

SHELLFISH FISHERIES

Southeast Alaska-Yakutat Region
1995/96

Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
Juneau, Alaska

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Report to the Board of Fisheries

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Section 1

INTRODUCTION TO THE 1995/96 SHELLFISH FISHERIES

REPORT TO THE BOARD OF FISHERIES
INTRODUCTION TO 1995/96 SHELLFISH FISHERIES



By

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Commercial Fisheries Management and Development Division
Juneau, Alaska

January 1997

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INTRODUCTION

This report reviews the commercial fisheries for shellfish and miscellaneous dive species in Region 1, which consists of Southeast Alaska (Statistical Area A) and Yakutat (Statistical Area D). Area A encompasses all waters within the Alexander Archipelago and offshore waters from Dixon Entrance to Cape Fairweather, divided into districts 1 through 16 (Figure 1.1). Area D encompasses state waters from Cape Fairweather to Cape Suckling, divided into districts 81 through 91. Shellfish fisheries in these areas are primarily in state waters; however, a few fisheries with state management authority, such as weathervane scallops, extend into the Exclusive Economic Zone (EEZ). Data for king and Tanner crab fisheries are summarized in this introduction for comparative purposes, but are not described in later chapters.

Shellfish harvests in Region 1 totaled over 13 million lb valued at over \$22 million during the last completed season or year (Table 1.1). In the top five fisheries, Southeast Dungeness crab was the most valuable, followed by Southeast Tanner crab, Southeast pot shrimp, sea cucumber, and Southeast red king crab. In poundage, Southeast Dungeness crab was also first, followed by beam trawl shrimp, sea urchins, Southeast Tanner crab, and sea cucumbers.

Most of the shellfish fisheries are fully developed. Some stocks have been able to sustain consistent and significant harvests, including fisheries for Dungeness crabs, Tanner crabs, trawl shrimp, and sea cucumbers. The red king crab fishery, reopened in 1993 after 8 years of closure, continues to rebuild in strength.

Other fisheries are in various stages of development. The pot shrimp fishery, recently limited to entry, has seen large increases in harvest and effort in the past decade. A quota of nearly 6 million lb of sea urchins is now available for commercial harvest following a 3 million lb test fishery ending in April 1996. Geoducks have had fairly stable landings, but their increased value, particularly for live shipments, is increasing the demand for expansion of the fishery. On the down side, the abalone fishery has continued to decline and is closed for the 1996/97 season for stock conservation.

Limited entry has played a significant role in harvest and effort trends. Recently limited fisheries include Southeast Dungeness crab and pot shrimp. A limited entry program is currently under consideration for the Southeast trawl shrimp fishery. A four year moratorium on entry into Southeast Alaskan dive fisheries took effect on July 1, 1996.

Shellfish Research and Management

The ability of the department to provide for large and sustained yields varies among the fisheries. Those fisheries with stock assessment programs and management plans are most adequately managed. These include red king crab, sea cucumbers, and sea urchins. Others lack management plans and stock surveys and are cause for concern. These include fisheries for Dungeness crab, pot shrimp, and beam trawl shrimp. In between are fisheries having management plans, such as scallops (formal plan) and Tanner crab (draft plan) but no stock surveys.

Shellfish surveys include (1) an annual red king crab pot survey in northern Southeast Alaska, (2) annual sea cucumber dive surveys mostly in southern Southeast and the Sitka area, and (3) a new sea urchin dive survey program which is anticipated to continue annually. A pilot survey for Dungeness crab shell condition was initiated in May 1996, and a pilot pot survey of shrimp was conducted in District 7 in September, 1996. Prior surveys include a trawl survey to estimate stock abundance and size class composition of the Yakutat Bay pink and sidestripe shrimp, which was conducted on seven occasions, last in 1984. Population estimates of six exploited geoduck beds have also been completed in the past to establish guideline harvest levels for each location.

Dockside sampling and skipper interviews are conducted for the crab and trawl shrimp fisheries to gather a consistent time-series of data on size frequency, shell condition, average weight, sex (shrimp only), fishing location, effort levels, and estimates of average harvest per unit of effort (CPUE). These data provide the only biological information for those fisheries lacking stock surveys, which includes Dungeness crab, brown king crab, Tanner crab, shrimp, and scallops. The collected information allows some assessment of relative strength of various portions of the commercially exploited populations, and a qualitative estimate of stock condition. Harvest and effort data is also collected through the fish ticket system.

Logbook information is collected from the red king crab, Tanner crab, and sea cucumber fisheries and for the shrimp trawl fisheries in non-traditional areas. This information is particularly valuable for management of the crab fisheries. Logbook data has become unnecessary for the sea cucumber program given the high quality of the assessment survey data.

Staff

Regional fishery management (shellfish and other species) is under the supervision of Doug Mecum, regional management coordinator in Douglas. Marine fisheries research (non-salmon) is under the supervision of Doug Woodby, regional marine fisheries research supervisor, also in Douglas. The management and research programs for crab, shrimp, scallop, octopus, and littleneck clams are the responsibility of a shellfish staff (non-dive fisheries) with occasional participation by area management staff.

SHELLFISH STAFF			
Name	Title	Job Class	Location
Tim Koeneman	Regional Shellfish Biologist	Fisheries Biologist III	Petersburg
Catherine Botelho	Asst. Regional Shellfish Biologist	Fisheries Biologist II	Douglas
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Rexanne Stafford	Port Sampler	Fish and Wildlife Technician III	Petersburg
John E. Clark	Shellfish Biometrician	Biometrician II	Douglas

Research and stock assessment for the sea cucumber, sea urchin, abalone, and geoduck dive fisheries is accomplished by the dive fishery staff, with help from the area management staff.

DIVE FISHERY RESEARCH STAFF			
Name	Title	Job Class	Location
Robert Larson	Herring and Miscellaneous Species Project Leader	Fisheries Biologist III	Petersburg
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John E. Clark	Shellfish Biometrician	Biometrician II	Douglas

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

Season or Year	Fishery	Harvest in Thousands of lb	Approximate Exvessel Value in Thousands of \$\$ ^a
<u>Southeast</u>			
1995/96	Dungeness Crab	4,402.8	7,246.9
1995/96	Pot Shrimp	906.5	2,590.8
1995/96	Beam Trawl Shrimp	3,056.5	869.4
1995/96	Otter Trawl Shrimp	0.0	0
1995/96	Abalone	14.0	126.6
1995/96	Geoduck	213.4	432.4
1995/96	Sea Cucumber	1,331.1	1,621.4
1995	Sea Urchins ^b	2,985.6	1,297.8
1995	Littleneck Clams	15.6	33.8
1995	Octopus	1.2	1.5
1995/96	Red and Blue King Crab	361.3	1,499.4
1995/96	Tanner Crab (bairdi)	2,020.0	4,242.1
1995/96	Tanner Crab (tanneri)	*	*
1995/96	Brown King Crab	15.8	41.6
	SUBTOTAL ^c	12,267.3	20,003.7
<u>Yakutat</u>			
1995/96	Dungeness Crab	557.5	950.6
1995/96	Pot Shrimp	12.7	43.6
1995/96	Otter Trawl Shrimp	0.0	0
1995 ^d	Weathervane Scallops	242.5	1,299.8
1995/96	Red and Blue King Crab	*	*
1995/96	Tanner Crab	27.8	67.1
	SUBTOTAL ^c	840.5	2,361.1
<u>GRAND TOTAL^c</u>		<u>13,107.8</u>	<u>22,364.8</u>

* Where number of vessels participating is less than three, the information is considered confidential.

^a This column is calculated from the average price per lb of all tickets having values indicated on them.

^b Sea urchin data are from a 14-month test fishery from March 1995 to April 1996 in District 1 near Ketchikan.

^c Totals do not include confidential data.

^d District 16 is included in Statistical Area D for this fishery only.

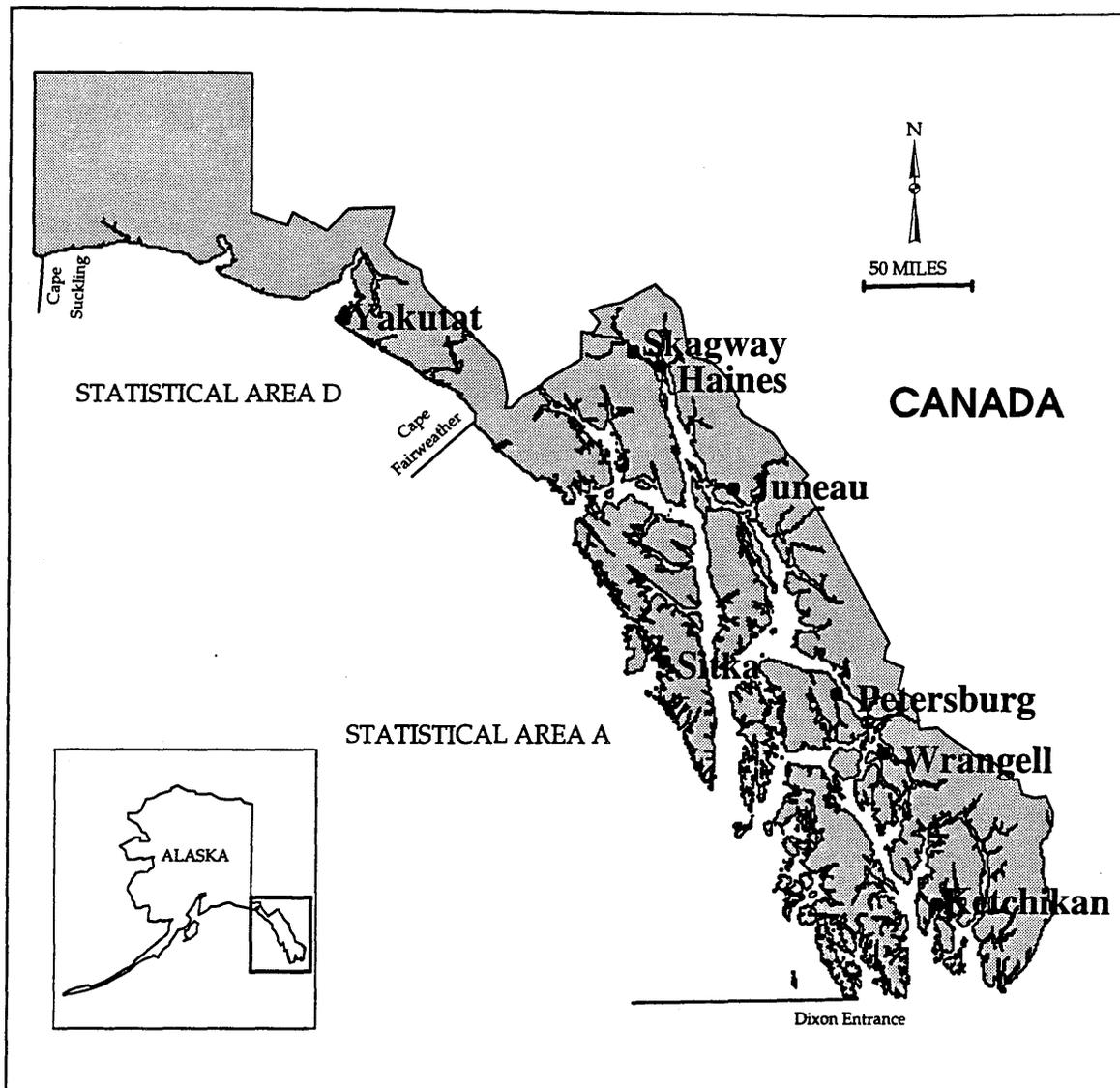


Figure 1.1. Statistical Area A (Dixon Entrance to Cape Fairweather) and Statistical Area D. (Cape Fairweather to Cape Suckling).

Section 2

SOUTHEAST ALASKA DUNGENESS CRAB FISHERIES, 1995/96

REPORT TO THE BOARD OF FISHERIES
SOUTHEAST ALASKA DUNGENESS CRAB FISHERIES, 1995/96



By

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January 1997

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INTRODUCTION

Dungeness crabs *Cancer magister* are members of the highly evolved brachyuran (true crab) subgroup of the order Crustacea. They are commercially significant and widely distributed in coastal waters of the eastern Pacific Ocean from Baja California to the Aleutian Islands.

Southeast Alaska (Statistical Area A) is near the northern limit of the range of Dungeness crab. In Southeast Alaska, Dungeness crabs are found throughout the reporting districts between Dixon Entrance and Cape Fairweather. They congregate in areas with mud and sand substrate and depths between two and 40 fathoms, generally in the northern half of Southeast Alaska. Southeast Alaska has produced a long-term average of about 1,900,000 lb per season.

Southeast Alaska is a superexclusive registration area for Dungeness crab; a vessel registered to fish in this area cannot register or fish in any other area in Alaska during the same calendar year. The fishery is also under limited entry. Currently, 300 or more vessels per season register and fish in Southeast Alaska. Most vessels are below limit seiner length (58'), although they range in size from aluminum skiffs to over 90 feet long. Almost all participants use standard, hatbox-shaped pots constructed with steel frames and webbed with stainless steel wire. The maximum legal limit of gear is 300 pots.

The summer fisheries overlap important parts of the male molting period, which extends into mid-summer, and the female molting period that extends through the summer. The major mating period is also during mid to late summer. Most of the product is marketed as whole-cooked and live crab during the summer tourist markets in Washington, Oregon, and California. Alaska is the only management jurisdiction on the West Coast that allows major summer fisheries for Dungeness crabs, justified on the basis of the overriding economics of the summer fishery.

Fishing during molting and mating periods risks local depletion and general fishery collapse. This is exacerbated by limited information for management, comprised solely of port sampling and fish ticket data. The risks have increased since the early 1980s when ample fishing grounds were available, seasons were longer, and fishers encountering high percentages of soft-shelled crab, female crab, or mating pairs could move to grounds where better harvest conditions prevailed.

Many peripheral areas that once served as nursery or refuge areas that could buffer the effects of heavy harvest in adjacent areas are now heavily fished. Since the late 1980s, all available fishing grounds, even marginal ones, have been fully utilized, the exploitation rate has climbed, and the fishery is much more dependent on annual recruitment. The effect of poor recruitment of even a single year class on the fishery would be much more pronounced now than it would have been prior to the mid-1980s.

Conflict between user groups is rising as competitive pressure and gear saturation crowd commercial gear onto grounds traditionally used by non-commercial fishers. This has resulted in commercial closures of

small areas around many communities in Southeast Alaska, including Juneau, Tenakee Springs, Elfin Cove, Point Baker, Hollis, and Gustavus with continuing requests for commercial closures around more.

Lastly, sea otter populations are expanding in Southeast Alaska. Their expansion into many areas has been accompanied by drastic declines in availability of many economically important invertebrate species, one of which is Dungeness crab. While the eventual extent of their distribution in the more interior waters of Southeast Alaska cannot be ascertained, their effect on favored prey species is well-known.

FISHERY DEVELOPMENT AND HISTORY

The fishery dates back to the 1930s. Prior to the 1960s, harvests from much of the Gulf of Alaska coast were combined into a single total. Since 1960, harvests from Southeast Alaska have averaged about 1,993,000 lb when annual (1960 to 1968) and seasonal (1969/70 to present) data are combined (Table 2.1).

The fishery in Southeast Alaska has evolved through three distinct periods since the early 1960s. From the early 1960s through the early 1980s, participation was so low that need for formal regulations and other restrictions was minimal. The 1960s were characterized by a few larger vessels in a directed fishery harvesting up to several million lb per year. This was in response to high market demand caused by low harvests in Washington, Oregon, and California. The principal product was canned crab meat.

During the 1970s, production in Washington and Oregon rebounded, demand for crab from Southeast Alaska declined. With little or no processor support, fishers had to either sell over the dock to the public or make complicated and risky arrangements for air-freighting live crab out of state. Although the summer closure was rescinded, only a few dozen vessels in the 30' to 45' range fished mostly during the summer.

In the most recent period, since the 1981/82 season, the fishery has undergone sweeping change. Declining harvests in Pacific Coast states and changing market preferences increased demand for Alaskan frozen sections, whole cooked crabs, and air-freighted live crabs. More processors began purchasing crab and supporting the fishery through the entire summer through winter season. Catches increased, averaging 2,887,000 lb per season, and the numbers of participants increased, climbing to 317 vessels. The fishery grew from a small group of 30' to 45' vessels to a large fleet of skiff-sized vessels up to 30' in length. This resulted in a defacto harvest reallocation from a primary fishery for a relatively small number of single-species participants to a secondary fishery for a larger number of new and often transitory entrants.

Most recently, interest in air-freighted live Dungeness crab is growing in the Orient. There has also been a growing demand from Canada for live crab. Recent legislative changes will allow surface shipment of live crab from Southeast Alaska to Canadian markets, starting in late 1996.

Increasing numbers of participants led to a permit moratorium, imposed by the Commercial Fisheries Entry Commission (CFEC) in 1991. During the four years of the moratorium, the CFEC first conducted numerous studies and public meetings to evaluate the need for limited entry into this fishery, then convinced the legislature to authorize use of tiered pot limits to accommodate the large number of qualifying participants while limiting the effort to acceptable levels. In January 1996, the moratorium period ended and a tiered pot limit form of limited entry was adopted for implementation by June 15, 1997. As currently envisioned, the maximum number of permits will eventually be set at 308 and the tiered permits system will be structured to limit the maximum number of pots to less than 48,300.

In the spring of 1996, the department conducted a pre-season assessment survey of the Dungeness stocks off the Stikine River flats in central Southeast Alaska. This stock is a consistently important contributor to the overall Southeast Alaska harvest. Using a random transect experimental survey design and commercially-configured pots with smaller than usual mesh, the department collected size, sex, and shell hardness data over a period of four days during late May, preceding the commercial fishery which started on June 15. After the season opened, research staff conducted on-board field observations of commercial fishing operations in the same general area. The goal of this initial project was to develop a method for estimating the prevalence of sub-legal and legal-sized soft-shelled male crabs that would be vulnerable to handling by the commercial fleet early in the summer season. Preliminary examination of the experimental and observer data sets suggest that the two are not comparable. Yet to be determined are whether a correlation exists between the experimental and observer data or whether the sampling design needs to be modified to better reflect the commercial harvest.

REGULATION DEVELOPMENT

All registration areas in Alaska apply generally passive management measures limiting the size, the sex, and to some extent, the season during which crab may be caught. In Southeast Alaska, seasons are timed to avoid some of the sensitive life history periods while maximizing economic returns.

There are more active management alternatives to size, sex, and season methods currently used by the state. Some of these, such as guideline harvest levels based on stock assessment surveys, could structure harvest to protect weak stock segments or soft-shell crabs while optimizing exploitation rates and product quality. Until the advent of more active management, the state will rely on passive methods refined over the long history of the fishery.

Fishing Seasons and Periods

From the early 1930s through 1955, regulations included a prohibition on the taking of females, a minimum size limit for males, and a closed season on the most important grounds for two to four months between May 1 and September 1. Available documentation from that period indicates that molting was thought to occur during the summer. The summer closure was generally acceptable to fishers because of other fishing opportunities in the salmon and halibut fisheries. It was revoked in the late 1950s.

Since the late 1960s, fishing season closures have been introduced, and then modified, to reduce fishing pressure during sensitive periods in the life history of the species. An example was the closure from March through May in 1976/77 to protect male crabs during their primary molting period. In the 1980s, management staff explored methods and means to further avoid sensitive life history periods to accommodate the increasing effort as the fleet slowly utilized more of the known habitat and range of the crabs. Management staff felt that as more of the discontinuous distribution of the species was exploited, there would be fewer unfished stocks to act as reproductive buffers against local depletion in adjacent fishing grounds. Then, beginning in 1985, the commercial fishery was closed between August 16 and September 30 because field observations suggested that it was the major mating period. In response to increasingly high effort levels and high harvest rates, the season was further shortened in 1989 by reducing the winter season to October and November in most of Southeast Alaska. The split seasons have been in effect since then.

Size Restrictions

From 1924 to 1935, legal crabs were restricted to males over 6.5 inches in greatest width. From 1936 to 1962, only males over 7.0 inches in greatest width were legal. Since 1963, the legal size has been 6.5 inches, measured across the carapace immediately anterior to the tenth anterolateral spines. This is the current standard measuring point in all jurisdictions throughout the range of this crab and is used because the large tenth anterolateral spines are often broken or eroded in older shelled crabs.

Gear Definitions and Specifications

Since 1934, trawls have been prohibited in this fishery. Gear was further limited to pots or ring nets in 1954. A pot limit of 300 pots or ring nets was implemented in 1963. Diving gear was included as legal gear in 1966. Nearly all of the commercial harvest is currently taken with pots.

Starting in 1963, Dungeness crab buoys were required to display the registration number of the vessel fishing the gear. In 1988, the minimum size of buoy markings was set at one and one-half inches in height, in numerals at least one-fourth inch wide that contrasted with the color or texture of the buoy.

In 1977, two escape rings of 4 3/8" diameter were required in each pot, and a Dungeness pot was defined by its tunnel eye openings, which individually could not exceed 30 inches. In 1978, an escape panel secured by a maximum of 120 thread cotton twine was required. A minimum size for buoy numbers of one and one-half inch high and 1/4 inch wide numbers was implemented in 1989. In 1991, the breaking strap or biodegradable twine for the lid retainers was changed from 120 thread to 60 thread. The intent was to minimize untended ghost fishing of lost or derelict pots.

Dungeness gear development remained static for many years, with little change in configuration, materials, size, and weight to significantly affect pot efficiency. Within the last two seasons, trigger enhancing devices that minimize escapement of crabs through entrance tunnels have been developed and are being installed on commercial gear. Future comparisons of historical harvest rates will need to account for the possible enhanced efficiency of pots with the new trigger designs.

Other Regulatory Changes

Vessel registration and hold inspection requirements started in 1974. Southeast Alaska was designated a superexclusive registration area in 1983. Hold inspections were rescinded in 1984.

1995/96 SEASON SYNOPSIS

The 1995/96 season was divided into summer (June 15 - August 15) and winter (October 1 - November 30) segments. The overall harvest was 4,403,000 lb (Table 2.1), with an exvessel value of \$7,700,000 (\$1.75/

lb). Summer season landings totaled 3,466,000 lb, and winter season landings totaled 916,000 lb (Table 2.2). Two hundred permit holders reported landings for either the summer or winter seasons (Table 2.1).

Districts 6, 8, 9, 10, and 14, with reported landings of 2,582,000 lb, accounted for 59% of the total harvest (Table 2.2). Seventy-nine percent of the harvest was taken during the summer season (Table 2.2). The winter harvest was much higher than last winter (Table 2.2).

Testing for Paralytic Shellfish Poison (PSP) continued, with small samples representative of harvests from major fishing grounds sent to the Alaska Department of Environmental Conservation laboratories in Palmer. PSP levels were low and no restrictions were placed on the transport and sale of whole crabs.

1996/97 SEASON OUTLOOK

Over 4,000,000 lb were harvested from June 15 through August 15, indicating major recruitment entering the fishery this season. Distribution of the harvest indicated that production in central districts contributed most significantly to the total. Although some smaller processors paid up to \$1.25 per lb, most of the harvest was sold for \$0.85 per lb.

Major harvests will probably continue to be concentrated in the summer season, much as they have been in the past. Winter fisheries contend with icing of productive areas at the heads of bays, shorter days, more inclement weather, and poorer market conditions. If winter harvests follow the same trends as the 95/96 season, up to a million more lb may be landed before the winter portion of the 96/97 season ends on February 28, 1997.

Use of the newly authorized option for surface transport of live crab to foreign ports will bear some scrutiny as crabbers exploit this marketing option and take advantage of favorable prices being offered by Canadian buyers. It is likely that the first foreign landings will be at British Canadian ports such as Prince Rupert.

