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Stock Status of Spot Shrimp in Southeast Alaska Prior to the 2008–09 Season

by

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

Symbols and Abbreviations

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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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ABSTRACT

Spot shrimp, *Pandalus platyceros*, are targeted by a pot fishery in Southeast Alaska. This species is a protandric hermaphrodite with fairly stenophilic temperature and hard bottom habitat requirements; there is limited Alaska-specific life history information. A fixed quota harvest strategy was employed; data were reviewed annually to determine stock status. Guideline Harvest Levels (GHLs) were set within a Guideline Harvest Range (GHR) and targeted inseason. The upper limits of Guideline Harvest Ranges, originally set based on historical harvest levels, have since been adjusted. A minimal stock assessment program has been developed to support management; this includes fishery-independent pot surveys in 4 of 19 management units, accounting for 38% on average of the annual harvest; commercial catch sampling and logbooks, and commercial catch and effort data. Data on shrimp size, the size at which 50% are female (L_{50}), catch-per-unit-of-effort (from surveys, logbooks, and commercial harvest information), and on harvest rate estimates from Leslie depletion modeling of logbook data were analyzed. The current season's data were compared to established baselines and scored to designate a stock status of "Good", "Moderate", "Poor", or "Unknown". A confidence rating was also determined for each stock status based on the proportion of actual to possible data pieces. Of 19 management units, stock status was poor in 9, moderate in 8, good in 0, and unknown in 2. Confidence levels ranged from 0.15 to 0.66. Ranges for adjustments to Guideline Harvest Levels were suggested for Poor, Moderate, and Good stock status designations. Suggested ranges are intended to provide for rapid response under poor stock conditions but only gradual increases because of the "data-poor" assessment of this fishery. A rotational harvest strategy or 3-yr closure is recommended for management units with low Guideline Harvest Levels and poor stock status.

Key words: Spot shrimp, *Pandalus platyceros*, stock assessment, Southeast Alaska, pot fishery, management

INTRODUCTION

LIFE HISTORY

Life history information on spot shrimp, *Pandalus platyceros*—the target species for the shrimp pot fishery in Southeast Alaska—is limited. Thus, much must be inferred from examining life history information from Prince William Sound and British Columbia studies of *P. platyceros* and from North Atlantic studies of congeneric *P. borealis*.

Spot shrimp are widely distributed within the North Pacific Ocean. They occur from the intertidal to depths of greater than 1,500 feet, from the Korea Strait to the Sea of Japan, along the Siberian east coast, and from Unalaska to San Diego, California (Butler 1964).

Larvae hatch at night, assisted by the female, who moves her pleopods while swimming or clinging to something to expel them. The free-swimming larvae spend up to three months in the plankton. Five larval stages are reported, stages I to IV being zoea, and stage V being a megalopa (Price and Chew 1972). Five juvenile stages are reported prior to maturation to a functional, adult male (Berkeley 1930; Haynes 1985).

All pandalid shrimp are protandric hermaphrodites; they mature and spawn first as males, and 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 one or two seasons in British Columbia (Butler 1964). The transition from male to female occurs during the late winter and early spring, and shrimp mature as females at two or three years of age in British Columbia (Berkeley 1930). Interannual and spatial variability in the size at which shrimp transition, quantitatively expressed as the length at which 50% are female (L_{50}) has been well-described for congeneric *Pandalus borealis*, and declines with increased growth rates, as a function of either a substantial decrease in shrimp density or an increase in water temperature (Koeller et al. 2003; Wieland 2004). Females undergo another molt into "breeding dress," characterized by deepened abdominal pleura and elongated setae on the pleopods, in the late summer or fall, after which they extrude mature eggs from their internal ovaries. Eggs are

fertilized externally as they are extruded and become attached to the pleopods, where they are carried until fully developed. Near Petersburg, Hynes (1930) found an average count of 3,900 eggs per female. In Alaska, eggs may be held until the onset of the spring phytoplankton and zooplankton blooms during late March to mid-May.

