Fishery Management Report No. 14-47

2015 Annual Management Report for Southeast Alaska and Yakutat Shrimp Fisheries

by

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and

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December 2014

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Measures (fisheries)

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

Mathematics, statistics

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

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

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ABSTRACT

This report reviews the commercial fisheries for shrimp in the Southeast Alaska and Yakutat management areas (Region I), which includes Southeast Alaska (Registration Area A) and Yakutat (Registration Area D).

Shrimp harvests for the 2013/14 season in Region I totaled over 0.69 million pounds valued at over $2.0 million during the last completed season. Ninety-six percent of the value of the fisheries is from the Southeast pot shrimp fishery; the Southeast beam trawl fishery made up the majority of the remaining 4%. Yakutat trawl fisheries have had no recent effort while little effort has occurred in the pot shrimp fishery, with less than three permits fishing in the most recent season.

The Southeast pot shrimp fishery is fully developed, with an average of 181 permits landing 719,631 lb/year over the last 10 years. Over this time stocks have been declining, and guideline harvest levels (GHLs) have been adjusted in response to this decline. The Southeast beam trawl fishery has been unable to sustain consistent and significant harvests due to poor market conditions. Yakutat fisheries are harvested at very low levels, with the last harvest in the otter trawl fishery occurring in the 2004/05 season and the last non-confidential harvest occurring in the 1992/93 season. The Yakutat pot shrimp fishery has been harvested annually at a small level, with an average of 4 permits landing 2,100 lb/year.

The Southeast pot shrimp fishery has a developing stock assessment program but no abundance-based management plan. Beginning in 2010, survey and on-the-grounds sampling plans were revised to maximize available data, and in 2011, two new districts were added to the annual preseason pot shrimp survey. The Southeast beam trawl fishery is currently monitored by voluntary logbooks and dockside sampling; no sampling programs exist for the Yakutat fisheries.

Key words: spot shrimp, *Pandalus platyceros*, coonstripe shrimp, *Pandalus hypsinotus*, northern shrimp, *Pandalus borealis*, sidestripe shrimp, *Pandalopsis dispar*, Southeast Alaska, Yakutat, Fisheries management, Invertebrate fisheries, Shrimp, Harvest statistics.

CHAPTER 1: INTRODUCTION TO SOUTHEAST ALASKA/YAKUTAT SHRIMP FISHERIES

INTRODUCTION

This report reviews the commercial fisheries for Shrimp in Southeast Alaska and Yakutat (Region I, which includes Southeast Alaska [Registration Area A] and Yakutat [Registration 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 (Figure1.1). Area D encompasses state waters from Cape Fairweather to Cape Suckling, divided into Districts 81 through 91. Shrimp fisheries in these areas are entirely in state waters.

The Southeast pot shrimp fishery is fully developed, with an average of 181 permits landing 719,631 lb/year over the last 10 years. Over this time stocks have been declining, and guideline harvest levels (GHLs) have been adjusted accordingly. The Southeast beam trawl fishery has been unable to sustain consistent and significant harvests due to poor market conditions. Yakutat fisheries are harvested at very low levels, with the last harvest in the otter trawl fishery occurring in the 2004/05 season and the last non-confidential harvest occurring in the 1992/93 season. The Yakutat pot shrimp fishery has been prosecuted annually at a small level, with an average of 4 permit holders landing 2,100 lb/year.

Limited entry has played a significant role in harvest and effort trends. All Southeast Alaska shrimp fisheries are currently under limited entry. In contrast, all Yakutat shrimp fisheries remain open access.

Shrimp harvests in Region I totaled 693,000 pounds valued at over $2.0 million during the last completed season (Table 1.1). Ninety-six percent of the value of the fisheries is from the Southeast pot shrimp fishery; the Southeast beam trawl fishery made up the majority of the remaining 4%. Yakutat trawl fisheries have had no recent effort while little effort has occurred in the pot shrimp fishery.

SHRIMP RESEARCH AND MANAGEMENT

The ability of the Alaska Department of Fish and Game (department) to manage for sustained yields varies among the fisheries due to different levels of development of stock assessment programs and management plans. Shrimp fisheries lack developed management plans and stock assessment programs, and thus have a high risk of over-exploitation. The southeast shrimp pot fishery has a developing stock assessment program but no abundance-based management plan. Southeast beam trawl shrimp and the Yakutat shrimp fisheries have neither stock assessment programs nor management plans, making them the highest risk fisheries.

Stock assessment surveys currently conducted in Southeast Alaska include an annual shrimp pot survey in six districts. These surveys are all relatively recent, with the District 3 survey started in 1997, Districts 7 and 13 in 1999, District 12 in 2000, and Districts 1 and 2 in 2011. Short-term surveys that have been conducted in the past include a trawl survey to estimate stock abundance and size class composition of northern and sidestripe shrimp in Yakutat Bay, which was conducted on seven occasions, ending in 1984. A survey program to investigate the use of the Canadian spawner index management system began in 2012 and was cancelled after the 2013 survey due to budget cut backs.

On-the-grounds sampling is conducted for the Southeast pot shrimp fishery annually in 5 to 6 districts. The objectives of-on-the grounds sampling is to get detailed fishing location and effort

information, as well as data on size frequency and sex. The major target of on-the-grounds sampling is catcher processors, which cannot be sampled dockside.

Dockside sampling and skipper interviews are routinely conducted in Southeast Alaska for all shrimp fisheries. The objectives of dockside sampling are to gather data and information on size frequency, sex, fishing location, effort levels, and estimates of average catch per unit of effort (CPUE). These data provide the only biological information for shrimp beam trawl fisheries, which lack stock assessment surveys. However, for Yakutat shellfish fisheries even basic port sampling has not been systematically conducted. Harvest and effort data are also collected through the fish ticket system for both Yakutat and Southeast Alaska shellfish fisheries.

Onboard observers were placed sporadically on vessels in the beam trawl shrimp fishery beginning with the 2001/2002 season, but the program is no longer conducted.

Logbook information is collected voluntarily in the Southeast pot fishery, and is mandatory for the shrimp trawl fisheries in non-traditional areas as well as for the directed sidestripe shrimp trawl fisheries. This type of information is particularly valuable for management of the fisheries because it provides detailed catch and pot lift information.

TASK FORCE STATUS

The Southeast Alaska Pot Shrimp Task Force was formed by the Alaska Board of Fisheries (board) in 2003 and was charged with conducting an annual joint meeting with the department. The goals of this task force were to review pot shrimp stock status and exchange information and ideas to further improve fishery management. The b chose to dissolve the formal Task Force in 2012 in favor of an ad hoc organization.

STAFF

The Region I shrimp pot fishery is the only shellfish fishery managed individually by area offices within the region. These fisheries are managed by Area Management Biologists under the supervision of Dan Gray, Regional Management Coordinator, stationed in Sitka. All other marine fisheries research (i.e., non-salmon and herring) and management is under the supervision of Scott Kelley, Shellfish-Groundfish Coordinator, stationed in Douglas. All Region I shrimp stock assessment and research programs are conducted by the Regional Shrimp and Scallop Biologist Quinn Smith, stationed in Douglas. The regional stock biology staff conducts dockside sampling and skipper interviews with assistance from the shellfish and area management staff.

Shrimp Project Staff

Name	Title	Job Class	Location
Scott Kelley	Region I Shellfish-Groundfish Coordinator	Fish & Game Coordinator	Douglas
Dan Gray	Region I Fisheries Management Coordinator	Fish & Game Coordinator	Sitka
Quinn Smith	Region I Shrimp and Scallop Biologist	Fishery Biologist II	Douglas
Katie Palof	Shellfish and Dive Fisheries Biometrician	Biometrician II	Douglas

CHAPTER 1: TABLES AND FIGURES

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

Area Season	Fishery	Harvest (lbs)	Approximate exvessel Value
Southeast			
2013/2014	Pot shrimp	561,184	$2,127,071*
2013/2014	Beam trawl shrimp	131,724	$89,656*
	Subtotal	692,908	$2,216,727
Yakutat			
2013/2014	Pot shrimp	**	**
2004/2005	Otter trawl shrimp	**	**
	Subtotal	**	**

* Value estimate based on 2013 exvessel price data from Commercial Fisheries Entry Commission.

** Confidential data, fewer than three permits fished.

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

CHAPTER 2: SOUTHEAST BEAM TRAWL SHRIMP FISHERY

INTRODUCTION

LIFE HISTORY

The northern shrimp, *Pandalus borealis*, has a circumboreal distribution from Maine to Southeast Alaska, although its Atlantic cousin is thought to differ at the subspecies level (Squires 1992). It is a pelagiobenthic species, associated with soft bottoms, and exhibits diurnal vertical migrations to feed on plankton (Barr 1970, Rice et al. 1980) as well as seasonal migrations to shallow water for reproduction. Like most of its genera, this species is a protandric hermaphrodite, and most individuals begin life as males, transitioning to females after reproducing for one or two years (Berkeley 1930, Butler 1964). However, primary females occur at varying prevalence in all populations, and there is significant plasticity in the time of transition, which is related to growth rate. At higher growth rate, the species matures as a female at a smaller size; growth rate increases with increasing water temperature and food availability; this latter factor is affected by both food supply and population density (Koeller et al. 2003, Wieland 2004). Besides changes in the size at transition, water temperatures outside their narrow preference (3–6 ºC for *P. borealis*) can cause both delays in oviposition timing and reductions in the number of breeding females (Nunes 1984). Thus, increased water temperature can cause declines in recruitment.

COMMERCIAL FISHERY

The beam trawl fishery in Southeast Alaska has historically targeted primarily northern shrimp *Pandalus borealis* and secondarily larger sidestripe shrimp *Pandalopsis dispar*. In the current smaller fishery the preference has been reversed. Other species incidentally captured and landed in smaller quantities are the coonstripe shrimp *Pandalus hypsinotus,* humpy shrimp *P. goniurus*, and spot shrimp *P. platyceros*.

Productive beam trawl fishing has historically been limited to four major fishing areas in Southeast Alaska. These areas are District 8, portions of Districts 6 (Duncan Canal and Kah Sheets Bay), District 7 (Eastern Channel), and District 10 (Thomas and Farragut Bays), all located in the Petersburg–Wrangell Management Area (Figure 2.1). The concentration of the fishery in these areas has been due to the abundance of the resource, the presence of the major processors, and limited vessel capabilities. Most vessels are less than 60 ft in length, utilize small horsepower engines, do not have refrigerated holds, and have a crew of two or three. One vessel that had fished up until the 1999/2000 season had been participating since the inception of the fishery in 1915. Vessels have striven to provide a high quality product through daily deliveries. Most of the participants are residents of Petersburg or Wrangell.

When compared to the more common otter trawl, 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, rigid members control two important net dimensions: 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." Vessel length limits beam length. Most beam trawls are deployed with a single bridle and fish best on flat substrates. However, they can effectively fish some gradual side slopes and irregular bottoms. When not deployed, the beam trawl is stored on the vessel bulwarks, somewhat compromising the sea-keeping capabilities of the vessel.

Management is based on a closed season from March 1 through April 30, which is designed to prevent fishing on major stocks during the egg-hatch period;, GHLs, which are determined by historic harvests; and three fishing periods in the three major fishing areas, plus a fourth fishing period in the Stikine Flats area only. The fishing periods were based upon industry input and are designed to spread out the harvest and processing requirements. Multiple fishing periods also 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. Floating canneries also located in Thomas Bay processed this harvest. 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 (Registration 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 pounds through the 1970s. Cook Inlet and Westward harvests declined after that period and closed prior to the 1982/83 season, and the Southeast Alaska beam trawl shrimp fishery was 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 pounds, with an average of 3,600,000 pounds per year (Table 2.1). The number of vessels participating ranged from 10 to 22. The peak production year was 1958 when 14 vessels caught over 7,600,000 pounds. During the late 1960s and early 1970s, harvest and effort declined. Seasonal harvests averaged 916,300 pounds and effort averaged 12 vessels during the 1970s. Through the 1980s, the harvest and effort increased to an average of 1,409,500 pounds by an average of 19 vessels. During the 1990s the harvest has averaged 2,674,500 pounds by an average of 34 permit holders. Some of the participants that were involved in the fishery between 1992 and 1997 were speculating on qualification into the limited entry program. Relatively few of the maximum of 51 vessels contributed substantially to the harvest or were dependent upon the fishery for a major portion of their fishing income. The effects of the limited entry program are evident in the 1998/1999 fishery when only 24 permit holders participated. Fisheries conducted during the 2000/2001 through 2002/2003 seasons averaged 990,000 pounds delivered by an average of 14 active participants worth on average about $280,000 annually. Effort and participation in the fishery continued to decline after the 2002/03 season, mostly due to low prices per pound as a result of large harvests of slightly larger northern shrimp from the Eastern seaboard and the western coast of North America. Regionwide harvest dropped off precipitously in the 2006/2007 season when the main buyer of northern shrimp in Petersburg stopped buying shrimp after an eighty-year history in the fishery (Table 2.1). Since the 2006/2007 season, harvests have largely been marketed to small buyers and through dockside sales.

During the 1970s, harvest opportunities occurred in all major fishing areas throughout the year (Table 2.2). As substantial and consistent increases in effort began in 1980, GHLs 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. Typically, the months of May, July, and September received high effort, with each month providing harvests exceeding 500,000 pounds (Table 2.2). Seasonal harvests for the region approached 1,000,000 pounds prior to 1980. In the 1980s, harvests

increased and averaged 1,400,000 pounds. Harvest and effort in the fishery increased again and averaged about 2,700,000 pounds during the 1990s. Harvests have declined to an average of 560,000 pounds during the first decade of the 21st century.

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 occurred 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 1969/1970 through the 1978/1979 fishing seasons, District 6 harvests averaged almost 600,000 pounds per season while District 8 harvests averaged less than 250,000 pounds per season (Table 2.3). During this ten-season period, harvests from District 8 exceeded harvests from District 6 only once. Regulatory GHLs were increased in 1978. In the following decade through the 1988/1989 season, average shrimp harvests from Duncan Canal were nearly 900,000 pounds, more than double that of the Stikine Flats area (Table 2.4). Three fishing periods were established in regulation in 1989 for the four major fishing areas. During the 1990s, the pattern of high harvests in District 6 relative to District 8 continued, with District 6 averaging 1,200,000 pounds per year and District 8 averaging 800,000 pounds (Table 2.5). As price per pound and processing capacity declined in the 21st century, fewer permit holders have found this fishery to be worth the effort, thus harvest and participation from all areas has declined. Since the 1999/2000 season, harvest has largely been dominated by effort in Districts 6 and 8, with very little harvest coming from the non-traditional areas (Table 2.6). The main buyer of northern shrimp in Petersburg stopped buying in shrimp June of 2005 after an eighty-year history in the fishery. Since then the few permit holders left participating in the fishery have largely targeted sidestripe shrimp in District 8 for smaller markets and dockside sales.

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 first 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 beam trawl fisheries occur primarily in the vicinity of Petersburg and Wrangell. Until recently, most other areas were not significantly constrained by restrictive fishing seasons, fishing periods, or guideline harvest ranges (GHRs).

FISHING SEASONS AND PERIODS

Traditional Northern Shrimp Fisheries

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 28. 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. A fourth

fishing period, December 1 through February 14, was added for Stikine Flats of District 8 only, in 1997. These regulatory periods were established for several reasons: to protect shrimp during the critical egg hatch period, to lengthen the total fishing season in these districts by spreading harvest over a longer period of time, to reduce effort during recruitment and growth periods in the spring and summer months, and to increase overall harvest in District 8.

Non-Traditional Northern Shrimp Fisheries

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 catcher-processor vessels using otter trawl gear requested permits to fish for shrimp in the region, leading to requests to the commissioner to close shrimp fisheries in outside waters. The department began to close some of the areas where these vessels were fishing to prevent bycatch of other commercial important species, primarily rockfish. Initial closures were made by either emergency regulation or emergency order (EO). The issue was brought before the Alaska Board of Fisheries (board) and resulted in the closure of Districts 1, 2, 4, and 12 through 16, which had low and sporadic historical effort and harvests.

At the request of industry in 1997, regulations were developed by the board to provide additional fishing time during the egg-hatch period in most of the non-traditional areas if their respective GHLs have not been achieved during the normal fishing time of May through mid-February (Table 2.2). Justification for the change was that these areas required more exploration, time, and expense than the traditional fishing areas, the months of March and April were generally free of commercial and personal use shrimp and crab pots, and weather was improved over the sometimes harsh winter conditions. The additional fishing time period, opened by EO only, was from February 15 through April 30. Logbooks were required. This exploratory fishery during the egg hatch period was eliminated in 2003 to provide greater consistency with the shrimp pot fishery and because there was limited effort during the exploratory fishery.

Directed Sidestripe Shrimp Fisheries

In 1997, regulations were adopted to provide for directed sidestripe shrimp fisheries by beam trawl only during fishing seasons, as well as during periods and in areas established by the commissioner by EO. Additional conditions included limiting the vessel from participating at the same time in a directed northern shrimp fishery, a larger minimum mesh size, and mandatory logbook completion. According to regulation, incidental shrimp species harvest could be greater than 10 percent of the total catch, and fishermen must notify the department 2 hours before landing to allow for biological sampling of the harvest. If necessary, the commissioner could require an onboard observer during fishing operations. The department evaluated opening a directed sidestripe shrimp fishery on a case-by-case basis. Since the sidestripe shrimp component of the Gulf of Alaska and Southcentral Alaska stocks seemed to be the most susceptible to overharvest and stock collapse, these measures were required in Southeast to collect the necessary information needed to manage sidestripe shrimp harvest conservatively. To date, fishing opportunities have been provided during eight fishing periods in District 8 since the 1997/98 season, during one fishing period in District 6 during the 1997/1998 season, and once in Section 11-B during the 2001/2002 season. Only once during these openings has the upper end of the GHR (50,000 pounds) been reached, requiring an emergency closure prior to the regulatory closure date. Since 2002, sidestripe shrimp have only been harvested during the

traditional beam trawl season, and there have been no directed sidestripe fisheries as described in regulation.

Size Restrictions

As early as 1941, regulations specified that not more that 50 percent of the shrimp harvested could be less than three inches total length. These regulations were altered to no more than 25 percent in 1942, and in 1948 the size was changed to less than 2.5 inches total length. By 1952 there were no size regulations, and the size of shrimp landed was only controlled by industry through price.

By 1979 the board 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 segregated schools of small shrimp. Management measures are to optimize the harvest of larger female northern shrimp while minimizing retention of male, transitional, and smaller female shrimp.