The Alaska Department of Environmental Conservation will resume testing crabs for PSP before, and immediately following, the start of the 1997 summer fishery.

The department intends to continue refining and expanding the preseason index and shell condition survey initially conducted on the Stikine River flats in May and June, 1996. Future utility of the assessment survey will depend on more complete analysis of the data.

Table 2.1 Statistical Area A (Southeast Alaska) Dungeness crab harvest, number of permits fished, number of landings, and average harvest per landing, 1961 to present.

Year/ Season	Catch in lb	Number of Permits	lb per Permit	Number of Landings	lb per Landing
1960	1,449,405	-			
1961	671,455	-			
1962	2,985,939	-			
1963	3,296,362	-			
1964	3,996,100	-			
1965	2,392,395	-			
1966	1,968,117	-			
1967	2,033,156	-			
1968	1,900,690	-			
1969/70	1,149,111	24	47,880	392	2,931
1970/71	776,617	21	36,982	380	2,043
1971/72	452,681	22	20,576	315	1,437
1972/73	597,587	31	19,277	315	1,897
1973/74	748,519	41	18,257	483	1,549
1974/75	713,915	55	12,980	453	1,576
1975/76	611,564	36	16,988	344	1,777
1976/77	512,328	25	20,493	171	2,996
1977/78	127,345	12	10,612	87	1,463
1978/79	750,284	25	30,011	207	3,624
1979/80	801,753	37	21,669	313	2,561
1980/81	521,247	26	20,048	227	2,296
1981/82	2,932,427	75	39,099	749	3,915
1982/83	3,668,062	129	28,435	1,303	2,815
1983/84	2,151,457	132	16,299	1,531	1,405
1984/85	1,835,494	181	10,141	1,586	1,157
1985/86	2,312,105	216	10,704	2,077	1,117
1986/87	2,453,055	224	10,951	2,330	1,052
1987/88	3,391,699	241	14,073	2,746	1,235
1988/89	3,321,734	264	12,582	2,683	1,238
1989/90	1,918,653	245	7,831	2,094	916
1990/91	2,662,840	243	10,958	2,342	1,136
1991/92	4,706,038	316	14,893	3,381	1,391
1992/93	3,089,398	247	12,508	2,492	1,239
1993/94	2,536,701	198	12,812	1,956	1,296
1994/95	1,921,689	182	10,559	1,786	1,075
1995/96 ^a	4,402,762	200	22,014	2,733	1,610

^a Most recent year's data should be considered preliminary.

Table 2.2. Statistical Area A (Southeast Alaska) 1995/96^a season; Dungeness crab harvest by month and district.

Dist.	1995								1996		Total
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	
101	Closed	Closed	Closed	Closed	Closed	21,550	15,129	17,703	15,361	25,071	94,814
102	Closed	Closed	Closed	Closed	Closed	*	0	0	0	0	*
103	Closed	*	*	*	Closed	0	0	Closed	Closed	Closed	*
104	Closed	0	*	0	Closed	0	*	Closed	Closed	Closed	*
105	Closed	109,609	194,735	71,477	Closed	46,111	19,816	Closed	Closed	Closed	441,748
106	Closed	270,530	256,348	76,998	Closed	99,964	25,660	Closed	Closed	Closed	729,500
107	Closed	55,334	72,691	35,821	Closed	12,566	2,961	Closed	Closed	Closed	179,373
108	Closed	236,948	223,460	75,556	Closed	101,414	55,005	Closed	Closed	Closed	692,383
109	Closed	139,823	260,401	118,551	Closed	107,976	30,426	Closed	Closed	Closed	657,177
110	Closed	137,949	186,605	47,536	Closed	33,719	9,866	Closed	Closed	Closed	415,675
111	Closed	19,381	27,911	15,725	Closed	43,754	23,381	Closed	Closed	Closed	130,152
112	Closed	55,409	82,526	53,901	Closed	51,112	12,042	Closed	Closed	Closed	254,990
113	Closed	52,842	82,966	26,291	Closed	16,507	12,833	*	*	*	196,643
114	Closed	88,043	193,053	108,269	Closed	85,782	27,551	Closed	Closed	Closed	502,698
115	Closed	19,193	33,254	12,655	Closed	*	*	Closed	Closed	Closed	75,208
116	Closed	*	*	*	Closed	*	*	Closed	Closed	Closed	*
Total		1,193,163	1,626,018	646,575		628,511	229,009	17,703	15,361	25,071	4,402,762

^a Most recent year's data should be considered preliminary.

* Where number of vessels participating is three or less, the information is considered confidential.

Section 3

SOUTHEAST ALASKA SHRIMP BEAM TRAWL FISHERY, 1995/96

REPORT TO THE BOARD OF FISHERIES
SOUTHEAST ALASKA SHRIMP BEAM TRAWL FISHERY, 1995/96



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INTRODUCTION

The beam trawl fishery primarily targets pink shrimp *Pandalus borealis* and secondarily targets the larger sidestripe shrimp *Pandalopsis dispar*. Other species incidentally captured and landed in smaller quantities are the coonstripe shrimp *Pandalus goniurus*, humpy shrimp *P. hypsinotus*, and the spot prawn *P. platycerous*.

Productive beam trawling has historically been limited to four major fishing areas in Southeast Alaska. These areas are District 8, and portions of Districts 6 (Duncan Canal and Kah Sheets Bay), District 7 (Eastern Channel), District and 10 (Thomas and Farragut Bays), all located in the Petersburg-Wrangell Management Area (Figure 3.1). The concentration of the fishery in these areas is due to the abundance of the resource, the presence of the major processors, and limited vessel capabilities. Most vessels are less than 60' in length, utilize small horsepower engines, do not have refrigerated holds, and have a crew of two. Some vessels currently fishing have been participating since the inception of the fishery in 1915. Vessels strive to provide a high quality product through daily deliveries. Most of the participants are residents of Petersburg or Wrangell.

The beam trawl is a relatively simple gear type in appearance and function. A strong wooden or metal beam acts as a head rope, and metal "shoes" connected directly to each end of the beam act as the breast of the trawl. Thus, two important dimensions of the net are controlled by rigid members: 1) the width of the mouth is determined by the length of the beam; and 2) the opening height of the net is determined by the height of the metal "shoes." Beam length is limited by the length of the vessel. Beam trawls are deployed with a single bridle and can effectively fish some gradual side slopes and irregular bottoms. When not deployed, the beam trawl is stored on the vessel bulwarks, which restricts the sea-keeping capabilities of the vessel.

Management is based on a closed season designed to prevent fishing on major stocks during the egg-hatch period from February 15 through April 30, guideline harvest levels based on historic harvests, and three fishing periods in major fishing areas, which were based upon industry input to spread out the harvest and take advantage of growth and recruitment.

FISHERY DEVELOPMENT AND HISTORY

The first documented beam trawl harvest of shrimp in Southeast Alaska occurred in Thomas Bay (located in District 10) in 1915. This harvest was processed by floating canneries also located in Thomas Bay. By 1921 five processors were operating. Fleet size, production capacity, and expansion of fishing grounds occurred well into the 1950s. Prior to the development of the Westward Area (Statistical Area J) shrimp fisheries in 1959, the beam trawl fishery in Southeast Alaska was the major shrimp fishery in the state.

Cook Inlet and Westward Region fisheries dominated the statewide production figures with harvests exceeding 100 million lb through the 1970s and harvests declined after that period until those fisheries were closed prior to the 1982/83 fishery. With the decline of the shrimp fishery in other parts of the state, the Southeast Alaska beam trawl shrimp fishery is once again the major trawl shrimp fishery in the state.

From 1955 through 1967 annual beam trawl harvests ranged from 1,800,000 to 7,600,000 lb, with an average of 3,600,000 lb per year (Table 3.1). The number of vessels participating ranged from 10 to 22. The peak production year was 1958 when 14 vessels caught over 7,600,000 lb. During the late 1960s and early 1970s harvest and effort declined. Seasonal harvests averaged 916,300 lb and effort averaged 12 vessels during the 1970s. Through the 1980s the harvest and effort increased to an average of 1,409,500 lb by an average of 19 vessels. During the 1990s the harvest has averaged 2,703,800 lb by an average of 32 vessels. Some of the vessels that recently entered the fishery are speculating on qualification into a future limited entry program. Relatively few of the maximum of 48 vessels are contributing substantially to the harvest or are dependent upon the fishery for a major portion of their fishing income. Recent fisheries have been worth approximately \$1,000,000 per season. While the fishery continues to develop, fishing opportunities are being reduced by premature closure of major fishing districts within each fishing period and long closed periods.

During the 1970s, harvest opportunities occurred in all major fishing areas throughout the year (Table 3.2). As substantial and consistent increases in effort began in 1980, guideline harvest levels were achieved quickly and it became necessary to close major fishing areas by emergency order. Fishing opportunities were no longer available in major fishing areas throughout the year, especially during the winter months. During recent seasons, the months of May, July, and September received high effort levels, each month provided harvests exceeding 500,000 lb (Table 3.2) and it became increasingly necessary to close major fishing areas early by emergency order. Seasonal harvests approached 1,000,000 lb prior to 1980. Recent fisheries in District 8 have been as short as four days during each of these months, and seasonal harvests for the region now average about 2,750,000 lb.

Prior to 1970 Districts 6 and 10 produced the majority of the beam trawl harvest and District 8 produced relatively low harvests. Harvests from District 10 centered in Farragut and Thomas Bays, and harvests from District 6 included Duncan Canal and Kah Sheets Bay. With the decline in abundance in District 10, the fishery became almost totally dependent upon District 6 and harvests from District 8 began to increase. From the 1969/70 through the 1978/79 fishing seasons, District 6 harvests averaged almost 600,000 lb per season while District 8 harvests averaged less than 250,000 lb per season (Table 3.3a). During this ten-season period, harvests from District 8 exceeded harvests from District 6 only once. Regulatory guideline harvest levels were increased in 1978 and three fishing periods were established in regulations in 1989. During the last ten fishing seasons, the pattern of high harvests in District 6 relative to District 8 has continued but the total harvests from those Districts have more than doubled (Table 3.3b). Recent harvests from District 10 have increased and Districts 3, 5, 7, 9, and 11, also produced significant harvests.

REGULATION DEVELOPMENT

Documentation describing shrimp fishing regulations is available since 1924. Regulations prior to that date are unknown. Regulations from 1924 through 1932 primarily concern fishing seasons. Size restriction regulations were implemented in 1941. During the next decade closed areas were added and from 1947 through 1949 Duncan Canal, now a major shrimp fishing area, was closed to commercial fishing.

The following discussion focuses on fisheries that occur primarily in the vicinity of Petersburg and Wrangell. As directed fisheries develop in other fishing areas it will be necessary to apply similar restrictions to them as well. Currently, most other areas are not significantly constrained by restrictive fishing seasons, fishing periods, or guideline harvest ranges (GHRs).

Fishing Seasons and Periods

A fishing season from May 1 through March 15 was established by 1924. A similar season has since been in place with some modifications to beginning and ending dates. The season is now May 1 to February 14. The purpose of the closed period is to protect female shrimp during the egg hatch period when fishing would reduce the reproductive potential of the stock.

As the fishery intensified during the 1980s, the GHR was taken in successively fewer days. In response, three fishing periods were established beginning in 1989. These periods were May 1 through June 30, July 1 through August 31, and September 1 through February 14. These periods were designed to lengthen the total season in major districts and to reduce fishing effort during periods of growth and recruitment.

Prior to 1994 all fishing districts in Southeast Alaska, except District 8 and a portion of District 6 (Duncan Canal and Kah Sheets Bay), District 7 (Eastern Channel), and District 10 (Thomas and Farragut Bays), were open throughout the year. During the early 1990s large otter trawling harvester-processors requested permits to fish for shrimp in the region, leading to requests to the commissioner to close shrimp fisheries in outside waters. The controversy surfaced because some members of other fishing organizations felt that trawlers were using a loophole in the regulations to either prospect or target other species, like rockfish. Initial closures were made by either emergency regulation or emergency order. The issue was brought before the Board of Fisheries and resulted in the closure for Districts 1, 2, 4, and 12 through 16, which had low and sporadic historical effort and harvests.

Size Restrictions

As early as 1941 regulations specified that not more than 50% of the shrimp harvested could be less than 3" total length. These regulations were altered to no more than 25% in 1942, and in 1948 the size was changed to less than 2.5" total length. By 1952 there were no size regulations.

By 1979 the Board of Fisheries adopted a policy to discourage the harvest of shrimp less than two years of age. This policy exists today and instructs the department to take action when the fishery targets on segregated schools of small shrimp.

Quotas and Guideline Harvest Ranges

In 1977 harvest quotas for each of the four major fishing areas (District 8 and portions of Districts 6, 7, and 10) were first established. These quotas were based on historical harvest records with some adjustment for existing stock conditions. Strict quotas were difficult to monitor and regulate, so in 1978 quotas were replaced by GHRs that provided more flexibility for in-season management based upon fishery performance and size-class distribution. The fishery continued to intensify through the influx of effort and increased processing capacity. In some districts, specifically Districts 8 and a portion of District 6, the seasonal GHR was taken very early in the fishing season necessitating an emergency order closure for the remainder of the season.

In 1988 the GHRs were evenly distributed through three fishing periods to lengthen the fishery and to take advantage of growth and recruitment which occurred during the spring and summer months. Guideline harvest ranges which exist today for each of the three fishing periods are: a portion of District 6 from 80,000 to 400,000 lb; a portion of District 7 from 15,000 to 50,000 lb; District 8 from 25,000 to 175,000 lb; and a portion of District 10 from 5,000 to 75,000 lb. In 1994, seasonal GHRs of 0 to 100,000 lb were established for Districts 3, 5, 9, and 11 and remaining portions of Districts 6, 7, and 10.

Gear Restrictions

In 1962 regulations defining a minimum mesh size used in beam trawls were established for a portion of the Petersburg-Wrangell area. By 1969 similar regulations were in place for all areas. The current regulatory

mesh size is approximately 1.15" stretched measure. Due to the relatively low market value of small pink shrimp, many fishers are currently using web between 1.38" and 1.50" stretched mesh, to reduce their harvest of small pink shrimp.

In 1959 otter trawls were not allowed in the Petersburg-Wrangell area in major locations utilized by the beam trawl fishery. Prior to the 1963/64 fishing season this regulation was altered to the present district boundaries.

In 1980 beam trawling was prohibited in waters of Lituya Bay (District 16) by the Alaska Board of Fisheries and in 1985 trawling was prohibited in waters of Glacier Bay by the National Park Service. Beginning in mid 1986, trawling was prohibited in waters of Tenakee Inlet (District 12). Otter trawls are allowed in Districts 3, 5, 7, 9, 11, and some portions of Districts 6, 7, and 10.

Limited Entry

Members of the fleet have petitioned the Commercial Fisheries Entry Commission to limit the number of vessels in the Southeast Alaska beam trawl fishery. This action is currently under consideration by the commission. Hearings have not been held and the development of criteria for a point system has not occurred. If the fishery was limited in 1996, it would include approximately 38 vessels.

1995/96 SEASON SYNOPSIS

The 1995/96 shrimp beam trawl fishery harvested 3,052,914 lb of shrimp in 792 landings by 48 vessels. The maximum number of vessels that fished during any single month did not exceed 20 (Table 3.4). The harvest was comprised of 98% pink shrimp, 1% sidestripe shrimp, and a trace of spot prawns and coonstripe shrimp. Total value of this fishery was approximately \$869,400. The fishery was characterized by intense effort during the all three fishing periods in District 8, an abundance of small shrimp in the Duncan Canal and Kah Sheets Bay portion of District 6, an increased harvest from District 10, significant harvest contributions from Districts 5 and 11, and a price increase due to improved market conditions. During the season, nine emergency orders were written to control the fishery. The major fishing areas are discussed below in order of descending contribution to the total harvest.

Duncan Canal and Kah Sheets Bay (northern District 6)

The total seasonal harvest of shrimp from the Duncan Canal and Kah Sheets Bay portion of District 6 totaled 1,343,200 lb in 390 landings. This harvest represented almost 44% of the total region trawl shrimp harvest. Thirty of the 48 shrimp beam trawl vessels fished and landed shrimp from this fishing area.

During the first fishing period, May 1 through June 30, the area was closed on June 21, 1996 by emergency order. This date was later than normal because much of the early effort was concentrated in the Stikine Flats. Effort entered the Duncan Canal and Kah Sheets grounds after the early closure of the Stikine Flats (May 4, 1995). The harvest was approximately 420,300 lb from 150 landings.

The fishery remained open during the entire second and third fishing periods, July 1 to August 31 and September 1 to February 14, 1996. Harvests totaled approximately 463,200 lb and 459,700 lb in 110 landings and 130 landings for the two periods, respectively.

Stikine Flats (District 8)

Twenty-one vessels made 169 landings from District 8 during the fishing season. The seasonal harvest of 905,665 lb from the Stikine Flats represented 30% of the total regional harvest by beam trawl vessels. Approximately 35,000 lb of this harvest was comprised of sidestripe shrimp which sold for \$1.25 to \$1.50/lb. The Stikine Flats provided more sidestripe shrimp than any other single fishing area during the season. The District 8 harvest occurred in only 18 fishing days. It was necessary to close the fishery by emergency order during each fishing period.

The first fishing period opened on May 1, 1995 and the harvest of about 244,000 lb were harvested by the closure on May 4, 1995. The fishery was characterized by large harvests of good quality shrimp. Effort was high, partially due to improved prices and the lack of other fishing opportunities.

The second fishing period was open for only seven days and resulted in a harvest of 288,462 lb. The slightly longer fishing period was because a portion of the fleet opted to participate in various salmon fisheries. The area was closed on July 7, 1995.

Significant effort occurred again during the third period. By September 7, 1995 the harvest of 362,997 lb had exceeded the GHR and the fishery was closed.

Thomas and Farragut Bays (southern District 10)

Thomas Bay shrimp stocks continued the improvement first seen during the 1991/92 fishing season. The total season's harvest was almost 240,000 lb from 81 landings by eight vessels. The harvest represented almost 8% of the total Southeast Alaska beam trawl shrimp harvest. The highest effort level occurred during May and the highest harvest occurred in July.

Over 90,000 lb were taken during the first fishing period through 39 landings. The harvest was split almost equally between May and June, but effort was greatest during May. The majority of the harvest was comprised of pink shrimp.

During the second fishing period almost 88,000 lb were taken by 25 landings. Most of the effort occurred in this area after the closure of the Stikine Flats fishing area. Once again, pink shrimp made up the majority of the harvest.

The third period resulted in 17 landings with a harvest of 35,000 lb of shrimp. A significant portion (8%) of the harvest was comprised of the more valuable sidestripe shrimp, with the remainder being pink shrimp.

Eastern Channel (District 7)

The total season's harvest from Eastern Channel was 168,125 lb from 68 landings by 12 different vessels. Approximately one-half of the total harvest occurred during the first opening in May. As a result, the fishery in Eastern Channel was closed early by emergency order during the first fishing period. Effort and resulting harvests were relatively light during the second fishing period. Four boats fished during the third fishing period, which began on September 1 and the fishery was closed by emergency order on December 20 after the guideline harvest range was exceeded. Eastern Channel was closed for the remainder of the fishing season.

Other Fishing Districts

Beam trawl fishing has occurred at low and sporadic levels outside the Petersburg-Wrangell area since at least the 1969/70 season. Fishing opportunities exist in Districts 3, 5, 9, 11, and portions of Districts 6, 7, and 10 during the normal fishing season. These districts are managed with a single fishing season and generic guideline harvest levels not to exceed 100,000 lb. Participants must notify the department prior to

fishing and logbook completion and submission are mandatory. During this past season these other districts contributed a harvest of almost 400,000 lb in 84 landings. The majority of this harvest was reported from Districts 5 and 11.

The fleet was provided an opportunity to fish in Districts 3, 9, 11, and some portions of Districts 6, 7, and 10 from March 21, 1996 through April 15, 1996. This harvest occurred during the normal egg-hatch period, with restrictive GHRs and mandatory logbook completion and submission. Significant effort developed in Districts 3 and 11, and District 11 was closed early by emergency order. Fishers targeted sidestripe shrimp in District 3 and high quality "spawner" pink shrimp in District 11.

1996/97 SEASON OUTLOOK

Through October 1996, the 1996/97 seasonal harvest from 50 vessels totaled over 2,412,000 lb. Over 75,000 lb of sidestripe shrimp, 21,500 lb of coonstripe shrimp and 4,300 lb of spot prawns are included in the season harvest to date. Fishing intensity was especially high in the District 8 (Stikine Flats), a portion of District 6 (Duncan Canal and Kah Sheets Bay), and a portion of District 10 (Thomas and Farragut Bays). Nine emergency orders have been written to manage the fishery within current regulations. The Stikine Flats and Thomas and Farragut Bays were closed early during each fishing period. The Duncan Canal and Kah Sheets Bay portion of District 6 was closed early during the first two fishing periods and undoubtedly will be closed before the end of the season. In addition it was necessary to close District 3 by emergency order.

Markets appear to be good for the near future. Effort continues to increase in terms of number of vessels and fishing intensity. Markets are developing for high quality spot prawns, coonstripe shrimp, and sidestripe shrimp that are taken incidentally during the pink shrimp fishery, and fishers are modifying gear to target specific grounds during certain times of the year for larger shrimp, especially sidestripe and coonstripe shrimp and spot prawns.

Present information does not allow the department to project future abundance in a scientific manner. Stock assessment data is not available, and shrimp samples obtained through port sampling are not analyzed in sufficient time to effect management decisions. But, it is possible to make a general qualitative statement concerning stock strength. Relatively strong year-classes have been evident in major stocks and have supported relatively strong harvests during the past few fishing seasons. Major stocks are expected to remain strong for the near term.

The increased use of larger mesh web in trawl construction could increase the quality of the pink shrimp available, and possibly increase the exvessel value. Even larger web is being used to target coonstripe and sidestripe shrimp. However, the use of larger mesh web does have possible negative biological consequences. Larger web will tend to target more strongly on the female portion of the stock. The

removal of female shrimp at an increasing rate could reduce the reproductive potential of the stock and result in smaller populations during future seasons. Without pre-season stock assessment methods or in-season monitoring tools, and with management based on historic harvests which included a broader segment of all year-classes, it is possible to over-exploit some stocks prior to taking appropriate management action. Using beam trawls to target spot prawns could have detrimental effects on the habitat and future spot prawn production.

The continued development of beam trawl fisheries in districts outside the boundaries of the four major fishing areas could provide more product to the fishery, particularly with the high proportion of larger and more valuable sidestripe shrimp found in some locations. Regulation changes may be needed to adequately control the expansion of the fishery and to prevent high-grading of some species of shrimp while dumping the less desirable species or smaller shrimp.

Effort increased from 28 vessels during the 1994/95 season to 50 vessels during the 1996/97 season. A portion of this increase is undoubtedly due to participants trying to qualify for a permit if limited entry occurs. Another portion of the increase is due to the need to diversify into other fisheries to maintain an economic benefit from total fishing operations. This may result in continued high effort levels, more efficient and species specific gear, and a continued development of the beam trawl fishery in non-traditional fishing locations. In turn, these changes identify the need to establish a research program for necessary biological information, a more active management program, and the development of a management plan to ensure future conservation goals are achievable.