Reports of the duration of the female period of spot shrimp life history vary. Females are not thought to survive long after the release of eggs in British Columbia while in Alaska, multiple size classes of female shrimp have been documented during Alaska Department of Fish and Game (ADF&G) surveys (Love and Bishop 2005). This suggests either multiple spawnings of individual females or a protracted and highly variable age at transition; however, the L_{50} within a year and location of Alaskan shrimp is not correspondingly variable. Two sizes of female spot shrimp have also been reported during some years in Hood Canal, Washington (Chew et al. 1974).

Similarly, there is no consensus on the maximum age of spot shrimp and it is likely to be longer in higher latitudes with colder bottom water temperatures. A maximum age of five years has been found in Canada (Butler 1964), while a tagging study from Prince William Sound, Alaska estimated the maximum age at 7 or more years (Butler 1964; Kimker et al. 1996).

There is an ontogenetic change in the habitat of spot shrimp. Juvenile spot shrimp inhabit shallow water eelgrass and *Laminarium* or *Agarum* spp. kelp but at a size of approximately 20 mm CL they 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 1980).

The concept of meta-populations may apply to spot shrimp. Although larvae are planktonic and may be widely transported by currents, juveniles and adults are relatively sedentary. Tagged adults remain within a mile or two of their release location (Kimker et al. 1996). Larval advection into bays and fjords in Southeast Alaska may depend on prevailing wind patterns and currents and larvae in some inshore waters may experience very small-scale entrainment patterns. Thus, depleted waters could be repopulated by a distant larval "source".

Pandalid shrimp populations are vulnerable from a number of standpoints to water temperatures outside their narrow preference (3 to 6ºC for *P. borealis*). First, delays may ocurr in both egg extrusion timing and in the number of breeding females associated with temperatures outside this range (Nunes 1984). Second, increased water temperatures result in declines in L_{50}, which causes decreased average mature female size and population fecundity. This can result in a decline in recruitment (Koeller et al. 2003).

STOCK ASSESSMENT PROGRAM DEVELOPMENT

The assessment program for spot shrimp, *Pandalus platyceros*, in Southeast Alaska was initiated in 1996. The program incorporates information from 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 became available and as the fishery product form and gear evolved.

The goals of the shrimp pot survey are to 1) develop a useful index of abundance for spot shrimp, 2) estimate the size composition of spot shrimp captured, 3) estimate L_{50} of spot shrimp population, and 4) describe the species composition of bycatch. For a more detailed description of the development of the shrimp pot survey see Love and Bishop (2005).

The goals of sampling the commercial fishery are as follows: 1) to estimate spot shrimp carapace length (CL) frequency, either of the population (using unsorted shrimp), or of the commercial harvest (using sorted shrimp); and, 2) to estimate L_{50}.

Commercial catch sampling has been conducted from four different sample site types, some of which have been discontinued as the fishery and stock assessment program have evolved. The 4 types are as follows: 1.) sampling of unsorted shrimp delivered to floating processors; 2.) sampling of sorted shrimp dockside; 3.) sampling of unsorted shrimp onboard catcher-processors; and, 4.) sampling of unsorted shrimp on the grounds from catcher-processors. A regulation giving the department the authority to require observers onboard floating processors was promulgated by the Alaska Board of Fisheries at its 1997 meeting (5 AAC 31.144). Accordingly, sampling aboard floating processors was initiated, with dual objectives of providing the department with the opportunity to sample unsorted shrimp and of assuring that harvest was reported. Shrimp deliveries in Districts 1, 2, 3, 9, 10, and 11 were sampled during the 1997, 1998 and 1999 seasons. Subsequently, the shrimp pot fishery became short and intense, and an increasing proportion of the fleet became catcher-processors; by 1999, only 2 trips in District 3 were sampled and by 2000 floating processors ceased to operate. Sampling DS was also initiated in 1997 first in Districts 1, 6, 7, 14, and 16 and gradually expanding into Districts 3, 4, 8, 10, 11 and 15. However, dockside deliveries gradually dwindled as the proportion of the catcher-processor harvest increased until by 2002 only Districts 6, 7, 8, 11, 14 and 15 were regularly being sampled DS. By 2007, this had dwindled further to Districts 6, 7, and 8 only, due to shifting or declining harvests in Districts 11, 14, and 15. Sampling onboard catcher-processors was conducted in Districts 1 and 2 in 2000 and 2003; this work ceased in 2004 due to budget reductions. This data is not analyzed herein because of the very short time series. As the fishery intensified, on-the-grounds sampling began in 1998, with dual objectives of obtaining catch-per-unit-effort (CPUE) information to accurately target guideline harvest levels (GHLs) inseason and of collecting sampling data from unsorted shrimp. District 2, Sections 3-A, and 3-B/C, Districts 6, 7, 8, 9, 10, Tenakee, and Section 13-C have been sampled in this way; recent trips have focused on District 2, Sections 3-A and 3-B/C, Districts 6, 7, 9, 10, and Section 13-C.

