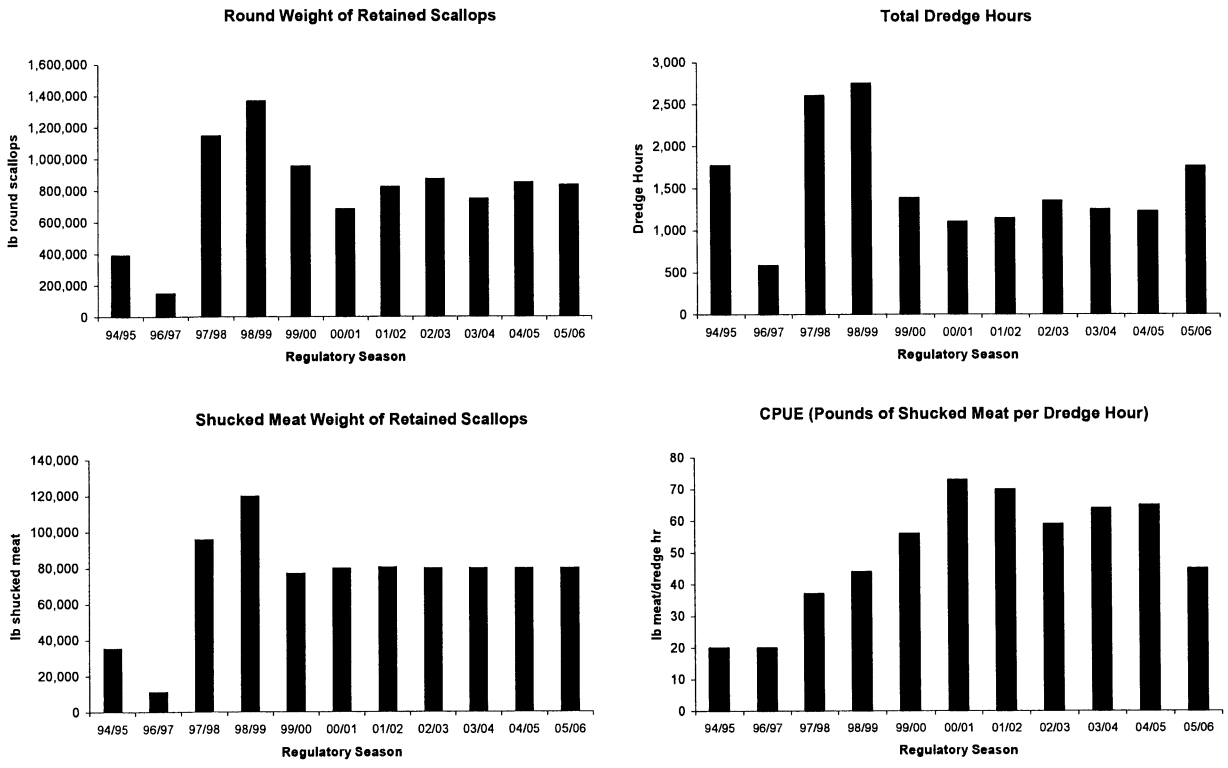

Figure 18.–Weathervane scallop harvest by round weight, scallop meat weight, dredge hours, and CPUE, Northeast District, Kodiak Registration Area, 1994/95–2005/06.