Table 3.1. Statistical Area A (Southeast Alaska) shrimp beam trawl harvest, number of permits, number of landings, pounds per permit, and pounds per landing, 1955 to present.^a

Year/ Season	Harvest in lb	Number of Permits	Landings	lb per Permit	lb per Landing
1955	1,777,122	15		118,475	
1956	3,301,598	15		220,107	
1957	2,350,499	10		235,045	
1958	7,605,871	14		543,277	
1959	5,518,843	22		250,857	
1960	3,343,373	21	1,007	159,208	3,320
1961	4,212,300	20	1,394	210,615	3,022
1962	3,884,050	22	1,400	176,548	2,774
1963	3,110,340	20	1,080	155,517	2,880
1964	2,793,101	13	1,092	214,854	2,558
1965	2,941,429	13	1,338	226,264	2,198
1966	3,784,597	14	1,663	270,328	2,276
1967	2,203,753	13	1,105	169,519	1,994
1968/69	2,003,753	12	925	166,979	2,166
1969/70	1,840,727	11	952	167,339	1,933
1970/71	742,404	11	477	67,491	1,556
1971/72	1,050,978	9	592	116,775	1,775
1972/73	797,387	9	421	88,599	1,894
1973/74	674,386	8	460	84,298	1,466
1974/75	1,205,617	20	434	60,281	2,777
1975/76	983,609	12	450	81,967	2,185
1976/77	768,930	14	476	54,924	1,615
1977/78	949,043	10	404	94,904	2,349
1978/79	1,033,325	9	519	114,814	1,990
1979/80	956,927	17	982	56,290	974
1980/81	843,737	21	920	40,178	917
1981/82	919,275	15	524	61,285	1,754
1982/83	1,397,026	15	455	93,135	3,070
1983/84	1,756,533	18	667	97,585	2,633
1984/85	1,294,545	23	811	56,285	1,596
1985/86	429,224	16	252	26,827	1,703
1986/87	2,203,935	16	435	137,746	5,066
1987/88	1,761,636	25	388	70,465	4,540
1988/89	1,675,643	18	527	93,091	3,179
1989/90	1,813,032	21	645	86,335	2,810
1990/91	2,494,957	23	793	108,476	3,146
1991/92	2,934,341	28	1,036	104,798	2,832
1992/93	2,378,632	42	923	56,634	2,577
1993/94	2,138,391	26	706	82,246	3,028
1994/95	3,223,791	25	814	128,952	3,960
1995/96 ^b	3,052,914	48	792	63,602	3,854

^a Data from 1955 through the 1968/69 seasons is from annual reports. Harvest and effort data from 1969/70 to the present is from Integrated Fisheries Data Base (IFDB).

^b Most recent year's data should be considered preliminary.

Table 3.2. Statistical Area A (Southeast Alaska) shrimp beam trawl harvest in thousands of pounds by month and season, 1969/70 to present.

Season	Month												Total
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
1969/70	326.7	280.2	78.8	129.1	184.7	241.2	119.6	165.2	160.0	100.6	32.4	22.4	1,840.7
1970/71	131.3	105.1	65.4	79.8	49.7	64.3	54.8	59.2	59.9	56.8	*	13.2	742.4
1971/72	139.0	106.3	144.5	106.5	69.7	78.3	101.6	71.1	66.0	121.1	38.7	*	1,051.0
1972/73	168.5	126.4	77.2	*	*	44.7	64.0	46.3	81.6	42.2	6.1	8.5	797.4
1973/74	96.3	124.1	*	*	*	*	59.1	64.8	60.3	29.2	*	8.4	674.4
1974/75	160.9	199.2	202.4	168.0	120.1	61.4	73.9	90.8	104.2	21.6	*	*	1,205.6
1975/76	180.7	130.3	67.2	*	112.3	154.5	73.0	77.8	38.9	46.1	*	6.7	983.6
1976/77	78.8	171.7	120.0	118.8	61.8	37.4	55.2	33.3	65.0	25.7	*	*	768.9
1977/78	73.7	235.3	147.9	166.6	126.2	48.3	29.5	18.7	81.2	21.7	0.0	0.0	949.0
1978/79	107.0	130.9	140.6	240.2	112.0	93.1	67.8	36.0	72.3	22.5	8.3	*	1,033.3
1979/80	98.2	154.9	146.6	177.4	104.2	55.1	58.4	39.6	66.3	48.1	*	*	956.9
1980/81	153.8	168.6	164.9	153.7	54.2	30.2	35.5	12.2	33.6	31.6	5.5	0.0	843.7
1981/82	165.1	183.4	124.0	168.8	81.1	52.7	36.5	48.3	33.0	22.3	0.9	3.1	919.3
1982/83	181.1	171.7	168.8	159.4	134.0	50.1	60.7	82.0	152.6	119.8	64.4	52.5	1,397.0
1983/84	436.3	249.0	287.0	218.2	127.5	132.0	83.3	86.9	101.7	16.2	9.0	9.6	1,756.5
1984/85	156.3	252.5	272.5	232.8	132.9	59.5	61.8	49.7	51.9	22.5	*	*	1,294.5
1985/86	125.6	105.3	46.1	23.2	39.1	13.8	31.3	27.0	*	7.7	*	*	429.2
1986/87	294.4	508.2	576.0	446.8	372.0	*	*	*	*	*	*	*	2,203.9
1987/88	634.0	721.0	291.2	90.8	*	*	*	*	*	6.0	*	*	1,761.6
1988/89	647.2	369.0	258.4	137.9	*	2.5	82.8	127.3	37.8	*	*	*	1,675.6
1989/90	473.6	236.2	259.0	173.4	224.3	115.8	*	38.4	167.8	53.4	*	*	1,813.0
1990/91	546.7	336.5	386.5	357.8	293.3	147.4	161.2	148.7	16.8	9.4	17.1	73.4	2,495.0
1991/92	611.6	325.5	887.2	79.1	336.4	219.0	167.2	165.6	113.6	14.8	*	13.8	2,934.3
1992/93	469.3	253.7	404.4	295.7	194.5	186.4	136.8	112.4	131.8	65.5	61.2	67.0	2,378.6
1993/94	550.1	215.4	372.0	239.2	121.3	86.9	104.5	100.3	147.4	85.7	112.1	*	2,138.4
1994/95	560.0	266.2	574.6	468.2	196.3	96.9	149.3	188.5	387.0	41.9	231.6	63.5	3,223.8
1995/96 ^a	686.6	338.2	522.3	344.7	515.0	66.7	137.8	55.8	62.7	157.9	104.1	61.3	3,052.9

^a Most recent year's data should be considered preliminary.

Table 3.3a. Statistical Area A (Southeast Alaska) shrimp beam trawl fishery harvest in thousands of pounds by season and district, 1969/70 through 1978/79.

District	Year									
	69/70	70/71	71/72	72/73	73/74	74/75	75/76	76/77	77/78	78/79
1	0.0	*	*	0.0	*	*	*	1.6	0.0	*
2	0.0	0.0	0.0	0.0	0.0	1.3	0.1	0.0	0.0	0.0
3	0.0	*	*	*	0.0	0.0	*	*	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	*	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0
6: Duncan	865.5	344.4	442.4	450.3	260.0	973.2	554.2	610.2	669.7	625.0
6: Sumner	0.0	0.0	0.0	*	0.0	0.0	257.6	10.7	*	*
7: Eastern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7: Blake	0.0	38.1	67.0	35.7	48.7	10.4	14.6	29.2	40.3	140.1
8: Stikine	609.7	158.5	285.7	219.6	323.4	212.4	84.5	85.5	176.0	261.9
9	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10: Thomas	350.1	198.6	252.3	89.9	*	*	*	27.9	*	3.4
11	*	0.0	0.0	0.0	0.0	*	*	*	*	*
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	1,840.7	742.4	1,051.0	797.4	674.4	1,205.6	983.6	768.9	949.0	1,033.3
Landings	952	477	592	421	460	434	450	476	404	519
Permits	11	11	9	9	8	20	12	14	10	9

Table 3.3b. Statistical Area A (Southeast Alaska) shrimp beam trawl fishery harvest in thousands of pounds, by season and district, 1979/80 to present.

District	Year																
	79/80	80/81	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96 ^a
1	*	*	*	*	*	*	*	*	0.0	*	*	*	0.0	0.0	Closed	Closed	Closed
2	1.5	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	Closed	Closed	Closed
3	*	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.1	20.4	125.3	18.9	31.6	18.8
4	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Closed	Closed	Closed
5	*	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	*	182.0
6: Duncan	427.4	415.0	693.8	1,199.6	1,015.4	523.9	235.7	1,645.3	1,225.7	1,043.9	1,006.9	1,565.5	1,680.5	1,184.8	831.8	1,406.7	1,343.2
6: Sumner	0.0	*	*	0.0	0.0	17.7	*	*	*	*	0.0	*	35.4	13.8	*	*	0.0
7: Eastern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	17.5	55.5	74.1	34.7	*	232.2	168.1
7: Blake	109.8	77.9	31.5	11.8	138.6	101.3	30.6	100.6	75.8	15.9	70.5	40.4	96.9	58.1	50.7	0.0	3.6
8: Stikine	405.7	342.5	88.6	51.0	545.0	610.8	160.9	432.4	436.3	590.0	676.7	652.0	697.9	683.6	834.3	848.5	909.1
9	0.0	*	0.0	*	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*	19.6	*	*	*
10: Thomas	2.8	0.0	0.0	*	26.3	33.8	*	*	*	*	*	*	321.3	148.7	219.7	241.7	239.7
11	0.0	*	*	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	*	2.8	97.7	109.8	295.0	170.3
12	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	Closed	Closed	Closed
13	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	Closed	Closed	Closed
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	Closed	Closed	Closed
15	*	*	*	*	2.0	*	*	0.0	0.0	0.0	*	*	0.0	*	Closed	Closed	Closed
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Closed	Closed	Closed
Total	956.9	843.7	919.3	1,397.0	1,756.5	1,294.5	429.2	2,203.9	1,761.6	1,675.6	1,813.0	2,495.0	2,934.3	2,378.6	2,138.4	3,223.8	3,052.9
Landings	982	920	524	455	667	811	252	435	388	527	645	793	1,036	923	706	814	792
Permits	17	21	15	15	18	23	16	16	25	18	21	23	28	42	26	25	48

^a Most recent year's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Table 3.4. Statistical Area A (Southeast Alaska) shrimp beam trawl harvest and landings () by district and month, 1995/96.^a

FISHERY									
Month	Duncan Canal	Sumner Strait	Eastern Channel	Blake Passage	Stikine Flats	Thomas Bay	all Others Southeast	Total Permits	Total Harvest
May	243,741 (77)		83,161 (29)		243,685 (42)	44,954 (24)		20	686,567
June	176,547 (73)				Closed	45,377 (15)		15	338,191
July	181,023 (44)				288,462 (59)	52,834 (14)		12	522,319
August	282,143 (66)		4,570 (4)		*	35,012 (11)		13	344,657
September	109,397 (29)		19,998 (11)		362,997 (66)	*		16	514,991
October	49,760 (15)		*			*		8	66,658
November	90,677 (29)		*			*		8	137,785
December	40,196 (15)		*			*		9	55,757
January	59,201 (18)			*				9	62,738
February	110,475 (24)					26,528 (7)		12	157,890
March	Closed			2,592 (7)			*	6	104,090
April	Closed			981 (3)			*	6	64,803
Total Harvest	1,343,160		168,125	3,609	905,665	239,680	*		3,052,914
Landings	390		68	11	169	81	*		792
Permits	30		12	5	21	8	*		48

^a Recent season's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

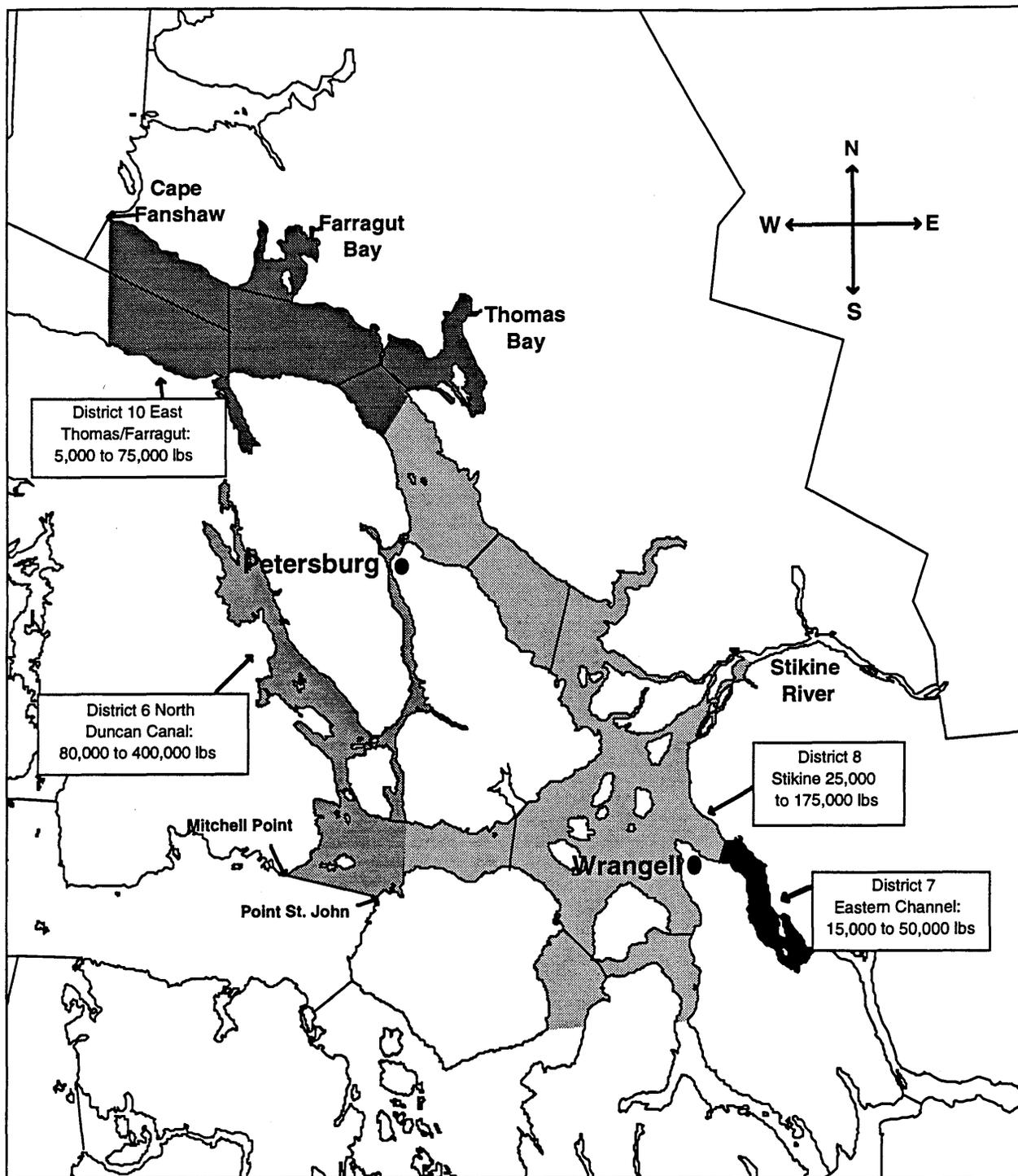


Figure 3.1. Traditional beam trawl shrimp regulatory areas and fishing period guideline harvest ranges for Southeast Alaska.

Section 4

SOUTHEAST SHRIMP OTTER TRAWL FISHERY, 1995/96

REPORT TO THE BOARD OF FISHERIES
SOUTHEAST SHRIMP OTTER TRAWL FISHERY, 1995/96



By

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and
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Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
Juneau, Alaska

January 1997

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INTRODUCTION

The otter trawl fishery targets primarily pink shrimp *Pandalus borealis*, and secondarily, the larger sidestripe shrimp *Pandalopsis dispar*. Other species captured incidentally and landed in smaller quantities are the coonstripe shrimp *Pandalus goniurus*, humpy shrimp *P. hypsinotus*, and the spot prawn *P. platycerous*.

When compared to beam trawls, otter trawls are generally larger, more complex in construction, double-bridled, and fish best on smooth, level bottoms. They are dynamic trawls which rely on bridle and "otter boards" to deploy, position, and maintain the opening dimensions of the net. The design and size allows much greater fishing power than beam trawls, considering similar length vessels. Otter trawl vessels are generally larger and more modern, with large hold capacities, and they use engines with larger horsepower ratings. Otter trawl vessels utilize many shrimp fishing grounds in the North Pacific. Most of the historical harvest in Southeast Alaska has occurred in Glacier Bay and other portions of District 14. Smaller harvests have occurred near Ketchikan, Juneau, and Petersburg. Major processors and markets have been as distant as Kodiak and Seward. Large harvester-processors have expressed interest in fishing both inside and outside waters.

FISHERY DEVELOPMENT AND HISTORY

The first recorded commercial shrimp otter trawl landing from Southeast Alaska waters occurred in 1975 (Table 4.1). Since then, there have been eight seasons with no otter trawl harvests reported in Southeast Alaska, and eleven seasons when effort was so low that harvests are confidential. In only two of the past seasons, 1980/81 and 1981/82, has effort been sufficient to provide significant harvests, with a peak harvest of 145,286 lb from 11 landings during the 1980/81 season. Most of this harvest occurred in Glacier Bay from larger vessels transiting through Southeast Alaska to the Westward Region to participate in spring shrimp fisheries. Most of the product was processed in Kodiak. Glacier Bay contributed the most significant portion of this harvest and this area is now closed to otter trawling. The lack of abundant resource and processing facilities has slowed the expansion of the fishery into many geographic locations. With the exception of past fisheries in Glacier Bay by larger vessels, the majority of the recent participants are relatively small vessels using small nets.

REGULATION DEVELOPMENT

Otter trawling is prohibited on some grounds traditionally utilized by beam trawl vessels (District 8, portions of Districts 6 and 10) and in Lituya Bay by state regulations, and in Glacier Bay by National Park Service regulations. Until the 1995/96 season the remainder of Southeast Alaska was open throughout the fishing year with no restriction on mesh size, guideline harvest range, or maximum net opening dimensions.

The current otter trawl fishing seasons begins on May 1 and closes on February 14. Interest from larger harvester/processors and potential conflicts with other gear users were instrumental in the closure of all districts without a history of consistent and substantial effort or harvest. Current open fishing areas and guideline harvest ranges are from 25,000 to 100,000 lb for Districts 3, 5, and 6 south of a line from Mitchell Point to Point St. John; Districts 7, 9, and 10 west of the longitude of Cape Fanshaw; and District 11. All participants in this fishery must register prior to fishing and complete logbooks.

1995/96 SEASON SYNOPSIS

There was no effort and harvest of shrimp by otter trawl gear in Southeast Alaska during the 1995/96 fishing season.

1996/97 SEASON OUTLOOK

Harvest information is intermittent and not adequate to project future harvests or market conditions. Past harvest data is not representative of stock status and stock assessment is not conducted by the department. With the early closure of the shrimp pot fishery and closure of major portions of the beam trawl fisheries, interest is developing in otter trawling in open areas. In particular, otter trawl fishermen are interested in targeting sidestripe shrimp as a substitute product for spot prawns or coonstripe shrimp that are normally caught in the pot shrimp fishery. Secondly, the consideration to limit entry into the trawl shrimp fishery has spawned participation in the otter trawl fishery before the end of the calendar year.

Table 4.1. Statistical Area A (Southeast Alaska) shrimp otter trawl fishery harvest, number of landings, and CPUE (lb-per-landing), 1975/76 to present.

Year/ Season	Catch in Pounds	Number of Landings	Pounds Per Landing	Number of Vessels	Pounds Per Vessel
1975/76	*	*	*	*	*
1976/77	*	*	*	*	*
1977/78	0	0	0	0	0
1978/79	0	0	0	0	0
1979/80	*	*	*	*	*
1980/81	145,286	11	13,208	3	48,429
1981/82	4,313	3	1,438	3	1,438
1982/83	*	*	*	*	*
1983/84	*	*	*	*	*
1984/85	*	*	*	*	*
1985/86	0	0	0	0	0
1986/87	*	*	*	*	*
1987/88	0	0	0	0	0
1988/89	0	0	0	0	0
1989/90	0	0	0	0	0
1990/91	0	0	0	0	0
1991/92	*	*	*	*	*
1992/93	*	*	*	*	*
1993/94	14,708	3	4,903	3	4,903
1994/95	*	*	*	*	*
1995/96 ^a	0	0	0	0	0

^a Most recent season's data should be considered preliminary.

* Where number of permits participating is less than three, information is confidential.

Section 5

SOUTHEAST ALASKA SHRIMP POT FISHERY, 1995/96

REPORT TO THE BOARD OF FISHERIES
SOUTHEAST ALASKA SHRIMP POT FISHERY, 1995/96



By

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January 1997

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INTRODUCTION

This chapter describes the commercial pot fishery for spot prawns in Southeast Alaska (Statistical Area A) with emphasis on the 1995/96 fishing season. The major issues of this fishery are driven by the recent, large increase in effort and the limited program for shrimp management and research in the region.

Management is based upon a closed season to prevent fishing on major stocks during the egg-hatch period, minimum mesh size restrictions intended to only capture and retain the larger segment of the stock, a maximum number of pots per vessel, and a guideline harvest level (GHL) for each fishing district. Fishing is allowed throughout the year in most of northern Southeast Alaska. Harvest is recorded and summarized through the ADF&G fish ticket system. Dockside sampling is not conducted.

The spot prawn *Pandalus platycerous* is the target species for the shrimp pot fishery, with smaller quantities of coonstripe shrimp *P. goniurus* also harvested. Life history information concerning these species is limited. Canadian reports suggest that the maximum age of the spot prawn is three to five years, while Alaskan tagging data suggests eight to ten years. All pandalid shrimp are protandric hermaphrodites, which means that they first mature and spawn as males, transition to females, and spawn as females for the remainder of their lives. Spot prawns are functional males for one to three seasons (in their fourth year), then change sex and spawn as females for four or more years. The fecundity of a large female spot prawn has been estimated at about 4,600 eggs per year. Literature reports that eggs hatch in late winter and early spring, followed by a growth molt for females. The transition from males to females occurs during the summer months. Females undergo another molt into "breeding dress" in the fall, after which they extrude their mature eggs from the internal ovaries. Eggs are fertilized externally when they are extruded. Developing embryos are carried on the external pleopods until they are fully developed. Hatching occurs during late spring through early summer.

Both species, *Pandalus platycerous* and *P. goniurus*, are harvested from rocky habitats, with the greatest portion of the harvest taken in Districts 1, 3, and 7. Smaller but significant historical harvests have also occurred in Districts 2, 6, and 8. More recently, harvests from Districts 9, 10, 11, 12, and 13 have become important.

Vessels used in the shrimp pot fishery range from smaller troll vessels to limit purse seiners. Fishermen use baited pot gear, which is either longlined or fished as single pots. In a longline system each pot is attached to the groundline with a snap or "c-links," similar to the longline system used in various groundfish fisheries. Pot construction is extremely varied in size, shape, weight, and configuration. The most common pot used during the initial stages of the fishery was a rectangular pot approximately 30" x 18" x 18" with a tunnel at either end. Gear designs have rapidly changed to increase fishing efficiency. Pots currently used include pots with a large bottom surface area, heavy pots, and pots with three to eight entrance tunnels. Small rectangular "king crab" style pots are also used by a number of fishermen.

One of the most commonly used pots today is a "cone style" pot. This pot is constructed using two stainless steel rings, the top ring smaller than the bottom, with vertical bars welded between the rings forming six sides, at least three of which contain tunnels. These cone pots are also constructed of either rubber wrapped or "dipped" mild steel. This pot type has webbing tightly drawn in on the top with a permanent closure. The bottom web is drawn in with a "pucker string" which is opened during baiting operations and to empty the pot of its harvest.