Beginning in 1997, spot shrimp have been regularly sampled and frozen from Districts 1, 2, 3, 6, 7, 8, 10, 11, and 14 for later laboratory determination of sex. Occasional size-at-sex samples have also been taken from Districts 4, 5, and 9 and 16. The sampling protocol does not call for taking inseason size-at-sex samples from Districts 3, 7, 12 and 13 which are regularly sampled for size-at-sex during the survey.

Fish tickets, on which are recorded harvest in pounds, effort in pot lifts, and location of harvest accurate to subdistrict, are mandatory for all commercial shrimp vessel landings. Catcher-processor vessels have been required to write daily fish tickets since 2003. Other shrimp pot fishing vessels must record each landing on a fish ticket. Accurate effort (pot lifts) information is available only for catcher-processors and, for them, only since 2005. Fish tickets do not require shrimp harvest to be broken into size category.

A voluntary logbook program was initiated in 2005 with the objective of collecting size-specific spot shrimp CPUE data from catcher-processors. Participating fishermen provide the department with definitions of their size categories at the beginning of the season and inseason record their harvest information by shrimp size category on their daily fish tickets. This information is 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 2007 in all districts except those which have seen limited effort (District 4) or have been closed during this time period (Districts 15 and 16); however, for many districts there is insufficient data for either analysis, either because of limited effort or limited participation.

MANAGEMENT PROGRAM

The Southeast Alaska pot shrimp fishery is managed inseason by emergency order to accurately target guideline harvest levels (GHLs) established by the department for each management unit. Guideline Harvest Ranges (GHRs) were first established in regulation in 1997 following initial implementation of separate, district-specific GHRs by emergency order for the 1995/95 season (Chapter 5, Alaska Administrative Code 5AAC 31.115. Shrimp Pot Guideline Harvest Ranges for Registration Area A). The lower limit of each GHR is 0 (indicating that an area may not open during a season), and the upper limits were originally set based on average harvest levels from the 1990/91 to the 1994/95 seasons. GHRs have been adjusted several times for many, but not all, management units. The first adjustment in 2000 was made to subdivide the GHR for District 3 into separate GHRs for Section 3-A and Sections 3-B and 3-C, and to account for the use of a more accurate conversion factor from tail weight to whole weight. The change in the conversion factor from 1.67 to 2.0 provided a more accurate determination of harvest levels during the 1990/91–1994/95 historic base period when much of the harvest was landed in the form of shrimp tails. Some GHRs were changed in 2003 because both Districts 12 and 13 had been further subdivided into smaller management areas. By the 2005/06 season the department had changed several GHL for inseason management to levels above or below GHRs in regulation. In 2006, 5AAC 31.115 was again was modified by increasing the upper GHR limits for eight management areas. This regulation was changed so that future annual GHL adjustments by the department would be made within levels established in regulation. The GHR adjustments in 2006 had been requested by the department since GHLs in four areas had been set above the current, historically determined GHRs; these and other GHR adjustments were advanced by industry to provide the department greater flexibility when setting GHLs.

A thorough review of the history of, and rationale for, GHL changes by management unit—including the timing for creation of new management units—is provided in the triennial Board of Fisheries report (Bishop and Stratman 2006). GHL recommendations are made annually based on stock assessment results. In 2004, decision rules were established to guide GHL determination based on stock status designation. A stock status designation of "Poor" was associated with a 20% reduction in GHL, a stock status of "Moderate" was associated with no GHL change, while a stock status of "Healthy" was associated with a GHL increase of 20%. These guidelines were in place through 2005. For 2006 and 2007, "Poor" stock status was changed to a 20–40% reduction, "Moderate" to a 0–20% reduction and "Healthy" to a 20–40% increase. This change was made to allow for discretion when setting GHLs, based on the strength of the stock assessment results, amount of data available to evaluate stock status, or the general level of concern about a stock. Once established, GHLs for each management unit are targeted for a period of three years unless there are compelling, data-supported reasons to do otherwise.