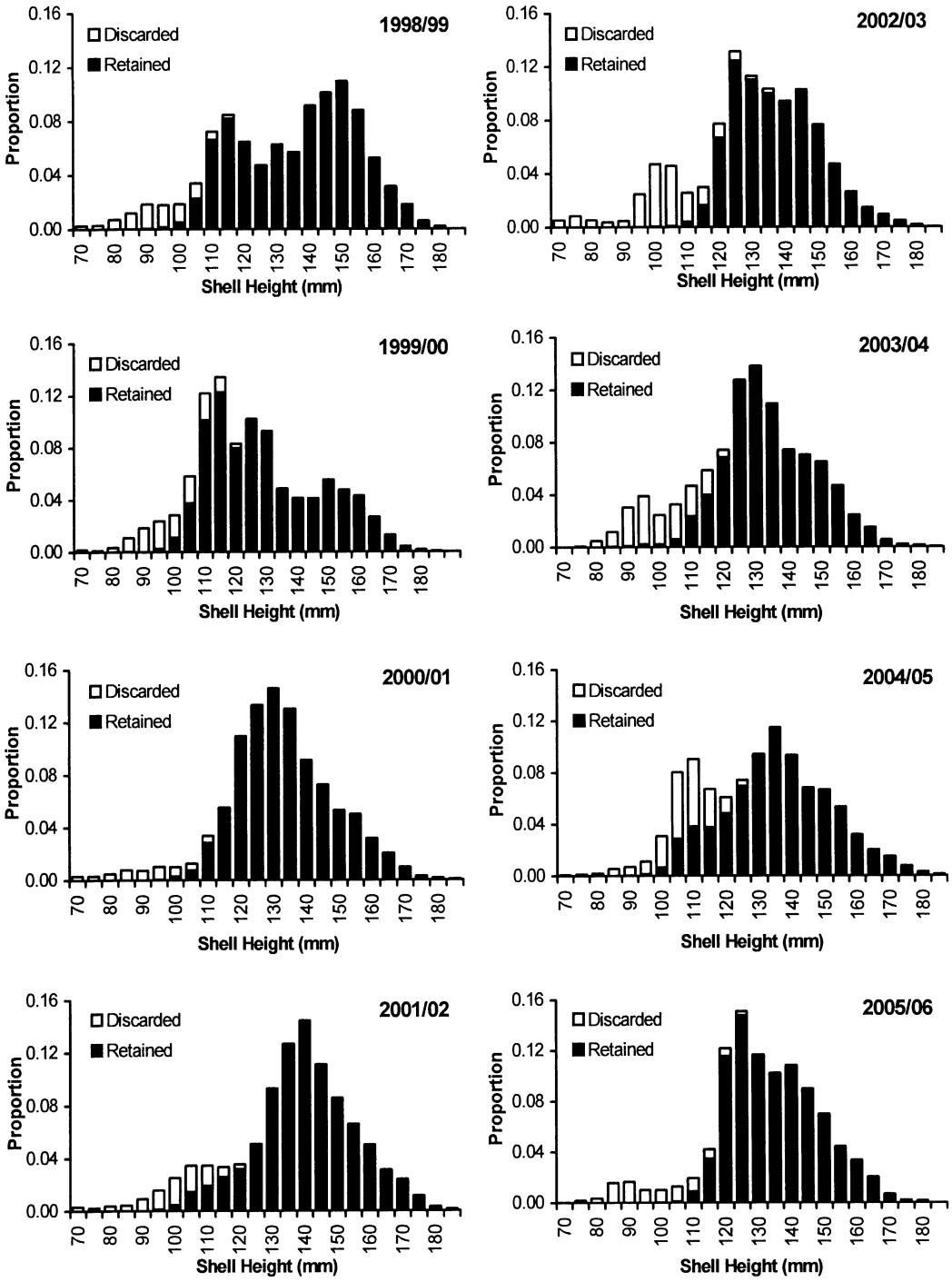

Figure 19.–Kodiak Shelikof District scallop shell heights from resampling observer data, 1998/99–2005/06.