FISHERY DEVELOPMENT AND HISTORY

Harvest records dating to 1962 indicate that the pot shrimp fishery began with sporadic effort and low harvests through the mid 1970s when the pot shrimp fishery served as a supplemental source of income when other fisheries, primarily salmon and halibut, were closed. Harvests and effort increased through the 1980s, and culminated in recent harvests of about 1 million lb caught by as many as 351 permit holders (Tables 5.1, 5.7 and 5.3).

Through the mid-1980s much of the product was sold over the dock to private individuals, restaurants, or other markets without passing through the traditional system of processors established for other fish and shellfish species. Primarily, picked "tails" were sold, and exvessel prices were dependent upon the size of the tails or count of tails per lb with the larger prawns commanding the highest price. Because the fishery was supported by relatively low volumes with moderate prices the fishery remained relatively slow paced.

From 1990/91 through the 1994/95 fishing seasons the character of the fishery underwent radical changes with permits climbing into the hundreds and harvests exceeding 1 million lb. In October, 1994 the first floating processor entered the fishery, and the market product began to change towards unsorted, whole shrimp with a moderate increase in value. This change in market product meant that fishermen no longer had to spend time sorting shrimp by size and picking tails on the ground, running to and from markets, or selling their own shrimp, effectively allowing them to spend more time fishing. Many fishermen utilized this fishery as a significant source of their fishing income. Pot efficiency during this period and the pace of the fishery increased and the first emergency order was issued to close Districts 6 and 8 when the guideline harvest level was reached. The rapid escalation of effort and harvest evoked petitions for limited entry, which was put in place 1995.

REGULATION DEVELOPMENT

Management of the pot shrimp fishery has generally been passive with limited fish ticket data available to assist managers. Seasons have been set to prevent harvesting during the egg hatch period in major districts and mesh restrictions were set to allow the escapement of all shrimp below approximately 30 mm in carapace length. Mesh restrictions are only partially effective due to current regulations and fishing practices. Guideline harvest levels were established to limit the harvest in each fishing district. Guideline harvest levels are based on harvest history data, and not on information describing stock abundance or stock condition.

Nearby jurisdictions use more active management approaches than in Alaska. The management goal in British Columbia is to limit fishing mortality of the female spawner portion of the stock. Biologists there use a pre-season stock assessment program to determine the harvest per unit of effort (CPUE) expressed as the average number of spawners per pot lift. An acceptable level of fishing mortality is applied to the average number of spawners per pot lift to determine a threshold. During the fishing season, CPUE data is collected through mandatory logbook programs with frequent review on the grounds by enforcement officers and biologists. Once the average CPUE dips below the threshold, the fishery is closed. The state of Washington uses a very short season, bases management on pre-season stock assessment, and specifies rigid mesh with a minimum mesh measurement as the only legal gear.

Fishing Seasons

Prior to 1970, pot shrimp fishing was allowed only during periods when the trawl shrimp fishery was open, (roughly May 1 through February 14). In 1970, pot fishing was allowed throughout the year; this liberal season existed through the 1981/82 fishing season. During the 1982/83 season, fishing was not allowed during May and June in Districts 1 through 8. This closure was intended to provide fecund, female shrimp protection from exploitation during the egg-hatch period in an attempt to maximize stock reproduction potential. The actual range of egg-hatch probably varies by location throughout the region but can safely be defined as from late February through the middle of May.

Prior to the 1983/84 season fishing in District 1 was restricted by the Board to September 1 through April 30. This was an allocation for fishermen who traditionally used District 1 as a supplemental income source during the fall and winter months. The closure during the summer provided the additional biological benefits of allowing stock recruitment to occur through molting and preventing fishing during the individual growth processes.

By the 1986/87 season, major areas (Districts 1, 2, 3, and 7) were open only from October 1 through February 28, and minor areas (Districts 6 and 8) were only open from May 1 through February 28. These fishing seasons exist today. In the case of the major areas the season is a combination of egg-hatch closure, stock growth and allocation for a fall/winter fishing season. In the case of the minor areas, only an egg-hatch closure is in place. All other areas (Districts 4, 5, and 9 through 16) remained open throughout the year without an egg-hatch closure.

Size Restrictions

The Alaska Board of Fisheries policy on small shrimp applies to the pot shrimp fishery. Specific regulations concerning a minimum legal size have not been developed. A mesh restriction specifying 1.75" stretch mesh was established in 1986 to assist in the escapement of shrimp less than 30 mm in carapace length and to reduce the potential for recruitment over-fishing. This regulation provides for some protection to approximately two-year classes of small shrimp. However, current regulations are not totally effective, because in some pots only a portion of the pot is required to have the minimum mesh panels, and construction designs have also changed. The maximum benefit of mesh restrictions would be realized by requiring the entire pot to be meshed with the minimum mesh and improving the wording for cone style pots. There is no mesh restriction for waters of Lituya Bay in District 16.

Quotas and Guideline Harvest Levels

Prior to the 1983/84 season, a guideline harvest level (GHL) of 125,000 lb was established for each district in Districts 1, 2, 3, and 7, and 55,000 lb for Districts 6 and 8. By the 1986/87 season the GHL for Districts 6 and 7 was altered to a range of 75,000 to 100,000 lb and dropped entirely for all other districts. This situation existed until October 1, 1995 when the department implemented GHLs for each district by emergency order. This action was taken to maintain the fishery at a stable level and provide for some protection against over-harvesting. For districts with a fairly consistent harvest history, guideline harvest levels are based on the average harvest for the five fishing seasons 1990/91 through 1994/95. For districts with low and intermittent harvests, guideline harvest levels were arbitrarily set at 20,000 lb.

Gear Restrictions

With the exception of the minimum mesh size, no gear restrictions were implemented until the 1976/77 season when a pot limit of 150 pots per vessel was established for Districts 1 through 15. At the present time, the 150 pot limit exists in all of statistical area A. Minor regulations concerning a maximum tunnel perimeter (15"), pot marking requirements, prohibitions against simultaneously fishing shrimp pots and miscellaneous pots, escape mechanisms, and clarification of mesh requirements have also been developed.

Limited Entry

In 1995 the Commercial Fisheries Entry Commission received petitions to limit the number of participants in the fishery from fishermen in Wrangell, Ketchikan, Craig, and from the Tenakee Springs Fish and Game Advisory Committee. These petitions were initially denied while the commission obtained and analyzed data concerning the fishery. The commission held a number of hearings throughout Southeast Alaska and eventually limited the fishery to approximately 332 participants. During October, 1996 the commissioners adopted a point system for the fishery.

RESEARCH

Little research has been conducted concerning the distribution and abundance of spot prawns in Southeast Alaska. Information concerning pot efficiency and limited stock distribution data was collected by various agencies during the 1960s and early 1970s. Pot efficiency studies concerned various pot tunnel configurations in rectangular pots, and a comparison of covered versus uncovered pots.

In recent years, the department reviewed available CPUE data recorded on fish tickets and found it to be insufficient to provide a basis for management. During September, 1996 the department conducted a pilot study to obtain data on CPUE, size and weight, and size and sex of spot prawns and coonstripe shrimp in District 7. The major purpose of the study was to collect data required for rational management, to understand the variability of various parameters associated with stock assessment, to investigate factors essential to establishing an appropriate stock assessment program, and to provide information necessary to develop a well founded management plan in the near future.

1995/96 SEASON SYNOPSIS

The 1995/96 pot shrimp fishery opened on October 1, 1995. Regulations remained the same but the department announced district GHs by news release. Fishing effort was very high, due in part to the potential adoption of a limited entry program for this fishery. A total of 351 permits were fished, and 2,840 landings were made (Table 5.4). There were three floating processors and numerous tenders, whereas in the previous fishing season there was only one active floating processor. A total of 914,993 lb of shrimp were harvested by season's end. The majority of this harvest was composed of spot prawns. Average price is estimated at \$3.25 per whole lb. The estimated exvessel value for the 1995/96 season was about \$2,974,000.

Effort was initially high in Districts 1, 2, 3, 6, 7, and 8. Districts 6, 7, and 8 were closed by emergency order on November 5, 1995, followed by District 3 on November 13. Districts 1 and 2 were closed on January 2 and January 10, 1996 respectively. All other major districts were closed by January 16, 1996, and by then 88 percent of the total harvest had been taken. On average, published district GHs were exceeded by 16 percent. Only Districts 14 through 16 remained open throughout the season, mainly because of low effort levels.

It is difficult to determine stock strength and the effects of intense fishing on stock strength and size composition. Dockside sampling is not conducted during this fishery, but the department is reviewing fish ticket information to determine if the relative abundance of various size or year classes is changing as a result of a more intense fishery. It is possible that some depletion in localized fishing areas has occurred, and that fishermen are maintaining good harvests through improved gear and fishing techniques, new grounds, increased effort not evident in current data, or other means. This fishery requires close scrutiny.

1996/97 SEASON NOTES

The 1996/97 fishing season opened on October 1, 1996. Market conditions are strong and available effort remains high. The number of registered fishers is currently 219, but because some boats may be crewed by more than one registered fisher, the actual number of participating vessels may be somewhat less. There have been as many as five floating processors buying and processing shrimp on the grounds. A number of tender operations are also being conducted to get product from the grounds to shore-based processing facilities. The major landed product is live, whole, unsorted shrimp. There are a number of harvester/processor vessels producing a frozen tail product on the grounds. Prices remain high, and are estimated at \$3.50 per lb, whole weight, for shrimp sold to floating processors or traditional processors.

The fishery began with a faster pace than the previous year, with District 3 closed by emergency order on October 14 and District 7 on October 20. All other major areas, including Districts 1, 2, 6, 7, 8, 10, and 13 closed by November 29, 1996.

Table 5.1. Statistical Area A (Southeast Alaska) shrimp pot fishery harvest, number of landings, and CPUE, 1968/69 season to present.

Season ^a	Harvest in lb	Number of Permits Fished	Number of Landings	lb Per Landing	lb Per Permit
1968/69	38,744	5	50	774	7,749
1969/70	19,928	3	25	797	6,643
1970/71	12,684	4	27	469	3,171
1971/72	28,053	7	50	561	4,008
1972/73	*	*	*	*	*
1973/74	*	*	*	*	*
1974/75	4,607	5	16	287	921
1975/76	12,573	5	29	433	2,515
1976/77	20,916	6	17	1,230	3,486
1977/78	23,559	10	76	309	2,356
1978/79	25,793	10	36	716	2,579
1979/80	51,621	19	124	418	2,717
1980/81	78,864	32	192	417	2,465
1981/82	138,630	49	377	360	2,829
1982/83	216,301	58	374	578	3,729
1983/84	233,312	93	653	357	2,509
1984/85	279,467	115	777	358	2,430
1985/86	185,873	82	495	368	2,267
1986/87	294,021	83	607	502	3,542
1987/88	313,556	96	688	456	3,266
1988/89	376,894	130	812	463	2,899
1989/90	365,898	110	815	448	3,326
1990/91	475,741	139	1,103	433	3,423
1991/92	657,727	175	1,480	442	3,758
1992/93	560,556	145	1,189	465	3,866
1993/94	778,366	180	1,591	489	4,324
1994/95	1,062,225	247	2,722	390	4,301
1995/96 ^b	914,993	351	2,840	322	2,607

^a Pot shrimp seasons are October through September.

^b Most recent year's data should be considered preliminary.

* Where number of vessels participating is less than three, information is confidential.

Table 5.2. Statistical Area A (Southeast Alaska) shrimp pot fishery harvest in thousands of pounds by month, 1968/69 season to present.

Year	Month												Total	Landings	Permits	
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	Jul.	Aug.	Sept.				
1968/69				4,246	5,669	13,475	5,471	*	*					38,744	50	5
1969/70			*	*	4,638	5,094	*	*						19,928	25	3
1970/71	*	*	3,213	*	3,520	*								12,684	27	5
1971/72	*	*	*	*	*	4,301	10,923	3,788	1,750		*			28,053	50	7
1972/73	*					*	*		*					*	*	*
1973/74			*		*	*	*		*					*	*	*
1974/75	*	*	*	*	*	*	*		*		*			4,607	16	5
1975/76		*	*	*	*	*	*	1,463	*	*	*			12,573	29	5
1976/77		*	1,646	*	*	*	*	*	*	*	*			20,916	17	6
1977/78	*	*		*	*	*	5,250	*	*	690	*	*		23,559	76	10
1978/79	*	*	*				*	5,109	3,168	*	*	*		25,793	36	10
1979/80	*	*		799	1,544	2,996	2,479	12,388	8,334	7,840	*	11,112		51,621	124	19
1980/81	9,410	3,149	706	*	1,373	4,041	7,178	6,463	7,238	21,946	9,964	5,717		78,864	192	32
1981/82	11,413	3,506	4,911	2,625	5,081	9,910	9,966	3,288	4,982	34,289	33,620	15,039		138,630	377	49
1982/83	20,566	7,042	16,187	9,214	25,817	7,468	*	4,354	3,142	44,570	41,698	35,574		216,301	374	58
1983/84	38,181	28,005	14,329	12,224	19,990	22,311	23,037	29,326	28,637	7,560	5,407	4,305		233,312	653	93
1984/85	32,313	36,059	26,421	29,615	35,238	8,312	8,459	29,614	20,274	15,909	17,290	19,963		279,467	777	115
1985/86	17,574	26,546	28,189	28,749	29,788	26,967	9,352	1,931	2,960	6,168	5,256	2,393		185,873	495	82
1986/87	45,647	44,510	39,352	45,460	60,328	24,912	9,884	5,294	2,709	6,682	4,172	5,071		294,021	607	83
1987/88	76,290	48,353	41,265	45,431	53,982	15,142	17,408	8,671	6,087	4,827	4,951	3,154		313,556	688	96
1988/89	72,296	82,230	63,238	47,771	52,524	19,997	10,641	2,057	5,041	6,755	8,372	5,972		376,894	812	130
1989/90	64,664	61,599	49,909	48,194	41,870	37,814	10,385	9,410	6,453	8,960	7,554	7,460		365,898	815	110
1990/91	110,159	64,453	56,460	68,781	86,453	24,032	18,073	3,330	10,522	14,371	10,196	8,911		475,741	1,103	139
1991/92	194,186	140,989	92,739	82,896	64,459	12,884	14,672	12,144	10,750	9,560	15,049	7,399		657,727	1,480	175
1992/93	109,844	77,768	55,533	101,117	114,274	36,799	12,392	19,613	7,129	9,497	9,116	7,474		560,556	1,219	145
1993/94	145,811	165,321	83,439	111,751	112,607	38,520	20,216	20,023	20,332	16,960	22,199	21,187		778,366	1,591	180
1994/95	166,023	121,441	94,593	182,144	177,685	56,001	31,260	112,617	56,574	22,061	17,713	24,113		1,062,225	2,722	247
1995/96 ^a	442,303	191,140	105,444	67,729	40,310	23,983	7,843	11,448	9,021	6,593	8,141	1,038		914,993	2,840	351

^a Most recent year's data should be considered preliminary; season in progress.

* Where number of vessels participating is less than three, information is confidential.

Table 5.3. Statistical Area A (Southeast Alaska) shrimp pot fishery harvest in thousands of pounds by district, 1968/69 season to present.^a

	District															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1968/69	31.4	*					*									
1969/70	11.9	*														
1970/71	3.7	*						*		*						
1971/72	10.1	14.8					*		*	*						
1972/73		*					*									
1973/74	*	*														
1974/75	2.4	*	*													
1975/76	4.3	7.7	*													
1976/77	*	11.7	*				4.8									
1977/78	5.6	13.1			*		*						*			
1978/79	4.2	6.7	*	*			3.6	*				*	*			
1979/80	14.9	12.4	*				16.8	*					*	*		
1980/81	14.9	14.6	25.0	*		*	15.5	*	*	*	*	*	*			
1981/82	21.3	15.2	51.7			8.5	14.5	2.0	3.6	*	*	*	12.3	*		4.5
1982/83	24.9	30.9	63.2	*		8.5	61.9	2.3	6.5	3.1		*	11.7	*		*
1983/84	39.1	20.8	34.1	*	*	6.7	77.5	14.5	*	12.0	*	2.9	19.1	*		*
1984/85	63.8	45.9	17.6	*	*	6.1	83.5	8.6	*	30.6	*	*	14.1	0.5		*
1985/86	37.9	33.8	61.7	*	*	5.1	19.1	2.6	*	10.8	*	0.3	8.9	*	*	*
1986/87	47.1	117.6	41.1		*	1.8	33.9	1.5	4.3	27.2	1.8	3.6	8.6	*	*	*
1987/88	98.9	71.4	22.0	*	*	0.5	43.0	2.4	15.8	24.4	2.0	11.9	17.9	1.7	*	*
1988/89	175.4	52.5	16.7	*	*	6.7	52.0	0.7	5.5	30.8	0.5	8.8	22.6	*		*
1989/90	142.1	58.0	23.6	2.2		7.0	37.8	15.6	*	43.1	*	5.5	25.9			*
1990/91	154.5	66.1	51.6	9.5		8.6	82.4	11.6	4.4	36.9	1.3	14.1	33.3		*	0.7
1991/92	145.6	70.0	213.8	*	*	18.5	99.8	13.0	1.9	41.8	*	5.4	40.2		0.9	4.1
1992/93	130.1	56.5	197.5	3.8	*	20.3	49.1	14.5	7.9	26.6	*	17.3	33.7		1.0	*
1993/94	128.0	102.9	246.6	4.5	*	35.2	100.4	19.9	24.2	31.3	1.9	26.5	52.5	*	1.5	*
1994/95	143.8	68.4	224.1	0.9	21.6	126.0	188.4	28.4	10.9	82.0	2.6	47.6	101.6	1.9	8.7	5.4
1995/96 ^b	164.9	77.0	237.4	22.7	21.9	75.1	117.4	9.1	21.7	40.9	21.2	26.0	45.4	17.0	8.5	9.0

^aPot shrimp seasons are October through September.

^bMost recent year's data should be considered preliminary.

*Where number of vessels participating is less than three, information is confidential.

Table 5.4. Statistical Area A (Southeast Alaska) shrimp pot harvests in thousands of pounds, number of permits, and number of landings by district by month, 1995/96 season.

DISTRICT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	HARVEST	PERMITS	LANDINGS
1	59.1	43.7	59.5	2.7	Closed January 2, 1996								164.9	67	529
2	29.7	23.8	13.7	9.8	Closed January 10, 1996								77.0	40	191
3	143.9	93.5	Closed November 13, 1995								237.4	41	443		
4	0	*	0	*	11.3	1.6	2.3	6.3	Closed May 8, 1996				22.7	15	109
5		*	*	*	10.6	8.1	Closed March 13, 1996					21.9	11	61	
6 & 8	81.7	2.4	Closed November 5, 1995								84.1	30	394		
7	113.3	3.4	Closed November 5, 1995								116.6	46	372		
9	2.3	*	1.5	5.0	5.6	6.9	Closed March 11, 1996					21.2	16	56	
10	8.0	14.2	14.8	3.9	Closed January 6, 1996							40.9	49	104	
11	*	*	*	*	2.7	3.9	3.3	1.9	7.5	Closed June 23, 1996			21.2	20	112
12	*	8.8	7.2	3.2	*	Closed February 4, 1996						26.0	20	45	
13	1.6	2.8	3.4	37.6	Closed January 16, 1996							45.4	45	159	
14	0.4	*	0.6	0.7	0.6	3.5	0.7	0.5	0.2	4.2	5.2	0.0	17.0	24	271
15	1.0	*	0.3	*	*	0	0.7	0.6	1.1	2.4	1.0	*	8.5	21	159
16	*	*	0	0	*	0	*	2.0	*	0	*	0.0	9.0	6	10
Harvest	442.3	191.1	105.4	67.7	40.3	24.0	7.8	11.5	9.0	6.6	8.1	*	915.2		
Permits	149	131	130	62	36	30	19	25	19	11	12	*		351	
Landings	1,120	519	367	216	140	86	60	85	94	65	77	*			2,840

5.13

Section 6

SOUTHEAST ALASKA SCALLOP FISHERIES, 1995/96

REPORT TO THE BOARD OF FISHERIES
SOUTHEAST ALASKA SCALLOP FISHERIES, 1995/96



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

January 1997

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INTRODUCTION

Commercial scallop dredging for the weathervane scallop (*Pactinopecten caurinus*) is limited by regulation to District 16 in the Southeast Alaska area (Statistical Area A). Lituya Bay in District 16 is closed to commercial dredging. The known offshore beds are small in comparison to those historically fished elsewhere in Alaska and overlap waters of the state and Exclusive Economic Zone (EEZ). Many of the productive beds in District 16 are discontinuous or dispersed between foul ground.

Most vessels working in this fishery are very seaworthy, in excess of 70 feet, although smaller vessels periodically fish in District 16. Most vessels are based in Kodiak, Seward, and ports in other states. The fleet is mobile, capable of working in any ocean in the world. They use New Bedford-type scallop dredges, each approximately eight to 15 feet in width, with one fished off each side of the vessel. These dredges have heavy, rectangular steel frames supporting a mesh bag made from heavy steel rings. They are bridled to prevent plowing as they are dragged over the sea floor. Ideally, the dredge skims the bottom just deeply enough to flip scallops into the mesh bag. Scallop fishing, processing, and marketing operations are more vertically integrated than most other fisheries in Alaska. The same company that owns or operates the vessel also stores, transships, brokers, and sells the product to consumers.

Currently, the sole product is the primary adductor muscle, with most processing and freezing, or icing, conducted aboard the catcher vessel on the fishing grounds. District 16 has a guideline harvest range (GHR) of zero to 35,000 lbs. of meat, usually producing a very small fraction of the total annual Alaskan harvest. Landed product weight is reported in pounds of frozen or iced meat, which comprises 6 to 11% of the live whole weight. The price during the past season was about \$5.75/lb. In many seasons the upper end of the GHR is not reached, since time spent in District 16 is often time lost in more productive areas. Although the grounds in District 16 produce only a small fraction of the total annual Alaskan harvest, the department has managed it since 1993 using the same stringent management measures applied to more intense, larger scale, scallop fisheries elsewhere in the state.

FISHERY DEVELOPMENT AND HISTORY

The fishery in Southeast Alaska started in the early 1980s as stocks in the Yakutat Area to the north and west were fished down. Interest and harvests have been generally low and intermittent. District 16 stocks have been spared much of the roller coaster highs and lows prior to implementation of the Alaska Scallop Management Plan (ASMP) in 1993. Only a few vessels fished in most seasons, with a maximum of nine vessels in 1994, and one to seven vessels in each of the other 11-years of record. The peak harvest of

148,624 lbs. occurred in 1990, with an overall historical average of about 31,000 lbs. (Table 6.1). Most of the effort in Southeast Alaska has occurred in District 16, although a few landings were reported during the 1982 season from three other districts around the outer coasts of southeast Alaska before limitation of the fishery to District 16 in 1993. Due to the low numbers of participants and landings, historical data for much of this fishery is confidential.

In recent seasons the harvest has been taken by one to nine vessels, usually after the Yakutat fishery closed or was fished down. The general pattern has been for vessels displaced by competition or closure from the more productive grounds in Alaska to prospect for product in Southeast Alaska.

Until about 1991, this fishery was driven by economic considerations with little regard for the biological status of the stocks. The fishery relied upon passive regulations, such as minimum ring size in the dredges, to protect sexually immature scallops. Despite its shortcomings, passive management was generally acceptable because of market demand and the limitations of hand-processing for larger scallops. Smaller scallops taken by the dredges were returned to the water. When the number of large scallops in an area declined, the fleet went on to better grounds. With only a few vessels dredging for scallops, the chance of a bed being repeatedly fished by different vessels during each season was low.