During this period, most of the same data were used for stock assessment; however, the final stock status determination was essentially subjective.

OBJECTIVES

The objective of this report is to provide a stock status and the confidence in stock status for each management unit of the shrimp pot fishery in Southeast Alaska.

METHODS

A combination of fishery-independent (surveys) and fishery-dependent (logbook, fish ticket, on-the-grounds-sampling (OTG), and dockside sampling (DS)) data was collected to assess the relative changes in abundance, and the overall stock condition of the spot shrimp in order to maintain a long-term sustainable harvest. The current year's stock assessment, though similar in concept to previous years, has undergone substantial improvements to provide a more consistent and logical framework from which more objective determinations of stock status can be made. The major changes are as follows: 1) redistribution of data into biologically relevant analysis areas; 2) streamlining the stock status matrix; 3) redesigning of matrix scoring and stock status determination; and, 4) more consistent process for changing GHLs.

ANALYSIS AREAS

Each management unit was divided into between 1 and 7 separate analysis areas, by combining subdistricts that are spatially related, or based on the distribution of fishing effort within the management unit (Table **1**). These analysis areas were then each individually weighted by a long-term average of commercial harvest. This provides a more accurate evaluation at the management unit level, since harvest varies dramatically among subdistricts.

STOCK STATUS MATRIX

The overall health of spot shrimp populations for each analysis area was assessed by statistically comparing the current year's data to long-term baselines and by analyzing short-term trends. This provides an objective and repeatable method for decision-making. Stock status for each area was determined through an examination of the following response variables: CPUE, harvest rate, mean carapace length, and L_{50}. In assessing stock status, each response variable was scored independently and weighted equally. Currently, there is no evidence to support weighting certain response variables more than others (though this will be examined in the future). If the current year response was significantly above the long-term average (defined below) it was scored +1, if not different than the long-term average it was scored 0, and if it was significantly lower than the average it was scored -1. Short-term trends (defined below) were scored as +0.25, 0, or -0.25 for significant increase, no change, or significant decrease, respectively. In order to detect long-term changes in mean CPUEs, a t-test was performed to detect any difference between 2007 mean CPUEs and the long-term baseline CPUEs. A 4-year linear regression analysis was used to detect any long-term trends. The total analysis area score was the weighted sum of the long- and short-term scores for each response variable for each management unit (weighted by analysis area). The possible range of scores for a given area was divided into three equal categories: "Poor" for the lowest ⅓ of possible scores, "Moderate" for the middle ⅓, and "Good" for the highest ⅓ of the possible scores. For example, if the scores ranged from +3 to -3 the categories would be: "Poor" < -1, "Moderate" -1 to +1, and "Good" > +1. For ease of regionwide interpretation, the overall scores for each district were also standardized to range from +1 to -1.

Data are separated into four broad categories: CPUEs, harvest rates, mean carapace lengths, and L_{50}. CPUEs can be used as a relative index of population size. However, CPUE data can be difficult to interpret with the confounding effects of changes in fishing effort, gear type, animal behavior, and population size. Three independent CPUEs were used depending on the data available: survey CPUE of ≥XL (≥ 40 mm carapace length) shrimp, standardized commercial CPUE, and logbook CPUE of ≥XL shrimp. Although each method provides a relative index of shrimp abundance, none provide an ideal measure due to trade-offs in their collection methods. Survey CPUE data is by far the most standardized from year to year and provides the greatest resolution in detecting changes in population size. Survey effort and gear is consistent over years and sample sizes are small enough to not produce a bias from over-sampling. Over-sampling (i.e. many pots fishing in the same area) can lead to non-independent data, which inhibits the logical interpretation of results. Also, since shrimp are individually measured, CPUEs can be separated by size class and thus allow a focused view on large shrimp. This removes any potential bias of changes in CPUEs due to changes in catchability, and provides the most sensitive measure of population change. The downside to survey CPUE is the assumption that the relatively small spatial scale of the survey is representative of the entire district.