In 1997, new regulations in Southeast Alaska defined the minimum average size of shrimp that could be sold. Shrimp taken by beam trawl gear had to be at least 150 count per pound. To determine the average count per pound, one sample of at least one pound of unbroken shrimp must be taken from each 500 to 1,000 pounds of shrimp, up to a maximum of 20 samples.

QUOTAS AND GUIDELINE HARVEST RANGES

Traditional Northern Shrimp Fisheries

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 potential adjustment based on stock conditions. Strict quotas were difficult to monitor and regulate. In 1978, quotas were replaced by GHRs that provided more flexibility for inseason management, which was 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 District 8 and a portion of District 6, the seasonal GHR was achieved 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. GHRs for each of the three fishing periods were as follows: a portion of District 6 from 80,000 to 400,000 pounds; a portion of District 7 from 15,000 to 50,000 pounds; a portion of District 10 from 5,000 to 75,000 pounds; and all of District 8 from 25,000 to 175,000 pounds. In 1997, with the addition of a fourth fishing period in District 8 and an increase in the upper GHR from 175,000 to 250,000 pounds, the seasonal harvest potential increased by half a million pounds, increasing the total allowed season harvest to 1.2 million pounds, more than double the previous GHR.

Non-Traditional Northern Shrimp Fisheries

In 1994, seasonal GHRs of 0 to 100,000 pounds were established for Districts 3, 5, 9, and 11 and remaining portions of Districts 6, 7, and 10. In 1997, at the request of industry, the total District 11 GHR was increased and is now more than triple the 1994 GHR. Seasonal GHRs were

established by section: from 25,000 to 75,000 pounds in 11-A, 11-B, and 11-C ; and from 50,000 to 150,000 pounds in 11-D.

Directed Sidestripe Shrimp Fisheries

With the implementation of the directed sidestripe shrimp fishery in 1997, a limit of 50,000 pounds of shrimp may be taken from any district or section during a season, during that fishery. Participants cannot concurrently participate in a northern shrimp fishery, must use a large mesh net, and must complete logbooks.

Spot and Coonstripe Shrimp Bycatch Limits

In 2003 the board addressed a series of proposals regarding spot and coonstripe bycatch in the beam trawl fishery. The board adopted the current spot and coonstripe shrimp beam trawl trip and seasonal bycatch limits at this meeting. Those limits were based on historic harvest of these species in the beam trawl fishery.

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. In 1997 the minimum mesh size was increased. The current regulatory mesh size is approximately 1.35-inches stretched measure. Due to the relatively low market value of small northern shrimp, many fishermen are currently using mesh size between 1.38-inch and 1.50-inch stretched measure to reduce their harvest of small northern shrimp.

Under the regulations provided in the directed sidestripe shrimp fishery that was adopted in 1997, shrimp trawl webbing must be a least 1 7/8-inch stretched measure, or no more than 13 meshes per foot, and the head rope may not be longer than the length of the beam plus 10 percent. Trawl web used during the directed sidestripe shrimp fishery was initially required, after the 1997 board meetings, to be square hung at the beam selvage (where the mesh is connected to the breastlines of the trawl), the intent being to allow the development of the directed sidestripe shrimp fishery while minimizing the impact on other smaller shrimp species. The regulation further provided that no more than 10% of the total pandalid shrimp harvest could be comprised of other species of shrimp. However, during the 2000 board meeting this regulation was eliminated, allowing diamond hung meshes to be used for the directed sidestripe shrimp fishery. It is not known what effect this change in net construction has on the retention of small shrimp. A minimum mesh size of 2-inch stretched measure may be advisable as a precaution against retention of small shrimp in this fishery.

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 board and in 1985 the National Park Service prohibited trawling in waters of Glacier Bay. Beginning in mid-1986, trawling was prohibited in the waters of Tenakee Inlet (in District 12). The board eliminated otter trawls as a legal gear type in Southeast Alaska, effective May 8, 1998. In 2006 the board clarified that having a spare net onboard a beam trawl vessel is permissible as long as only a single net is fished at any time.

LIMITED ENTRY

The Commercial Fisheries Entry Commission (CFEC), in response to petitions received from beam trawl permit holders during 1995 and 1996, established January 1, 1997, as the qualification date for limited entry, with the four years immediately preceding being the qualification period. Therefore, to be eligible to apply for an entry permit, an individual would have had to be a permit holder during at least one of the years during the qualification period of January 1, 1993, through December 31, 1996. To date 32 permanent permits have been issued. Of the permanent permits issued, 7 of these have been cancelled, leaving 25 permits active in the fishery (CFEC 2014a).

OTHER REGULATORY CHANGES

At the 2006 board meeting a new regulation preventing simultaneous registration for the beam trawl and pot shrimp fisheries was adopted. New reporting requirements were issued for catcher processors at the 2009 board meeting.

MANAGEMENT CONCERNS

Effort has decreased from 23 permits fished in the 1999/2000 season to 5 permits fished during the 2013/2014 season. This decrease has been due in part to low prices at the cannery, a reduction in processing capabilities, and the need to use existing facilities to process product from other fisheries. A portion of this decrease is undoubtedly because the limited entry permit qualification period is over. Also, the main buyer of northern shrimp in Petersburg stopped their shrimp operation in June of 2005. Currently, participation in the fishery is very low, with a handful of permit holders targeting sidestripe shrimp for smaller markets and dockside sales. With the implementation of the limited entry program, permits have been and will continue to be purchased by permit holders desiring diversification. If markets improve, this fishery may see higher effort levels in the future, more efficient and species-specific gear, and eventual development of non-traditional product forms, such as value-added frozen-at-sea shrimp, to garner a higher price from a currently undervalued resource. 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.

A preseason review of each season's fish tickets allows for some harvest trend description. Other components of the current management system include inseason harvest monitoring, which allows the manager to estimate the initial level of harvest and to make informed decisions about timing of closures relative to the GHLs established for the different areas. In addition, the manager tracks harvest of spot and coonstripe shrimp bycatch as it relates to the trip and seasonal limits in regulation. Summary of fish ticket totals document the actual reported harvest levels. While this report does not discuss the department's onboard and dockside sampling, these programs are proving useful in determining stock structure and pre-recruit status as well as actual species composition of the harvest. Developing programs, such as the logbook program required for the non-traditional areas and the beam trawl observer trips, will allow the department to assess the harvest levels and collect biological information from area fisheries.

Not unlike the management of the pot shrimp fisheries, beam trawl harvest levels are set based on average historical harvest levels, not population estimates. While this fishery has sustained itself for almost 80 years, the size composition of the harvest appears to be changing. The move

towards use of larger mesh sizes appears to be focusing more effort on the larger species and larger individual shrimp. 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. Additional regulations to separate traditional northern shrimp and sidestripe fisheries may be necessary to assure adequately conservative management for sidestripe populations.

STOCK ASSESSMENT

The beam trawl fishery stock assessment program in Southeast Alaska is still in its infancy. Although dockside sampling, collecting, and sexing of shrimp samples has been conducted since 1986, and sporadic sampling by onboard observers was conducted in 2002, to date no fishery-independent survey program has been developed. Furthermore, the decline in the market and resulting loss of peeling capacity in Petersburg beginning in 2005 all but shut down commercial beam trawl production of northern pink shrimp and eliminated dockside sampling. With the increase in harvest for the 2010/2011 season, a small dockside sampling program was resumed, and continues. More information is needed on northern and sidestripe shrimp stock size and life history in Southeast Alaska. Information is also needed on the effects of mesh size and gear configuration on catch size and species composition, what constitutes a sustainable harvest strategy, and bycatch and discard levels.

RECENT SEASONS

TRADITIONAL NORTHERN SHRIMP FISHERIES

Harvest and Effort by Area

Reported harvest from fish tickets and port-sampling data provide the information summarized for the traditional beam trawl fishing areas of Duncan Canal (District 6), Eastern Channel (District 7), the Stikine Flats (District 8) and Thomas and Farragut Bays (eastern District 10). Of these areas only Duncan Canal and the Stikine Flats have been fished in recent seasons. Most of the effort over the past three seasons has occurred in District 8 (Table 2.6) where sidestripe shrimp are more prevalent.

Since the 1997/1998 season, total harvest and number of permits fished have steadily declined (Table 2.1). Declines in total harvest and effort were due to low prices for northern shrimp, a lack of processing priority for northern shrimp, and fewer active participants in the fishery. Harvest was composed primarily of northern shrimp, though smaller numbers of small sidestripe shrimp and humpy shrimp were also harvested and sold as northern shrimp. The northern shrimp harvested in Southeast Alaska compete in the marketplace with large harvests of north Atlantic northern shrimp (thought by some to be a different species), and smooth pink shrimp from British Columbia and Oregon. This competition from other northern shrimp fisheries in the Pacific Northwest and north Atlantic led to the collapse of the Southeast northern shrimp fishery in 2005 (the 2005/2006 season) when the main buyer in Petersburg shut down its peelers after an 80-year history in the fishery. The last commercial quantities of northern shrimp were purchased in Wrangell in the spring of 2006 (the 2006/2007 season). The 2008/2009 and 2009/2010 seasons had continued low effort (Table 2.1), with a handful of registrants targeting the larger sidestripe shrimp for smaller markets and dockside sales. A slight increase in harvest has occurred during the last four seasons as permit holders explore new market opportunities.

Species Composition

The composition of harvest for Districts 6, 7, 8 and 10 has varied over the past 11 seasons. Duncan Canal has primarily supported a northern shrimp fishery, which made up over 99% of the species harvested in the last 10 seasons. Sidestripe, and to a lesser extent coonstripe and spot shrimp, have generally occurred in an increasing proportion of the harvest since 1991 from the Stikine Flats. Harvest by species for Stikine Flats averaged 93% for northern shrimp, slightly less than 7% for sidestripe shrimp, and less than 1% for coonstripe and spot shrimp for the 1991/1992 through 1996/1997 seasons. Proportional harvest by species for the period from 1997 to 2002 has averaged 85% for northern shrimp, 14% for sidestripe shrimp, and less than 1% for coonstripe and spot shrimp. In 2003/2004 season, coonstripe and spot shrimp bycatch limits went into effect in the beam trawl fishery. From the 2003/2004 through the 2007/2008 seasons combined, pink shrimp have comprised 82% of the harvest, sidestripe shrimp have comprised 15% of the harvest, coonstripe shrimp have comprised 2% of the harvest, and spot shrimp have comprised 1% of the harvest in the traditional beam trawl areas. From the 2008/2009 through the 2013/14 seasons combined, sidestripe shrimp have comprised 56% of the harvest, pink shrimp have comprised 41% of the harvest, and spot shrimp have comprised 3% of the harvest in the traditional beam trawl areas.

NON-TRADITIONAL NORTHERN SHRIMP FISHERIES

Beam trawl fishing has occurred at low and sporadic levels outside the Petersburg-Wrangell area since at least the 1969/1970 season, with the exception of Blake Channel which had significant harvests in the 1970s, 1980s and early 1990s (Tables 2.3, 2.4 and 2.5). These non-traditional beam trawl fishing areas include District 3, District 5, South Zarembo and Sumner Strait (a portion of District 6), Blake Channel (a portion of District 7), District 9, Upper Frederick Sound (a portion of western District 10), and District 11. These districts and portions of districts are managed with a single fishing season and generic GHLs not to exceed 150,000 pounds. During the past three seasons, the only non-traditional area fished was District 11 in 2010/11 (Table 2.6). Harvest and effort data are confidential since fewer than three permits were fished District 11 in the 2008/2009, 2009/2010, and 2010/2011 seasons.

DIRECTED SIDESTRIPE SHRIMP FISHERIES

Over the last three seasons, the beam trawl fishery in Southeast Alaska has continued to transition into a fishery in which a larger percentage of the permit holders target larger sidestripe shrimp rather than northern shrimp. As sidestripe shrimp are fully utilized in the current beam trawl fishery, the department has not approved any requests for directed sidestripe shrimp fisheries in the last three seasons. The last directed sidestripe shrimp fishery occurred in District 8 in June of the 2002/2003 season.

CHAPTER 2: TABLES AND FIGURES

Table 2.1.–Registration Area A (Southeast Alaska) shrimp beam trawl harvest, number of permits, number of landings, pounds per permit, and pounds per landing, 1955 to present.

Year/ Season	Harvest in pounds	Number of permits	Landings	Pounds per permit	Pounds per landing
1955	1,777,122	15	H	118,475	H
1956	3,301,598	15	H	220,107	H
1957	2,350,499	10	H	235,045	H
1958	7,605,871	14	H	543,277	H
1959	5,518,843	22	H	250,857	H
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

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Table 2.1.–Page 2 of 2.

Year/ Season	Harvest in pounds	Number of permits	Landings	Pounds per permit	Pounds per landing
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	2,375,742	41	922	57,945	2,576
1993/94	2,135,500	25	705	85,420	3,029
1994/95	3,223,791	25	814	128,952	3,960
1995/96	3,053,316	48	793	63,611	3,850
1996/97	2,536,985	51	884	49,745	2,869
1997/98	3,051,197	42	983	72,648	3,103
1998/99	2,264,641	24	834	94,360	2,715
1999/00	1,893,815	23	566	82,340	3,346
2000/01	1,413,264	16	543	88,329	2,603
2001/02	903,897	19	358	47,574	2,525
2002/03	1,096,235	13	423	84,326	2,592
2003/04	740,387	10	216	74,039	3,428
2004/05	986,451	8	232	123,306	4,252
2005/06	621,047	8	173	77,631	3,590
2006/07	133,869	7	50	19,124	2,677
2007/08	43,290	5	24	8,658	1,803
2008/09	88,641	6	64	14.774	1,385
2009/10	60,549	4	72	15,137	841
2010/11	132,385	5	114	26,477	1,161
2011/12	388,266	8	204	48,533	1,903
2012/13	234,491	7	110	33,499	2,132
2013/14	131,724	5	110	26,345	1,197

H Historical data was not collected or is not available

Table 2.2.–Registration Area A (Southeast Alaska) shrimp beam trawl harvest in thousands of pounds by month and season, 1969/70 to present.

Season	Month												
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
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	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	29.8	*	8.4	*	*	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	114.8	17.1	6.4	15.6	2,934.3

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Table 2.2.–Page 2 of 2.

Season	Month												
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
1992/93	469.3	253.7	404.4	295.7	194.5	186.4	136.8	112.4	131.8	65.5	58.3	67.0	2,375.7
1993/94	548.0	215.4	372.0	239.2	121.3	86.9	104.5	100.3	147.4	85.7	112.1	*	2,135.5
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	686.6	338.2	522.3	344.7	515.0	66.7	137.8	55.8	62.7	157.9	104.1	61.3	3,053.3
1996/97	782.8	262.2	609.0	162.8	510.3	100.3	73.3	7.6	*	1.4	*	*	2,537.0
1997/98	727.8	237.8	637.6	183.9	677.6	142.2	129.0	261.0	*	41.6	*	0.0	3,051.2
1998/99	524.8	260.8	501.3	317.7	348.7	138.8	102.6	3.4	22.3	15.5	*	*	2,264.6
1999/00	581.9	231.4	385.4	313.2	224.9	64.4	29.3	6.9	3.5	47.1	1.6	4.2	1,893.8
2000/01	486.3	172.6	219.6	185.8	92.0	78.5	118.7	*	25.4	25.9	*	*	1,413.3
2001/02	363.0	149.3	11.3	41.0	97.9	*	93.1	17.9	42.6	9.0	*	0.0	903.9
2002/03	314.4	138.7	*	90.7	147.5	*	129.3	18.4	38.9	110.9	*	0.0	1,096.2
2003/04	336.0	53.1	19.9	15.8	*	136.1	104.1	19.1	24.5	27.4	0.0	0.0	740.4
2004/05	480.0	195.5	*	*	*	76.8	126.0	5.7	12.1	10.8	0.0	0.0	986.5
2005/06	461.8	114.8	11.3	*	5.8	0.0	0.0	4.1	7.5	13.7	0.0	0.0	621.1
2006/07	84.4	23.0	0.0	0.0	*	0.0	0.0	1.6	3.0	21.2	0.0	0.0	133.9
2007/08	*	*	*	0.0	*	*	*	*	*	*	0.0	0.0	43.3
2008/09	*	*	*	*	*	*	5.0	3.9	5.7	25.3	0.0	0.0	88.6
2009/10	11.9	*	*	*	1.8	*	*	*	*	20.3	0.0	0.0	60.5
2010/11	20.3	*	11.2	*	0.0	*	*	*	31.8	47.8	0.0	0.0	132.4
2011/12	249.9	66.8	*	*	*	*	*	*	5.1	28.0	0.0	0.0	388.2
2012/13	177.5	*	*	*	*	*	*	*	*	15.8	0.0	0.0	234.5
2013/14	10.8	*	*	0.0	*	*	*	*	6.8	77.0	0.0	0.0	131.7

* Fewer than 3 permits were fished; information is confidential

Table 2.3–Registration Area A shrimp beam trawl fishery harvest in thousands of pounds by season and district, 1969/70 through 1979/80.

District	Season										
	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80
1	0	*	*	0	*	*	*	1.6	0	*	*
2	0	0	0	0	0	1.3	0.1	0	0	0	1.5
3	0	*	*	*	0	0	*	*	0	0	*
4	0	0	0	0	0	0	0	0	0	0	0.0
5	*	0	0	0	0	0	*	0	0	0	*
6: Duncan	865.5	344.4	442.4	450.3	260	973.2	554.2	610.2	669.7	625	427.4
6: Sumner	0	0	0	*	0	0	257.6	10.7	*	*	0.0
7: Eastern	0	0	0	0	0	0	0	0	0	0	0.0
7: Blake	0	38.1	67	35.7	48.7	10.4	14.6	29.2	40.3	140.1	109.8
8: Stikine	609.7	158.5	285.7	219.6	323.4	212.4	84.5	85.5	176.0	261.9	405.7
9	*	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	2.8
10: Up. Fred	0	*	0	0	0	0	0	0	0	0	*
11	*	0	0	0	0	*	*	*	*	*	0.0
12	0	0	0	0	0	0	0	0	0	0	0.0
13	0	0	0	0	0	0	0	0	0	0	*
14	0	0	0	0	0	0	0	0	0	0	0.0
15	0	0	0	0	0	*	0	0	0	0	*
16	0	0	0	0	0	0	0	0	0	0	0.0
Total	1,840.7	742.4	1051.0	797.4	674.4	1,205.6	983.6	768.9	949.0	1,033.3	957.2
Landings	952	477	592	421	460	434	450	476	404	519	982
Permits	11	11	9	9	8	20	12	14	10	9	17

* Fewer than three permits fished; information is confidential.

Table 2.4–Registration Area A shrimp beam trawl fishery harvest in thousands of pounds by season and district, 1980/81 through 1990/91 seasons.