Starting in 1990, there were indications that strengthening global markets for scallops and failures of fisheries in other parts of the world would result in more vessels entering the fisheries throughout the state. Through 1992, the fishery followed projections and continued attracting more entrants and harvesting more scallops. The department was unwilling to repeat the past boom and bust conduct of the fishery and initiated development of the Alaska Scallop Management Plan in early 1992. A preliminary statewide plan was implemented by emergency order in mid-1993.

The fishery in Southeast Alaska included state waters in District 16 and adjacent federal waters in the EEZ, but a jurisdictional loophole regarding fishing in the EEZ was inadvertently overlooked. In early 1995, a single vessel exploited the reporting exemptions to harvest more scallops in the EEZ than the maximum allowable harvest level for stocks in the Northeast Gulf of Alaska. The EEZ was closed by federal management authorities for nearly eighteen months until amendments to the Magnuson Act plugged the loophole.

REGULATION DEVELOPMENT

The weathervane scallop fishery in Alaska evolved from a wide-open, almost unregulated fishery through the 1992 season into one of the most stringently controlled and managed fisheries in the state in little more than a single season. The speed of implementation of the statewide ASMP, the scope of regulations, and the stringent harvest conditions are unprecedented.

Fishing Seasons and Period

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, 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 also open concurrently.

Size Restrictions

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

Quotas and GHRs

A GHR of zero to 35,000 pounds for District 16 was established by the ASMP in 1993. The 35,000 lb. ceiling was derived by rounding upwards the average annual harvest, between 1980 and 1992, of 33,235 lbs. Until a longer time series of data from the fishery is available for analysis, the fishery will probably be managed toward the upper end of this range, which is considered conservative.

Gear Restrictions

Scallops mature at approximately three inches, based on research conducted by department biologists from 1968 through 1972. Four inch minimum ring diameters for scallop dredges, permitting the escape of juvenile and smaller sexually mature scallops, was the primary passive management tool from 1969 through 1992, and continues to be used as a conservation measure to the present time. Since 1993, the width or horizontal front opening of scallop dredge gear has been limited to 15 feet and use of any chaffing gear or device that would tend to restrict the size of the rings has been prohibited.

To further discourage the entry of ever larger vessels into the fishery, regulations adopted as part of the ASMP in 1993 restricted the number of dredges that may be deployed at any time from a scallop vessel to two. Daily production per vessel was limited by restricting crew size to a total complement of 12, excluding the observer. Mechanical or automated shuckers were prohibited. With the exception of experimental dredges operating under stringent permit conditions, only dredges as defined and restricted by regulation are legal gear.

Other Regulations

Until 1993, scallop management never addressed harvest based on stock abundance. Other than gear restrictions, the fishery was unregulated. With development of the ASMP, management and conduct of the fishery changed drastically. In the space of a year, a management plan was in place and in addition to all the changes discussed above, vessels skippers had to maintain a fishing log, and third party observers were required on all vessels over 65 feet in total length to collect fisheries data and to radio encoded catch information to fishery managers each day.

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

Permits have not been issued for other known weathervane scallop grounds on inside waters of Statistical Area A, as the department considers these stocks too limited to sustain a commercial fishery. Inside weathervane scallop stocks have been considered to be fully utilized by subsistence, personal use, and sport users. Requests for collections from inside stocks for mariculture or educational purposes have been categorically denied because samples of the same species may be obtained from existing offshore fisheries.

1995 SEASON SYNOPSIS

New regulations limited the 1995 fishery to a winter season, starting on January 10 and closing by emergency order on February 13, during which the entire GHR was taken by a fleet of seven vessels reporting a catch of 33,302 lbs. of schucked meat. Review of the logbook and observer data suggested that meat recovery averaged about six percent, considerably lower than the standard operating assumption of 10 percent.

1996 SEASON OUTLOOK

The January opening in 1996 was limited to state waters and 7,700 lbs., the portion of the total GHR that could be justified by historical harvest records, since the EEZ had been closed by federal management authorities in February 1995 to prevent continued unrestricted fishing. Following adoption of a federal management plan in July 1996, the EEZ was opened on July 1 for harvest of the remaining GHR from EEZ waters.

Markets continue to be good for scallop meat so it is anticipated that interest in this fishery will continue. Future management of this fishery will depend greatly on analysis of the observer data, a time-series that now extends back to the 1993 season. In the interim, managers assume that an annual harvest of 35,000 lbs.

of scallop meat from District 16 and its extension in the EEZ is sustainable. Considerable conservation concerns for demersal fish and shellfish species persist; resistance from established fixed-gear user groups continues to grow.

Table 6.1. Statistical Area D (District 16 only) historic commercial catch and effort for weathervane scallops.

Season	Catch in Pounds	Number of Permits	Number of Landings	Average Pounds per Landing
1980	*	*	*	*
1981	*	*	*	*
1982	*	*	*	*
1983	*	*	*	*
1984				
1985				
1986				
1987				
1988				
1989				
1990	148,624	5	8	18,578
1991	39,817	3	9	4,424
1992	*	*	*	*
1993	*	*	*	*
1994	27,613	9	10	2,761
1995	33,302	7	8	4,162
1996 ^a	18,340	3	3	6,113
Average ^b	31,880	3	5	6,152

* Asterisks indicate confidential information where three or fewer permits were fished.

^a Most recent year's data should be considered preliminary.

^b Averages are calculated only from years where landings were reported.

Section 7

MISCELLANEOUS INVERTEBRATE FISHERIES, 1995/96

REPORT TO THE BOARD OF FISHERIES
MISCELLANEOUS INVERTEBRATE FISHERIES, 1995



By

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INTRODUCTION

Octopus, squid, snails, and littleneck clams have been commercially harvested but do not support any directed fisheries. They are harvested or taken incidentally in dredges, pots, trawls, or by hand. Formal regulations have yet to be developed for these fisheries; they are passively managed by means of special permits and registrations. Minimal management oversight is provided by shellfish program staff, who primarily manage commercial crab, shrimp, and scallop fisheries.

Separate reports are generally prepared for fisheries in Yakutat. However, there are no commercial landings on record from Yakutat for any of these miscellaneous species. Fisheries for deep-water Tanner crab (*C. tanneri*) in Yakutat were discussed in the most recent Tanner crab Board Report (1995) and initial interest expressed last year in helmet crabs (*Telemessus sp.*) has abated.

OCTOPUS

Fishery Development and History

Octopus, mostly *Octopus dofleini*, have been harvested in Southeast Alaska at minimal levels for many years. Most are caught incidentally in other shellfish pot fisheries. Since the first recorded harvest in 1975, octopus landings have been reported each year and have ranged between 305 and 20,485 lb, delivered by 3 to 47 fishermen per year (Table 7.1). The fishery peaked in the late 1980s and has since declined to very low levels. Higher landings in the late 1980s reflect efforts, centered out of Petersburg, to establish a commercial pot fishery. These efforts were futile and led to more restrictive regulations to prevent use of unlimited numbers of octopus pots in the gear-limited pot shrimp fishery. Octopus have been sold predominately for bait in the longline fisheries and secondarily to domestic food markets such as sushi bars. The last reported exvessel prices in 1995 were \$0.60 to \$1.60 per lb, with product destined for human consumption commanding the higher prices.

1995 Season Summary

Thirteen fishermen reported 29 landings totaling 1,165 lb in 1995 (Table 7.1). These levels of participation, landings, and harvest were representative of activity in this fishery since 1993. Harvest probably consisted of incidental harvest from the shrimp pot fishery in excess of the 20% bycatch provision in the regulations. Considering the incidental nature of this fishery, the harvest probably reflected the marginal economics of this fishery, rather than stock conditions.

1996 Season Outlook

There are no indications that this fishery will grow significantly in the near future, although it is one of the few commercial fisheries with any potential that is still open to entry. If a directed fishery develops for octopus, a management plan will need to be drafted for this fishery.

SQUID

Fishery Development and History

The commercial fisheries for squids, mostly *Loligo opalescens*, have been minimal and sporadic. There has been some interest in the use of purse seines, hydraulic pumps, and mechanical jigging machines for harvesting this species off the west coast of Prince of Wales Island where it has been observed concentrated in shallow waters in the spring. Only small harvests have occurred in this fishery (Table 7.1). There were permits requested for this species in 1979, 1984, and 1994. Only a limited amount was harvested in 1979 and none in 1984. The last reported harvest was a small amount taken in 1994 by a single permit holder.

1996 Season Outlook

Interest is very sporadic in this fishery and will probably continue to be so. The gear and expertise necessary to successfully harvest squid is readily available, so either lack of markets or concentrations of squid constrains further development of the fishery. No management plan has been developed for this fishery.

SNAILS

Fishery Development and History

Marine snails such as *Buccinum sp* and *Neptunia sp* are very common incidental harvests in the pot fisheries for shrimp and crab. Their distribution and local abundance throughout Southeast Alaska suggest that they are major parts of the benthic ecosystem. In some areas, they interfere with pot fisheries by scavenging bait and loading gear set to capture other shellfish. The foot muscles of these species, pickled, marinated or simply processed, command a modest price in the Orient and in specialized domestic markets as analogs of processed abalone.

There has long been interest in developing a pot fishery. However, major impediments have been low meat recovery (10% whole weight), low price (\$0.10 per lb whole weight), labor-intensive, added-value processing demanded by the preferred product forms, and potential bioaccumulation of paralytic shellfish toxin (PSP) by snails. If these problems could be overcome, there is probably sufficient biomass to support significant fisheries. Landings were reported in 1978, 1983, 1984, 1988, 1989, and 1994, with no trends nor consistency in harvest levels. Average harvest has been about 470 lb, limited to small amounts for test marketing or speculative sale, with no annual harvest in excess of 1,000 lb (Table 7.1).

1995 Season Summary

Two permits were requested for snail fishing in 1995. No product was reported landed in 1995.

1996 Season Outlook

Prospects for any significant fishery are unknown and no management plan has been developed for this fishery. Gear is available to successfully harvest this species, the general distribution of snails is well-known, and the major impediment to fishery development is the current lack of markets.

LITTLE NECK CLAMS

Fishery Development and History

Littleneck clams (*Protothaca staminea*), also called steamers, are commonly found in the intertidal and upper subtidal areas of sand and gravel beaches. They seldom measure more than two inches in maximum shell height. With short siphons, they are usually found within the first few inches of the substrate. They support active personal use and subsistence fisheries throughout their range in Southeast Alaska, despite their implication in occasional incidents of PSP. The unpredictable and widely variable intensity of PSP in this species has been the major impediment to general, widespread development of commercial fisheries.

However, this has not been a major concern in the current commercial fishery because harvest is limited to the general area of commercial oyster farming operations. The certification for the oyster farm requires testing for PSP in shellfish in the area. Littlenecks can be harvested from certified waters and offered for commercial sale. The littleneck clam fishery is limited to these waters, most of which are in southern Southeast Alaska. The fishery started on a small scale in 1990 and has been managed very conservatively under restrictive terms in special harvest permits, with a maximum harvest of about 500 lb per permit per month. The fishery reported a small harvest in 1990 and a larger one of 4,950 lb in 1991 (Table 7.1). Since then, the harvest has increased to between 9,000 and 16,000 lb per year.

1995 Season Summary

The littleneck clam harvest continued to increase in 1995, with landings reported by eight different permit holders. Total landings exceeded 15,500 lb, sold at between \$2.00 and \$3.00 per lb (live, whole weight) at point of first sale.

1996 Season Outlook

If harvest is limited to beaches around certified oyster farming operations, which include a very small percentage of suitable clam habitat in Southeast Alaska, there will eventually be a practical limit to the amount of clams that can be harvested. That limit is not known, but until arrangements can be made to open new areas to more general harvest, the fishery will be self-limiting for the near future.

The state is actively involved in developing a shellfish mariculture program, offering leases for beaches for commercial hard-shell clam harvests in Southeast Alaska. Permitting for prospective sites is ongoing and a small-scale harvest from newly certified beds could start occurring in the near future. Part of the permitting process may involve development of a comprehensive resource management plan and more active oversight of this resource.

Table 7.1. Statistical Area A (Southeast Alaska) and Statistical Area D (Yakutat) commercial harvest (landings) of miscellaneous species, in pounds, 1975-1995.

Year	Octopus	Littleneck Clams	Snails	Squid
1975	2,225 (25)			
1976	1,525 (20)			
1977	390 (8)			
1978	1,135 (15)		*	
1979	1,362 (18)			*
1980	3,581 (36)			
1981	6,610 (67)			
1982	2,274 (42)			
1983	5,750 (10)		*	
1984	3,796 (14)		*	
1985	305 (4)			
1986	356 (4)			
1987	17,611 (106)			
1988	20,485 (236)		873 (8)	
1989	6,414 (87)		463 (5)	
1990	8,810 (178)	*		
1991	12,137 (227)	4,950 (48)		
1992	3,594 (59)	12,042 (137)		
1993	139 (5)	9,740 (162)		
1994	365 (13)	9,412 (99)	*	*
1995	1,165 (29)	15,609 (86)		

^a Most recent year's data should be considered preliminary.

* Where number of permits participating is three or less, the information is considered confidential.

Section 8

MISCELLANEOUS DIVE FISHERIES, 1995/96

REPORT TO THE BOARD OF FISHERIES
MISCELLANEOUS DIVE FISHERIES, 1995/96



By

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and
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Alaska Department of Fish and Game
Commercial Fisheries Management and Development Division
Juneau, Alaska

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ABALONE

Background

The Alaskan abalone fishery targets the pinto, or northern abalone *Haliotis kamschatkana*, which inhabits the rocky, lower intertidal and subtidal surge zones of the outer coasts of Southeast Alaska. Commercially harvestable quantities of abalone occur in parts of Districts 3, 4, 5, and 13. Life history information for this species in Alaska is very limited. Information from other North Pacific locations is useful in understanding the basic biology of this species. Tagging studies indicate it is a slow growing, long-lived species. Spawning probably occurs during the summer and through early autumn in the most productive areas. Size frequency information indicates that, in at least some areas, a climax population may have existed prior to recent commercial exploitation. Recruitment levels appear to be low and sporadic and fecundity increases greatly with increasing shell length. Known predators include rockfish, starfish, octopus, sea otter, and man. Throughout the range of this and various other abalone species, exploitation has usually resulted in stock depletion and restrictive management.

Abalone can be picked by hand from the shoreline during extreme low tides. However, most of the personal use and all of the commercial fishery utilize SCUBA or hookah (umbilical diving) gear and most of the harvest occurs subtidally. Fishing success is variable depending upon weather, substrate, vegetative growth, visibility, diver experience, abalone abundance, and other factors.

Fishery Development and History

The abalone fishery is marked by a boom in harvests and effort in the late 1970s followed by declining harvests and increasing effort (Table 8.1). The decline in harvests may be attributed to a mix of excessive fishing, predation by a growing sea otter population, and apparent low productivity of abalone stocks when heavily harvested. Driving the effort changes was an increase in value from \$1 per lb in the early 1970s to more than \$10 per lb in the past four seasons.

The marked increase in harvests and effort came in the 1978/79 season, when effort increased more than three-fold and harvests jumped to 180,000 lb from a long-term average of about 6,000 lb. Harvests peaked at 378,685 lb in the next season, the first of the seasonal accounting year. This peak exceeded the quota of 250,000 lb, which the Board adopted in the spring of 1980, and the fishery was closed by emergency order for the first time.

High harvests continued through the 1981/82 season when 371,000 lb were landed, despite a further reduction in the guideline harvest range (GHR) to a maximum of 125,000 lb and a season shortened to two months. By the 1984/85 season, it was apparent that the resource was in trouble, when the lower end of the GHR (86,000 lb) was not reached despite 151 days of fishing.

The 1990/91 through 1995/96 seasons opened on October 1, and with the exception of District 13, which is managed separately and closed by emergency order, the length of the season for the rest of southeast Alaska was set prior to the opening to avoid overharvest. A harvest of 68,400 lb during the 1990/91 season was the beginning of a second downward trend resulting in 44,100 lb being harvested during the 1991/92 season, 36,000 lb in the 1992/93 season, and 34,900 lb during the 1993/94 season.

As the 1994/95 season progressed, it became apparent that harvests were much lower than anticipated, and dramatically lower than historic levels (Table 8.1). Final fish ticket data indicated that 15,055 lb had been harvested during the eight-day opening. Despite requests from harvesters to reopen the fishery, the southern Southeast fishery was not reopened. The District 13 fishery was open from October 1-5, 1994 and October 12-14, 1994 for a total of eight days. From the GHR of 8,000 lb, 7,824 lb were harvested. Anecdotal information from harvesters indicated that good harvest areas were difficult to find. Harvest per unit effort for the fishery (lb/diver/day) declined to 64% of the 1993 level.

Regulation Development

Prior to the boom in harvest and effort in the late 1970s, abalone harvests were regulated primarily by a three-inch minimum shell size. Quota and guideline harvest ranges were not imposed until 1980 after harvests began to soar. Season limitations were first imposed in 1980.

The major fisheries are divided into District 13 (northern outer coast) and Districts 3, 4, and 5 (southern and southern outer coast) fisheries. This division was established historically by early fishing and landing patterns that have generally persisted to this past season. Closed waters around Ketchikan and Sitka, Coronation Island in lower Chatham Straits, and the southern half of the west coast of Prince of Wales Island protect stocks from commercial exploitation.

Size limits have undergone several increases prior to reaching the present four-inch minimum. The size limit was raised for Districts 9 through 14 to 3 1/2 inches in 1976, followed by a general change for all districts to 3 1/2 inches in 1977. The board adopted an increase in minimum size to 3 3/4 inches in the spring of 1979. In November 1993 the Board again increased the legal size limit to 4.0 inches due to concerns that abalone stocks were declining. The intent of the larger size limit was to reduce the harvest rate on mature abalone thereby increasing the potential for improved stock abundance. The board also adopted a regulation prohibiting diving for fourteen days before and after the fishery.

Guideline harvest ranges and season length have dropped in several steps. In 1980 the harvest limit was set at 250,000 lb and the season was reduced from all year to September 1 through May 31. In the spring of 1981, the GHR was reduced to 100,000-125,000 lb, and the season was shortened to September 15 through May 15. In 1982 the Board split the existing guideline harvest range, allocating 86,000-107,500 lb to the Ketchikan area, and 14,000-17,500 lb to the Sitka area. In 1983 the Board split the season into autumn and spring segments in each of which 50% of the allowable harvest was to be taken. The BOF restricted the 1985/86 harvest to a range of 25,000-50,000 lb in the Ketchikan area and a maximum of 8,000 lb in the Sitka area. The District 13 season was reduced to November 1 to May 15 and all other areas were changed to October 1 to May 15. In 1986 the season was changed to October 1 through May 15 for all areas. The upper GHR was further reduced for the 1995/96 season to 10,000 lb for southern Southeast and to 6,000 lb for the Sitka area. The reduction was due to a continued apparent decline in abalone abundance in many areas, especially southern Southeast Alaska, and also to increased otter predation. These conservative GHRs were intended to provide a limited commercial fishery while increasing the potential for increased stock abundance.

1995/96 Season Summary

The southern Southeast abalone fishery opened on October 1, 1995 with an upper GHR of 10,000 lb and a closed on October 6, 1995. The District 13 fishery opened on October 1, 1995 with an upper GHR of 6,000 lb and closed on October 5, 1995. Closing dates were announced prior to the openings and were based on daily harvest rates from past seasons.

The harvest for southern Southeast Alaska of 8,524 lb was taken by 44 divers making 48 landings in six days. The average price per lb was \$8.99, giving the fishery an exvessel value of \$74,074. Due to poor harvest rates and a concern by some harvesters that abalone populations were below historic levels, the fishery was not reopened despite not reaching the upper end of the GHR. The District 13 harvest of 5,828 lb occurred in two different openings. The initial harvest of 3,833 lb took place from October 1-5, 1995. A final harvest of 1,995 lb occurred from October 15-16, 1995. A total of 56 divers making 73 landings produced an approximate exvessel value of \$52,452 in the District 13 fishery.

1996/97 Season Outlook

In response to a dramatic decrease in harvest rates observed during the past several seasons, the apparent lack of abalone in many of the important traditional harvest areas as noted by department divers conducting sea urchin assessment surveys, and the numerous comments from subsistence users and commercial divers

regarding the diminishing numbers of abalone, the department closed the 1996/97 abalone season by emergency order. The closure applied to all of Southeast Alaska including the Sitka area and southern Southeast fisheries.

GEODUCKS

Background

Known geoduck clam *Panopea abrupta* beds have a patchy distribution in the central and southern portions of Southeast Alaska, primarily in protected waters near the outside coast. Studies conducted in other locations, specifically Puget Sound in Washington State, and more generally in British Columbia, indicate that this clam may live to be over 100 years old. It appears that Southeast Alaska is the extreme northern limit of the geographic range of this species and that recruitment may be sporadic or very low seasonally. Problems specific to this species include susceptibility to overharvest because of sporadic recruitment, low growth rates, and extremely high maximum age.

One of the most troubling problems is the tendency for the clams to bioaccumulate undesirable microorganisms or compounds. Fairly high levels of paralytic shellfish poisoning (PSP) have been found in geoducks in Southeast Alaska, most strongly associated with the viscera. However, the mantle and necks are the usual body parts consumed, and PSP concentrations are lower in these parts.

In order to protect consumers, the state requires that each individually delivered lot of commercially harvested clams be tested by the Alaska Department of Environmental Conservation (ADEC) laboratory in Palmer and certified to be within acceptable levels of PSP prior to release for marketing. In addition, water quality for commercial beds is tested for human pathogenic microorganisms and certified safe by the ADEC. Waste portions of the clam must be disposed of safely. The need to securely quarantine lots subject to approval for sale, the time required for transport and testing of samples, and the relatively short shelf life of the fresh product, requires a closer working relationship between government and industry to successfully market the product than is necessary for most other seafood products.

Fishery Development and History

Starting in 1978 with the Noyes Island survey, state grants were used to find and qualitatively assess commercial beds in the Ketchikan, Craig, Petersburg-Wrangell, and Sitka areas. A number of potential commercial beds were located near Ketchikan, Craig, and Sitka. Procedures for testing and certifying the product for human consumption were established by ADEC. Assessment surveys were conducted on three beds on Noyes Island near Craig and a harvestable biomass estimated. The ADEC completed sanitation surveys on these areas.

Two processors conducted the required modifications to their facilities and procedures to handle batch processing, lot testing, and product quarantine and were certified to process geoducks. In late 1985, the first permit was issued for the commercial harvest of geoduck clams. During the 1985/86 season, 129,700 lb (Table 8.2) were harvested of the 300,000 lb five-year quota in the Noyes Island area. During the 1986/87 season, only 28,191 lb were harvested. The decline was due mainly to poor marketing conditions and high operational costs. Increased interest in this fishery began after department personnel completed a population estimate on the west side of Gravina Island in 1987. During the 1987/88 season all harvest occurred in the spring of 1988 and totaled 124,568 lb from the Vallendar Bay area of Gravina Island, and 60,577 lb from Noyes Island. Biorka Island near Sitka was included in the geoduck fishery during the 1989/90 season and Kah Shakes included in the 1990/91 season. There have been no additional areas surveyed since that time. The 1991/92 geoduck fishery also saw an increased interest in participation and harvest by divers from Washington State. Prior to this season, non-resident participation was minimal.