Commercial CPUE information is difficult to interpret even where standard and accurate measures of effort exist. This is because commercial fishermen are able to increase effort in ways that are difficult to quantify in order to maintain an economically profitable harvest level even as populations decline. Specific examples of this include, improved navigational plotting equipment allowing fishermen to better pinpoint habitat, improved gear efficiency, changes in bait type or volume, and changes in sorting. This problem is known to be particularly acute for fisheries on species with very limited distributions (Orensanz et al. 1998). Since the shrimp pot fishery in Southeast Alaska has had accurate units of effort only since the 1996/97 season, and the species has a limited distribution, commercial CPUE is an insensitive index and declines in CPUE are likely to be observed only after large changes in population size. Nonetheless, for many districts it is the only information available. In addition, raw commercial CPUE cannot be separated by size class and therefore lacks resolution. However, the sample size of commercial CPUEs is much higher than that of survey CPUE. This leads to much better representation of the full spatial scale of the fishing grounds, but also has the potential to introduce bias due to over-sampling (due to non-independence of data). To improve the utility of commercial CPUE data, a standardized CPUE is used to describe trends in CPUE. Commercial CPUEs were standardized by effort. The season with the smallest effort (fewest potlifts) was used as the standard and all other years' data was trimmed to match this effort as closely as possible. All data were sorted by date to ensure CPUE was calculated from the first potlifts of the season. The long-term baseline to which the current year's data was compared consists of all years from the 2001/02 to the 2007/08 season (where sufficient data existed). The short-term score was based on a regression analysis of the last four years (including the current year).

The CPUEs calculated from commercial logbooks provide a compromise between the unbiased, high resolution survey data, and the biased, lower resolution commercial data. Since size class information is recorded on logbooks, CPUE of large shrimp can be calculated. Also, since commercial fishing occurs over a much broader scale, the spatial extent of the data should be better, however voluntary logbook data is available for only the most recent three years. Simple analysis of variance (ANOVA) followed by a Tukey HSD (honestly significant difference) test was conducted to detect short-term trends in logbook CPUE and to identify differences between

years. Declines in the 2007 season relative to either 2005 and/or 2006 were scored -1, while no difference was scored as 0, and an increase scored as +1.

The goal of harvest rate strategies is to maximize sustainable yield. Harvest rates generally correlate with growth, longevity and reproductive rates of the exploited species (i.e., faster growing, shorter-lived and more fecund species tend to tolerate higher harvest rates). Harvest rates calculated using harvest data provide an estimate of the overall fishing pressure on the exploited shrimp population. Harvest rates can be estimated by using a Leslie depletion model with commercial logbook data. The Leslie depletion model is used to estimate the exploitable population size of a fished area. From this estimate, the harvest rate can be estimated by dividing the total catch in an area by the estimated population size. For a detailed description of the Leslie depletion model, see Siddon et al. (2009).

The system for scoring harvest rates was dually based. First we applied the work of Kimker et al. (1996), who found that the maximum age of *Pandalus platyceros* in Prince William Sound exceeded 7 years of age; we used 8 as the maximum age, and applied the equation of Hoenig (1983) to estimate natural mortality at M=.55. We set F equal to M which yields a limit annual harvest rate of 42%. Second, we conducted a literature survey to check limit reference points for harvest rates currently in use for fisheries on North Atlantic *P. borealis* populations, which has a similar life history, maximum age and natural mortality to *P. platyceros*. In Maine, Clarke et al. (2000) found that yield and egg-per-recruit modeling showed that F = .34 or an annual mortality of 29%, was sustainable; they estimated the maximum age at 5 so this population could likely support a more aggressive harvest strategy than the more long-lived spot shrimp. In the past, a 35% target exploitation rate was used for *P. borealis* stocks with natural mortality in the range of M=.5 to M=.8 in eastern Canada (Mohn et al. 1992). However, this fell out of favor when it was exceeded for several stocks with no apparent ill effects and since then, stock-specific limit reference points for F have been established. For *P. jordani* in California, F_{MSY}, which should be considered a limit reference point, was estimated at 0.5 or 39% annually (Abramson and Tomlinson 1972). For Icelandic *P. borealis*, Skuladottir (1979) calculated an F_{MSY} of .4 or 33% annually with M assumed to be 0.2. On the high side, for Norwegian populations, yield-per-recruit modeling estimated an $F_{0.1}$ of 0.76 or 53% annually assuming an M of 0.75 (ICES 2000). Therefore, estimated harvest rates of ≥XL shrimp for Southeast Alaska are scored as: excessive (-1), for harvest rates exceeding 50%; moderate (0), for harvest rates ≥40% and ≤50%; or good (+1), for those less than 40% annually. As logbook data accumulates, it may be possible to develop an F_{limit} specific to Southeast Alaska using the empirical relationship between stock trends and harvest rate estimates.