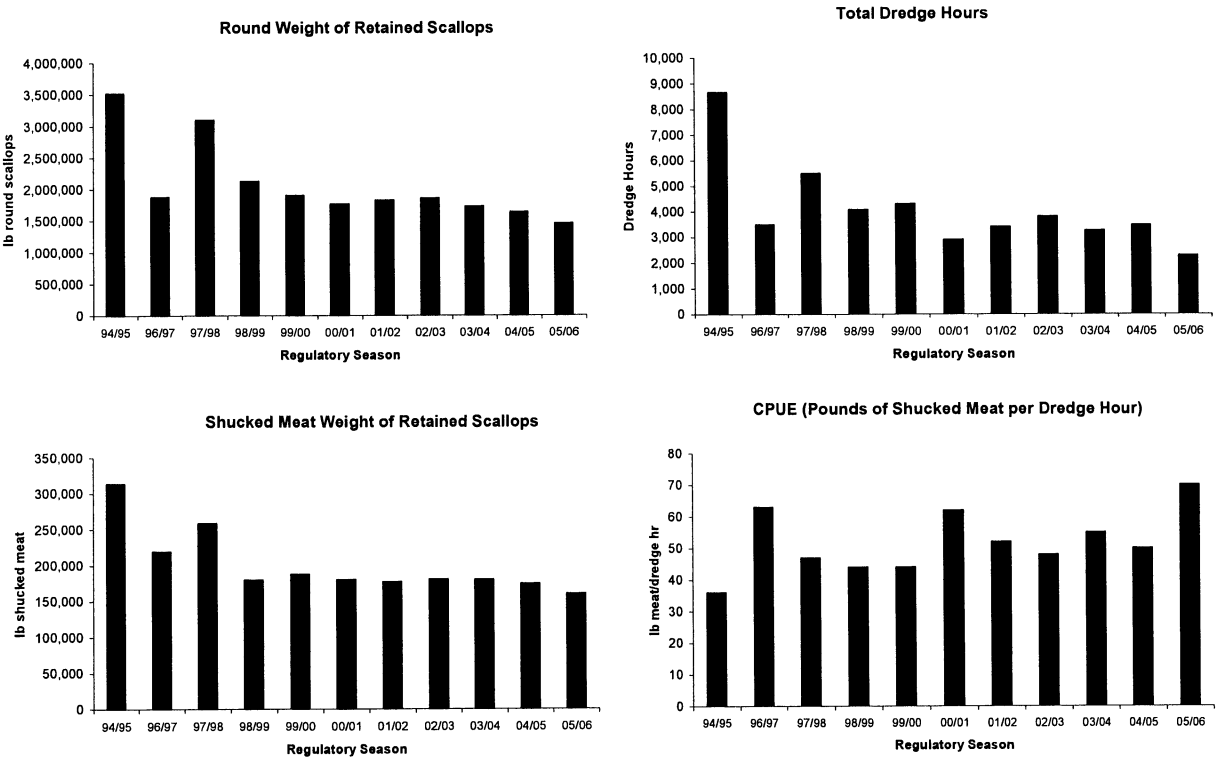

Figure 20.–Weathervane scallop harvest by round weight, scallop meat weight, dredge hours, and CPUE, Shelikof District, Kodiak Registration Area, 1994/95–2005/06.

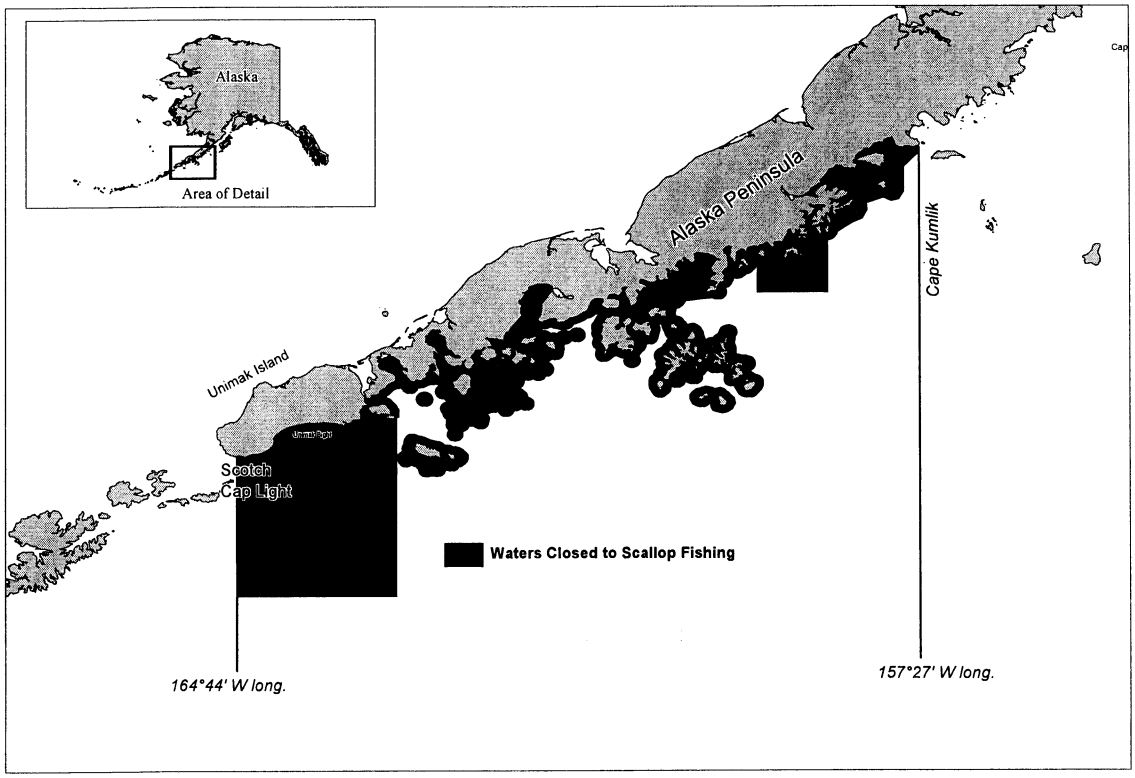

Figure 21.–Alaska Peninsula weathervane scallop registration area and closed waters.