District	Season										
	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91
1	*	*	*	*	*	*	*	0.0	*	*	*
2	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	80.1
4	0.0	0.0	0.0	0.3	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	0.0	0.0
6: Duncan	415.0	693.8	1199.6	1,015.4	523.9	235.7	1,645.3	1,225.7	1,043.0	1,006.9	1,565.5
6: Sumner	*	*	0.0	0.0	17.7	*	*	*	*	0.0	*
7: Eastern	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	*	17.5	55.5
7: Blake	77.9	31.5	11.8	138.6	101.3	30.6	100.6	75.8	15.9	70.8	40.5
8: Stikine	342.5	88.6	51.0	545.0	610.8	160.9	432.4	436.3	590.0	676.7	652.0
9	*	0.0	*	*	0.0	0.0	0.0	0.0	0.0	0.0	*
10: Thomas	0.0	0.0	*	26.3	33.8	*	*	*	*	*	*
10: Up. Fred	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	*	*	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	*
12	0.0	0.3	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	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0
15	*	*	*	2.0	*	*	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	0.0
Total	843.8	919.6	1,397.5	1,756.8	1,298.3	435.2	2,205.6	1,764.1	1,678.5	1,813.0	2,495.0
Landings	920	524	455	667	812	252	435	388	528	645	793
Permits	21	15	15	18	23	16	16	25	18	21	23

* Fewer than 3 permits were fished; information is confidential.

Table 2.5–Registration Area A shrimp beam trawl fishery harvest in thousands of pounds by season and district, 1991/92 through 2001/02 seasons.

District	Season										
	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
1	0.0	0.0	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	*	*	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
3	20.4	125.3	18.8	31.6	19.2	69.9	24.2	47.3	*	*	*
4	0.0	0.0	0.0	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
5	0.0	*	0.0	*	182.0	74.1	11.7	0.0	*	0.0	0.0
6: Duncan	1,680.5	1,184.8	829.0	1,406.7	1,355.6	1,285.2	1,250.6	989.1	838.9	585.8	222.5
6: Sumner	0.0	13.8	*	*	0.0	*	0.0	0.0	0.0	0.0	0.0
7: Eastern	74.1	42.4	*	232.2	168.1	115.2	174.7	62.7	45.8	89.2	57.7
7: Blake	101.5	60.1	50.7	0.0	3.6	8.4	*	0.8	*	*	*
8: Stikine	697.9	683.6	834.4	848.5	905.7	611.9	1,347.8	818.8	704.7	562.3	583.1
9	*	19.6	*	0.0	*	*	*	*	*	*	5.9
10: Thomas	321.3	148.7	220.2	241.7	239.7	280.8	240.1	*	247.1	64.1	23.2
10: Up. Fred	*	0.0	0.0	*	*	28.4	16.9	*	*	*	*
11	9.6	98.0	112.4	295.0	170.3	57.4	13.9	36.2	26.0	81.9	*
12	*	0.0	0.0	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
13	*	0.0	0.0	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
14	0.0	0.0	0.0	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
15	0.0	*	*	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
16	0.0	0.0	0.0	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
Total	2934.3	2,375.7	2,139.0	3,223.8	3,053.3	2,537.0	3,051.2	2,269.1	1,893.8	1,413.3	903.9
Landings	1,036	922	705	814	793	884	983	834	566	543	358
Permits	28	41	25	25	48	51	42	24	23	16	19

* Fewer than 3 permits were fished; information is confidential

Table 2.6–Registration Area A shrimp beam trawl fishery harvest in thousands of pounds by season and district, 2002/03 through 2013/14 seasons.

District	Season											
	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
3	*	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	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
6: Duncan	99.9	62.5	484.1	302.7	*	0.0	0.0	0.0	0.0	*	*	0.0
6: Sumner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7: Eastern	62.4	35.6	*	*	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7: Blake	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8: Stikine	790.8	571.2	467.7	300.0	120.6	37.8	85.7	55.7	130.6	192.8	77.9	131.7
9	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10: Thomas	*	*	*	*	*	*	0.0	0.0	*	0.0	0.0	0.0
10: Up. Fred	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	*	*	*	*	0.0	0.0
12	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
13	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
14	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
15	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
16	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed	Closed
Total	1,096.2	740.4	986.5	621.1	133.9	38.4	85.2	58.4	126.7	338.3	234.5	131.7
Landings	423	216	232	173	50	24	63	73	105	204	110	110
Permits	13	10	8	8	7	5	6	4	5	8	7	5

* Fewer than 3 permits were fished; information is confidential

Table 2.7–Beam trawl fishing areas and associated statistical areas (districts and all associated statistical areas) for the harvest information from fish tickets for the 1991/92 to 2010/11 seasons.

Type	Management unit	Fishing area	Statistical areas
Traditional	District 6	Duncan Canal	106-42, 43, 44
	District 7	Eastern Channel	107-45
	District 8	Stikine Flats	108-10, 20, 30, 40, 41, 45, 50, 60
	District 10	Thomas and Farragut Bays	110-11, 12, 13, 14, 15, 16
Non-traditional	District 6	South Zarembo	106-10, 20, 21, 22, 25, 30
		Sumner Straits	106-41
	District 7	Blake Channel	107-10, 20, 30, 35, 40
	District 10	Upper Frederick Sound	110-17, 21, 22, 23, 24, 31, 32, 33, 34
	Districts 3, 5, 9		All statistical areas
	Sections 11-A, 11-B, 11-C, 11-D		All statistical areas

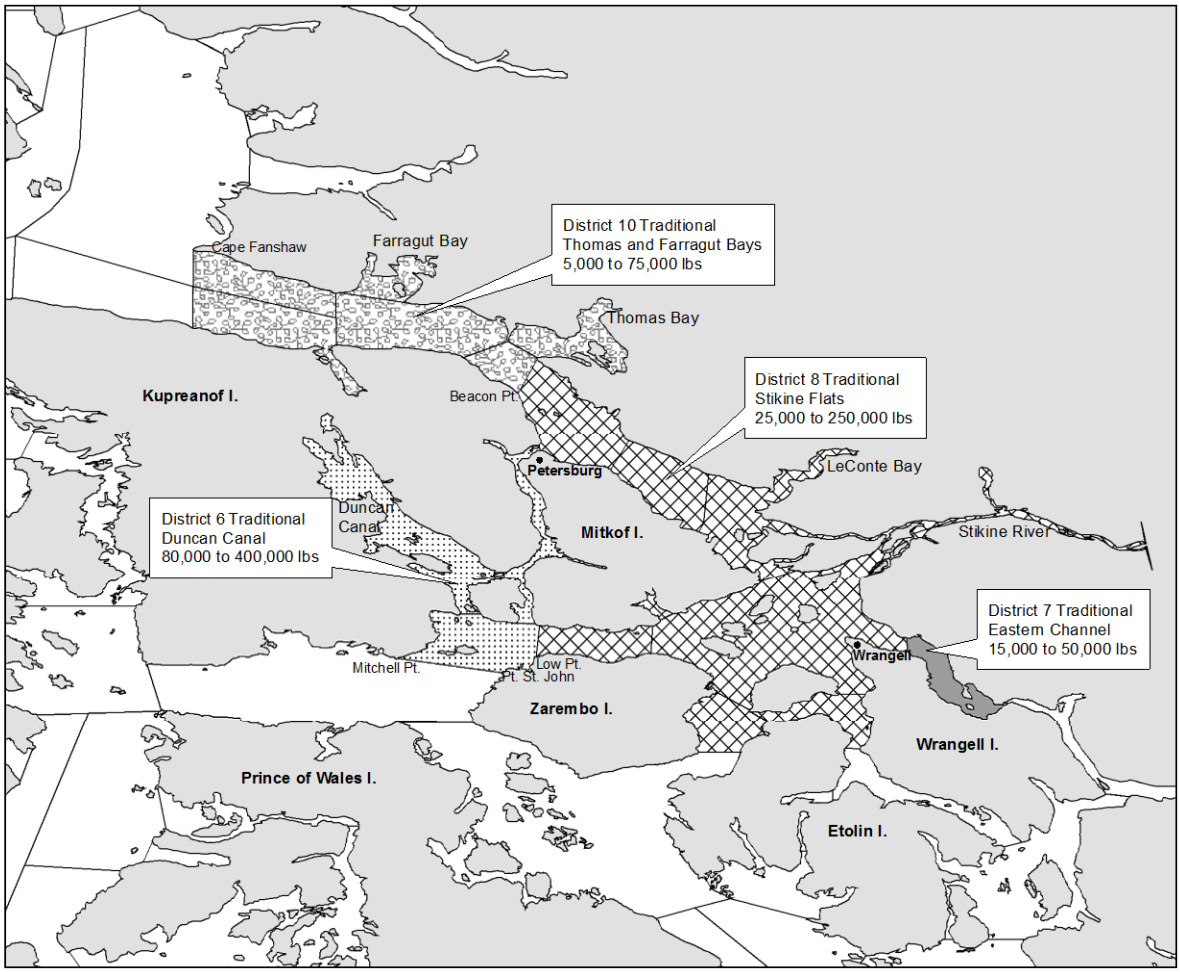

Figure 2.1–Traditional beam trawl shrimp fishery areas and fishing period guideline harvest ranges for Southeast Alaska.

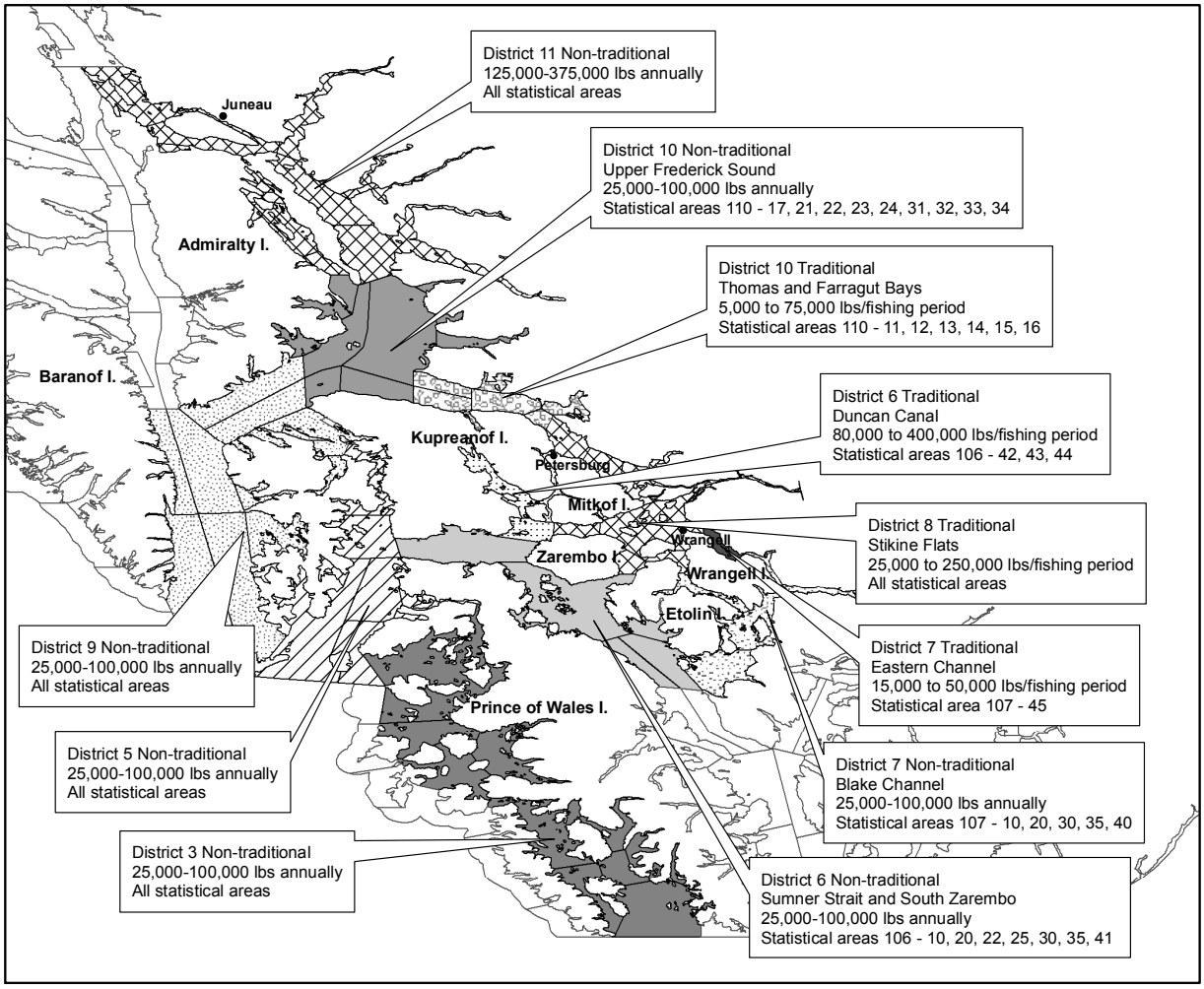

Figure 2.2–Beam trawl shrimp fishery areas and fishing period guideline harvest ranges for Southeast Alaska.

CHAPTER 3: SOUTHEAST SHRIMP POT FISHERY

INTRODUCTION

This chapter describes the life history of spot shrimp *Pandalus platyceros* and the commercial pot fishery in Southeast Alaska (Registration Area A). The events characteristic of this fishery are driven by increasing effort and subsequent limited entry, significant regulatory changes, increasing effort by catcher-processors that produce value-added frozen-at-sea products, and a developing program for shrimp management and biological research in the region.

LIFE HISTORY

Spot shrimp, the target species for the shrimp pot fishery in Southeast Alaska, are widely distributed within the North Pacific Ocean. They occur from the intertidal zone to depths of greater than 1,500 ft, and are geographically distributed from the Korea Strait to the Sea of Japan, along the Siberian east coast, and from Unalaska to San Diego, California (Butler 1964).

Southeast Alaska specific life history information on Spot shrimp is limited. Thus, much must be inferred from studies in Prince William Sound and British Columbia.

Spot shrimp have a complex life cycle; they hatch from eggs carried on the female's abdomen and progress through five planktonic larval stages (Price and Chew 1972) before settling to the benthos as juveniles. Five juvenile stages occur prior to maturation to a functional, adult male (Berkeley 1930; Haynes 1985).

There is an ontogenetic change in the habitat of spot shrimp. Juvenile spot shrimp utilize shallow water eelgrass and kelp (*Laminarium* or *Agarum* spp.) habitats, until they grow to approximately 20 mm in carapace length. They then migrate to rocky habitats including reefs, glass sponge reefs, and corals (Chew et al. 1974; Marliave and Roth 1995).

Adult Spot shrimp are benthic scavengers as well as predators and undergo diurnal feeding migrations, moving shoreward along the bottom into shallower waters at night and back to deeper waters during the day (Butler 1970).

All pandalid shrimp are protandric hermaphrodites; they mature and spawn first as males, subsequently transition to females, and spawn as females for the remainder of their lives. Spot shrimp are thought to mature sexually after 1.5 years and to reproduce as males for an additional one to three seasons in British Columbia (Butler 1964). The transition from male to female occurs during second or third year of life. The size at which shrimp make this transition is quantitatively expressed as the length at which 50% are female (L50), and varies with environmental and populations stresses, thus making a useful metric to gauge population health.

Disagreement exists on both spot shrimp longevity and multiple spawning potential. Fishery managers in British Columbia manage based on the assumption that shrimp live to a maximum of 5 years and spawn once as females (Butler 1964). Studies done in Prince William Sound found a maximum age of 8-10 years or greater (Armstrong et al. 1995, Kimker et al. 1996). Multiple size classes of female shrimp have been documented during department surveys (Love and Bishop 2005). This suggests either multiple spawnings of individual females or a protracted and highly variable age at transition, which the L50 values in department surveys do not corroborate. Preliminary data from laboratory studies done by the University of Alaska in collaboration with the Alaska Department of Fish and Game (department) show that females are capable of multiple spawnings, and do start producing new eggs soon after their clutch hatches.

The concept of meta-populations may apply to spot shrimp. Larvae are planktonic and may be widely transported by currents, while juveniles and adults are relatively sedentary. Tagged adults remain within a mile or two of their release location (Kimker et al. 1996). Larval transport into bays and fjords in Southeast Alaska may depend on oceanographic conditions such as prevailing wind patterns, tidal currents, fresh water influence, and differential flow dynamics. Larvae in some inshore waters may experience very small-scale entrainment patterns. Thus, depleted waters could be repopulated by a distant larval source, or areas of good habitat may not get adequate larval supply to support a viable population.

COMMERCIAL FISHERY

Two species of shrimp, spot shrimp and coonstripe shrimp (*Pandalus hypsinotus)*, are harvested in the shrimp pot fishery of Southeast Alaska. Shrimp harvests in recent years, from the 2000/2001 through the 2010/2011 seasons, have averaged 886,500 pounds. Generally, there has been a progressive increase in harvest from the 1970s, when harvests averaged only 21,500 pounds, to 285,000 pounds in the 1980s, 876,000 pounds in the 1990s, 919,000 pounds in the 2000s, and 557,000 pounds in the 2010/11 season (Table 3.1). The greatest portion of the harvest is taken in Districts 1, 2, 3 and 7, which represent 62% of the most recent 10-year average harvests (Table 3.2). Smaller but significant historical harvests have also occurred in Districts 6, 10 and 13, which represent 18% of the most recent 10-year average harvests. Nineteen distinct areas, including districts or portions of districts, are managed to achieve GHLs. Most districts are managed to target spot shrimp; however, GHLs in Districts 15 and 16 are based on coonstripe shrimp, and the GHL in District 11 is based on spot and coonstripe shrimp combined.

Vessels used in the shrimp pot fishery range from smaller style gillnet or troll vessels to limit purse seiners. Catcher-processors in the 60-foot keel length range also participate. Gear is standardized by regulation to large or small pots with associated definitions based on pot base perimeter. Gear-specific pot limits of 100 large or 140 small pots, and a minimum mesh size to allow passage of a 7/8-inch diameter wooden dowel, are in effect. Pot gear is generally longlined. Pot construction varies in size, shape, weight, and configuration. Gear designs have rapidly changed to increase fishing efficiency. Cone style pots are most commonly used today. Cone pots are constructed using two or three 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. Pots have 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 and to empty harvested shrimp from the pot.

The fishing season is October 1–February 28, with a provision for re-opening of districts where the GHL is not taken during the regular season for a summer season of May 15–July 31. However, in productive districts most of the harvest occurs in the first month or week of the fishery. Over the most recent 10-year period, 79% of seasonal harvests have taken place by the end of October (Table 3.3).