The mean carapace length (CL) is an index of the relative population structure. Decreases in mean CL can theoretically arise from an increase in the relative proportion of small shrimp (e.g., large recruitment event) or a decrease in large shrimp (e.g., high harvest rates). Conversely, increases in mean CL can arise from an increase in large shrimp or a decrease in small shrimp. These possibilities make the interpretation of changes in mean CL difficult. However, pre- and postseason shrimp pot surveys conducted in Districts 3 and 7 showed that the removal of large shrimp actually increases the catchability, and hence the CPUE, of small shrimp postseason (Clark and Love 2003). This suggests that a decrease in mean CL is more likely a result of decreases in larger shrimp rather than a large recruitment (of small shrimp). In order to detect changes in mean CL, a t-test was conducted to test the difference between the 2007 sample mean and the long-term baseline mean. Baselines for commercial samples consisted of the mean of the

first three sampled years for each area having three or more trips and a sample size of 200 or more shrimp and for survey data, the long-term baseline is based on the first three years with a sample size of 200 or more shrimp.

The unique plasticity of the size at sex change of this genus makes the L_{50}, useful as an indicator of population status. For *P. borealis*, L_{50} has been shown to decline with increased growth rates, as a function of either a substantial decrease in shrimp density or an increase in water temperature (Koeller et al. 2003; Wieland 2004). Thus, decreases in L_{50} result in decreased population fecundity, as fecundity increases with size for most pandalid shrimp species; this can lead to reductions in recruitment levels and (further) reductions in population size. Unlike the other metrics described above, L_{50} data is little affected by catchability issues and changes in L_{50} are more easily interpreted. However, since change in reproductive age is a population level response, changes in L_{50}s are likely to respond more slowly than other metrics. In order to detect changes in L_{50}, the confidence interval around the 2007 sample mean was compared with the long-term baseline value. Baselines established for commercial samples consisted of the mean of the first three sampled years for each area having three or more trips and a sample size of 200 or more shrimp and for survey data the long-term baseline is based on the first three years with a sample size of 200 or more shrimp.

Other information that is used in the stock assessment are qualitative data and a measure of confidence in the overall interpretation of available data. Qualitative data, though difficult to analyze can provide useful insight into the overall stock assessment, especially in data poor areas. Information such as changing markets, fuel prices, weather, etc. can help interpret changes in season length, overall harvest, distribution of harvest, and effort. Direct communication with fishermen can provide their impression of stock health. These "manager's scores" were scored as +1, 0, or -1.

The confidence level of the stock assessment for each analysis area is assessed according to the number of data pieces for the current season compared to the total possible number. This provides a metric of our ability to interpret the overall stock health of a given area. Areas with low confidence should be treated with a more precautionary approach.

RECOMMENDATIONS

In general, data availability for spot shrimp stocks in Southeast Alaska is inadequate to estimate absolute 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. Changes in GHLs should be considered based on the stock status designation, which is based on a standardized score, and confidence levels. For management units with a "Poor" designation, a GHL reduction of at least 20% should be considered. For those with a "Moderate" designation a 0–20% reduction in GHL should be considered, and for those with a "Good" designation a 0–20% increase should be considered. Decreases in GHLs must be large enough to be effective, and increases not so large as to produce future declines. Stock status designations are categorical for simplicity, and due to the lack of resolution on a continuous scale. For example, if a management unit is designated as "Moderate," but is very close to being "Poor," a GHL adjustment on the conservative end of the scale could be made. In addition, as confidence in stock status declines, more conservative actions should be taken.