Exvessel values and the number of divers increased during the 1992/93, 93/94, and 94/95 seasons. For the 1994/95 commercial geoduck season, the department set aside a portion of the quota for a mid-winter fishery. The purpose of the mid-winter fishery was to determine if the value of the product could be increased by marketing live clams and to monitor PSP levels. A quota of 49,000 lb was established for the second fishery which took place on the west shore of Gravina Island, Little Steamboat Bay on Noyes Island, and Symonds Bay near Sitka. The second fishery was opened on January 9, 1995 and closed on January 10, 1995. The combined seasonal harvest of 194,900 lb, harvested by 60 divers, gave the fishery an exvessel value of \$409,208. During the 1994/95 mid-winter fishery, geoduck clams from Symonds Bay were within the ADEC standards and were allowed to be sold on the live market.

Management Strategy and Regulations

The objective of geoduck fishery management is to allow a low exploitation rate because the species is long-lived with low and sporadic recruitment. Harvests are by permit only and have been allowed from October 1 through May 31 to avoid the summer spawning and recovery period and to minimize PSP toxin

levels. Department studies are underway to determine the feasibility of continuing a mid-winter fishery to allow geoducks to be sold to a live market.

Harvests are restricted to beds for which biomass estimates are available. Only four areas have been surveyed: Symonds Bay on Biorka Island in the Sitka Management Area, West Gravina Island, Kah Shakes Bay, and the Ulitka/Little Steamboat/Big Steamboat complex of bays on the north shore of Noyes Island in the Ketchikan Management Area. The guideline harvest level (GHL) for each area is estimated as 2% of the harvestable population.

1995/96 PSP Sampling Program

During the 1995/96 fishery, the department implemented a geoduck test fishery to determine levels of PSP at several locations in Southeast Alaska. The increase in effort for the commercial geoduck fishery has occurred in response to increased local interest and the lucrative live geoduck market. To be sold live, geoducks must have PSP levels under 80ug/100g. Areas planned to be open for commercial geoduck harvest during 1996 were sampled for PSP during an 11-month test fishery. From each commercial harvest area, four sample sites were chosen with three clams taken monthly at each site for a total of 12 clams. Results from these limited samples showed that Kah Shakes and Noyes Island had the greatest potential for live sales. February through June showed the lowest PSP levels in all areas.

1995/96 Season Summary

The 1995/96 commercial geoduck season occurred from October 1, 1995 through October 5, 1995 and from January 8 through January 16, 1996. The purpose of the mid winter opening in Sitka was to encourage sales of live clams. A GHL of 209,000 lb was available from three separate areas near Ketchikan. Prior to the fishery, the department conducted a test fishery for 1% of the GHL in the three open areas near Ketchikan to determine PSP levels. These harvests included 1,250 lb from Vallenar Bay, 200 lb from Kah Shakes, and 640 lb from Big Steamboat Bay.

Based on prelicensing information obtained from ADEC, it became evident that a dramatic increase in effort would occur during the 1995/96 fishery. In response, the department reduced the daily fishing time from eleven to six-hours per day. The October fishery was completed in the Gravina Is., Noyes Is., and Kah Shakes areas by October 10 with an exvessel value of \$364,900. Due to varying levels of PSP and transportation problems, no live clams were sold from west Gravina or Noyes Island. Some clams harvested in the Kah Shakes area were shipped live from Ketchikan via Vancouver, B.C., Canada to the Orient. The

fishery in the Symonds Bay area near Sitka lasted four days and was closed on January 16, 1996. Almost all geoducks from Symonds Bay were sold on the live market at an approximate exvessel value of \$4.00/lb, for a total exvessel value of \$34,700.

1996/97 Season Outlook

The 1996/97 fishery will be managed under a similar plan as the 1995/96 season. The fishery opened at Kah Shakes, Noyes Island, and Gravina Island on Monday, October 7 with weekly fishing periods each Monday from 7:00 a.m. to 1:00 p.m. The Biorka Island area will be opened in January to capitalize on the increased value of live clams. No additional population assessment surveys were conducted this year and guideline harvest ranges will be similar to previous seasons.

The test fishery to identify harvest areas and time periods of low PSP levels will be continued with the goal of targeting next year's openings to increase the exvessel value of this fishery.

SEA URCHINS

Background

Two commercial species, red sea urchins *Strongylocentrotus franciscanus* and green sea urchins *S. drobachensis*, are common in Southeast Alaska. The red sea urchin occurs primarily on rocky shorelines of the outside coast with largest concentrations in southern Southeast Alaska. Green sea urchins are most common in protected waters of Southeast Alaska in a wider variety of habitats. The red sea urchin population is kept at low levels by sea otters on many areas of the outside coasts, including Chichagof Island, the Maurelle Islands, the Barrier Islands, southern Prince of Wales Island, and nearby areas. Urchins are harvested for their gonads, commonly called roe or uni, with no distinction made between males or females. The product is most valuable fresh and is marketed primarily in Japan.

Fishery Development and History

Harvests of red sea urchins in Southeast Alaska began in 1981 near Ketchikan, primarily around Gravina Island. Both red and green sea urchins were harvested, with the vast majority of the harvest comprised of red urchins. Participation and harvest built through the mid-1980s (Table 8.3), expanding to include Districts 1, 2, 3, and 4. Harvests peaked at 646,347 lb in 1987 and then tapered off due to difficulties in marketing. Beginning in 1988, harvests were restricted to District 1, Gravina Island, and District 3, the West Coast of Prince of Wales Island due to lack of staff time and budget support.

Interest in establishing a commercial urchin fishery in Southeast Alaska greatly resurged in 1990 due to the success of urchin fisheries in California, Washington, and British Columbia. This interest was directed towards the Sitka area; however, lacking basic stock information, further commercial harvest was postponed until completion of a test fishery there in late 1990 and early 1991 to estimate population size and to gather size frequency data. The commercial fishery opened in southern Sitka in January 1991 with a harvest of 174,233 lb by closure in April. Subsequent fisheries were opened in 1992 and 1993, and then closed indefinitely due to extreme predation by sea otters. All other areas of Southeast Alaska remained closed according to department policy which does not allow fisheries for which there is no management plan, stock assessments, harvest quotas, or means of monitoring and managing the fishery.

The department initiated a test fishery in District 1 near Ketchikan during the 1995-96 season as a method to pay for population assessment surveys. The test fishing contract was awarded to Ocean Fresh Seafoods of Fort Bragg, California, the sole bidder. Under the contract, Ocean Fresh paid the department \$139,567 in exchange for the opportunity to harvest 3,000,000 lb of red sea urchins. The test fishery spanned 14 months from March 1995 through April 1996, and harvested 2,985,607 lb of red sea urchins (Table 8.4). Harvests were distributed to seven subdistricts in proportion to the available biomass. Over one-half of the harvest came from Subdistrict 101-21 on the south and west shore of Duke Island and the reefs offshore (Figure 8.1). Monthly roe recovery averaged between 5.5% and 12.2%. The average price per lb ranged from \$0.29 to \$0.81. The test fishery provided considerable employment and revenues to Southeast Alaska, and was estimated to have a value an exvessel value of \$1,400,000 paid to dive harvesters.

Regulation Development

Prior to 1996, permits to fish for sea urchins were given under authority of 5 AAC 38.062. In 1984, the first year with significant landings of red urchins, there was a size limit of 3-5 inches test diameter to protect small urchins for recruitment, to provide large urchins as a protective spine canopy for small urchins, and to give processors the desired size urchin. An interim management plan was in place in 1987 for the Ketchikan area with a 3-year area rotation and size limits modified slightly to 3 - 4.5 inches. A second

interim plan was developed for 1991 through 1993 for the Sitka area. The Sitka area plan included a 3.2% annual harvest rate on the estimated biomass, 3-year area rotations, weekly fishing periods of noon, Saturday through noon, Thursday, and no size limits.

In 1996, the department, in cooperation with the sea urchin fishing industry, developed interim regulations and a management plan for a commercial fishery in Southeast Alaska beginning with the 1996/97 season. The regulations were adopted by the commissioner under authority of 5 AAC 39.210 for High Impact Emerging Fisheries and became effective in December, 1996. The core elements are:

1. Annual guideline harvest levels are 6% of the biomass estimate, which is the lower bound of the 90% confidence interval for biomass. Fisheries will only be opened where biomass surveys have been conducted in the previous three years.
2. Harvest opportunities are to be distributed to each week of every month that the fishery is open. The 1996/96 season is to be managed to span approximately four months, subject to needs for conservation, law enforcement, reducing waste, and promoting fishery development. Size limits and trip limits may be imposed if needed to slow the pace of the fishery.
3. Processing vessels must carry observers, and vessels transporting unprocessed product out of Registration Area A must first obtain a transport permit.
4. In addition to fish ticket requirements, processors must submit records of the roe recovery within 30 days of landing.

1996/97 Season Outlook

The 1996/97 season is the first under the interim regulations adopted by the commissioner. The GHL for the 1996/97 season is approximately 5.8 million lb for the Districts 1, 2, 3, and 4. Biomass surveys were conducted in the portions of those districts with commercially viable red urchin populations between August 1994 and July 1996. Under the 4-year moratorium on entry to dive fisheries in Southeast Alaska, effective July 1, 1996, there are 557 eligible participants in the urchin fishery.

SEA CUCUMBERS

Background

The principal commercial species of sea cucumber harvested in Southeast Alaska is the giant red sea cucumber *Parastichopus californicus*. It is a common species distributed from Mexico to Southeast Alaska and it has been observed at least as far west and north as Cook Inlet and Kodiak Island. It occupies a broad range of subtidal habitats from nearshore shallows to over 100 fathoms where its primary food is detritus, which it ingests along with significant amounts of fine substrate. Its ecological function seems to include recycling detrital material into nutrients for the primary producers in the marine food chain. It appears to favor locations with moderate current, avoiding mud bottoms and areas subject to inundation by freshwater or glacial runoff. The abundance of sea cucumbers in Southeast Alaska is greatest in the southern and western portions not directly exposed to the open ocean.

Most of the harvest in Alaska has been confined to Southeast Alaska around the communities of Ketchikan, Sitka, and Craig. Sea cucumbers harvested in Southeast Alaska are processed in Ketchikan, Craig, Petersburg, and Sitka with a significant amount of product processed in British Columbia.

Most of the vessels pioneering this fishery were small skiffs of limited range and capability operating in the vicinity of either Ketchikan or Sitka, mostly as a day fishery. Larger vessels with two divers and a crewman with living quarters and the capability of transporting product and divers during typical fall and winter weather conditions are now the norm. Harvest is conducted by SCUBA or hookah diving gear usually at depths from between 10 to 60 feet. The number of hours each diver can work each day depends on the maximum working depths and may be as little as three or four hours. Harvest consists of collecting sea cucumbers in large mesh bags and transporting the filled bags to the tendering vessels.

Processing is currently conducted in a two step process. The freshly caught animal is eviscerated on the fishing grounds by either the diver or a tender operator. The drained sea cucumbers are then placed in buckets or totes and transported to the processing facility where they are processed immediately or held for up to two days in a refrigerator, or on ice. Sea cucumbers have been purchased by the bucket in previous years but are now sold exclusively by drained weight. Holding times for the eviscerated, densely packed sea cucumbers are limited by their rapid decomposition even when refrigerated.

Processing at the plant consists of separating the muscle bundles from the skin with a scraper or knife. The major products from this fishery are the longitudinal and transverse muscle bundles or meat, and the skins.

Skin processing involves cooking or boiling the skins to a specific texture and drying the product. The dried skins are ostensibly used mostly in the Orient in upscale cuisine. The dried skin product, known in the industry as *trepang* or *beche de mer*, has only been acceptable to the local industry during the past few years.

Historical Summary

The first experimental fishing permits for sea cucumbers were requested in 1981. One or two permits were issued each year between 1981 and 1986, but only one vessel reported any landings during this period. The first fisheries were based in Ketchikan and, over the years, evolution of the management strategy resulted in a partition of most of the statistical subdistricts into one of three seasonal rotations. The initial fishery had no established season; harvests are reported in Table 8.5 on an October to September basis for consistency with years since 1990.

The fishery expanded rapidly in the late 1980s (Table 8.5). In 1989 the fishery became a virtual gold rush, exceeding the ability of the department to manage by the permit system. In response, the Central Council of the Tlingit and Haida Tribes of Alaska filed suit claiming that the State of Alaska was not properly managing the resource and that the subsistence opportunities were not being protected. The department closed the fishery in May 1990 pending development of a management plan.

Interim management measures for the sea cucumber fishery were developed during the summer of 1990 and the fishery was reopened in October 1990. The Board of Fisheries approved the Sea Cucumber Management Plan and the department filed emergency regulations with the Lieutenant Governor. In March 1991 the court declined to approve an injunction to prevent further fisheries. Subsequent seasons have been managed according to the plan (below). Scheduled openings have primarily been in the vicinity of Ketchikan (Districts 1 and 2) and Sitka (District 13), and secondarily near Craig (District 3; Table 8.6)

Management Strategy and Regulation Development

The Southeast Alaska Sea Cucumber Commercial Fisheries Management Plan (5 AAC 38.140) was developed to provide for a conservative annual quota, thereby protecting subsistence opportunities and providing for sustained harvests. Quotas are approximately 5% on a three-year rotational basis applied to subdistricts.

The season began October 1 in 1990, with two 48-hour openings per week. The season was changed to a November opening in 1993, and in order to extend the season, weekly fishing periods were reduced to seven daylight hours on Mondays in November, plus an additional four daylight hours on Tuesdays from December through March.

In order to provide a refuge for sea cucumbers below a depth of 60 feet, use of mixed gases or saturation diving is prohibited. Sea cucumbers may be hand-picked only and any means other than individually collecting sea cucumbers by hand and placing them in bags is prohibited. Sea cucumbers may be harvested by diving with the aid of breathing apparatus, including SCUBA, surface supplied systems, and snorkels.

In 1993, The Alaska Board of Fisheries also adopted regulations prohibiting the operation of dive fishing gear 14 days prior to and 14 days after a commercial opening for miscellaneous shellfish and prohibits more than one species of miscellaneous shellfish to be on board a vessel at one time. In addition, no person may land or have on board more than 2,000 lb of eviscerated sea cucumbers during any fishing period established by the department and no more than two divers registered to fish sea cucumbers may be on board a vessel registered to fish sea cucumbers at one time.

To protect subsistence opportunities, the cucumber management plan established 18 areas closed to commercial fishing (5 AAC 38.140(h)). There are also provisions to prevent the use of diving gear in the subsistence (5 AAC 02.010(1) and personal use (5 AAC 77.010(l)) fisheries in those areas.

1995/96 Season Summary

The 1995/96 season opened by regulation on November 6, 1995 (the first Monday in November) and closed on January 3, 1996. A total of 11 rotational fishing areas were opened during this season with a combined total guideline harvest of 1,157,500 lb. A total of 1,205,443 lb of sea cucumbers were harvested by a record 424 divers with an exvessel value of \$1.30 per lb for a total exvessel value of \$1,567,076. The greatly increased numbers of fishermen can be attributed to high prices the previous year, the economic problems in the salmon industry, and concerns that the fishery may be limited by the Commercial Fisheries Entry Commission.

1996/97 Season Outlook

Biomass estimates made in the summer and fall of 1996 indicate a harvestable surplus of 737,000 lb. This is a sharp decline from past years, and represents an extreme reduction in populations near Sitka. It is suspected, though unverified, that these reductions are largely due to predation by sea otters.

To meet demands for additional harvests, Norquest Seafoods contributed \$15,000 to fund a four-day survey of Sea Otter Sound (Subdistrict 103-90) in late November.

Table 8.1. Statistical Area A (Southeast Alaska) commercial abalone harvests, effort, value, and season length, 1970/71 through 1996/97.

Season	Guideline Harvest Range or quota (lb)	Southern Southeast Harvest (lb)	District 13 Harvest (lb)	Total Southeast Harvest (lb)	Number of divers	Exvessel value	Season length (days)
70/71							365
71/72			923	923	1	\$923	365
72/73		65	2,610	2,675	6	\$2,675	365
73/74			3,000	3,000	3	\$4,500	365
74/75			13,826	13,826	3	\$20,739	365
75/76		55	8,497	8,552	8	\$17,104	365
76/77			546	546	1	\$1,092	365
77/78		805	10,861	11,666	10	\$14,816	365
78/79		130,607	49,320	179,927	35	\$253,697	365
79/80		316,952	61,733	378,685	43	\$408,980	287
80/81	250,000	233,589	18,382	251,971	40	\$420,792	273
81/82	100,000-125,000	338,305	32,589	370,894	54	\$445,073	59
82/83	100,000-125,000	100,458	12,826	113,284	41	\$240,162	36
83/84	100,000-125,000	99,294	8,735	108,029	31	\$302,481	126
84/85	100,000-125,000	59,237	8,379	67,616	25	\$165,659	151
85/86	25-58,000	32,817	7,720	40,537	18	\$117,963	71
86/87	25-58,000	47,404	13,820	61,224	24	\$168,366	146
87/88	25-58,000	57,209	10,406	67,615	42	\$208,930	36
88/89	25-58,000	65,928	10,172	76,100	45	\$307,444	33
89/90	25-58,000	57,784	4,020	61,804	67	\$330,651	40
90/91	25-58,000	62,779	5,607	68,386	97	\$374,071	9
91/92	25-58,000	35,987	8,095	44,082	95	\$267,578	35
92/93	25-58,000	26,905	9,083	35,988	99	\$386,151	19
93/94	25-58,000	27,680	7,172	34,852	85	\$487,928	7
94/95	25-58,000	15,055	7,824	22,879	101	\$330,373	8
95/96	0-16,000	8,524	5,828	14,352	101	\$125,580	7
96/97	closed						

Table 8.2. Statistical Area A (Southeast Alaska) historic geoduck harvests in pounds, by management area, 1985/86 through 1995/96.

Season	Guideline Harvest Level	Total divers	Gravina Island	Kah Shakes	Noyes Island	Biorka Island	Total value	Total lb
1985/86		6			129,700		\$25,940	129,700
1986/87		3			28,200		\$7,050	28,200
1987/88		6	124,600		61,000		\$55,710	185,150
1988/89		9	114,500		28,700		\$42,960	143,200
1989/90	184-209,000	18	128,300		68,300	10,500	\$103,550	207,100
1990/91	171-196,000	15	118,600	19,300	43,800	7,900	\$94,800	189,600
1991/92	194-219,000	20	110,200	14,100	62,800	5,900	\$135,100	193,000
1992/93	171-196,000	22	119,800	20,800	40,900	7,900	\$234,856	189,400
1993/94	194-219,000	30	117,000	19,100	63,300	9,900	\$313,985	209,300
1994/95	195,000	60	126,700	19,700	38,500	10,000	\$409,208	194,900
1995/96	219,000	114	130,600	20,000	60,000	9,700	\$399,604	220,300

Table 8.3. Statistical Area A (Southeast Alaska) red sea urchin harvest, permits, landings, and value, 1981-1996.

Year	Harvest	Permits	Landings	Value
1981	a	a	a	a
1982	a	a	a	a
1983	a	a	a	a
1984	107,380	11	45	\$19,656
1985	125,973	12	59	\$15,747
1986	282,384	13	153	\$39,763
1987	652,965	19	332	\$96,085
1988	54,409	4	31	\$22,141
1989	142,068	12	107	\$35,091
1990	16,270	5	28	\$4,279
1991	174,233	6	91	\$52,444
1992	428,220	37	256	\$123,756
1993	143,485	17	107	\$40,893
1994	0	0	0	0
1995 ^b	2,088,395	1	1,391	\$944,329
1996 ^b	877,212	1	705	\$458,508

^a When number of permits participating is three or less, the information is considered confidential.

^b Department test fishery.

Table 8.4. Red sea urchin test fishery harvest in pounds by month and subdistrict, 1995-96.

Date	SUBDISTRICT							Total
	101-11	101-21A	101-21B	101-23	101-25	101-29	101-41	
Mar-95	29,251			5,443	13,203			47,897
Apr-95	105,174							105,174
May-95	94,954	207,522				3,605		306,081
Jun-95		312,118	37,762	1,261				351,141
Jul-95	54,304	169,426			147,266			370,996
Aug-95	7,589	50,567	206,131		1,922	7,093		273,302
Sep-95		4,820	109,775	11,660	16,500	328		143,083
Oct-95		9,032	86,942	45,154	10,291	16,912		168,331
Nov-95		2,174	124,405		2,875	9,073		138,527
Dec-95		5,886	110,222	33,230	26,753	7,772		183,863
Jan-96	19,097	121,415	30,683	23,997	39,657	11,137		245,986
Feb-96	8,073	131,323		14,254	25,834	2,768		182,252
Mar-96	70,105			122,852	509	13,505		206,971
Apr-96				16,617	2,096	237,412	5,878	262,003
Total	388,547	1,014,283	705,920	274,468	286,906	309,605	5,878	2,985,607

Table 8.5. Statistical Area A (Southeast Alaska) commercial sea cucumber harvests, guideline harvest levels, permits, landings, and value, 1981/82 through 1995/96.

Year	Guideline Harvest Level (lb) ^a	Harvest (lb)	Permits	Landings	Exvessel value
1983/84	none	*	*		
1984/85	none				
1985/86	none				
1986/87	none	34,043	7	44	
1987/88	none	65,056	11	143	\$15,449
1988/89	none	776,675	57	922	\$10,635
1989/90	none	2,301,426	205	2,263	\$542,168
1990/91	704,491	804,184	143	890	\$1,276,255
1991/92	839,160	831,710	187	704	\$997,951
1992/93	1,100,440	1,249,621	240	1,003	\$1,158,799
1993/94	799,235	964,343	320	949	\$995,783
1994/95	1,351,000	1,322,175	261	1,378	\$1,725,868
1996/96	1,157,500	1,332,095	424	1,582	\$2,141,213

^a Guideline harvest level was based on numbers of individual sea cucumbers through 1993/94; these were converted for this table using a factor of 0.42 lb per individual for the 1990 and 1991 seasons and .44 lb per individual for the 1992 and 1993 seasons.

^b Most recent year's data is considered preliminary.

* Where number of vessels participating is three or less, the information is considered confidential.

Table 8.6. Statistical Area A (Southeast Alaska) sea cucumber harvests in lb and (permits), by district, 1987/88 to present.