The product type has changed over recent seasons, from a primarily hand-packed, frozen-at-sea whole shrimp for the Japanese sushi market to a domestic tailed product. There has been some experimentation with the live shrimp market.

The basis of current management includes the following key features: a closed season to prevent fishing on major stocks during the egg-hatch or growth and recruitment periods, maintenance of

a number of age classes of shrimp, maintenance of adequate brood stock for rebuilding of shrimp stocks, minimum mesh size restrictions intended to only capture and retain the larger size segment of the stock, pot standardization of two sizes, a maximum number of pots per vessel, hauling hour restrictions, distinct GHLs for each fishing area, and reporting requirements to ensure timely harvest monitoring and closures.

Regulations have also been adopted for permitting of shrimp floating processors, and for reporting and fish ticket requirements for shrimp catcher-processors and catcher-seller vessels. Harvest is recorded and summarized through the department's fish ticket system. In addition to fish ticket data from commercial landings, the department collects biological information to support management of the fishery from a variety of sources. Preseason surveys, and on-board and dockside sampling are conducted annually; major areas are surveyed and sampled, while lesser areas may have sampling only while minor areas may not be sampled. Onboard observing has also been conducted in some years. The pot shrimp stock assessment survey program was described in a report completed in 2005 (Love and Bishop 2005). The department provides detailed information on the shrimp pot fishery, management activities, and research program for all districts of Southeast Alaska in the form of a triennial report to the board.

FISHERY DEVELOPMENT AND HISTORY

Harvest records dating from 1962 indicate that the shrimp pot fishery began with sporadic effort and low harvests through the late-1970s when the shrimp pot fishery served as a supplemental source of income to other fisheries. Harvests and effort increased through the 1980s, and culminated in the mid-1990s with harvest of almost 1.14 million pounds caught during the 1994/1995 season. The maximum number of permits fished was 352 during the 1995/1996 season (Table 3.1). During the past several years, harvest as well as effort has declined somewhat from a peak period during the early 2000s.

Through the mid-1980s most 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. Vessels conducting business in this manner are termed "catcher-sellers." Primarily, shrimp tails were sold, and exvessel prices were dependent upon the size of the tails or count of tails per pound, with the larger shrimp commanding the highest price. Because the fishery was supported by relatively low volumes with moderate prices, the fishery remained relatively slow paced. Harvests in the 1980s averaged 285,000 pounds per year, and the average effort was from 84 permits fished (Table 3.1).

From 1990/1991 through the 1994/1995 fishing seasons, the character of the fishery changed. Through these years the number of permits fished increased to 248 and harvests reached in excess of 1.1 million pounds. 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 grounds, running to and from markets, or selling their own shrimp, effectively allowing them to spend more time setting and retrieving gear. Many fishermen began to rely on this fishery as a significant source of their fishing income. During this period, both pot efficiency and the pace of the fishery increased. The first inseason emergency order (EO) was issued in the 1994/1995 season to close District 13 in mid-March of 1995. GHLs were first assigned to all districts for fisheries beginning October 1, 1995. Following this, the first succession of inseason EOs were issued when the guideline harvests

levels were reached for the 1995/1996 season to close Districts 6, 7, and 8 on November 5; District 3 on November 13; and District 1 on January 2 . Effort in the 1995/1996 season peaked for the history of the fishery at 352 permits. The rapid escalation of effort and harvest evoked petitions for limited entry, which was adopted by the Commercial Fisheries Entry Commission (CFEC) in November, 1995. The CFEC established the maximum number of permits in the fishery as 332, based on participation during the 1995 calendar year.

Harvest and effort decreased moderately following implementation of limited entry in 1998, then increased again as many shrimp fishermen switched to on-board processing in order to capitalize on high prices for sorted, boxed, whole shrimp frozen-at-sea for the Japanese markets. With so many inexperienced catcher-processors delivering inconsistent quality product, the Alaska frozen-at-sea markets declined in value for a few years following the 1999/1900 season, although harvests subsequently regained previous, high levels. The percentage of shrimp landed by catcher-processors peaked at 72% for the 2006/2007 season. The Japanese market for whole frozen shrimp declined sharply during the 2007/2008 season, leading to increased harvest of shrimp as tailed product for the domestic market.

REGULATION DEVELOPMENT

Throughout most of the development of the shrimp pot fishery, management has been passive, with only fish ticket data available to assist managers. As the intensity of the fishery has increased over the years, regulations have been adopted to provide a manageable and sustainable fishery. Seasons have been set to prevent harvesting during the egg hatch period, and mesh restrictions were set to allow the escapement of shrimp below approximately 30 mm in carapace length. Standardization of pots sizes and numbers, as well as adoption of limited entry by the CFEC, have helped to provide a more orderly fishery, and to derive information on area specific harvest rates. The guideline harvest ranges (GHRs) currently in regulation for each area were initially established as GHLs based on historical harvests to prevent uncontrolled expansion of the fishery, but they were not based on information describing stock abundance or stock condition. Current research aims to develop a biologically based index of abundance, which the department reviews each year as a basis to adjust GHLs to provide for sustainable harvest. Some history on the development of regulations for the pot shrimp fishery is provided in the following sections.

FISHING SEASONS

Prior to 1970, shrimp pot fishing was allowed only during periods when the shrimp trawl fishery was open (roughly May 1 through February 14). In 1970, pot fishing was allowed throughout the year; this liberal season existed through the 1981/1982 fishing season. During the 1982/1983 season, fishing was not allowed during May and June in Districts 1 through 8. This closure was intended to protect fecund, female shrimp 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 be safely defined as late February through the middle of May.

For the 1983/1984 season, the District 1 fishery was restricted by the Alaska Board of Fisheries (board) to a September 1 through April 30 season. 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 late spring and summer provided the important biological benefits of allowing stock recruitment to occur through molting and growth processes.

By the 1986/1987 season, major areas (Districts 1, 2, 3, and 7) were open only from October 1 through February 28, which was established for a combination of egg-hatch closure, growth, and allocation for a fall/winter fishing season. The minor areas (Districts 6 and 8) were open from May 1 through February 28 with only an egg-hatch closure in place. All other areas (Districts 4, 5, and 9 through 16) remained open throughout the year without an egg-hatch closure.

In 1997, the board adopted a regulatory opening of October 1 and closure of February 28 for all districts. In 2000 the board implemented a regulation providing for reopening of districts where the GHL is not achieved for a summer season from May 15 to July 31. This continues the egg hatch closure, allows a regulatory closure of 2 months prior to the October opening, and allows for some areas to be fished during the summer growth period. The current season remains October 1 through February 28 in all districts and May 15 through July 31 by EO.

SIZE RESTRICTIONS

The board policy on small shrimp (79-46-FB), primarily developed for the trawl fisheries, also applies to the shrimp pot fishery; however, specific regulations concerning a minimum legal shrimp size have not been developed. A mesh restriction specifying 1.75-inch 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 growth over-fishing. This minimum size is similar to that recommended for the Canadian west coast shrimp trap fisheries (Boutillier 1984), and should provide for some protection for at least two year-classes of small shrimp. Shrimp pots must be entirely covered with net webbing or rigid mesh. However, there is no mesh restriction for waters of Lituya Bay in District 16. Fleet testimony at the 1997 board meeting indicated that significant amounts of small shrimp were being discarded at floating processors. The requirement for mandatory observer coverage implemented at this meeting was, in part, required to document possible discard as well as to verify fish ticket information.

Fishing hours of 8:00 a.m. to 4:00 p.m. are currently in regulation to slow the pace of the shrimp fishery and to allow mesh restrictions time to allow small shrimp to escape the pot. Mesh restrictions have not been totally effective at protecting small shrimp because current regulations do not restrict fishermen from picking sets twice during the daily 8:00 a.m. to 4:00 p.m. fishing period. Longer soak periods would allow the regulatory mesh size more time to passively sort small shrimp but could lead to other impacts on the dynamics or on the economics of the fishery.

QUOTAS AND GUIDELINE HARVEST LEVELS

Prior to the 1983/1984 season, a GHL of 125,000 pounds was established for each of Districts 1, 2, 3, and 7, and a GHL of 55,000 pounds for each of Districts 6 and 8. By the 1986/1987 season, a GHR for Districts 6 and 8 was set to a range of 75,000 to 100,000 pounds and dropped entirely for all other districts. This situation existed until October 1, 1995 when the department implemented GHLs for each district by EO. This action was taken in response to the ongoing trend of increasing harvests in an attempt to maintain the fishery at a sustainable harvest level. For districts with a fairly consistent harvest history, GHLs were set based on the average harvest for the previous five fishing seasons, 1990/1991 through 1994/1995. The District 13 GHL was set based on harvests from only four years since harvests in 1994/1995 were nearly double any previous year. For districts with low and intermittent harvests, GHLs were arbitrarily set at

20,000 pounds. In January of 1997, the board adopted regulatory GHRs for each district. Those GHRs were the same as the levels imposed by EO beginning with the 1995/1996 season, with the lower end of each range set to zero.

In 2000 the board adopted the Pot Shrimp Management Plan. This plan addressed GHLs in several ways. First, it specified that the upper range of the existing GHRs be modified to use a more accurate tail to whole weight conversion factor of 2.0 based on data from shrimp collected during the research surveys in Southeast Alaska. The previous conversion factor of 1.67 was developed for sidestripe shrimp, *Pandalopsis dispar*, from Cook Inlet. This higher conversion factor resulted in increased upper limits of the GHR in those districts where historical harvest had been primarily of tails. The new GHRs were implemented beginning with the 2000/2001 season following a major effort by the department to verify, correct, and apply the new conversion to the historic fish ticket databases.

Secondly, it specified that for each of Districts 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, and 14, GHRs would be for spot shrimp, while GHRs for Districts 15 and 16 GHRs would refer to coonstripe shrimp, and for District 11 GHRs would be for both spot and coonstripe shrimp. This effectively raised the upper level of the GHR for each district by the proportion of historic harvest that was actually the other species. In most districts this was relatively insignificant; however, in the case of District 7 it amounted to a 20,000–30,000 pound increase.

Finally, the *Pot Shrimp Management Plan* (5 AAC 31.145) specified that District 3 be split into two management areas–Section 3-A, and Sections 3-B and 3-C combined. The GHR for Section 3-A was set at a range of 0–264,000 pounds. Sections 3-B and 3-C were provided a GHR of 0–50,000 pounds. These ranges were based upon the perception that shrimp populations in District 3 could support a higher harvest than the historical average. For the spot shrimp districts, no specific GHRs for coonstripe shrimp were set, but it was stated that the ”allowable harvest” would be based on the average catch during the 1995/1996 through 1999/2000 seasons.

GHRs were again addressed at the 2006 board meeting in Ketchikan. The department had increased some annual GHLs above the upper end of the GHR in regulation based on good stock performance and lowered GHLs in other areas. The Pot Shrimp Task Force was concerned that the department needed greater flexibility to adjust GHLs up as well as down, but within the regulatory GHR. GHRs in regulation were increased in District 2, Section 3-B/C, Districts 4, 6, 8, 10, Tenakee Inlet, and Section 13-C. GHRs were changed in areas where the department had already increased GHLs by EO and in areas where the department considered that there was some future potential to increase GHLs above then existing GHRs.

GEAR RESTRICTIONS

With the exception of the minimum mesh size, no gear restrictions were implemented until the 1976/1977 season when a pot limit of 150 pots per vessel was established for Districts 1 through 15. Until October of 1997, the 150-pot limit applied to all portions of Registration Area A. Regulations concerning a maximum tunnel perimeter (15-inch), pot marking requirements, prohibitions against simultaneously fishing shrimp pots and any other type of commercial, sport, or personal use pot, escape mechanisms, and some clarification of mesh requirements had also been developed.

Enforcement problems repeatedly demonstrated the need for clearer definitions of shrimp pot gear. It was also thought that a reduction in pot sizes would slow the fishery and could provide

more useful catch per unit effort (CPUE) data to the department if gear was standardized, and if a tiered pot system under consideration by the CFEC was implemented. Coupled with the implementation of limited entry, in January 1997 the board adopted gear regulations providing for phased implementation of standardized pots. Through September 30, 1998, the number of shrimp pots that could be operated from a registered shrimp fishing vessel was 140 small pots or 100 pots larger than a small pot. If any pot operated from a vessel was larger than a small pot, the total number of pots that could be operated from that vessel was 100 pots.

Effective in October of 1998, a "small pot" was defined as having a bottom perimeter of no more than 124 inches and a "large pot" was defined as having a bottom perimeter of more than 124 inches, but not more than 153 inches. Perimeter measurements were selected over diameter measurements to facilitate enforcement. Further, all pots on board a vessel or operated from a vessel had to be of the same type and of the same size.

Pots may not have more than one bottom, a vertical height of more than 24 inches, and more than 4 tunnel eye openings which individually do not exceed 15 inches in perimeter. The sides of the pot may only be at a right angle to the plane of the bottom of the pot or slanted inward toward the center of the pot in a straight line from the bottom to the top.

Other shrimp pot regulations adopted in 1997 included: time limitations for deployment and retrieval of gear from 8:00 a.m. until 4:00 p.m. each day, carrying pot gear was restricted to only the owner of the gear, and unique pot identification tags were issued for each pot. Unique pot identification tags were issued for a few seasons; however, this requirement was made optional in 2003. Pot tags have not been issued since that time.

At the 2006 board meeting in Ketchikan, regulations were clarified so that fishermen could only fish all small pots or all large pots in order to improve the quality of harvest rate information reported on fish tickets. Pot marking requirements were modified to provide marked buoys on each end of a longline with more than five pots. This regulation is intended to prevent gear entanglement and loss in congested fishing areas. In 2006 a new regulation prevented simultaneous registration for the pot shrimp and beam trawl shrimp fisheries.

FLOATING PROCESSORS

Floating processors entered the fishery in 1994. Different practices immediately followed that changed the character of the fishery in several ways. Small fishing boats could deliver on the grounds without spending time for roundtrip travel to shore-based plants. The "floaters" could store and transport pots for fishing vessels and could purchase unsorted, live shrimp. Along with good prices, the pace of the fishery was greatly accelerated. Arrangements for communications between processing vessels and department staff needed to be developed to monitor harvests. Fishing in areas of proximity to processors created more potential for localized depletion of shrimp stocks.

In 1997 the board eliminated the ability of floating processors to transport pots for fishing vessels and implemented requirements that included reporting processor location and any changes in location, reporting projected dates of operation, and daily reporting. The only practical way for the department to have verification of daily reporting or to monitor reported discards of small shrimp size classes was to implement mandatory observer coverage, the cost of which was borne by the processor. The last season that a floating processor participated in this fishery was 1998.

CATCHER-PROCESSOR REPORTING

Reporting requirements for shrimp catcher-processors were first established at the 2000 board meeting and revised in 2003, 2006, and 2009. With such a large proportion of the fleet acting in the dual role both as fishermen and as processors (and therefore issuing their own fish tickets), it became necessary to regulate harvest reporting to support inseason management and prevent overharvesting in any of the 19 areas being managed. Under statewide general provisions, fish tickets are not required to be delivered to the department until seven days after each landing of product, making the tracking of harvests with fish tickets impractical for management purposes. Reporting requirements now allow the department to regularly track harvest from shore-based processors, catcher-processors, and catcher-sellers inseason. A catcher-processor is defined as a vessel that catches and processes their own product on board. Catcher-processors cannot buy or process shrimp from another fishing vessel or act as a tender, so observers are not required. Regulations in 2003 allowed the department to specify information to be reported during weekly call-in periods by EO. Regulations were modified in 2006 so that the department would not need to specify what information would be required by EO each year. Catcher-processors were also required to report harvests to department managers within 72 hours of the closure of a fishing area and to contact the department before fishing in a new fishing area. Regulations required catcher-processors to report harvest on fish tickets for each day fished and for each area fished. Fish tickets are due to the department within seven days of the closure of an area where the catcher-processor has fished.

In 2009 reporting requirements were changed and clarified to further improve and more accurately track harvests inseason. The requirement to report fishing activity was shortened to within 2 business days of deploying gear, or within two business days of ceasing fishing in a district, and was extended to apply to all shrimp fishermen (not just to catcher-processors). Weekly reporting by noon Wednesday each week was also extended to include catcher-sellers (in addition to catcher-processors). For catcher-processors, it was further clarified that the department must be contacted before fishing in a new district.

CATCHER-SELLERS

Catcher-sellers are vessels that sell unprocessed shrimp to persons not licensed to process shrimp. Regulations require that catcher-sellers issue a fish ticket for the weight of all shrimp on board the vessel before the shrimp are removed from the vessel.

LIMITED ENTRY

In April 1995 the CFEC received petitions from more than 70 people from Wrangell, Ketchikan, and Craig, as well as the Tenakee Springs Fish and Game Advisory Committee, requesting limitations to the number of participants in the Southeast shrimp pot fishery. After the CFEC obtained and analyzed data concerning the fishery, their proposed regulations were consistent with what the petitioners had suggested; specifically, that 1995 should not be included in the eligibility time frame. Including 1995 would have capped the number of limited entry permit holders at 186, which was the highest participation level in any of the four years prior to the original qualification date. Initially, the CFEC held numerous public hearings throughout Southeast Alaska and announced in early November 1995, while fishing was in progress, that they had adopted a limited entry program that would include participation during 1995 towards qualification. At the time, the effort level had increased to 234 fishermen. Finally, by law, the

CFEC was required to revise the limited entry program upward to 332, the maximum number of permits that legally participated in the fishery during calendar year 1995. In October 1996 the CFEC adopted a point system for the fishery. By February 1998, the CFEC began the process of issuing and denying permits for this fishery. Of the 329 original permits that were granted, 273 remained active and eligible to participate in the fishery during the 2013 season, but only 109 permits were actually fished during the 2013 calendar year (CFEC 2014b). The average permit market price was $15,000 in 2012.

STOCK ASSESSMENT

The assessment program for spot shrimp was initiated in 1996 and consists of pot surveys, commercial catch sampling from four different sample site types, fish tickets, and voluntary logbooks. The spatial and temporal data coverage is inconsistent, as new programs have been introduced, and spatial data coverage has been increased incrementally as funding has become available and as the fishery product form and gear have evolved.