When a more risk-prone strategy is chosen, data collection for future analyses should be increased. Special consideration should also be taken for management units with GHLs ≤20,000

lbs; when stock status is poor but a decrease would reduce the GHL to a level difficult to accurately target, a three-year closure or rotational fishery (two years of fishing and one closed season, or one year of fishing followed by two closed seasons should be considered.

RESULTS AND DISCUSSION

An overview of stock status for all management units is provided in Table 2. Boundaries of management units (districts and sections) are shown in Figures 1, 2, and 3.

DISTRICT 1

The GHL for this district increased from 145,000 to 164,000 pounds in the 2000 season, it was subsequently held steady through the 2005 season (Table 3). In response to poor fishery performance, the GHL was reduced to 98,400 pounds beginning with the 2006 season; management error has averaged +6% and harvest has averaged 150,000 pounds since the 1998/99 season, excluding the current season, which is ongoing. This district is divided into 7 analysis areas (Back Behm Canal, East Behm Canal, West Behm Canal, Boca de Quadra, Inner Ketchikan Inlets, Portland Canal, and Revilla Channel/Gravina) with weights of: 0.26, 0.20, 0.12, 0.05, 0.20, 0.15, and 0.02 respectively (Tables 3 and 4) There is evidence of serial depletion in this district, with the GHL being achieved through a change in the distribution of harvest, as declining East and West Behm Canal harvest is balanced by increases from Back Behm Canal, Portland Canal, Inner Ketchikan, and Revilla Channel/Gravina analysis areas.

The 2007 commercial CPUE for District 1 is significantly below the long-term baseline for all 5 analysis areas and short-term CPUE is declining significantly in 1 of 5 analysis areas, with no significant trend in the other 4 areas (Tables 3 and 4). Overall, the CPUE is 0.75 lbs/pot below the long-term baseline.

There is no 2007 commercial logbook data for District 1, so logbook CPUE is not scored, however; a significant decline in CPUE between 2005 and 2006 was observed for 1 of the 2 analysis areas for which there was data in both years, there was no significant difference for the other (Tables 3 and 4, Figures 4 and 5).

Depletion estimators fitted to 2005 and 2006 data were significant for Back Behm Canal in 2005 and 2006; and West Behm and Boca de Quadra in 2005 only, yielding harvest rate estimates of 55%, 70%, 60%, and 70% respectively (Figures 6 and 7). It should also be noted that while a linear regression is being fitted to the relationship between CPUE and cumulative catch to estimate the population size as the X intercept, the relationships between CPUE and cumulative catch visually displayed in Figures 6 and 7 are curvilinear. Thus the population size is overestimated and the harvest rate underestimated by the use of a linear function. This is cause for concern considering the harvest rates estimated using this method are already the highest in the region. The lack of significance of the estimator for Inner Ketchikan Inlets, and Portland Canal (Figure 7) could be a function of either insufficient data or low harvest pressure. Implementing 100% logbook coverage would eliminate some of the ambiguity in these estimators.

There is no recent data on trends in carapace length for District 1 from either dockside or on-the-grounds sampling (Figure 8).

There is no recent data on trends in L_{50} for District 1 from either dockside or on-the-grounds sampling (Figure 9).

The manager's score reflects that much of the sporadic harvest in the past season is largely driven by market conditions and is considered a neutral indicator. However, two analysis areas (East and West Behm Canal) were considered to show some negative indicators.

The overall matrix score is -1.22 (poor) and has .18 (low) level of confidence.

DISTRICT 2

The GHL for this district increased from 65,000 to 86,000 pounds in the 2000 season (Table 5), and accuracy of management has averaged +13% and harvest 92,000 pounds since the 1998/99 season. This district is divided into 3 analysis areas: Lower Clarence, Middle Clarence, and Lyman Cleveland Shoreline with weights of 0.19, 0.80, and 0.01 respectively. The catch coming from the Middle Clarence analysis area is increasing, while that of Lower Clarence is decreasing and there has been almost no harvest from the Lyman Cleveland shoreline since the 1996/97 season.

The commercial CPUE for District 2 is significantly below baseline, with significant short-term declines for Lower Clarence, but does not differ from baseline nor have any significant short-term trends for Middle Clarence (Figure 10).