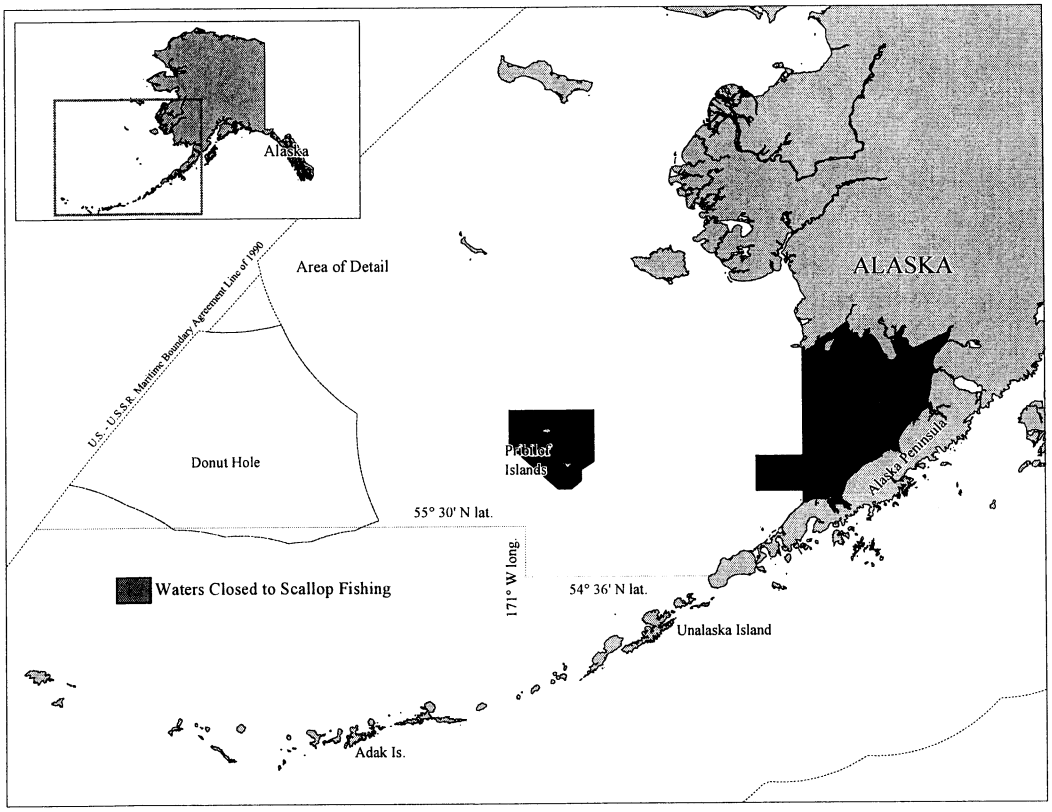

Figure 22.–Bering Sea weathervane scallop registration area and closed waters.