Season	1	2	3	5	6	7	8	9	10	12	13	Total
1983/84	300	0	0	0	0	0	0	0	0	0	0	300
1986/87	33,600	500	0	0	0	0	0	0	0	0	0	34,000
1987/88	50,700	14,300	0	0	0	0	0	0	0	0	0	65,100
1988/89	339,500	107,600	0	600	0	0	0	0	0	0	353,700	801,400
1989/90	470,900	138,300	406,100	121,900	56,200	15,100	0	95,200	2,400	65,500	946,700	2,318,300
1990/91	52,100	197,300	74,300	19,400	0	0	0	0	0	0	461,200	804,200
1991/92	333,500	153,100	183,800	1,500	0	0	0	0	0	66,400	131,600	870,000
1992/93	361,700	223,500	137,900	0	0	0	0	188,200	0	44,100	294,200	1,294,600
1993/94	144,200	187,700	85,300	0	0	0	0	0	0	0	547,200	964,300
1994/95	229,900	122,500	288,300	0	467,500	0	0	17,800	0	123,100	73,000	1,322,200
1995/96	268,600	205,400	117,600	100,700	327,000	0	0	81,800	0	22,700	208,300	1,332,100

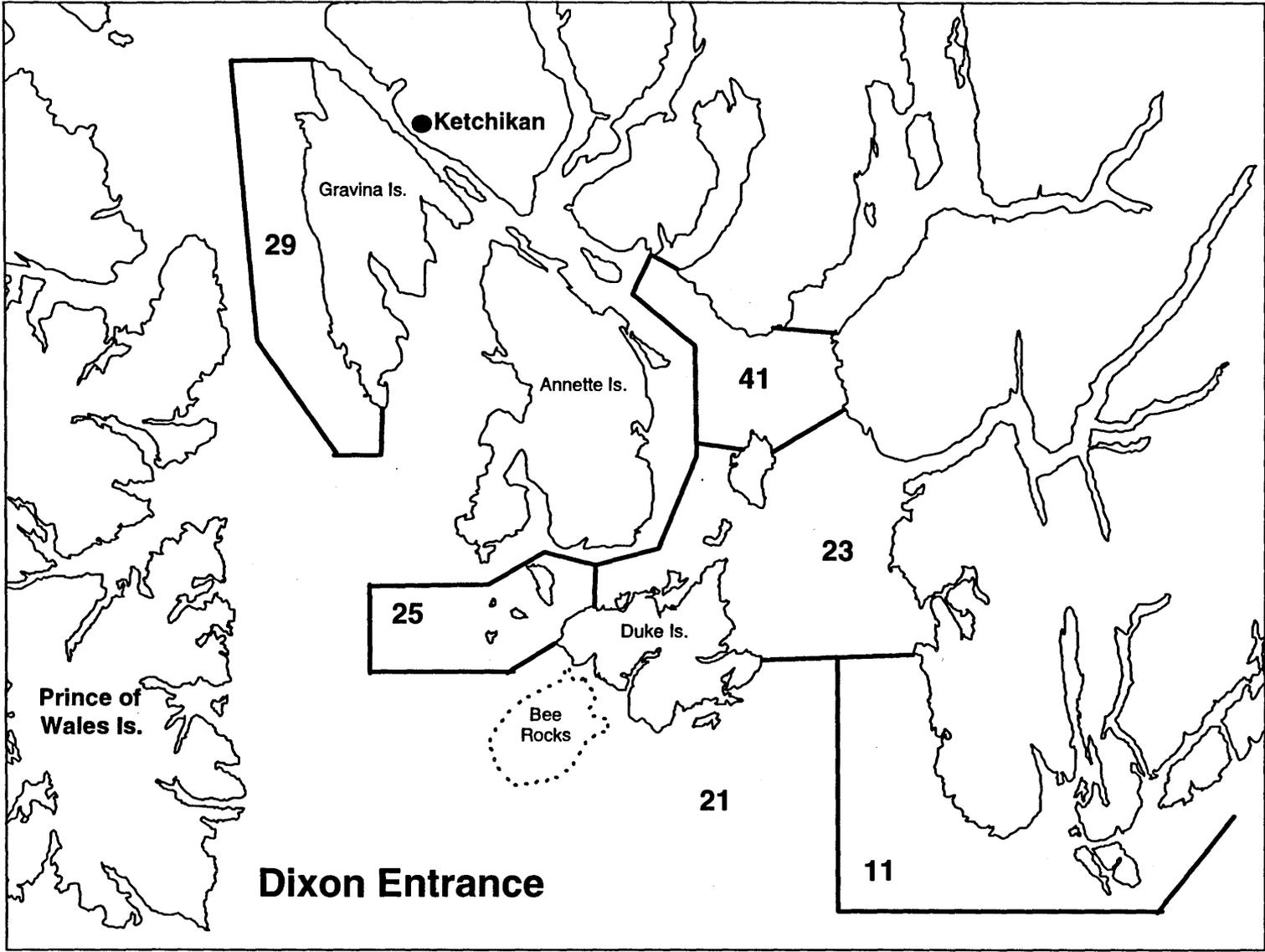


Figure 8.1. Seven subdistricts of District 1 comprising the 1995-96 sea urchin test fishery.

Section 9

YAKUTAT DUNGENESS CRAB FISHERIES, 1995/96

REPORT TO THE BOARD OF FISHERIES
YAKUTAT DUNGENESS CRAB FISHERIES, 1995/96



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INTRODUCTION

Dungeness crabs *Cancer magister* are members of the highly evolved brachyuran (true crab) subgroup of the order Crustacea. They are commercially significant and widely distributed in coastal waters of the eastern Pacific Ocean from Baja California to the Aleutian Islands.

Fishing grounds in Yakutat (Statistical Area D) are close to the northern limit of Dungeness crab. They are widely distributed in Yakutat waters, but tend to concentrate off ocean beaches in two to 10 fathoms. Some of the most productive summer fishing occurs in the shore break of exposed beaches. Although the fishery extends along the entire coast, much of the total harvest each year is taken from four or five distinct, localized fishing grounds. Yakutat has produced a long-term average harvest of about 1,500,000 lb per season (Table 9.1). Most of the product is marketed as whole-cooked and live crab in the summer tourist markets in Washington, Oregon, and California.

Yakutat is a superexclusive registration area for Dungeness crab; a vessel registered to fish in this area cannot register or fish in any other area in Alaska during the same calendar year. The fishery is currently under open entry. Anyone with a permit and license can register a vessel to crab in this area. During the past decade, up to 67 vessels have registered and fished in the Yakutat area. An average of 46 vessels have fished there within the past four seasons. Most vessels are 50 feet or larger, with some vessels up to 90 feet in length. As a rule, the fleet is composed of sturdy vessels designed to be operated in near-shore rollers and capable of open ocean transit. The 400 pot limit, open ocean conditions, and the remote nature of the fishing grounds favor vessels typical of Dungeness fisheries in the Pacific Northwest. In fact, most of the vessels fishing the more remote western and eastern grounds have home ports in the Pacific Northwest. Almost all participants use standard, hatbox-shaped pots constructed with steel frames and webbed with stainless steel wire.

Management of this fishery is complicated because collection of biological data is limited to port sampling of the landed harvest for size frequency information, and the harvest reports on the fish ticket record. The remoteness of many landing ports, such as Pelican and Cordova, make it difficult to schedule dockside sampling of deliveries. The remoteness of many of the grounds complicates understanding the effects of the fishery on crab stocks. Determining stock composition and abundance would require more field work than is currently programmed.

The summer fisheries overlap important parts of the male molting period, which extends into mid-summer, and the female molting period that extends through the summer. The major mating period is also during mid to late summer. The relative success of the summer fishery depends on sporadic major recruitment events that support the fishery for up to three years thereafter. Once a large recruit year-class passes through the fishery, the fishery is dependent on annual recruitment and is vulnerable to local depletion until another large year class enters the fishery. It has been at least four years since any significant recruitment in the Yakutat area. Stocks are currently considered depressed.

Alaska is the only management jurisdiction on the West Coast of North America that allows major summer fisheries for Dungeness crabs, justifying the risks because of overriding economic considerations. The Yakutat summer fishery is considered a necessary concession to the extreme winter weather conditions on the open ocean fishing grounds. However, under depressed stock conditions, it may be prudent to manage the summer fishery more conservatively. Yakutat is near the northern range limit for this species and depressions in stock abundance can be expected to be more severe and extended than in areas farther south.

A major issue that affects the commercial fishery is conflict between user groups and between large and small vessel operators. A difficult management problem is how to minimize the handling and sorting mortality of unmarketable crab with a minimum of management oversight.

FISHERY DEVELOPMENT AND HISTORY

Through much of its history, from the mid-1920s to the mid-1960s, Southeast Alaska and Yakutat were managed as a single unit. Prior to the 1960s, harvests from much of the Gulf of Alaska were combined into a single total; Yakutat contributions were significant, but the exact percentages are unavailable.

Since the early 1960s, the fishery in the Yakutat area has evolved through two major periods. Between the early 1960s and the 1981/82 season, the landings and participants fluctuated widely (Table 9.1). Until the early 1980s, demand for Dungeness crab from Yakutat was generally inversely related to the availability of crab from Washington, Oregon, and California and highly dependent on the willingness of one or two larger processors to purchase crab during the summer. The fishery was market driven.

Since the 1981/82 season, effort and participation has generally increased. As the preferred product form changed from frozen or canned meat to air-freighted live crab, there was increasing interest from processors to handle Dungeness crab. For many crabbers from the Pacific Northwest, the Yakutat summer fishery continues to be attractive because their home waters are closed during the summer. The rising demand in the early 1980s coincided with the entry of a huge recruit class into the fishery and a decline in harvests from Washington, Oregon, and California. The year class supported increasing fishing effort through the next two seasons and set the pattern for the development of the current fishery, which is driven by stock abundance.

REGULATION DEVELOPMENT

The documented regulatory history of this fishery started in 1924. Most management jurisdictions within the range of this species employ passive management measures such as size limits, restricting harvest to males, and specifying a season that avoids known sensitive molting and mating periods. In Yakutat, this management triad, called 3-S management (size, sex, and season), is actually 2-S management, since the summer fishery occurs while males and females are molting and mating. The current May 15 to July 15 opening is a compromise developed over many years to avoid the major molts to the extent possible, while maximizing economic returns. There are few alternatives to a summer season in Yakutat because the most productive grounds are exposed to extreme weather conditions in the winter. Both classical 3-S and modified 2-S management usually do not effectively manage intensive, highly competitive fisheries. If the effort in Yakutat continues to climb, other management options will need to be considered.

There are more active management alternatives to 2-S methods currently used by the state. Some of these, such as guideline harvest levels based on stock assessment surveys, could structure harvest to protect weak stock segments or soft-shell crabs while optimizing exploitation rates and product quality. Until the advent of more active management, the state will rely on passive methods refined over the long history of the fishery.

Fishing Seasons and Periods

For most of the years and seasons before 1975/76, the fishery was open all year. The accounting period started on January 1 and ended on December 31. In 1975, following eight consecutive years of harvests between one and two million lb and a rapid rise in the number of fishing vessels, the season was shortened to May 16 through February 28, 1976. It was then closed in the summer by emergency order because large numbers of soft-shelled crab were observed in the landed harvest. It was a season notable only because it marked the advent of short seasons and in-season management of the fishery based on stock conditions.

The 1976/77 season started on June 1, with a scheduled closure on February 28, 1977. The season opening and closing dates remained the same through the 1981/82 season, although several intervening seasons were closed by emergency order when large numbers of soft-shells were sampled at the dock. The season changed again in 1982, to May 1 through February 28, 1983. Each season from 1982/83 through 1984/85 was closed by emergency order at some point in the summer due to increasing numbers of soft shell in the landed harvest. In 1985, a split season was implemented from May 1 through July 14, and November 1 through February 28, 1986. Management of the summer fishery focused on avoiding major male molts, which frequently start on the western grounds around Icy Bay and move eastward through the summer. The summer season was generally tailored to start after the major molt on the western grounds, and end before the major molt in the Yakutat Bay stocks. By 1986, it was evident that the May 1 opening was too early and

the season was shortened to start on May 15. For each season since, the summer segment of the season has started on May 15 and ended on July 14, and the winter segment has started on November 1 and ended on February 28. The timing of the winter segment was intended to provide a fishery for local residents fishing in Yakutat Bay. Emergency closures have been unnecessary since the 1987/88 season.

Size Restrictions

From 1924 to 1935, the legal size of male crabs was 6 ½" in greatest width of carapace. This changed in 1936 to 7" and remained unchanged until 1963, when the measurement was redefined as 6 ½" in width, measured immediately anterior to the tenth anterolateral spines. This was essentially the equivalent of a seven inch total shell width measurement but more consistent since damage to the tips of the tenth anterolateral spines is common, particularly in older shell crabs. This measurement standard has been in effect since then.

Gear Restrictions

In 1934, trawls were prohibited. Only pots or ring nets were allowed from 1954 to 1965. A gear limit of 300 pots or ring nets was implemented in 1963. In 1966, diving gear was legalized. The legal limit for pots and ring nets was raised to 600 pots in 1968. In 1995 the legal limit for pots was reduced to 400. This limit continues to the present. Two escape rings with a minimum inside diameter of 4 3/8" were first required in 1976. The intent of escape rings is to permit the escape of sublegal males and females, which are usually smaller than legal males. In 1977, a Dungeness pot was defined as a pot with tunnel eye openings which individually do not exceed 30" in perimeter. A biodegradable natural fiber breaking strap for the pot tiedown has been required since 1978. Originally specified for a maximum of 120 thread, it was reduced in 1990 to 30 thread, then increased in 1991 to 60 thread.

Other Regulations

Registration and hold inspections were required starting in 1974. In midsummer 1983, Yakutat was designated a superexclusive registration district and vessels registering to fish in Yakutat were prohibited from fishing in any other area in Alaska for the calendar year. The hold inspection requirement was rescinded in 1984, although registration was still required. In the same year, the area between Sitkagi Bluffs and Cape Yakataga, the western half of the Yakutat fishing district, was designated a non-exclusive area. The partial non-exclusive area was difficult to enforce and other problems led to redesignation of the entire Yakutat fishing district as a superexclusive registration area in 1985. In 1986, Yakutat was designated as Statistical Area D, distinct and separate from Southeast Alaska (Statistical Area A).

1995/96 SEASON SYNOPSIS

Forty-six vessels reported landings in the 1995/96 season. The 1995/96 fishery was divided into summer (May 15 - July 14) and winter (November 1 - February 28) segments, during which a total of 557,500 lb were landed (Table 9.1). This was well below the long-term average. Over 46 percent of the total season harvest was taken during the first two weeks of the season (Table 9.2). This was a clear indication that stock abundance was down and recruitment into the fishery was poor this season. Non-resident fishers landed a large proportion of the total tonnage. All fishery performance indicators were down this past season, including total harvest, harvest per vessel, and lb per landing. Fishing was so poor that some of the vessels left after the first few weeks to tender salmon, fish for halibut, or return to the Pacific Northwest.

1996/97 SEASON OUTLOOK

The department did not conduct any assessment surveys for this fishery. However, summer season harvest and harvest rates indicate that this will be one of the poorest seasons in at least ten years.

Table 9.1. Statistical Area D (Yakutat) Dungeness harvest, number of participating vessels, number of landings, and average harvest per landing, 1960 to present.

Year/ Season	Harvest in lb	Number of Permits	lb Per Permit	Number of Landings	lb Per Landing
1960	543,762	-			
1961	1,023,545	-			
1962	937,051	-			
1963	1,383,298	-			
1964	637,140	-			
1965	910,278	-			
1966	528,060	-			
1967	2,031,460	-			
1968	2,096,119	-			
1969/70	1,207,397	11	109,763	107	11,284
1970/71	1,508,561	10	150,856	83	18,175
1971/72	1,212,198	7	173,171	88	13,774
1972/73	1,992,574	9	221,397	85	23,442
1973/74	2,347,752	27	86,953	236	9,948
1974/75	1,031,573	22	46,889	154	6,698
1975/76	579,908	17	34,112	113	5,131
1976/77	537,543	7	76,791	28	19,197
1977/78	131,052	3	43,684	11	11,913
1978/79	1,799,403	12	149,950	122	14,749
1979/80	1,436,923	21	68,424	87	16,516
1980/81	895,220	10	89,522	63	14,209
1981/82	3,228,301	28	115,296	169	19,102
1982/83	5,160,135	35	147,432	305	16,918
1983/84	2,666,383	67	39,797	458	5,821
1984/85	774,828	39	19,867	228	3,398
1985/86	371,237	32	11,601	168	2,209
1986/87	755,912	22	34,359	111	6,810
1987/88	2,725,040	28	97,322	191	14,267
1988/89	3,494,368	32	109,199	220	15,883
1989/90	1,701,859	29	58,684	207	8,221
1990/91	2,101,676	36	58,379	320	6,567
1991/92	2,852,074	67	42,568	482	5,917
1992/93	1,392,700	49	28,422	257	5,419
1993/94	815,969	44	18,544	250	3,263
1994/95	915,523	47	19,479	240	3,814
1995/96 ^a	557,528	46	12,120	269	2,072

^a Most recent year's data should be considered preliminary.

Table 9.2. Statistical Area D (Yakutat) 1995/96 season: Dungeness crab harvest by month and district.

Dist.	1995							1996 ^a		Total	
	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan		Feb
181	247,259	189,018	23,476	Season ----- Closed			14,641				474,394
183	12,049	5,518	4,356	Season ----- Closed			19,932	7,427	2,104	*	51,386
191	*	*		Season ----- Closed				*			30,865
Total	259,308	194,536	27,832				34,573	7,427	2,104	*	556,645

^a Most recent year's data should be considered preliminary.

* Where number of permits is less than three, the information is considered confidential.

Section 10

YAKUTAT SHRIMP OTTER TRAWL FISHERY, 1995/96

REPORT TO THE BOARD OF FISHERIES
YAKUTAT SHRIMP OTTER TRAWL FISHERY, 1995/96



By

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INTRODUCTION

This report describes the commercial otter trawl fishery for shrimp in the Yakutat Area (Statistical Area D) and reviews the history of the fishery and development of management regulations. The report emphasizes the otter trawl fishery; although beam trawls are also legal gear, their reported use has been insignificant. Many otter trawlers that participated in the Yakutat shrimp fishery also utilized shrimp fisheries in other registration areas. In the Yakutat Area most of the otter trawl harvest has occurred in waters of Yakutat Bay and Icy Bay. Major processors and markets have been in Kodiak, Seward, Valdez, and Astoria, Oregon.

The most significant historic harvests targeted pink shrimp *Pandalus borealis*, with smaller quantities of sidestripe shrimp *Pandalopsis dispar*, also retained. Other species incidentally captured and landed in much smaller quantities are the coonstripe shrimp *Pandalus goniurus*, humpy shrimp *P. hypsinotus*, and the spot prawn *P. platycerous*. Pink shrimp are harvested in large volumes but with a relatively low exvessel value. Significant quantities of incidentally captured sidestripe shrimp are normally retained because of their relatively high economic value. The adoption of restrictive monthly guideline harvest levels has forced industry to target the more valuable sidestripe shrimp in lower volumes during recent seasons.

Otter trawls are double-bridled and fish best on smooth, level bottoms. They are dynamic trawls that rely on bridle and "otter board" arrangements to deploy, position, and maintain the opening dimensions of the net. Their design and size allows much greater fishing power than beam trawls, vessel characteristics being equal. Otter trawl vessels are generally large and modern, with large holding or processing capacities and they have high horsepower ratings for their size.

FISHERY DEVELOPMENT AND HISTORY

The first recorded shrimp otter trawl landing from the Yakutat area occurred in 1976 (Table 10.1). During the past 20 seasons, there have only been five seasons when harvests exceeded 100,000 lb and these all occurred between 1981 and 1987. Harvests are confidential for nine seasons when there were a limited number of boats and landings.

The highest harvest on record was in the 1980/81 season when a harvest exceeding 1,900,000 lb was reported by 16 vessels making 23 landings (Table 10.1). Most of this volume was harvested in Yakutat Bay during the fall (Table 10.2) by larger vessels which also participated in various shrimp fisheries around Kodiak Island and further westward. Fish ticket data indicate the harvest was comprised of only pink shrimp, but undoubtedly some sidestripe shrimp were also harvested. Pink shrimp were the predominate species harvested through the 1987/88 season. No harvest was reported from the 1988/89 and 1989/90 seasons.

There was a small resurgence in the fishery from the 1990/91 through the 1993/94 seasons. Effort and harvests during this period were light, primarily due to restrictive monthly harvest levels, limitation of trawl fisheries to Icy and Yakutat bays, closures of major portions of Yakutat Bay, and generally more conservative management. These harvests were almost evenly split between pink and sidestripe shrimp, but the target species was sidestripe shrimp due to their higher value and the restrictive monthly harvest levels. Fishing occurred within, or immediately adjacent to, these two bays and will be limited by regulation to the bay areas in the future (Table 10.3). There were no harvests reported for the 1994/95 and 1995/96 seasons.

The department conducted stock assessment surveys in Yakutat Bay from 1980 through 1984 (Table 10.4). The fall 1980 and spring 1981 surveys were conducted in cooperation with the National Marine Fisheries Service. All subsequent surveys occurred with department vessels, equipment, and personnel. During some years, both spring and fall surveys were completed. Survey results indicated population estimates ranging from 1,840,000 to 6,460,000 lb of all species of shrimp combined, and an average composition of 70% pink shrimp and 30% sidestripe shrimp. No surveys have been conducted since 1984. The department assumes that harvestable stocks of pink and sidestripe shrimp are present in Icy and Yakutat bays, but the current abundance of either of these species is unknown.

REGULATION DEVELOPMENT

Initially, the entire Yakutat Area (Statistical Area D, between Cape Suckling and Cape Fairweather) was open to trawling and there were no restrictions on season, harvest level, gear, or closed waters. After the intense 1980/81 season was closed by emergency order, regulations were developed in cooperation with the Yakutat Advisory Committee and brought before the Board. The resulting regulations were a mixture of biological needs expressed by the department and desires by the community of Yakutat to continue to utilize the local resources through commercial, personal use, and subsistence fisheries. By the 1982/83 season, a 30,000 lb monthly guideline harvest level, closed waters, and season opening and closing dates were implemented by regulation and emergency orders. In 1993, all waters except Icy Bay and specified areas in Yakutat Bay were closed to trawl fisheries, logbooks were made mandatory and all participating vessels had to be registered prior to fishing. Gear regulations were liberal.

Fishing Seasons

In 1981 a fishing season from June 21 through February 14, opened and closed by emergency order, was established for Yakutat Bay. The closed period was presumed to be the peak egg-hatch period, based on life history information from other fisheries around the Gulf of Alaska. The closure alleviated gear conflicts during the spring halibut openings. All other waters, including Icy Bay, remained open throughout the year. By 1993, the trawl shrimp fishery was restricted to Icy and Yakutat bays.

Guideline Harvest Levels

Initial guideline harvest levels were estimated using average abundance per unit surface area from population estimates previously conducted on other Gulf of Alaska shrimp stocks, a preliminary survey conducted in Yakutat Bay by the National Marine Fisheries Service in 1953, and applying a fishing morality of approximately 0.30.

During September 1980, the first population estimate using modern nets and the area swept method was conducted. Another survey was conducted during the spring of 1981 and this information was used to establish a guideline harvest level of 1.28 to 2.0 million lb for Yakutat Bay for the 1981/82 season. In 1982, the board amended the harvest level to 30,000 lb/month to prevent taking the entire GHM early in the season. This conservative monthly harvest level was also established to provide opportunities for local Yakutat residents to enter the commercial fishery.

Gear Restrictions

Legal trawl gear is still broadly defined as trawls, including beam and otter trawls, with no restriction to the maximum opening dimensions of the trawl mouths. During periods specified by emergency order when the fishery targets sidestripe shrimp, there are regulations defining the minimum mesh size that may be used to reduce the bycatch of other shrimp species. Incidental shrimp species retention was limited to 10 percent, by weight of target species.

Closed Waters

A considerable portion of Yakutat Bay, including protected waters in the vicinity of Yakutat and extending to Knight Island, and Russell and Nunatak Fjords are closed to commercial trawling. The commercial closure protects important subsistence fishing grounds and prevents conflict with growing commercial pot shrimp fisheries in these areas.

1995/96 SEASON SYNOPSIS

No shrimp were reported taken with trawl gear in the Yakutat Area during the past season.

1996/97 SEASON OUTLOOK

There has been little interest in this fishery during the past three seasons, but the markets for shrimp in general, and specifically sidestripes, are improving and this situation could change. If the market supports the operation of a harvester-processor or a floating processor, or if land based processing interest develops in the city of Yakutat, it may be difficult to effectively manage the fishery with existing regulations and programs. If the resurgence of the fishery targets sidestripe shrimp while discarding pink shrimp, accurate accounting for bycatch will be necessary. Trawlable grounds in Yakutat Bay are utilized by other important species which include Tanner crab, king crab, halibut, and scallops.

Stock assessment surveys have not been conducted since September 1984 (Table 10.4), and the current condition of shrimp stocks is unknown. Previous survey estimates and current regulations would support a seasonal harvest of up to 270,000 lb from Yakutat Bay. An additional 350,000 lb could be harvested from Icy Bay. Sustained harvests at these levels would require stock assessment surveys to verify seasonal abundance and new regulations to assure adequate monitoring and reporting of both the harvest of target species and incidental bycatch. It may be necessary to incorporate bycatch criteria into the management strategy for this fishery.