STOCK ASSESSMENT SURVEY

A preseason pot shrimp pilot survey was conducted in September 1996 in Ernest Sound. Additional areas were added: Cordova Bay (1997), Hoonah Sound (1999), Tenakee Inlet (2000), Kasaan Bay (2011), Cholmondeley Sound (2011), Back and West Behm Canals (2011), and George and Carroll Inlets (2011) (Figure 3.2). In order to minimize variability in catch rates and provide more accuracy when conducting analyses, index set locations and standardized methods were established. The objectives of these surveys were to obtain information on shrimp abundance, define trap selectivity and associated behavior of shrimp attracted to pot gear, develop a survey-based index of abundance, define the size composition of stocks from a variety of areas, and to determine sex ratios, size at first spawning, and female fecundity for both spot and coonstripe shrimp (Love and Bishop 2005, Bishop et al. 2009).

ON-THE-GROUNDS SAMPLING

On-the-grounds sampling began in 1998, with dual objectives of obtaining catch rate information to accurately target GHLs inseason and of collecting sampling data from unsorted shrimp. Districts 1, 2, Sections 3-A, and 3-B/C, Districts 6, 7, 8, 9, 10, Tenakee, Section 13-C, and District 15 have been sampled in this way; recent trips have focused on District 2, Section 3-A, Districts 6, 7, 10, and 15.

LOGBOOK PROGRAM

A voluntary logbook program was initiated in 2005 with the objective of collecting size-specific spot shrimp CPUE data from catcher-processors. Participating fishermen were to provide the department with definitions of their size categories at the beginning of the season and record their harvest information inseason by shrimp size category on their daily fish tickets. This information has been used for analysis of interannual trends in CPUE and for Leslie depletion estimator modeling to determine harvest rate. Logbook data has been collected from 2005 to 2010 in all districts except those that have seen limited effort (District 4) or been closed during this time period (Districts 15 and 16); however, for many districts the data have been insufficient for either analysis due to limited effort or limited participation. Logbooks were required in Districts 6 and 7 starting in 2012 in support of an experimental inseason management system.

DOCKSIDE SAMPLING

Dockside sampling began in 1997 in Districts 1, 6, 7, 14, and 16 and was gradually expanded to Districts 3, 4, 8, 10, 11 and 15. However, dockside deliveries dwindled as the proportion of the harvest that was processed onboard increased. By 2002 only Districts 6, 7, 8, 11, 14 and 15 were regularly being sampled dockside. By 2007 the number of districts being sampled dockside had dwindled further to Districts 6, 7, and 8 due to shifting or declining harvests in Districts 11, 14, and 15 (Bishop et al. 2009). By 2010 only catches from part of District 6 were sampled. The dockside program was revitalized for the 2011/2012 season in an attempt to maximize the availability of this important data; however, it quickly dropped off again, mainly due to the lack of unsorted product available for sampling.

STOCK ASSESSMENT REGIONWIDE OVERVIEW

In general, data availability for spot shrimp stocks in Southeast Alaska is inadequate to estimate shrimp population size and appropriate harvest rates for sustainable yield. This allows much less reliability in predicting stock changes over time and increases the potential risk for over-harvesting, thus conservative management must be used. Recommendations for changes in GHLs are made are based on stock status, standardized score, and confidence levels (Table 3.9). A "Poor" designation is associated with a 40% reduction in the GHL or district closure; a "Below Average" designation can range from a 20 to 40% reduction; a "Moderate" designation is associated with a 0–20% reduction; an "Above Average" designation is associated with a 0–20% increase; and a "Healthy" designation is associated with a 0–40% increase. Decreases in GHLs need to be large enough to be effective, and increases need to be not so large as to produce future declines.

RECENT SEASONS

2011/2012 SEASON SUMMARY

A detailed season-opening news release was issued on September 8, 2011, announcing fishing seasons, fishing periods, lawful gear, vessel registration, GHLs, anticipated management actions, catcher-processor reporting requirements, fish ticket requirements, logbooks, and other information. The fishery opened on October 1, 2011, targeting a regionwide GHL of 535,600 pounds. In comparison with the 2010/2011 season, the 2011/2012 regional GHL was decreased by 11%. GHLs were decreased in 2 areas:in District 6 by 65% and in District 9 by 20%. District 16 was closed according to the two-year rotational cycle (Table 3.4).

A total of 272 CFEC permits were issued for the 2011 calendar year. A total of 108 fishing vessels and 4 tenders registered for the 2011/2012 season. Fifty-six permit holders, 53% of the fishing vessels, were registered as catcher-processors, and there were no floating processors. A total of 110 CFEC permit holders fished and made 1,005 landings (Table 3.1).

Total landings for the season were 565,057 pounds, 105% of the total GHL (Table 3.1). The average pounds per landing was 562, and the average pounds per permit was 5,137. Total landings of spot shrimp were 546,096 pounds, and total landings of coonstripe shrimp were 18,397 pounds, or 3.3% of the total. The CFEC reported total gross earnings of $1,724,155 for the 2011 calendar year, which largely overlapped with the major harvest period in October, November, and December of the 2011/2012 season (CFEC 2014b). Landings and value reported on annual operator reports equated to an average ex-vessel price of $3.05/pound. The average

annual earnings per permit holder was reported by CFEC as $15,964. Of total pounds landed for the 2011/2012 season, 66% were by catcher-processors, 14% were by vessels that delivered to shore-based processors, and 18% were by catcher-sellers.

The 2011/2012 season progressed rapidly, with 533,400 pounds (99% of the season's GHL and 94% of total season landings) harvested in October (Tables 3.5, 3.3). Another 14,500 pounds was harvested in November, bringing cumulative annual pot gear shrimp harvests to 97% of seasonal landings by the close of November. Landings during the fall-winter season (October 1–February 28) were 99% of total landings, and landings during the summer season (May 15–July 31) were around 1% of the total, with landings from two districts that were re-opened. A historical summary of shrimp harvests by season and district is presented in Table 3.2. Table 3.5 shows harvests by area and month for the 2011/2012 season, including closure dates for each district, effort levels by district, effort levels by month, and overall effort for the season. The first area to close was Section 13-C after 4 days. Districts 1, 2, 3, 6, 7, 8, 9, 10, and 11 closed by the end of October (Table 3.5). The remainder of District 12 closed in November, Section 13-A/B closed in December, and Districts 4, 5 and 15 were closed by regulation after 151 days on February 28. Additional fishing time was provided in Districts 5 and 15 during the summer fishing period, which began May 15. Participation by month and district declined from 146 permit holders in October, to 9 permit holders in November, and to 3 or fewer permit holder through February. Peak effort in the summer season was by 2 permit holders in May and June.

2012/2013 SEASON SUMMARY

A detailed season-opening news release was issued on September 14, 2012, announcing fishing seasons, fishing periods, lawful gear, vessel registration, GHLs, anticipated management actions, catcher-processor reporting requirements, fish ticket requirements, logbooks, and other information. The fishery opened on October 1, 2012, targeting a regionwide GHL of 564,800 pounds. In comparison with the prior season, GHLs were decreased by 13% in Section 13-C, and District 16 was open for the season as a continuation of the alternate-year harvesting strategy, with a GHL of 15,000 pounds. The regional GHL was increased by 5% compared with the previous season (Table 3.4).

Inseason management of Districts 6 and 7 was implemented in the 2012/2013 season. For inseason management, the commercial fishery data include daily harvest rates from catcher-processors, harvest rates of size XL or larger shrimp from catcher-processor log book data, and carapace length data derived from sampling on the grounds. The department analyzes the harvest information from the first 7 to 10 days of the fishery and compares it to prior seasons. Adjustments to the GHL are made based on whether the current year's harvest is above or below that of prior seasons. Inseason adjustments are not to exceed 40% of the initial GHL, and the department may close the fishery before the inseason revised GHL is reached if it becomes evident that fishery performance is below historical levels for healthy stocks. Using these inseason management criteria for District 6 during the 2012/2013 season, the net increase in harvest was 20%, which increased the GHL from 32,000 to 38,400 pounds of spot shrimp. For District 7 the net increase in harvest was 27%, which increased the GHL from 63,700 to 80,700 pounds of spot shrimp. The adjusted total GHL was 588,200 pounds.

A total of 269 permits were issued by the CFEC for the 2012 calendar year. A total of 115 fishing vessels and 2 tenders registered for the 2012/2013 season. Fifty-six permit holders, or 49% of the fishing vessels, were registered as catcher-processors, and there were no floating

processors. A total of 106 CFEC permit holders fished and made 1,152 landings over the course of the season (Table 3.1).

The total pounds landed for the season was 615,277, or 105% of the adjusted GHL. The average landing was 534 pounds, and the average pounds per permit was 5,805. Total landings of spot shrimp were 586,626 pounds; total landings of coonstripe shrimp were 28,651 pounds, or 4.9% of the total. The CFEC reported total gross earnings of $2,025,867 for the 2012 calendar year, which equates to a reported average ex-vessel price of $3.29/pound (CFEC 2014b). The average annual earnings per permit holder for 2012 was reported by the CFEC as $19,669. Of total pounds landed for the 2012/13 season, 70% was by catcher-processors, 20% was by vessels that delivered to shore-based processors, and 10% was by catcher-sellers.

The 2012/2013 season progressed rapidly, with 564,691 pounds (100% of the season's GHL) harvested in October. Another 25,000 pounds was harvested in November, bringing cumulative annual pot gear shrimp harvests to 96% of the final season landings (Tables 3.2, 3.6). Landings during the fall-winter season (October 1–February 28) were 99% of total landings, and landings during the summer season (May 15–July 31) were around 1% of total landings, similar to the previous season. A historical summary of shrimp harvests by season and district is presented in Table 3.3. Table 3.6 shows harvests by district and month for the 2012/2013 season, including closure dates for each district, effort levels by district, regional harvest and effort levels by month, and harvest and effort level for the season. The first area to close was Section 13-C after four days, and Districts 1, 2, 3, 6, 7, 8, 9, 10, and 11-Seymour Canal closed by the end of October (Table 3.6). District 14 closed in November and District 16 closed in December. The remainder of District 11 closed on February 20, and Districts 4, 5, 15, and Section 13-A/B were closed by regulation at the end of the season on February 28. Districts 5 and 15 were re-opened for a summer season beginning May 15. Participation by month and district declined from 142 permit holders in October, to 10 permit holders in November, and to 5 or fewer permit holder for the remainder of the season (Table 3.6). Summer season effort was 4 permit holders.

2013/2014 SEASON SUMMARY

A detailed season-opening news release was issued on September 11, 2013, announcing fishing seasons, fishing periods, lawful gear, vessel registration, GHLs, anticipated management actions, catcher-processor reporting requirements, fish ticket requirements, logbooks, and other information. The fishery opened on October 1, 2013, targeting a regionwide GHL of 537,800 pounds. In comparison with the prior season, the GHL was decreased by 25% in District 10, and Districts 12, 14, and 16 were closed. The regional GHL was decreased by 5% compared with the prior year (Table 3.4).

Inseason management of Districts 6 and 7 was initiated in the 2012/2013 season and continued in 2013/14. Using the inseason management criteria for District 6, the net increase in harvest was 15%, increasing the GHL from 32,000 to 36,800 pounds of spot shrimp. For District 7, the net increase in harvest was 22%, increasing the GHL from 63,700 to 77,500 pounds of spot shrimp. The adjusted total GHL was 556,400 pounds.

A total of 266 permits were issued by the CFEC for the 2013 calendar year. A total of 117 fishing vessels and two tenders registered for the 2013/2014 season. Permit renewals fell slightly over the prior three years as did vessel registrations. Sixty-two fishermen, or 53% of the fleet, were registered as catcher-processors. A total of 108 CFEC permit holders fished and made 1,143 landings over the course of the season (Table 3.1).

The total pounds landed for the season was 560,834, or 101% of the adjusted GHL. The average pounds per landing was 491, and the average pounds per permit was 5,193. The total pounds of spot shrimp landed was 535,775, and total landings of coonstripe shrimp was 24,819 pounds, or 4.6% of the total. The CFEC reported preliminary total gross earnings of $2,127,071 for the 2013 calendar year, which equates to a reported average ex-vessel price of $3.79/pound, a gradual increase over recent years (CFEC 2014b). The average annual earnings per permit holder was reported by the CFEC as $19,514. Of total pounds landed for the 2013/14 season, 68% was by catcher-processors, 18% was by shore-based processors, and 14% was by catcher-sellers.

The 2013/2014 season progressed rapidly, with 97% of the harvest taken in October and 99% of the harvest taken by the end of November., Harvest for the remainder of the fall-winter season was confidential (Table 3.3). Pounds harvested by month were 542,100 in October and 12,100 in November. Pounds harvested by month were confidential from December through February. A historical summary of shrimp harvests by season and district is presented in Table 3.2. Harvests by district and month for the 2013/2014 season, including closure dates for each district, seasonal effort levels by district, effort and harvests by month and regional effort levels for the season are shown in Table 3.7. The first area to close by EO was Section 13-C after four days. Districts 1, 2, 3, 6, 7, 8, 9, 10, and 11 closed by the end of October, and Section 13-A/B closed in November (Table 3.7). The three remaining areas, Districts 4, 5, and 15, were closed on February 28 by regulation, and Districts 5 and 15 were reopened on May 15. Participation by month and district was 156 permit holders in October, 11 permit holders in November, and 4 or fewer permit holders through the end of the season (Table 3.7). A total of 108 permit holders made landings for the season, with the great majority (106) fishing during October.

2014/2015 Season Outlook

The 2014/2015 Southeast pot shrimp fishery will begin on October 1, 2014. A season-opening news release was issued on September 10, 2014, announcing fishing seasons, fishing periods, lawful gear, vessel registration, GHLs, catcher-processor reporting requirements, fish ticket requirements, voluntary logbook program plans, and other information. The fishery is targeting a GHL of 513,700 pounds. In comparison with the prior season, GHLs were decreased by 4% overall. GHLs were reduced by 20% in District 2 and 30% in District 8, while District 16 will be open in continuation of the alternate-year harvest strategy. The GHL reductions and management measures were implemented following a detailed review of shrimp population stock status and a consultation with shellfish research and management biologists on May 29, 2014.

Inseason management of Districts 6 and 7 will continue in the 2014/2015 season, and those GHLs may be adjusted.

MANAGEMENT CONCERNS

The Southeastern Alaska pot shrimp fishery has a long history and is unique within the state. The fishery is well regulated, yet there continue to be problems of concern to management. Based on an annual review of the available harvest and stock assessment information, there is evidence that the majority of shrimp management areas are moderately and steadily declining. The department has responded by reducing historically determined GHLs or implementing fishery closures for many of 19 areas managed over the past eight-year period (Table 3.4). GHLs have been reduced from 1,010,000 pounds in 2003/2004 to 513,700 pounds in 2014/2015. In response, harvests over this period have declined from 1,132,721 pounds in 2003/2004 to 556,947 pounds

in 2010/2011. The department intends to manage this resource conservatively in order to ensure an ongoing and sustainable fishery and has identified the following management concerns:

1. Declining harvests, decreased GHLs, and biological evaluations of specific populations all reflect the conclusion that many shrimp populations in the region have begun to decline from recently more robust populations. The ability to react to changing resource levels will be important to provide a sustainable fishery.
2. The fishery is affected by changing markets. Markets for shrimp rapidly developed in the early 1990s, leading to increased and accelerated harvests, emergency closures, GHLs based on historical harvests (1990/1991 to 1994/1995), and the adoption of a limited entry program beginning in 1998. This was followed by a collapse of the whole frozen Japanese market in 2008, leading to lower prices, new markets, and decreased effort. Markets appear to have increased from 2011/2012 through 2013/2014.
3. The department has maintained six fishery-independent detailed stock assessment surveys in Districts 1, 2, 7, and 12-Tenakee, Sections 3-A, and 13-C. Additional surveys or stock assessment data sources may be needed in the future.
4. Subsistence fisheries harvests in Districts 7, 8, 13, and Section 15-A, Personal Use fisheries in all other districts, and sport harvests throughout the region are not monitored. Current harvests and future trends in harvests may represent a significant component of overall harvests, especially in areas near major communities.
5. The board established a Southeast Alaska Pot Shrimp Fishery Task Force in 2003 to help develop the fishery with industry representation from various communities. The Task Force meets infrequently and has not held regular elections, so only some communities are represented by this process.
6. There were 266 limited entry and interim permits issued in 2013, yet only 108 permits made landings in that year. Many of the 158 latent permits are transferable and effort in the fishery may be expected to increase when shrimp stocks or economic factors change.
7. Southeast Alaska–specific biological data for pot shrimp is limited. Basic life history parameters such as lifespan, multiple spawning potential, and spawn success are unknown in the region. If basic life history were better understood, it would increase understanding of the resource and improve fishery management.

CHAPTER 3: TABLES AND FIGURES

Table 3.1–Registration Area A (Southeast Alaska) shrimp pot fishery harvest, number of landings, and catch per unit effort (CPUE), 1973/74 season to present. Reported catches include both tailed and whole product of all species captured, expressed in terms of whole pounds with a conversion factor of 2.0.

Season	Harvest (pounds)	Permits	Landings	Pounds per landing	Pounds per permit
1973/74	*	*	*	*	*
1974/75	7,640	7	16	478	1,091
1975/76	19,242	5	29	664	3,848
1976/77	15,716	6	16	982	2,619
1977/78	24,631	10	76	324	2,463
1978/79	21,318	9	35	609	2,369
1979/80	57,878	19	124	467	3,046
1980/81	80,862	31	191	423	2,608
1981/82	157,770	49	381	414	3,220
1982/83	268,680	58	374	718	4,632
1983/84	257,317	93	653	394	2,767
1984/85	299,015	117	781	383	2,556
1985/86	209,211	81	498	420	2,583
1986/87	354,145	83	608	582	4,267
1987/88	369,164	96	688	537	3,845
1988/89	440,615	121	812	543	3,641
1989/90	415,828	110	816	510	3,780
1990/91	562,596	138	1,100	511	4,077
1991/92	823,511	177	1,561	528	4,653
1992/93	676,928	150	1,266	535	4,513
1993/94	918,021	183	1,625	565	5,017
1994/95	1,142,717	248	2,718	420	4,608
1995/96	988,805	352	2,854	346	2,809
1996/97	1,035,344	203	1,996	519	5,100
1997/98	891,119	200	1,766	505	4,456
1998/99	856,284	185	1,839	466	4,629
1999/00	868,520	154	1,378	630	5,640
2000/01	1,063,047	160	1,311	811	6,644
2001/02	1,052,015	169	2,450	429	6,225
2002/03	1,058,348	151	2,695	393	7,009
2003/04	1,132,721	156	2,801	404	7,261
2004/05	1,000,677	149	2,499	400	6,716
2005/06	975,777	143	2,320	421	6,824
2006/07	937,066	136	2,029	462	6,890
2007/08	722,028	110	1,609	449	6,564
2008/09	590,107	95	1,451	407	6,212
2009/10	661,940	109	1,609	411	6,073
2010/11	556,947	109	1,176	474	5,110
2011/12	565,057	110	1,005	562	5,137
2012/13	615,277	106	1,152	534	5,805
2013/14 **	560,834	108	1,143	491	5,193
Avg. 70-79	21,545	7	38	567	3,078
Avg. 80-89	285,261	84	580	492	3,396
Avg. 90-99	876,378	199	1,810	484	4,404
Avg. 00-09	919,629	138	2,078	443	6,664

* Fewer than 3 permits were fished; information is confidential.