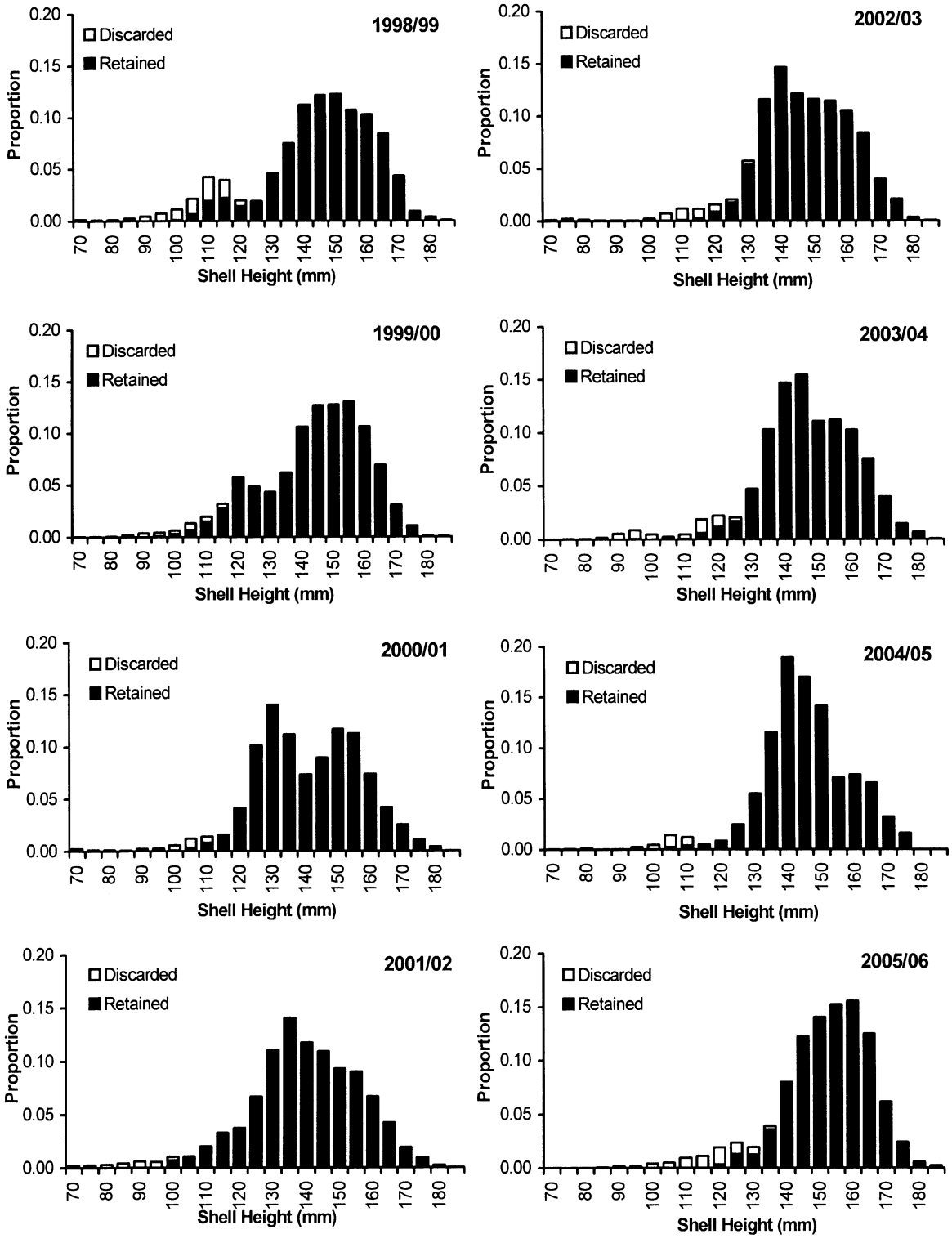

Figure 23.–Bering Sea Registration Area scallop shell heights from resampling observer data, 1998/99–2005/06.