Table 10.1. Statistical Area D (Yakutat) shrimp trawl harvest, number of vessels, number of landings, pounds per vessel, and pounds per landing, 1976/77 to present.^a

Year/ Season	Harvest in lb	Number of Permits	Landings	lb per Permit	lb per Landing
1976/77	*	*	*	*	*
1977/78	0	0	0	0	0
1978/79	0	0	0	0	0
1979/80	*	*	*	*	*
1980/81 ^b	1,906,680	16	23	119,168	82,899
1981/82	*	*	*	*	*
1982/83	141,714	3	7	47,238	20,245
1983/84	426,649	5	10	85,330	42,665
1984/85	*	*	*	*	*
1985/86	*	*	*	*	*
1986/87	*	*	*	*	*
1987/88	40,448	3	6	13,483	6,741
1988/89	0	0	0	0	0
1989/90	0	0	0	0	0
1990/91	*	*	*	*	*
1991/92	*	*	*	*	*
1992/93	34,875	3	3	11,625	11,625
1993/94	*	*	*	*	*
1994/95	0	0	0	0	0
1995/96 ^c	0	0	0	0	0

^a Almost all landings of trawl shrimp have been made using otter trawl gear.

^b 1980/81 season includes 450,000 lb caught by otter trawl out of Yakutat Bay during the fishery (August 1980), but not reported on fish tickets.

^c Most recent year's data should be considered preliminary.

* Where number of permits is three or less, data is considered confidential.

Table 10.2. Statistical Area D (Yakutat) shrimp trawl harvests in thousands of pounds by month and season, 1976/77 to present. ^a

Season	Month												Total
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	
1976/77	0.0	*	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
1977/78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1978/79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1979/80	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*
1980/81 ^b	0.0	0.0	*	1,350.0	481.9	0.0	0.0	0.0	0.0	0.0	*	0.0	1,906.7
1981/82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	*
1982/83	*	*	*	*	*	0.0	0.0	0.0	*	0.0	0.0	0.0	141.7
1983/84	0.0	0.0	0.0	0.0	*	*	0.0	0.0	0.0	0.0	*	128.0	426.6
1984/85	0.0	*	0.0	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*
1985/86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	*
1986/87	0.0	0.0	0.0	0.0	0.0	0.0	*	*	0.0	*	*	0.0	*
1987/88	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	*	0.0	*	0.0	40.5
1988/89	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1989/90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1990/91	0.0	*	0.0	*	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*
1991/92	0.0	0.0	*	*	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	*
1992/93	0.0	0.0	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	34.9
1993/94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	*
1994/95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1995/96 ^c	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0

^a Almost all landings of trawl shrimp have been made using otter trawl gear.

^b 1980/81 season includes 450,000 lb caught by otter trawl out of Yakutat Bay during the fishery (August 1980), but not reported on fish tickets.

^c Most recent year's data should be considered preliminary.

* Where number of permits is three or less, data is considered confidential.

Table 10.3. Statistical Area D (Yakutat) shrimp trawl fishery harvest in thousands of pounds, by season and district, 1979/80 to present. ^a

Dist.	Year																			
	76/77	77/78	78/79	79/80	80/81 ^b	81/82	82/83	83/84	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94	94/95	95/96 ^c
81	*	0.0	0.0	0.0	556.8	0.0	*	310.4	*	*	*	40.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
83	0.0	0.0	0.0	*	1,349.9	*	*	*	*	0.0	0.0	0.0	0.0	0.0	*	*	*	*	*	0.0
89	*	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	*	0.0	0.0	0.0
91	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	*	0	0	*	1,906.7	*	141.7	426.6	*	*	*	40.5	0	0	*	*	34.9	*	0	0
Landings	*	0	0	*	23	*	7	10	*	*	*	6	0	0	*	*	3	*	0	0
Permits	*	0	0	*	16	*	3	5	*	*	*	3	0	0	*	*	3	*	0	0

^a Almost all landings of trawl shrimp have been made using otter trawl gear.

^b 1980/81 season includes 450,000 lb caught by otter trawl out of Yakutat Bay during the fishery (August 1980), but not reported on fish tickets.

^c Most recent year's data should be considered preliminary.

* Where number of permits is three or less, data is considered confidential.

Table 10.4. Summary of shrimp research cruises in Yakutat Bay, Alaska.

Begin Date	Vessel	Cruise Number	Gear	Strata	Tows	Shrimp per nm (lb)	Percent Pink Shrimp	Percent Sidestripe Shrimp	Area Surveyed (nm ²)	Point Estimate (lb x 10 ⁶)	Range of Point Estimate (lb x 10 ⁶)
3/53	John N. Cobb	COBB1 5	20' Beam		26	297.42 ^a			Unknown	Unknown	Unknown
9/80	Resolution	8008	32' NMFS ^b		9	680.56	91	8	50.01	6.46	4.73 to 8.19
3/81	John N. Cobb	JC81-01	32' NMFS		24	231.00	43	57	105.70	4.38	3.04 to 5.72
8/81	Pandalus		32' NMFS		22	196.27	72	27	50.01	1.86	1.13 to 2.60
9/82	Resolution		32' NMFS	2	14	141.53	47	53	50.01	1.43	1.05 to 1.64
9/82	Resolution		32' NMFS	3	5	206.00	65	35	12.89	0.50	0.30 to 2.13
9/84	Pandalus		32' NMFS	2	22	181.06	61	38	50.01	1.72	1.31 to 2.13
9/84	Pandalus		32' NMFS	3	3	230.33	93	7	12.89	0.56	0.24 to 0.89

^a Figure in lb of pandalids per trawl hour. Species composition unknown quantitatively. Report suggest preponderance of sidestripes.

^b NMFS gear is an otter trawl.

Section 11

YAKUTAT SHRIMP POT FISHERY, 1995/96

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INTRODUCTION

The fishery primarily targets spot prawns *Pandalus platycerous*, although significant quantities of coonstripe shrimp *P. goniurus* also are harvested. Life history information concerning these species is limited. Canadian reports suggest that the maximum age of the spot prawn is three to five years, while Alaskan tagging data suggests eight to ten years. All pandalid shrimp are protandric hermaphrodites, which means that they first mature and spawn as males, transition to females, and spawn as females for the remainder of their lives. Spot prawns are functional males for one to three seasons (in their fourth year), then change sex and spawn as females for four or more years. The fecundity of a large female spot prawn has been estimated at about 4,600 eggs per year. Literature reports that eggs hatch in late winter and early spring, followed by a growth molt for females. The transition from male to female occurs during the summer months. Females undergo another molt into "breeding dress" in the fall, after which they extrude their mature eggs from the internal ovaries. Eggs are fertilized externally when they are extruded. Developing embryos are carried on the external pleopods until they are fully developed. Hatching occurs during late spring through early summer.

Both spots and coonstripes are primarily harvested from rocky habitat located in Yakutat Bay by fishers using baited pot gear, which is either longlined or fished singly from vessels ranging in length from small skiffs up to about 40 feet. In a longline system each pot is attached to the groundline with a snap, similar to that used on longline snap-on groundfish gear. Pot construction is extremely varied in size, shape, weight and configuration, so it is difficult to describe a "standard" pot. The most common pot used during the initial stages of the fishery was a rectangular pot approximately 30" x 18" x 18" with a tunnel at either end. Gear designs have rapidly changed to increase fishing efficiency. One of the most commonly available pots today is a "cone style." This pot is constructed using two stainless steel rings, the top ring smaller than the bottom, with vertical bars welded between the rings forming six sides, at least three of which contain tunnels. This pot type has webbing tightly drawn in on the top with a permanent closure. The bottom web is drawn in with a "pucker string" which is opened during baiting operations and to empty the pot of its harvest.

FISHERY DEVELOPMENT AND HISTORY

The first reported landings occurred in the Yakutat Area during the 1969/70 fishing season. For the next ten seasons, landings occurred during only two seasons. Participation and landings have been fairly consistent since the 1982/83 fishing season, with a peak landing of 29,830 lb occurring during that season. The peak effort level of 15 permits occurred during the 1995/96 season when 12,714 lb were landed. Average landings have totaled 8,150 lb by seven vessels per season since 1982/83. Usually, only the tails are sold by the shrimper to private individuals, restaurants, or other specialty markets without passing through traditional processors. This is a low volume fishery with a relatively high exvessel value. The average price paid for tails has been about \$5.00 per lb during recent seasons.

Peak effort and harvests normally occur during May and June. However, activity in this fishery can be highly variable. For example, the peak harvest during the 1982/83 season occurred during the month of September.

REGULATION DEVELOPMENT

Management of the commercial pot shrimp fishery in the Yakutat Area is largely passive, focusing on Yakutat Bay. Regulations specific to Yakutat Bay are limited to a closed season to prevent fishing during the egg-hatch period, a minimum mesh size to retain the larger female segment of the stock, a maximum number of pots per participant to limit effort, and prohibition of trawling in productive areas heavily utilized by the pot fishery. Fish ticket data assists tracking major trends or changes in stock status. The Yakutat Area has had a separate section in the regulatory code since 1985.

A guideline harvest level (GHL) of 10,000 lb for the May through September period was established for Yakutat Bay in 1996, in response to increasing effort and higher harvest rates. The GHL was based on historical harvest data, and not on information describing stock abundance or stock condition.

Fishing Seasons

Prior to 1985, the Yakutat Area was open throughout the year. In 1985, a May 1 through February 28 season was established for Yakutat Bay. The closed period coincides with the major egg-hatch period, which is assumed to be similar to that of Southeast Alaska for the spot prawn. The remainder of the Yakutat Area outside the bay remains open throughout the year.

Size Restriction

The Alaska Board of Fisheries policy on small shrimp applies to the Yakutat Area pot shrimp fishery. Specific regulations concerning a minimum legal size have not been developed. Management assumes that passive sorting through minimum mesh webbing minimizes the retention of smaller male, transitional, and female prawns and coonstripe shrimp. It is likely that the minimum mesh size in Yakutat Bay is optimized for coonstripe shrimp because they comprise a significant portion of the commercial pot harvest. This risks unintended harvest of smaller spot prawns than are considered appropriate and is a source of some concern.

Gear Restriction

A mesh restriction specifying 1 1/2" stretch measure was established in 1986 for all pots used in Yakutat Bay to reduce the potential for recruitment over-fishing in this area. This regulation provides some protection to approximately one or two-year classes of small shrimp. However, current regulations are not totally effective, because only a portion of the pot is required to have the minimum mesh panels, and construction designs have changed. The maximum benefit of mesh restrictions will be realized only if the entire pot is covered with rigid minimum mesh.

A pot limit of 75 pots per vessel was established in 1985 for Yakutat Bay. Waters on the east side of Yakutat Bay are reserved for pot fishing only; no trawling is allowed in this area or in Russell and Nunatak Fjords. There are no pot limits, mesh restrictions, or other harvest-limiting gear regulations for other waters in the Yakutat Registration Area. Additional regulatory requirements for commercial shrimp pot gear include maximum tunnel perimeters (15"), buoy markings, and escape mechanisms.

Quotas and Guideline Harvest Levels

During the 1996/97 season, a GHL of 10,000 lb was set for Yakutat Bay, north and east of a line from Ocean Cape to Point Manby, for the period between May through September. The harvest level for the winter fishery from October 1 through February 28 was unrestricted because potential effort is less in winter than in summer. The GHL capped the harvest at a level commensurate with those historically reported for this fishery and provided some protection against possible local depletion. The summer GHL represents a higher harvest than the past ten-year seasonal average but is lower than the maximum historical harvests in the early 1980s. In the absence of definitive abundance estimates, the department will monitor the fish ticket record for indications of changes in the stock status of spot prawns and coonstripe shrimp in Yakutat Bay and periodically reassess the suitability of the current harvest levels.

1995/96 SEASON SYNOPSIS

A harvest of 12,714 lb was reported in 1995/96 by 15 permit holders making 104 landings (Table 11.1). Most of the harvest occurred during the months of May through August, although landings were also reported through the entire open season, except in September (Table 11.2). The major part of the harvest was reported taken in Yakutat Bay, District 83 (Tables 11.2). The harvest level, number of participants, and the number of landings were much higher than average and the highest since the record setting seasons in the early 1980s (Table 11.1). No dockside sampling or skipper interviews were conducted and no fish ticket size data are available to assist managers.

1996/97 SEASON OUTLOOK

Current effort levels are high, and rising, and given the limited and dated information of trawl surveys in the 1980s, it is difficult to determine resource status for Yakutat Bay. It is likely that a maximum sustainable yield has not yet been reached for the Yakutat Bay stocks of spot and coonstripe shrimp and the current GHL of 10,000 lb per season will constrain the harvest at a reasonably conservative level. The major unforeseeable factors are the intensity of the coming summer segment of the fishery and the length of the season.

Table 11.1. Statistical Area D (Yakutat) shrimp pot fishery harvest, number of landings, and CPUE, 1968/89 to present.

Season ^a	Harvest in lb	Number of Permits Fished	Number of Landings	lb Per Landing	lb Per Permit
1968/69	0	0	0		
1969/70	*	*	*		
1970/71	0	0	0		
1971/72	0	0	0		
1972/73	0	0	0		
1973/74	0	0	0		
1974/75	*	*	*		
1975/76	0	0	0		
1976/77	0	0	0		
1977/78	0	0	0		
1978/79	0	0	0		
1979/80	*	*	*		
1980/81	*	*	*		
1981/82	*	*	*		
1982/83	29,830	4	63	473	7,458
1983/84	13,938	8	33	422	1,742
1984/85	2,475	6	35	70	413
1985/86	6,910	5	33	209	1,382
1986/87	2,421	5	10	242	484
1987/88	2,945	8	45	65	368
1988/89	2,995	6	16	187	499
1989/90	7,148	5	72	99	1,430
1990/91	10,711	7	70	153	1,530
1991/92	7,316	12	78	93	610
1992/93	2,999	4	40	74	750
1993/94	5,916	6	55	107	986
1994/95	5,738	6	64	89	956
1995/96 ^b	12,714	15	103	123	848

^a Pot shrimp seasons are October through September.

^b Most recent year's data should be considered preliminary.

* Where number of vessels participating is less than three, information is confidential.

Table 11.2. Statistical Area D (Yakutat) shrimp pot harvests in lb by district and month, 1995/96.^a

Month	District	
	81	83
Oct.		424
Nov.		*
Dec.		*
Jan.		*
Feb.		*
Mar.		
Apr.		
May.		4,834
Jun.	*	3,221
Jul.		1,688
Aug.		*
Sep.		
Total	*	12,643

^a Most recent year's data should be considered preliminary.

* Where number of vessels participating is less than three, information is confidential.

Section 12

YAKUTAT SCALLOP FISHERIES, 1995

REPORT TO THE BOARD OF FISHERIES

YAKUTAT SCALLOP FISHERIES, 1995



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INTRODUCTION

Commercial dredging for the weathervane scallop (*Pactinopecten caurinus*) in the Yakutat (Statistical Area D) area in Region 1 occurs in open coastal waters between Cape Fairweather and Cape Suckling. Known offshore beds are extensive and overlap state and federal Exclusive Economic Zone (EEZ) waters. Harvestable populations also occur in Yakutat Bay, but scallop dredging in the bay is prohibited by regulation.

Most vessels working in this fishery are very seaworthy, in excess of 70 feet, and based in Kodiak, Seward, and ports in other states. The fleet is highly mobile. Most vessels fish New Bedford-type dredges, approximately 12 to 15 feet in width, with one set off each side of the vessel. These dredges have heavy, rectangular steel frames supporting a mesh bag made from heavy steel rings. Ideally, the dredge skims the bottom just deeply enough to flip scallops into the mesh bag without plowing into the substrate.

Scallop fishing, processing, and marketing operations are more vertically integrated than most other fisheries in Alaska. The same company that owns or operates the vessel also warehouses, transships, brokers, and sells the product to consumers.

The primary product is the major adductor muscle, with most processing, and freezing or icing, conducted aboard the harvester vessel on the fishing grounds. The current guideline harvest range (GHR) is zero to 250,000 lb. Landed product weight is reported in lb of frozen or iced meat, which comprises 6 to 11% of the live whole weight. The price during the past season was about \$5.75/lb. The Yakutat area often produces a sizable fraction of the total annual Alaskan harvest and the department has managed it since 1993 by emergency order, under guidelines in the Alaska Scallop Management Plan (ASMP).

FISHERY DEVELOPMENT AND HISTORY

The first reports of scallop harvests in the Yakutat area were in 1968. Since then, harvests have varied widely (Table 12.1). The roller coaster highs and lows in the harvest reflect a largely unregulated fishery, driven by economics and market forces, before adoption of the ASMP in 1993. Since scallops live for many years after reaching harvestable size and worldwide demand has generally outstripped supply, the recurring crashes in the historical harvest record were strong circumstantial evidence that exploitation rates during some years had been too high. There was little consideration for long-term reproductive viability. Combined with sporadic recruitment, heavy harvests did not leave enough scallops on the grounds to carry the fishery over poor years.

The earliest years of the fishery, 1968 and 1969, were very productive. Virgin biomass supported harvests of over 900,000 lb in 1968 (Yakutat Annual Report, 1968) and 800,000 lb in 1969, by up to 14 vessels (Table 12.1). These years were followed by two decades of reduced effort and harvests. A statewide trend in increasing interest and participation in scallop fisheries in the early 1990s culminated in a peak harvest of over one million lb in Area D in 1992.

Through 1992, this fishery was open all year. Management relied upon passive regulations, including the size of rings in the dredges to minimize retention of sexually immature scallops. Passive management was assumed to be adequate because both market demand and the limitations of hand-processing selected for larger scallops. Many of the smaller scallops taken by the dredges were shoveled over the side. When the number of large scallops in the hauls declined, a bed was left to recover. The chance of a bed being repeatedly dredged by different vessels during each season was low.

Starting in 1990, there were indications that strengthening global markets for scallops and failures of fisheries in other parts of the world would result in more vessels entering the fisheries throughout the state. Through 1992, the fishery followed projections and continued attracting more entrants and harvesting more scallops. The department was unwilling to repeat the past boom and bust conduct of the fishery and initiated development of the Alaska Scallop Management Plan in early 1992. A preliminary statewide plan was implemented by emergency order in mid-1993.

The fishery in Yakutat includes state waters in districts 181 and 191 and adjacent federal waters in the EEZ, but a jurisdictional loophole regarding fishing in the EEZ was inadvertently overlooked by state resource managers. In early 1995, a single vessel exploited reporting exemptions for vessels fishing only in the EEZ. It proceeded to take more than the maximum allowable harvest level for stocks in the Northeast Gulf of Alaska. The EEZ was closed by federal management authorities for nearly eighteen months until amendments to the Magnuson Act allowed joint state and federal management of the scallop resource.

After three seasons of emergency order management, proposals to adopt the management plan will be placed before the Board in 1997. If adopted by the Board, the ASMP will provide the regulatory basis for statewide scallop management.

REGULATION DEVELOPMENT

The weathervane scallop fishery evolved from a wide-open, almost unregulated fishery through the 1992 season into one of the most stringently controlled and managed fisheries in the state in little more than a single season. The speed of emergency order implementation of the statewide ASMP, the scope of regulations, and the stringent harvest conditions were unprecedented.

Fishing Seasons and Periods

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

Size Restrictions

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

Quotas and GHRs

A GHR of zero to 250,000 lb for Yakutat was established by the ASMP in 1993. The 250,000 lb ceiling was the long-term average annual harvest up to 1992. Until a longer time series of data is available for analysis, the fishery will probably be managed toward the upper end of the range, which is considered conservative.

Gear Restrictions

Scallops mature at approximately three inches, based on research conducted by department biologists from 1968 through 1972. Four inch minimum ring diameters for scallop dredges, permitting the escape of juvenile and smaller sexually mature scallops, was the primary passive management tool from 1969 through 1992, and continues to be used as a conservation measure to the present time. Since 1993, the width or horizontal front opening of scallop dredge gear has been limited to 15 feet and use of any chaffing gear or device that would tend to restrict the size of the rings has been prohibited.

To further discourage the entry of ever larger vessels into the fishery, regulations adopted as part of the ASMP in 1993 restricted the number of dredges that may be deployed at any time from a scallop vessel to two. Daily production per vessel was limited by restricting crew size to a total complement of 12, excluding the observer. Mechanical or automated shuckers were prohibited. With the exception of experimental dredges operating under stringent permit conditions, only dredges as defined and restricted by regulation are legal gear.

Other Regulations

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

Until 1993, scallop management never addressed harvest based on stock abundance. Other than gear restrictions, the fishery was unregulated. With development of the ASMP, management and conduct of the fishery changed drastically. In the space of a year, a management plan was in place and in addition to all the changes discussed above, vessel skippers had to maintain a fishing log, and third party observers were required on all vessels over 65 feet in total length to collect fisheries data and to radio encoded harvest information to fishery managers each day.

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

1995 SEASON SYNOPSIS

In 1995, the season started on January 10, with the intent of taking the entire allowable harvest of 250,000 lb in a single opening. The initial closure occurred on February 2, but it was subsequently determined that harvest was significantly short of the GHL of 250,000 lb. The season reopened on February 13 and closed after a 24-hour opening on February 14, 1995.

1996 SEASON OUTLOOK

Statewide, all scallop fisheries remained closed after the 1995 winter season until the next winter fishing period started on January 10, 1996 in state waters in the Yakutat and Prince William Sound registration areas. Federal waters in the EEZ remained closed through the winter of 1996. As a result, the total allowable harvest for Yakutat was set at 55,000 lb, a projection of past three-year average harvests from state waters in the Yakutat area. Adoption of a federal management plan in July allowed opening the EEZ to scallop dredging on August 1, 1996. The fishery was limited to the EEZ, state waters remained closed, and the GHR was set at 195,000 lb. The harvest was taken by three larger vessels, one of which broke down in midseason and discontinued fishing. The fishery closed at noon on September 4, 1996. Fisheries harvest information and biological data collected by observers is being entered into databases for future analysis.

The established GHL and current management oversight are probably sufficient to assure sustainable harvests in the Yakutat fishery. Consistent, world-wide demand for scallops should insure continued annual harvest of all allocated harvest from the Yakutat area.

Table 12.1. Statistical Area D (Yakutat) historic commercial harvest and effort for weathervane scallops.

Season	Harvest in Lb	Number of Permits	Number of Landings	Average Lb per Landing
1969	837,087	14	59	14,187
1970	*	*	*	*
1971	84,948	3	10	8,494
1972	128,241	4	6	21,373
1973	173,700	4	4	43,425
1974	*	*	*	*
1975	122,853	6	11	11,168
1976	189,543	6	15	12,636
1977	*	*	*	*
1979	*	*	*	*
1980	255,667	8	22	11,621
1981	455,858	12	36	12,663
1982	168,353	7	24	7,015
1984	74,010	3	15	4,934
1985	*	*	*	*
1986	98,513	3	19	5,255
1987	*	*	*	*
1988	*	*	*	*
1989	*	*	*	*
1990	442,070	9	48	9,209
1991	402,571	5	55	7,319
1992	1,020,968	8	67	15,238
1993	264,193	8	16	16,325
1994	253,060	11	18	14,059
1995	242,491	8	18	13,472
1996 ^a	238,736	3	15	15,916
Average ^b	229,230	5	21	10,822

* Asterisks indicate confidential information where fewer than three permits were fished.

^a Most recent year's data should be considered preliminary.

^b Averages are calculated only from years where landings were reported. Differences between confidential and non-confidential data are insignificant.