**The 2013/14 data should be considered preliminary.

Table 3.2–Registration Area A (Southeast Alaska) shrimp pot fishery harvest in thousands of pounds by district, 1970/71 season to present.

Season	District															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1970/71	3.7	*	0	0	0	0	0	*	0	*	0	0	0	0	0	0
1971/72	10.6	14.8	0	0	0	0	*	0	*	0	0	0	0	0	0	0
1972/73	0	*	0	0	0	0	*	0	0	0	0	0	0	0	0	0
1973/74	*	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1974/75	4.1	*	*	0	0	0	0	0	0	0	0	0	0	0	0	0
1975/76	7.2	11.5	*	0	0	0	0	0	0	0	0	0	0	0	0	0
1976/77	*	9.6	*	0	0	0	3.3	0	0	0	0	0	0	0	0	0
1977/78	5.6	14.1	0	0	*	0	*	0	0	0	0	0	*	0	0	0
1978/79	4.2	6.7	*	*	0	0	3.6	0	0	0	0	*	*	0	0	0
1979/80	19.0	12.8	*	0	0	0	18.3	*	0	0	0	0	*	*	0	0
1980/81	15.4	14.8	25.0	*	0	*	16.6	*	*	*	0	*	*	0	0	0
1981/82	26.3	17.5	57.1	0	0	9.4	15.6	2.0	4.9	*	*	*	14.6	*	0	4.7
1982/83	31.0	36.5	84.8	*	0	7.8	73.9	2.7	9.6	3.9	0	*	14.9	*	0	*
1983/84	41.1	22.5	36.6	*	*	7.7	87.2	16.5	*	14.2	*	3.3	21.1	0	0	*
1984/85	69.1	50.6	18.5	*	*	6.2	85.4	8.7	*	33.5	*	*	17.1	0.5	0	*
1985/86	36.7	37.5	71.1	*	*	6.0	23.1	2.8	1.7	13.4	*	0.4	11.1	*	*	*
1986/87	60.9	137.3	48.9	0	*	2.2	40.6	2.0	5.2	33.1	2.3	3.9	11.0	*	*	*
1988/89	200.8	62.8	19.8	*	*	8.0	61.5	0.9	6.6	36.4	0.6	10.7	26.8	*	0	*
1989/90	155.3	68.6	27.0	2.7	0	8.4	44.2	18.7	*	47.9	*	6.6	30.5	0	0	*

-continued-

Table 3.2.–Page 2 of 2.

Season	District															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1990/91	181.3	78.9	61.8	11.4	0	10.2	97.6	13.6	5.2	42.8	1.5	16.8	39.8	0	*	0.8
1991/92	168.6	83.5	274.4	*	*	21.2	123.4	15.3	2.9	49.7	*	12.3	61.2	0	3.3	4.5
1992/93	160.1	70.0	221.9	4.7	*	24.4	64.5	20.1	9.6	30.5	*	26.8	40.4	0	1.2	*
1993/94	147.0	120.5	288.6	5.4	*	41.2	120.5	25.3	27.0	36.0	2.1	33.5	61.7	*	1.8	*
1994/95	159.9	76.9	232.0	1.0	21.6	130.2	199.6	30.4	12.1	88.5	3.1	58.9	110.8	2.4	8.9	5.9
1995/96	179.4	90.5	245.1	23.3	34.9	76.0	120.2	9.2	25.9	48.8	23.4	28.3	49.2	17.7	10.1	7.7
1996/97	171.9	82.5	280.9	20.8	24.2	79.0	128.2	29.8	19.5	53.0	20.5	28.6	48.8	4.3	22.2	*
1997/98	142.7	83.0	228.0	10.2	5.9	72.6	127.2	20.0	21.0	39.6	18.3	25.5	41.1	12.2	21.9	*
1998/99	163.2	76.5	225.7	6.1	5.5	68.3	101.9	20.5	18.1	31.8	8.9	30.1	66.8	6.6	22.8	17.6
1999/00	158.6	76.1	237.8	16.6	11.8	70.0	100.9	23.5	18.3	37.9	8.6	26.0	48.0	*	24.7	*
2000/01	161.3	122.0	305.6	20.3	14.3	79.4	116.2	23.5	20.8	46.2	19.8	25.6	47.8	16.5	24.2	*
2001/02	174.2	103.7	320.7	10.4	7.9	71.0	128.8	19.6	18.5	38.4	24.1	36.7	42.3	21.9	18.9	*
2002/03	157.4	89.6	320.8	22.2	19.6	68.3	114.0	24.3	15.9	54.7	19.5	41.8	55.6	19.9	19.6	23.3
2003/04	182.4	96.7	350.1	20.4	17.7	70.0	122.1	22.7	18.2	61.7	22.0	54.4	58.5	19.6	6.9	16.2
2004/05	169.5	88.5	302.9	19.3	21.6	66.5	91.0	19.8	17.9	51.6	21.9	41.4	52.9	21.3	6.3	*
2005/06	176.3	83.1	258.5	18.6	19.3	82.4	87.9	24.9	20.3	53.3	23.6	50.0	57.7	15.8	4.2	closed
2006/07	154.0	99.1	252.7	15.1	10.2	80.7	87.3	23.5	24.1	51.4	23.5	48.6	53.6	13.3	Closed	closed
2007/08	97.7	91.0	226.8	*	0	37.8	84.8	17.0	17.4	44.2	20.7	35.5	44.5	13.1	Closed	closed
2008/09	56.1	88.4	149.6	0	8.0	33.9	58.1	8.7	18.1	55.7	20.2	26.3	45.0	7.7	Closed	*
2009/10	50.8	65.2	184.1	20.9	16.7	54.9	87.1	20.7	19.0	53.5	27.4	22.6	37.6	closed	10.4	closed
2010/11	39.5	69.2	118.3	*	10.7	36.4	49.9	14.0	21.9	56.8	24.2	23.1	46.9	closed	9.3	*
2011/12	55.9	76.2	138.7	*	8.6	31.8	62.4	12.9	10.8	52.7	21.3	8.3	53.6	closed	14.8	closed
2012/13	71.7	74.8	140.8	*	*	37.7	82.9	12.9	16.5	40.3	30.3	closed	43.4	8.8	15.8	*
2013/14**	55.0	62.3	150.0	12.6	3.0	35.1	97.0	12.4	15.3	35.6	21.6	closed	46.4	closed	14.6	closed
10-year Average 2004/05–2013/14	92.7	79.8	192.2	*	*	49.7	78.8	16.7	18.1	49.5	23.5	32.0	48.2	13.3	10.8	*
Avg. Percent	13%	11%	26%	*	*	7%	11%	2%	2%	7%	3%	4%	7%	2%	1%	2%

Note: Harvest based on 2.0 conversion tail to whole weight and corrected fish tickets.

* Fewer than 3 permits were fished; information is confidential.

**The 2013/14 data should be considered preliminary.

Table 3.3–Registration Area A (Southeast Alaska) shrimp pot fishery harvest in thousands of pounds by month, 1970/71 season to present.

Season	Month												Total Harvest	Landings	Permits
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
1970/71	*	*	3.2	*	3.5	*	0	0	0	0	0	*	13	27	5
1971/72	*	*	*	*	*	4.5	11.3	3.8	1.8	0	*	0	27	49	6
1972/73	*	0	0	0	0	*	*	0	*	0	0	0	*	*	*
1973/74	0	0	*	0	*	*	*	0	*	0	0	0	*	*	*
1974/75	*	*	*	*	*	*	*	0	0	*	0	0	8	16	7
1975/76	0	*	*	*	*	*	*	*	*	*	*	0	19	29	5
1976/77	0	*	*	*	0	*	*	0	0	*	0	*	16	16	6
1977/78	*	*	0	*	*	*	*	*	*	*	*	*	25	76	10
1978/79	*	*	*	0	0	0	*	5.1	*	*	*	*	21	35	9
1979/80	0	*	0	*	1.5	3.0	2.7	16.5	8.3	7.9	*	9.1	58	123	19
1980/81	10.0	3.1	*	*	*	4.2	8.1	6.5	7.2	22.0	9.9	5.9	81	192	32
1981/82	11.4	3.8	5.5	2.7	6.3	14.6	11.7	3.4	6.3	34.4	36.2	20.3	158	381	49
1982/83	25.3	11.7	22.3	13.9	26.5	11.4	*	7.9	3.4	51.5	51.6	39.6	269	373	58
1983/84	44.2	32.4	15.0	13.3	21.3	22.9	24.3	32.5	31.7	8.7	5.9	4.1	257	653	93
1984/85	35.3	34.6	26.5	30.3	40.5	9.9	9.7	31.7	21.1	17.0	20.0	22.2	299	780	117
1985/86	20.3	30.3	25.2	34.7	33.1	31.1	11.1	2.3	4.3	7.3	6.3	2.6	209	498	81
1986/87	54.6	55.6	45.7	55.3	70.1	30.4	12.3	7.0	3.6	7.6	5.0	6.0	354	608	83
1988/89	86.6	97.3	68.9	56.1	62.3	23.4	12.3	2.5	5.8	8.1	9.9	7.1	441	836	121
1989/90	87.9	70.7	51.9	53.8	48.6	41.8	11.6	11.1	7.7	10.8	8.8	8.9	416	816	110

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Table 3.3.–continued (page 2 of 2)

Season	Month												Total Harvest	Landings	Permits
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep			
1990/91	129.4	76.0	65.1	81.3	105.6	28.5	20.9	3.9	12.6	16.6	12.1	10.4	563	1,100	138
1991/92	226.2	166.0	110.3	104.9	79.4	54.2	18.4	14.3	12.7	10.8	16.8	8.8	823	1,560	177
1992/93	140.5	105.7	91.5	101.8	124.7	34.9	15.4	22.8	8.5	11.3	10.6	8.3	677	1,291	150
1993/94	174.3	194.6	99.2	131.1	130.5	44.5	22.4	25.0	23.2	20.4	26.3	24.4	916	1,650	182
1994/95	184.8	140.4	104.6	179.1	182.4	61.0	30.6	118.2	63.6	19.3	25.1	29.9	1,140	2,687	246
1995/96	463.0	205.3	119.1	73.3	41.4	38.8	8.3	11.3	9.4	6.9	8.4	1.4	987	2,843	351
1996/97	795.3	129.7	23.7	18.3	20.7	7.8	4.7	6.0	3.5	3.7	4.5	4.6	1,023	1,988	202
1997/98	757.0	57.9	30.9	3.7	6.8	5.6	7.5	9.4	10.1	*	*	0	868	1,759	198
1998/99	618.9	128.6	47.8	19.9	25.6	*	0	16.3	4.1	2.1	3.8	2.9	861	1,833	185
1999/00	639.8	96.9	39.0	33.3	24.5	CLOSED	CLOSED	18.0	8.2	12.2	CLOSED	*	870	1,373	157
2000/01	816.3	153.3	39.4	18.1	13.6	CLOSED	CLOSED	11.7	6.2	4.1	CLOSED	*	1,057	1,302	161
2001/02	841.2	120.9	26.3	17.9	17.3	CLOSED	CLOSED	11.8	9.4	5.3	CLOSED	*	1,047	2,440	172
2002/03	814.4	163.2	34.4	8.6	24.6	CLOSED	CLOSED	6.4	7.5	*	CLOSED	6.9	1,066	2,709	155
2003/04	918.1	154.5	12.4	16.7	8.4	CLOSED	CLOSED	8.4	5.7	8.5	CLOSED	CLOSED	1,133	2,801	156
2004/05	840.9	112.3	17.4	8.7	11.0	CLOSED	CLOSED	4.3	*	3.8	CLOSED	CLOSED	1,001	2,499	149
2005/06	800.2	114.0	21.9	13.1	16.8	CLOSED	CLOSED	2.7	*	*	CLOSED	CLOSED	976	2,320	143
2006/07	830.9	78.8	4.1	5.3	8.4	CLOSED	CLOSED	*	*	*	CLOSED	CLOSED	943	2,029	136
2007/08	518.4	91.8	16.1	34.4	30.7	CLOSED	CLOSED	16.9	11.6	5.1	CLOSED	CLOSED	728	1,614	108
2008/09	378.0	87.5	27.6	46.6	40.2	CLOSED	CLOSED	*	4.1	*	CLOSED	CLOSED	585	1,440	99
2009/10	543.8	58.2	18.0	16.1	12.1	CLOSED	CLOSED	*	*	*	CLOSED	CLOSED	656	1,609	109
2010/11	466.1	43.7	19.3	15.2	8.5	CLOSED	CLOSED	*	*	*	CLOSED	CLOSED	557	1,175	108
2011/12	533.4	14.5	*	*	3.7	CLOSED	CLOSED	*	*	0	CLOSED	CLOSED	565	1,005	110
2012/13	564.7	25.1	6.1	5.7	6.8	CLOSED	CLOSED	3.7	3.1	0	CLOSED	CLOSED	615	1,152	106
2013/14**	542.1	12.1	*	*	*	CLOSED	CLOSED	1.9	*	0	CLOSED	CLOSED	561	1,143	108
Avg. Pct. for 2004/05 to 2013/14	83%	9%	2%	2%	2%			1%	1%	<1%			-	-	-

Note: Harvest based on 2.0 conversion tail to whole weight and corrected fish tickets.

* Fewer than 3 permits were fished; information is confidential.

**The 2013/14 data should be considered preliminary.

Table 3.4–Guideline harvest levels for the Southeast Alaska commercial pot shrimp fishery by Area, in pounds whole shrimp from the 2002/03 through 2013/14 season, noting years when GHL changes were implemented.

Area	GHL											
	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
1	164,000	164,000	164,000	164,000	**98,400**	98,400	**78,700**	**50,000**	50,000	50,000	50,000	50,000
2	86,000	86,000	86,000	86,000	86,000	86,000	86,000	**65,000**	65,000	65,000	65,000	65,000
3-A	264,000	264,000	**198,000**	198,000	198,000	198,000	**158,400**	158,400	**95,000**	95,000	95,000	95,000
3-B/C	50,000	50,000	50,000	50,000	50,000	**40,000**	40,000	40,000	**30,000**	30,000	30,000	30,000
4	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
5	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
6	68,000	68,000	68,000	**82,000**	82,000	82,000	**68,000**	68,000	68,000	**24,000**	**38,400**	**36,800**
7	104,000	104,000	**78,000**	78,000	78,000	78,000	78,000	78,000	**54,600**	54,600	80,900	**77,500**
8	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	**15,000**	15,000	15,000	15,000
9	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	**14,000**	14,000	14,000
10	36,000	36,000	**48,000**	48,000	48,000	48,000	48,000	48,000	48,000	48,000	48,000	36,000
11 Sey*											**Exp****	15,000
11-Rem	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	**7,500**	7,500
12-Ten.	20,000	20,000	20,000	**28,000**	28,000	28,000	**17,000**	17,000	**10,000**	**Closed**	Closed	Closed
12-Rem.	15,000	15,000	15,000	15,000	15,000	15,000	**10,000**	10,000	10,000	10,000	**Closed**	Closed
13-A/B	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
13-C	30,000	30,000	**42,000**	42,000	42,000	**34,000**	**30,000**	30,000	30,000	30,000	**26,000**	26,000
14	20,000	20,000	20,000	20,000	**15,000**	15,000	**10,000**	**Closed**	Closed	Closed	10,000	Closed
15	20,000	20,000	20,000	**15,000**	**Closed**	Closed	Closed	**15,000**	15,000	15,000	15,000	15,000
16	20,000	20,000	**15,000**	**Closed**	Closed	Closed	**15,000**	**Closed**	**15,000**	**Closed**	**15,000**	**Closed**
Total	1,010,000	1,010,000	937,000	939,000	853,400	835,400	752,100	692,400	598,600	535,600	564,800	537,800

Note: The year when the GHL was changed is highlighted in bold type.

* After the 2012 board meeting, Seymour Canal GHL was split from the remainder of District 11

** The 2012/13 season in Seymour Canal was experimentally managed based on the Canadian Spawner Index system. This experiment was terminated when it became apparent that the approach would lead to overharvest of the stock.

Table 3.5–Registration Area A (Southeast Alaska) shrimp pot harvest in thousands of pounds, number of permits, and number of landings by district, by month, and for the 2011/12 season.

Area	Oct	Nov	Dec	Jan	Feb	May	Jun	Jul	Closure Date	Harvest Pounds	Permits	Landings
1	55.2	-	-	-	-	-	-	-	Oct-26	55,231	17	131
2	75.4	-	-	-	-	-	-	-	Oct-20	75,425	15	127
3-A	97.6	-	-	-	-	-	-	-	Oct-19	97.632	13	171
3-B/C	41.1	-	-	-	-	-	-	-	Oct-23	41,103	9	52
4	*	*	*	*	*	-	-	-	Feb-28	*	2	31
5	2.6	5.1	0	*	*	-	-	-	Jul-31	8,568	7	42
6	31.8	-	-	-	-	-	-	-	Oct-10	31,756	5	43
7	61.8	-	-	-	-	-	-	-	Oct-12	62,381	12	84
8	12.9	-	-	-	-	-	-	-	Oct-22	12,880	8	52
9	10.8	-	-	-	-	-	-	-	Oct-10	10,799	3	13
10	52.7	-	-	-	-	-	-	-	Oct-7	52,735	16	74
11	21.3	-	-	-	-	-	-	-	Oct-6	21,349	6	33
Tenakee	Closed	-	-	-	-	-	-	-		Closed		
R-12	8.3	-	-	-	-	-	-	-	Nov-11	8,339	7	43
13-A/B	12.8	*	-	-	-	-	-	-	Dec-3	15,345	6	28
13-C	37.4	-	-	-	-	-	-	-	Oct-4	38,233	21	51
14	Closed	-	-	-	-	-	-	-		Closed		
15	8.3	0	0	0	*	*	*	-	June-10[a]	14,766	5	29
16	Closed	-	-	-	-	-	-	-		Closed		
Harvest	533,373	14,520	*	*	3,732	*	*	-	Ann. harvest	*	-	-
Permits	146	9	1	2	3	2	2	-	Ann. permits	-	11	-
Landings	943	45	5	4	8	16	7	-	Ann. landings	-	-	1,199

* Fewer than 3 permits were fished; information is confidential.