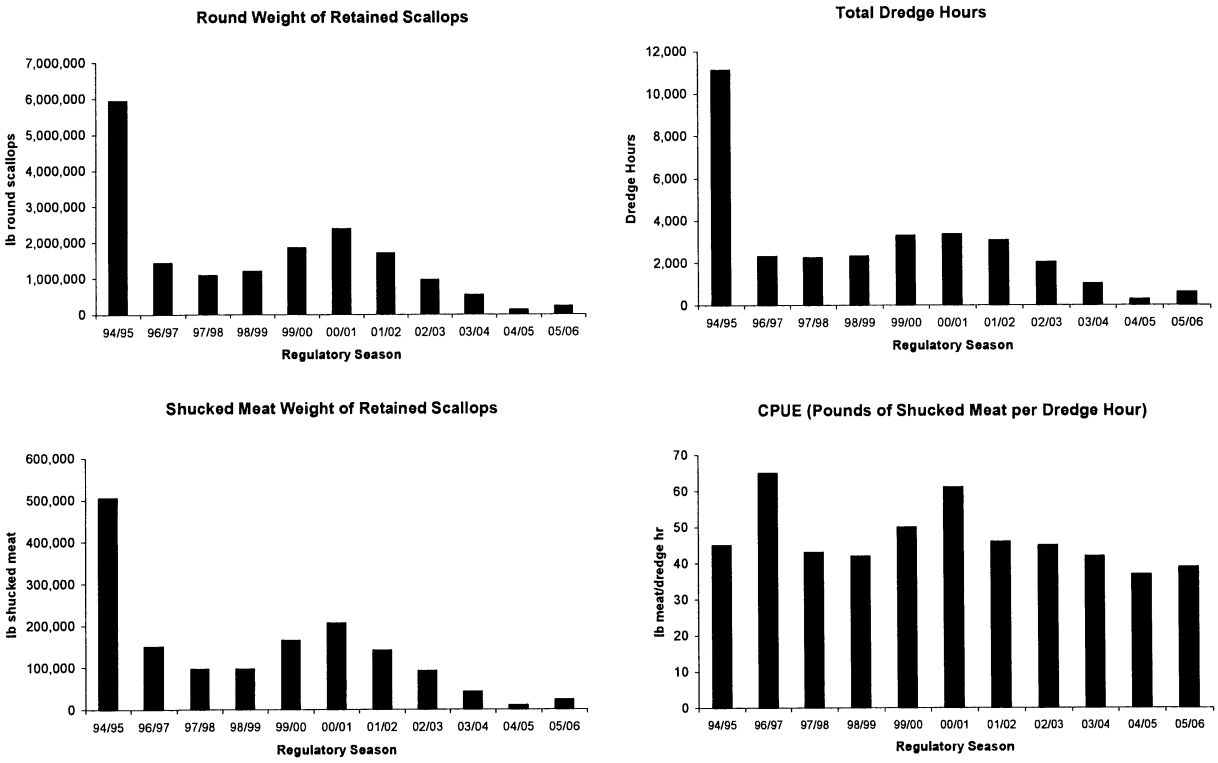

Figure 24.–Weathervane scallop harvest by round weight, meat weight, dredge hours, and CPUE, Bering Sea Registration Area, 1994/94–2005/06.

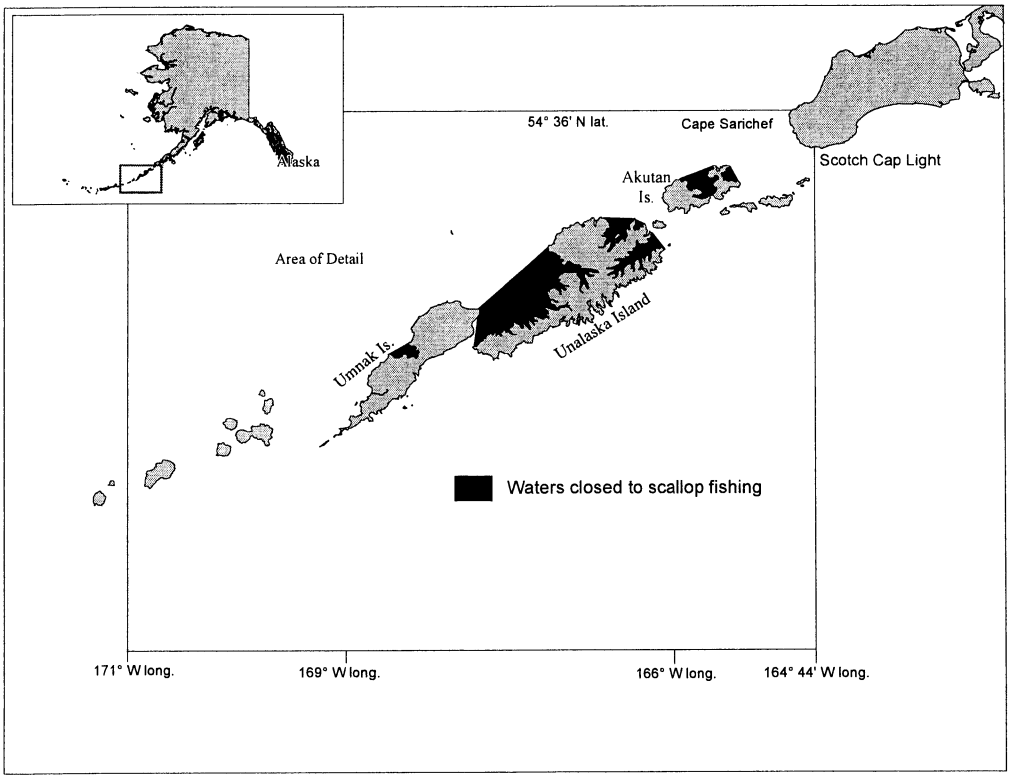

Figure 25.–Dutch Harbor weathervane scallop registration area and closed waters.

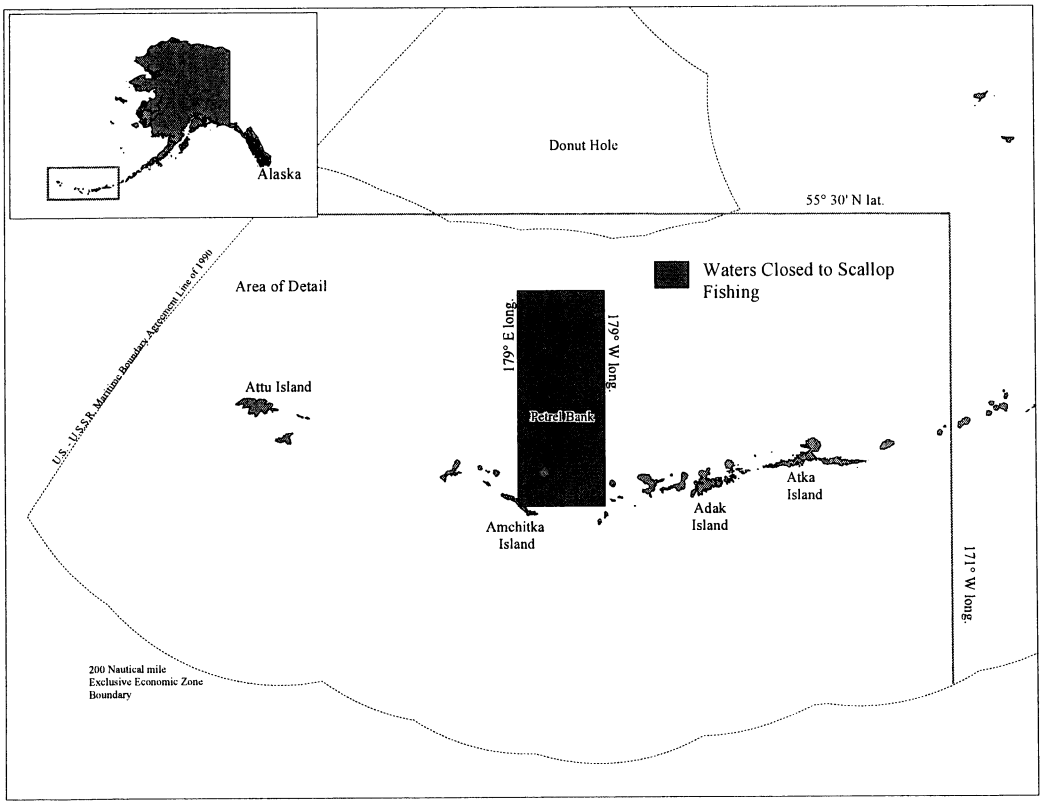

Figure 26.–Adak weathervane scallop registration area and closed waters.

APPENDIX A

Appendix A1.–Commercial harvests of weathervane scallops from Prince William Sound, 1992–2005.

Year	No. of Vessels	Harvest[a] (meat lb)	Harvest objective[b] (meat lb)	Season (hours)	Comments
1992	4	208,836	64,000		
1993	7	63,068	50,000	67	
1994		Fishery rescheduled to 1995			Season start date changed.
1995	2	108,000	50,000	390	Additional 60,000 lb of illegal harvest.
1996	0		0		Closed due to illegal harvest.
1997	1	18,000	17,200	141	
1998	2	19,650 combined	6,000 East 14,000 West	78	
1999	2	20,410 combined	6,000 East 14,000 West	54 East 84 West	
2000	3	30,266 combined	9,000 East 21,000 West	744 East 783 West	
2001	1	30,090 combined	9,000 East 21,000 West	5,367 East 5,441 West	
2002	2	15,641 combined	6,000 East 14,000 West	5,544 East 5,517 West	
2003	1	19,980 combined	6,000 East 14,000 West	5,004 East 4,984 West	
2004	2	49,320 combined	26,000 East 24,000 West	2,748 East 5,367 West	
2005	3	49,205 combined	26,000 East 24,000 West	1,264 East 1,048 West	

[a] Harvest total for east and west areas combined are provided by provisions of confidentiality releases.

[b] Separate GHLs were established for areas east and west of Kayak Island beginning in 1998.