[a] Reopened by emergency order from May 15 to July 31.

Table 3.6–Registration Area A (Southeast Alaska) shrimp pot harvest in thousands of pounds, number of permits, and number of landings by district by month, 2012/13 season.

Area	Oct	Nov	Dec	Jan	Feb	May	Jun	Jul	Closure Date	Harvest Pounds	Permits	Landings
1	71.7	-	-	-	-	-	-	-	Oct-21	71,690	19	141
2	74.8	-	-	-	-	-	-	-	Oct-15	74,807	12	111
3-A	107.6	-	-	-	-	-	-	-	Oct-16	107,643	17	156
3-B/C	33.1	-	-	-	-	-	-	-	Oct-29	33,146	9	68
4	*	*	0	*	*	-	-	-	Feb-28	*	2	30
5	*	0	0	*	*	-	-	-	Jul-31	*	2	17
6	37.7	-	-	-	-	-	-	-	Oct-11	37,695	7	69
7	82.9	-	-	-	-	-	-	-	Oct-17	82,853	11	124
8	12.9	-	-	-	-	-	-	-	Oct-21	12,854	9	55
9	16.5	-	-	-	-	-	-	-	Oct-11	16,495	6	35
10	40.3	-	-	-	-	-	-	-	Oct-9	40,321	15	70
11	28.4	0	0	0	*	-	-	-	Feb-20[a]	30,305	7	63
Tenakee	Closed	-	-	-	-	-	-	-				
R-12	Closed	-	-	-	-	-	-	-				
13-A/B	8.0	*	*	-	-	-	-	-	Feb-28	14,040	5	21
13-C	29.4	-	-	-	-	-	-	-	Oct-4	29,404	13	37
14	5.1	*	-	-	-	-	-	-	Nov-23	8,833	5	53
15	2.3	2.8	2.3	*	*	3.7	3.1	-	Jun-21[b]	15,775	7	76
16	*	*	*	-	-	-	-	-	Dec-11	*	1	27
Harvest	564,691	25,134	6,081	5,681	6,849	3,743	3,098	-	Ann. harvest	615,277	-	-
Permits	142	10	5	3	4	4	4	-	Ann. permits	-	106	-
Landings	1,008	64	21	12	21	30	30	-	Ann. landings	-	-	1,152

* Fewer than 3 permits were fished; information is confidential.

a Seymour Canal portion was closed Oct-8.

b Eastern portion of district was closed January7, and the remainder of the district was reopened by emergency order for summer season May 26 to July 31.

Table 3.7–Registration Area A (Southeast Alaska) shrimp pot harvest in thousands of pounds, number of permits, and number of landings by district by month, 2013/14 season.

Area	Oct	Nov	Dec	Jan	Feb	May	Jun	Jul	Closure date	Total pounds harvested	Area permits	Landings
1	55.0	-	-	-	-	-	-	-	Oct-14	54,965	16	114
2	62.2	-	-	-	-	-	-	-	Oct-19	62,250	17	154
3-A	123.2	-	-	-	-	-	-	-	Oct-13	123,238	17	132
3-B/C	26.8	-	-	-	-	-	-	-	Oct-19	26,766	13	52
4	*	*	*	0	*	-	-	-	Jul-31	12,554	4	45
5	2.6	*	0	0	0	*	*	-	Jul-31[a]	2,998	8	29
6	35.1	-	-	-	-	-	-	-	Oct-21	35,116	8	89
7	97.0	-	-	-	-	-	-	-	Oct-17	96,952	14	168
8	12.4	-	-	-	-	-	-	-	Oct-28	12,444	9	55
9	15.3	-	-	-	-	-	-	-	Oct-11	15,313	9	38
10	35.6	-	-	-	-	-	-	-	Oct-10	35,604	12	62
11	21.6	-	-	-	-	-	-	-	Oct-19[b]	21,570	6	43
Tenakee	Closed	-	-	-	-	-	-	-				
R-12	Closed	-	-	-	-	-	-	-				
13-A/B	17.0	5.9	-	-	-	-	-	-	Nov-25	22,857	10	48
13-C	26.8	-	-	-	-	-	-	-	Oct-4	23,577	15	32
14	Closed	-	-	-	-	-	-	-				
15	10.8	1.7	*	*	0	1.9	-	-	May-23[a,c]	14,630	7	84
16	Closed	-	-	-	-	-	-	-				
Harvest	*	12,138	*	*	*	*	*	-	Ann. harvest	560,834	-	-
Permits	156	11	2	1	1	5	1	-	Ann. permits	-	108	-
Landings	1,056	39	6	6	14	21	3	-	Ann. landings	-	-	1,143

* Fewer than 3 permits were fished; information is confidential.

[a] Reopened by emergency order for summer season from May 15 to July 31.

[b] Seymour Canal portion closed Oct-8.

[c] Eastern portion of District 15 closed Nov-8.

Table 3.8–Historical number of days open by area for the Registration Area A (Southeast Alaska) commercial pot shrimp fishery, 2001/02 through 2013/14 seasons.

Area	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
1	50	52	49	80	75	47	229	151	38	38	26	21	14
2	28	30	21	13	14	38	107	122	34	33	20	15	19
3-A	28	41	47	20	15	18	229	151	32	30	19	16	13
3-B/C	46	21	14	14	6	47	132	151	68	22	23	29	19
4	229	151	213	150	213	229	229	229	218	125	229	229	151
5	229	228	229	222	151	229	229	229	151	229	229	229	229
6	27	26	24	21	77	39	151	78	84	92	10	11	21
7	71	39	113	37	30	22	59	78	84	34	12	17	17
8	35	31	18	37	37	30	151	151	73	92	22	21	28
9	25	32	24	30	19	16	14	12	24	49	10	11	11
10	14	16	12	11	8	8	9	16	9	8	7	9	10
11-Sey*												8	8
11-Rem	116	73	48	43	43	19	15	19	10	10	6	143	19
12-Ten	6	6	6	3	5	4	3	4	3	2	Closed	Closed	Closed
12-R	90	31	37	23	16	12	10	9	10	19	42	Closed	Closed
13-A/B	151	97	152	152	30	17	14	151	151	229	64	229	56
13-C	4	5	5	5	6	5	7	5	4	6	4	4	4
14	194	110	107	68	151	151	151	151	Closed	Closed	Closed	54	Closed
15	163	129	230	226	151	Closed	Closed	Closed	151	151	229	192	151
16	66	151	152	151	Closed	Closed	Closed	127	Closed	54	Closed	72	Closed

Note: For recent years, the fall season October 1–February 28, has been 151 days. The summer season, May 15–July 31, plus the fall season has generally been 229 days.

* After the 2012 board meeting, the Seymour Canal GHL was split from the remainder of District 11.

Table 3.9–Stock status, confidence information, and standardized scores for the 2013/14 season of the Registration Area A (Southeast Alaska) commercial pot shrimp fishery. Standardized scores are used to compare among districts and range from +1 to -1. The standardized score is calculated as the raw score divided by the total possible score for a given management unit.

Management Unit	Stock Status	Confidence	Std. Score
District 1	Moderate	0.27	-0.15
District 2	Below Average	0.47	-0.37
Section 3-A	Moderate	0.28	0.07
Sections 3-B/C	Moderate	0.15	-0.18
District 4	Moderate	0.18	0.00
District 5	Below Average	0.15	-0.56
District 6	Moderate	0.35	0.01
District 7	Moderate	0.65	0.16
District 8	Poor	0.18	-0.82
District 9	Below Average	0.14	-0.50
District 10	Poor	0.37	-0.65
Seymour	Poor	0.18	-1.00
District 11	Above Average	0.03	0.50
Tenakee	Below Average	0.41	-0.51
Remainder of District 12	Closed	NA	NA
Sections 13-A/B	Below Average	0.18	-0.38
Section 13-C	Moderate	0.44	0.05
District 14	Closed	NA	NA
District 15	Moderate	0.20	0.04
District 16*	Moderate	0.10	0.20

*District 16 is on a rotational fishery. Scores are from the most recent open season, which was 2012/13.

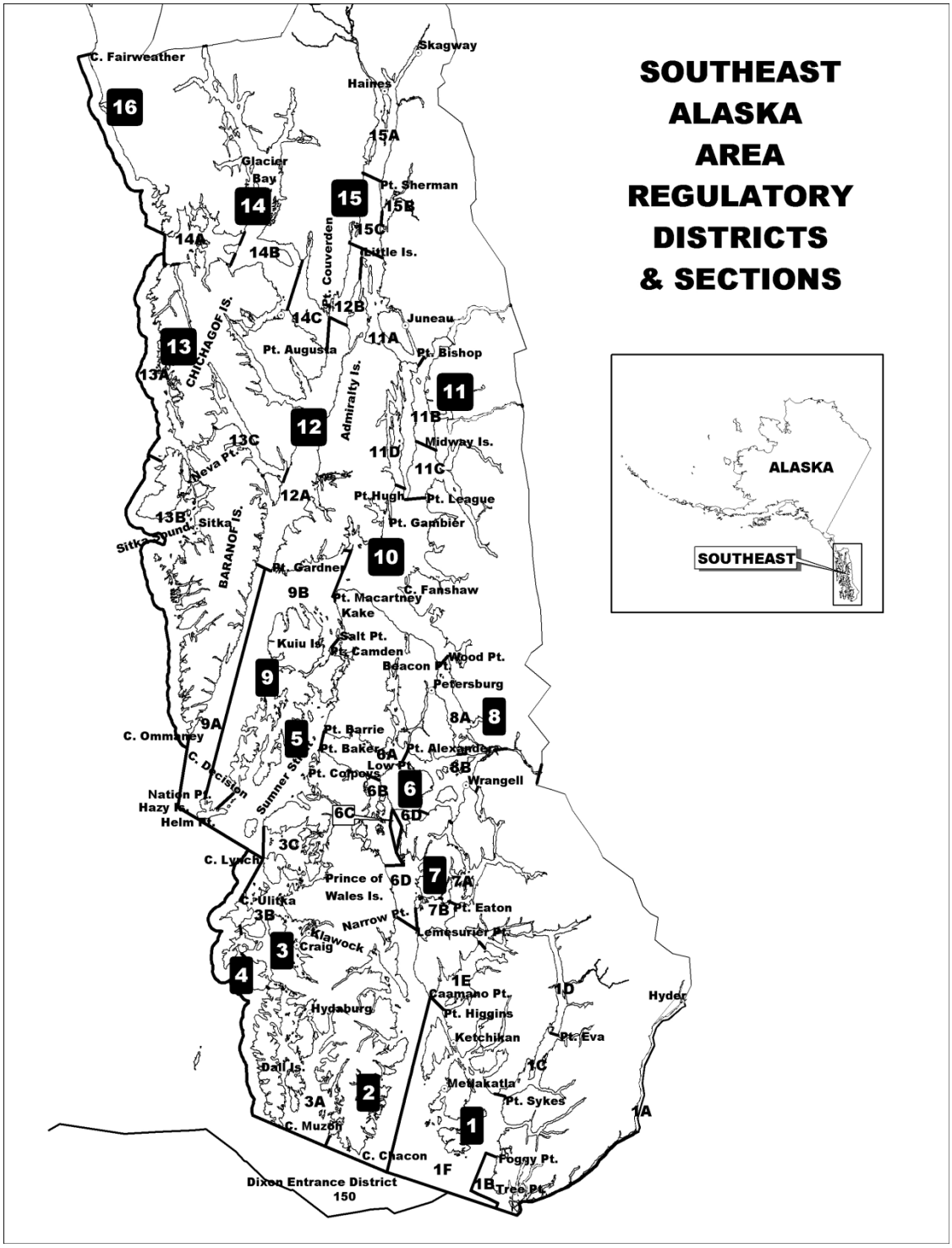

Figure 3.1–Shrimp pot fishery management units in Registration Area A (Southeast Alaska).

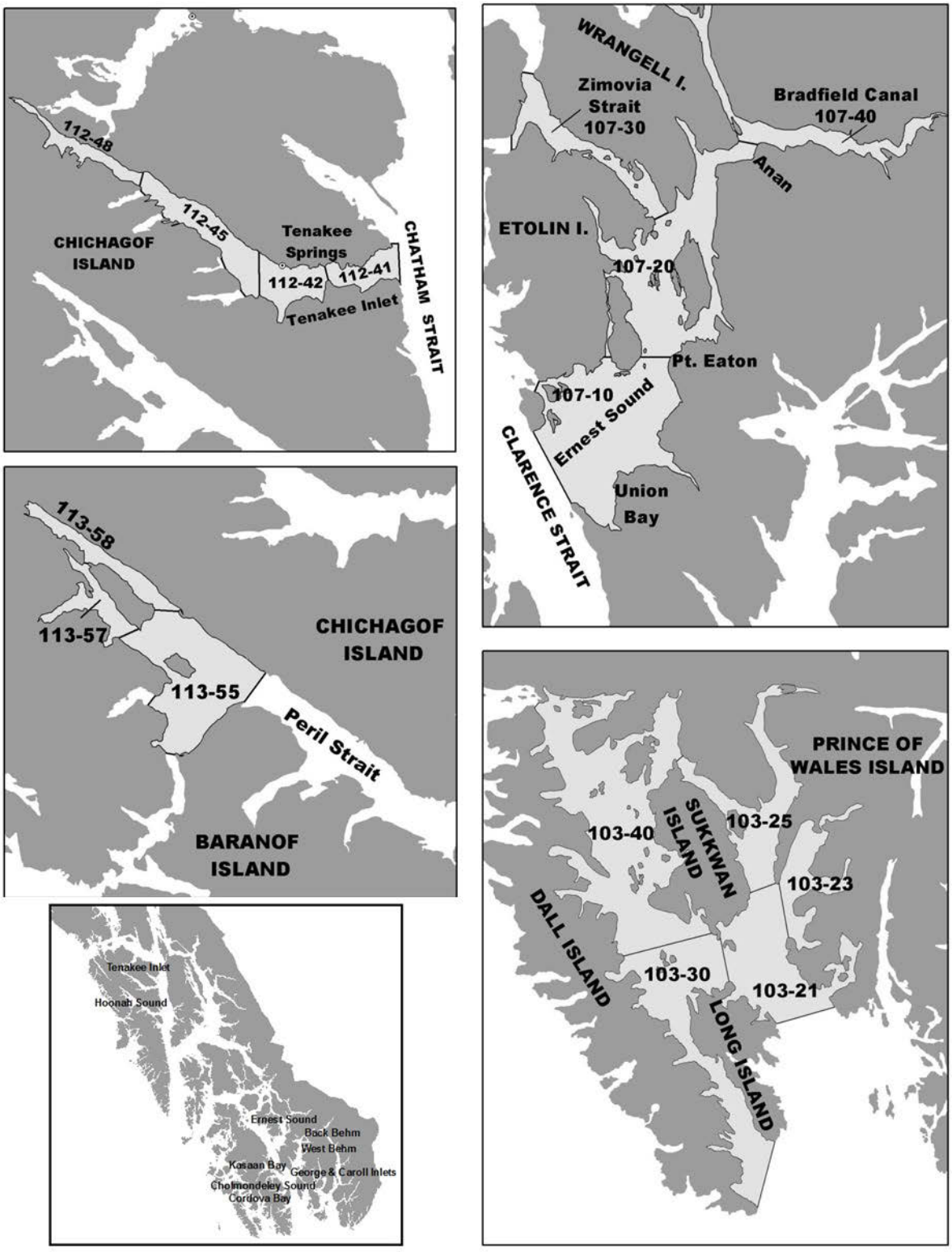

Figure 3.2–Areas currently surveyed for stock assessment of the shrimp pot fishery in Registration Area A (Southeast Alaska).

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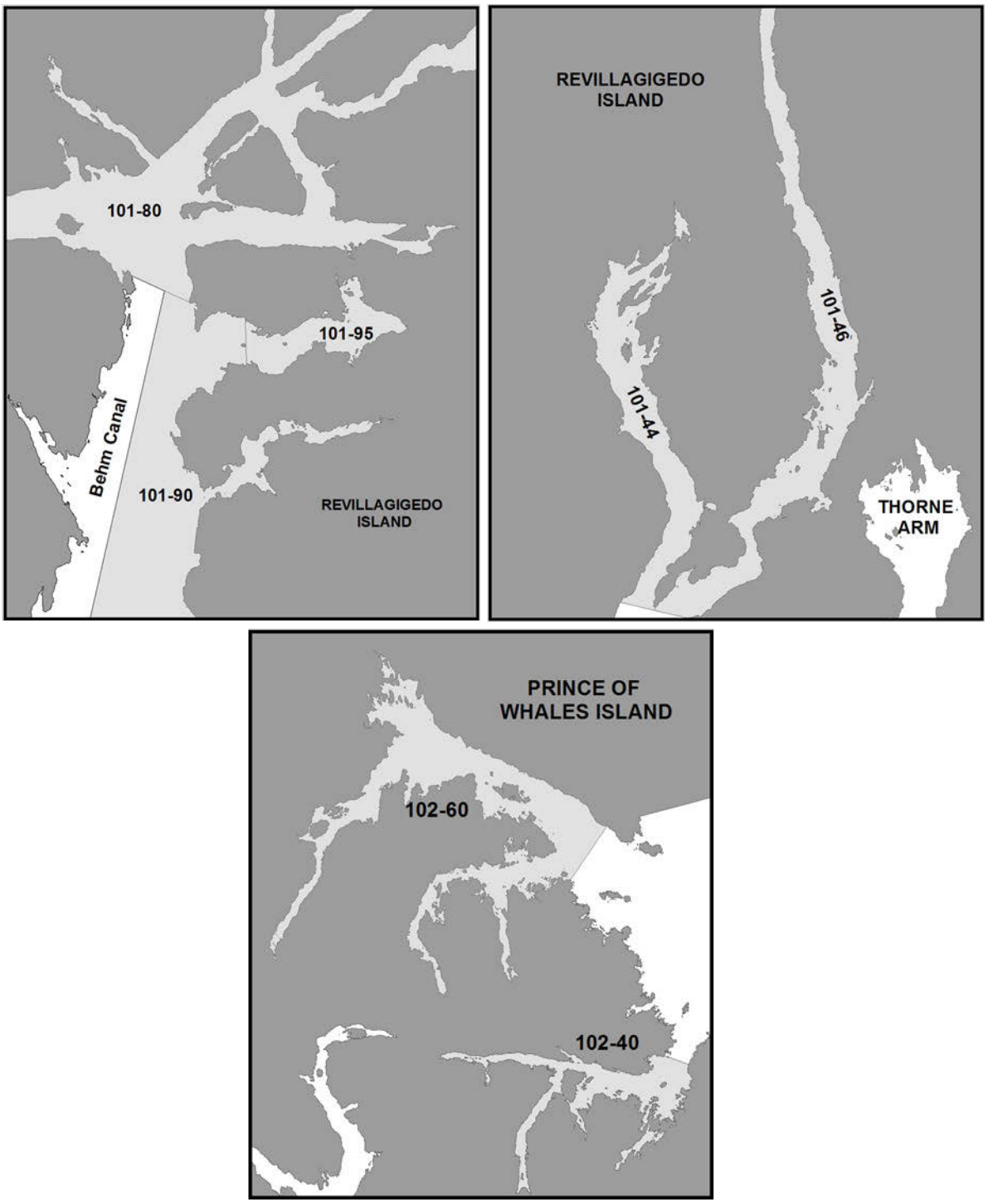

Figure 3.2–Page 2 of 2.

CHAPTER 4: YAKUTAT SHRIMP OTTER TRAWL FISHERY

INTRODUCTION

COMMERCIAL FISHERY

This report describes the commercial otter trawl fishery for shrimp in the Yakutat Area (Registration 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 vessels using otter trawl gear that have participated in the Yakutat shrimp fishery have also participated in shrimp fisheries in other registration areas. In the Yakutat Area, most otter trawl harvest has occurred in waters of Yakutat Bay and Icy Bay. Major processors and markets used to exist in Kodiak, Seward, Valdez, and Astoria, Oregon.

The largest historic harvests targeted northern shrimp *Pandalus borealis*, with smaller quantities of sidestripe shrimp *Pandalopsis dispar* also retained. Other species incidentally captured and landed in much smaller quantities include coonstripe shrimp *Pandalus hypsinotus*, humpy shrimp *P. goniurus*, and spot shrimp *P. platyceros*. Northern shrimp are harvested in large volumes but with a relatively low exvessel value. Significant quantities of incidentally captured sidestripe shrimp were often retained because of their relatively high economic value.

Otter trawls are double-bridled and fish best on smooth, level substrate. 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, other 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 4.1). During the past 23 seasons, there have only been 6 seasons when harvests exceeded 100,000 pounds, and these all occurred between 1977 and 1987. Harvests are confidential for 10 seasons when there were a limited number of boats and landings.

The highest harvest on record was in the 1980/1981 season, when a harvest exceeding 1,900,000 pounds was reported by 16 vessels making 23 landings (Table 4.1). Most of this volume was harvested in Yakutat Bay during the fall (Table 4.2) by larger vessels that 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. These northern shrimp (pink shrimp and small sidestripe shrimp) were the predominate species harvested through the 1987/1988 season. No harvest was reported from the 1988/1989 and 1989/1990 seasons.

There was a small resurgence in the fishery from the 1990/1991 through the 1993/1994 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 northern shrimp 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 (Table 4.3). There were no harvests reported for the 1994/1995 through 1998/1999 seasons.

The Alaska Department of Fish and Game (department) conducted stock assessment surveys in Yakutat Bay from 1980 through 1984 (Table 4.4). 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 pounds of all species of shrimp combined and an average composition of 70% northern shrimp and 30% sidestripe shrimp. No surveys have been conducted since 1984. The abundance of northern and sidestripe shrimp in Icy and Yakutat bays is unknown.

REGULATION DEVELOPMENT

Initially the entire Yakutat Area (Registration 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 1980/1981 season was closed by emergency order (EO), regulations were developed in cooperation with the Yakutat Advisory Committee and brought before the Alaska Board of Fisheries (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 1982/1983 season, a 30,000 pound monthly guideline harvest level (GHL), closed waters, and season opening and closing dates were implemented by regulation and EO. 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.

In 1997 the board eliminated trawl shrimp fishing in the contiguous waters of Yakutat Bay east of a line from the westernmost tip of Ocean Cape to the westernmost tip of Point Manby, including the waters of Russell and Nunatak fjords.

FISHING SEASONS

In 1981 a fishing season from June 21 through February 14, opened and closed by EO, 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 and since 1997, the fishery has been further restricted to Icy Bay only.

GUIDELINE HARVEST LEVELS

Initial GHLs 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 rate 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 GHL of 1.28 to 2.0 million pounds for Yakutat Bay for the 1981/1982 season. In 1982 the board amended the harvest level to 30,000 pounds/month to

prevent taking the entire GHL early in the season. This monthly harvest level was also established to provide opportunities for local Yakutat residents to enter the commercial fishery. In 1997 fishing for shrimp with trawl gear was eliminated from Yakutat Bay.

In 1997 a trawl shrimp guideline harvest range (GHR) was established for Icy Bay of a harvest between 50,000 and 350,000 pounds for the entire fishing season. Permit holders were required to contact the department, obtain logbooks, and attach them to the fish ticket at time of delivery.

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. In 1997 the board discussed limiting gear to beam trawl only but did not take action to do so. During periods specified by EO when the fishery targets sidestripe shrimp, there are regulations defining the minimum mesh size that may be used in order to reduce the bycatch of other shrimp species. Incidental shrimp species retention was limited to 10% 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 was closed to commercial trawling through early 1997. At that point, all waters of Yakutat Bay east of a line from the westernmost tip of Ocean Cape to the westernmost tip of Point Manby were closed to shrimp trawling. The commercial closure protects important subsistence fishing grounds and prevents conflict with growing commercial pot shrimp fisheries in these areas.

MANAGEMENT CONCERNS

Except for the directed sidestripe fishery provisions in regulation, there is no legal trawl gear description in regulation for the traditional northern shrimp fishery. Since the collapse of the northern shrimp market in Southeast Alaska, effort has been almost non-existent in the Yakutat area. It is likely that future effort in the fishery will target the larger sidestripe shrimp. If the fishery is once again prosecuted, 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. Additional regulations to separate traditional northern shrimp and sidestripe fisheries may be necessary to assure adequately conservative management for sidestripe populations.

STOCK ASSESSMENT

Trawl surveys have not been conducted in Registration Area D since September 1984 (Table 4.4), and the current condition of the shrimp stocks is unknown. Future sustained harvests would require stock assessment surveys to verify seasonal abundance and new regulations to ensure adequate monitoring and reporting of both the harvest of target species and incidental bycatch. If landings increased, it could become necessary to incorporate bycatch criteria into the management strategy for this fishery.

RECENT SEASONS

No shrimp were reported taken with trawl gear in the Yakutat Registration Area during the past 3 seasons. The last harvest of shrimp taken with trawl gear occurred in November of the 2004/2005 season (Table 4.2).

CHAPTER 4: TABLES AND FIGURES

Table 4.1–Registration Area D (Yakutat) shrimp trawl harvest, number of vessels, number of landings, pounds per vessel, and pounds per landing, 1976/77 to present.

Year/ Season	Harvest in pounds	Number of permits	Landings	Pounds per permit	Pounds per landing
1976/77	*	*	*	*	*
1977/78	0	0	0	0	0
1978/79	0	0	0	0	0
1979/80	*	*	*	*	*
1980/81[a]	1,906,68	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	*	*	*	*	*
No Harvest in seasons 1994/95 through 2003/04					
2004/05	*	*	*	*	*
No Harvest in seasons 2005/06 through 2013/14					

a The 1980/1981 season includes 450,000 pounds caught by otter trawl out of Yakutat Bay during the fishery (August 1980) but not reported on fish tickets.

* Fewer than 3 permits were fished; information is confidential.

Table 4.2–Registration Area D (Yakutat) shrimp trawl harvests in thousands of pounds by month and season, 1976/77 to present.

	Month												
Season	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
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	0.0
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	0.0
1979/80	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0	*	*
1980/81[a]	0.0	0.0	*	1,350.0	481.9	0.0	0.0	0.0	0.0	0.0	24.3	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	*	154.7	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	0.0
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	0.0
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	*
No Harvest in seasons 1994/95 through 2003/04													
2004/05	0.0	0.0	0.0	0.0	0.0	0.0	*	0.0	0.0	0.0	0.0	0.0	0.0
No Harvest in seasons 1905/06 through 2013/14													

a The 1980/1981 season includes 450,000 pounds caught by otter trawl out of Yakutat Bay during the fishery (August 1980) but not reported on fish tickets.

* Fewer than 3 permits were fished; information is confidential.

Table 4.3–Registration Area D (Yakutat) shrimp trawl fishery harvest in thousands of pounds, by season and district, 1979/80 to present.

	District						
Season	181	183	189	191	Total	Landings	Permits
1976/77	*	0	*	0	*	*	*
1977/78	0	0	0	0	0	0	0
1978/79	0	0	0	0	0	0	0
1979/80	0	*	*	0	*	*	*
1980/81	556.8	1349.9	0	0	1906.7	23	16
1981/82	0	*	0	0	*	*	*
1982/83	*	*	0	0	141.7	7	3
1983/84	310.4	*	0	0	426.6	10	5
1984/85	*	*	0	0	*	*	*
1985/86	*	0	0	0	*	*	*
1986/87	*	0	0	0	*	*	*
1987/88	40.5	0	0	0	40.5	6	3
1988/89	0	0	0	0	0	0	0
1989/90	0	0	0	0	0	0	0
1990/91	0	*	*	0	*	*	*
1991/92	0	*	0	0	*	*	*
1992/93	0	*	*	0	34.9	3	3
1993/94	0	*	0	0	*	*	*
No Harvest in seasons 1994/95 through 2003/04							
2004/05	*	0	0	0	*	*	*
No Harvest in seasons 1905/06 through 2013/14							

* Fewer than 3 permits were fished; information is confidential.

Table 4.4–Summary of shrimp research cruises in Yakutat Bay, Alaska.

Begin Date	Vessel	Cruise Number	Gear	Strata	Tows	Shrimp per nm (lbs)	Percent Northern Shrimp	Percent Sidestripe Shrimp	Area Surveyed (nm^2)	Estimated biomass (lbs x 10^6)	Confidence limits of biomass estimate (lbs x 10^6)
March, 1953	*R/V John N. Cobb*	COBB15	20' Beam		26	297.42[a]			Unknown	Unknown	Unknown
September, 1980	*R/V Resolution*	8008	32' NMFS[b]		9	680.56	91	8	50.01	6.46	4.73 to 8.19
March, 1981	*R/V John N. Cobb*	JC81-01	32' NMFS		24	231.00	43	57	105.70	4.38	3.04 to 5.72
August, 1981	*R/V Pandalus*		32' NMFS		22	196.27	72	27	50.01	1.86	1.13 to 2.60
September, 1982	*R/V Resolution*		32' NMFS	2	14	141.53	47	53	50.01	1.43	1.05 to 1.64
September, 1982	*Resolution*		32' NMFS	3	5	206.00	65	35	12.89	0.50	0.30 to 2.13
September, 1984	*R/V Pandulus*		32' NMFS	2	22	181.06	61	38	50.01	1.72	1.31 to 2.13
September, 1984	*R/V Pandulus*		32' NMFS	3	3	230.33	93	7	12.89	0.56	0.24 to 0.89

Source: Schaefers and Smith 1954

[a] Figure in pounds of pandalids per trawl hour. Species composition unknown quantitatively. Report suggests a preponderance of sidestripe shrimp.

[b] National Marine Fisheries Service gear is an otter trawl.

CHAPTER 5: YAKUTAT SHRIMP POT FISHERY

INTRODUCTION

COMMERCIAL FISHERY

Both spot shrimp *Pandalus platyceros* and coonstripe shrimp *Pandalus hypsinotus* are harvested, primarily from rocky habitat located in Yakutat Bay, by fishermen using baited pot gear, which is either longlined or fished singly from vessels ranging in length from small skiffs up to about 40 ft. In a longline system, each pot is attached to the groundline with a snap, similar to that used on longlined snap-on groundfish gear. Pot construction is extremely varied in size, shape, weight and configuration, so it is difficult to describe a "standard" pot.

Management of the commercial shrimp pot fishery in the Yakutat Area is largely passive. Regulations are limited to a closed season to prevent fishing during the egg-hatch period from March 1 to April 30, mesh large enough to pass a three-quarter-inch diameter dowel, a pot limit of 30 pots per participant when fishing in Yakutat Bay, and a prohibition of trawling in productive areas heavily utilized by the pot fishery. Fish ticket data assists in tracking major trends or changes in stock status. The Yakutat area has had a separate section in the regulatory code since 1985.

FISHERY DEVELOPMENT AND HISTORY

The first reported landings occurred in the Yakutat Area during the 1969/1970 fishing season. For the next ten seasons, landings occurred during only two seasons. Participation and landings have been fairly consistent since the 1982/1983 fishing season, with a peak landing of 29,830 lbs occurring during that season. The peak effort level of 15 permits occurred during the 1995/1996 season, when 13,418 lbs were landed. Average landings have totaled 7,705 pounds by six vessels per season (Table 5.1). Usually only the tails are sold by the shrimpers 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 $10.50 per pound 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 1982/1983 season occurred during the month of September.

REGULATION DEVELOPMENT

Management of the commercial shrimp pot 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 a 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 lbs 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. In 1997 the Alaska Board of Fisheries (board) adopted separate monthly GHLs

for two portions of Yakutat Bay for each month the fishery is open. By doing so, the total seasonal harvest potential was effectively doubled to 20,000 lbs.

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 coincided with the major egg-hatch period, which was assumed to be similar to that of Southeast Alaska for the spot prawn. In 1997 separate fishing periods were adopted for portions of Yakutat Bay. In the waters running east of a line from the northernmost point of Khantaak Island to Logan Bluff and east of a line from the northernmost point of Khantaak Island to the northernmost point of Doggie Island, the season runs from October 1 through February 28. The remaining waters of Yakutat Bay east of a line from the westernmost tip of Ocean Cape to the westernmost tip of Point Manby are open May 1 through February 28. The remainder of the Yakutat Area outside the bay remains open throughout the year.

SIZE RESTRICTION

The board policy on small shrimp discourages harvest of shrimp less than two years of age. A mesh size restriction is used in lieu of specific regulations for a minimum legal size in order to reduce the harvests of small shrimp. The mesh size assumes that passive sorting through minimum mesh webbing minimizes the retention of smaller male, transitional, and female prawns and coonstripe shrimp.

GEAR RESTRICTION

A mesh restriction specifying 1.5-inch 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 provided some protection to approximately one- or two-year classes of small shrimp. Prior to 1997 only a portion of the pot was required to have the minimum mesh panels. Current regulations require that the pot be entirely covered with webbing or rigid mesh. At least two opposing sides of the pot must have a webbed panel of 1.5-inch stretch mesh if a permit holder is fishing inside Yakutat Bay. The 1.5-inch minimum mesh size allows the retention of smaller shrimp, compared to the Southeast Alaska fishery.

A pot limit of 75 pots per vessel was established in 1985 for Yakutat Bay. Even with the relative stability with regard to the number of permit holders up until the 1995/1996 season, fleet members considered the number of allowable pots to be more than the fishery could withstand. Current regulations allow for a limit of 30 pots per vessel inside Yakutat Bay. Along with the pot reduction adopted in 1997, trawling is prohibited within all waters of Yakutat Bay.

There are no pot limits, mesh restrictions, or other harvest-limiting gear regulations for all waters in the Yakutat Registration Area outside of Yakutat Bay. Additional regulatory requirements for commercial shrimp pot gear include maximum tunnel perimeters (15-inch), buoy markings, and escape mechanisms.

GUIDELINE HARVEST LEVELS

In the mid-1990s several larger southeast pot shrimp vessels and a floating processor entered the fishery in Yakutat Bay. Although their presence was transitory, it did lead to closure of the

commercial fishery in the bay, changing in-season starting and ending dates and implementation of a GHL for the commercial harvest.

During the 1996/1997 season, a GHL of 10,000 lbs 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 was 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 represented a higher harvest than the prior 10-year seasonal average but was lower than the maximum historical harvests in the early 1980s.

While there had not been a consistent trawl shrimp fishery in Yakutat Bay, surveys in the early 1980s demonstrated harvestable stocks capable of supporting a fishery with a monthly quota of 30,000 lbs. In 1997 the board prohibited continuation of trawl shrimping inside Yakutat Bay. This prohibition to trawl gear may maximize the availability of coonstripe shrimp to pot gear, but does eliminate harvest of pink and sidestripe shrimp. Coupled with this trawl prohibition, separate monthly GHLs were established for two portions of Yakutat Bay. In waters of Yakutat Bay east of a line running from the northernmost point of Khantaak Island to Logan Bluff and the waters east of line running from the northernmost point of Khantaak Island to the northernmost point of Doggie Island, the monthly GHL is 2,000 lbs for each month the fishery is open. This provides a potential season total of about 10,000 lbs. For the remaining waters of Yakutat Bay that are east of a line running from the westernmost tip of Ocean Cape to the westernmost tip of Point Manby, the monthly GHL is 1,000 lbs for a potential seasonal total of 10,000 lbs.

RECENT SEASONS

Fewer than 3 permits were fished in the 2008/2009, 2010/2011, 2012/2013, and 2013/2014 seasons, and catch records are confidential. In 2009/2010 3 permit holders harvested 3,026 pounds and made 30 landings (Table 5.1). Effort and landings were less than half of average. No dockside sampling or skipper interviews were conducted, and no fish ticket size data are available.

CHAPTER 5: TABLES AND FIGURES

Table 5.1–Registration Area D (Yakutat) shrimp pot fishery harvest, number of landings, and CPUE, 1971/72 to present.

Season	Harvest (lb)	Number of Permits Fished	Number of Landings	Lb per Landing	Lb per permit
1971/72	0	0	0	0	0
1972/73	0	0	0	0	0
1973/74	0	0	0	0	0
1974/75	*	*	*	*	*
1975/76	0	0	0	0	0
1976/77	0	0	0	0	0
1977/78	0	0	0	0	0
1978/79	0	0	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	13,418	15	103	123	848
1996/97	20,862	14	218	96	1,490
1997/98	9,546	10	135	71	955
1998/99	11,833	14	127	93	845
1999/00	4,107	8	76	54	513
2000/01	28,674	13	167	172	2,206
2001/02	16,746	13	152	110	1,288
2002/03	11,943	12	143	84	995
2003/04	4,514	8	57	79	564
2004/05	2,280	5	28	81	456
2005/06	7,397	6	74	100	1,233
2006/07	752	4	17	44	188
2007/08	*	*	*	*	*
2008/09	*	*	*	*	*
2009/10	3,026	3	30	101	1,008
2010/11	*	*	*	*	*
2011/12	*	*	*	*	*
2012/13	3,638	4	78	47	909
2013/14**	*	*	*	*	*
10 year average	2,100	3	30	70	700

* Fewer than 3 permits were fished; information is confidential.**The 2013/14 data should be considered preliminary.

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