There is no 2007 commercial logbook data for District 2, so logbook CPUE is not scored, however; there was a significant decrease in the CPUE of XL and larger sized spot shrimp between 2005 and 2006 for Middle Clarence (Tables 5 and 6).

Since there is no 2007 commercial logbook data for District 2, logbook harvest rate is not scored; however, an excessive harvest rate of 60% was estimated for the Middle Clarence analysis area in 2005 (Figure 11).

The on-the-grounds mean carapace length for 2007 was available only for the Middle Clarence analysis area and did not differ significantly from the long-term baseline (Figure 12).

The on-the-grounds L_{50} for 2007 had too small of a sample size to be reliable (Figure 13).

The overall matrix score is -0.24 (moderate) and has .27 (low) level of confidence. This is based on declining or stable commercial CPUE.

DISTRICT 3

Section 3-A

The GHL for this section was established at 264,000 pounds beginning with the 2000 season, when Section 3-A was split from Sections 3-B and C and given a separate GHL. Prior to this time, the GHL for the entire district had been 200,000 pounds. In response to poor stock status, the Section 3-A GHL was decreased to 198,000 pounds beginning with the 2004 season (Tables 7 and 8). Since the 2000/01 season, management accuracy has averaged +6% and harvest has averaged 248,000 pounds, (excluding the current season which is ongoing). This section is divided into 4 analysis areas (Hetta Inlet, Lower Cordova Bay, Mid Cordova Bay, and Upper Cordova Bay) with weights of 0.20, 0.20, 0.10, and 0.50 respectively. The bulk of the catch in this section comes from the Upper Cordova Bay and Lower Cordova Bay analysis areas. However, the harvest from these two areas has been steadily declining, shifting harvest pressure to Hetta Inlet and Mid Cordova Bay analysis areas.

Survey CPUE of XL and larger-sized shrimp have significantly declined relative to the long-term baseline for both the Hetta Inlet and Mid Cordova Bay analysis areas. However short-term trends are not significant (Figure 14).

The commercial CPUE for Section 3-A was below baseline for all but the Upper Cordova Bay analysis area (Figure 15).

Logbook data for 2007 was available only for the Lower Cordova Bay analysis area, where there was a significant decline in CPUE of size XL and larger shrimp between 2006 and 2007 seasons; significant decreases in the CPUE were also documented for Mid and Upper Cordova Bay analysis areas between 2005 and 2006 seasons (Table **8**).

The depletion estimator for the Lower Cordova Bay analysis area was not significant in 2005, 2006 or 2007; graphic examination of the plot suggests this may be a function of low effort and serial shifts of effort between subdistricts rather than a low harvest rate. Excessive harvest rates of 52%, 76%, and 88% were documented for Mid Cordova in 2005, and Upper Cordova in 2005 and 2006 respectively, however the regression for Mid Cordova in 2006 was not significant, although effort was similar to that of 2005 (Figure 16).

Survey data show that mean carapace length is well below the long-term baseline for both Hetta Inlet and Mid Cordova Bays; short-term trends show a significant decrease for Mid Cordova and an increase for Hetta Inlet (Figure 17).

Only Upper Cordova analysis area was sampled for mean carapace length by on-the-grounds sampling in 2007 and it was significantly below the long-term baseline (Figure 18).

There was no significant difference for either Hetta Inlet or Mid Cordova Bay analysis areas of the 2007 compared to baseline L_{50}s from survey data. Nor were there significant short-term trends (Figure 19).

2007 sample sizes from on-the-grounds L_{50} sampling of Section 3-A had inadequate sample sizes for the purposes of statistical testing (Figure 20).

The manager's score reflects that the sporadic harvest in the past season is largely driven by market conditions and is considered a neutral indicator.

The overall matrix score is -4.49 (poor) and has .41 (moderate) level of confidence. This is due to a declining commercial CPUE, declining survey CPUE of size XL and larger shrimp, declining logbook CPUE, declines in the survey mean carapace length over both long and short-term, and a decline in on-the-grounds sampling mean carapace length.

Sections 3-B/C

The GHL for these sections increased to 50,000 pounds in 2000 when they were split from Section 3-A, and were given their own GHL (Tables 9 and 10). Beginning with the 2007 season, the GHL was decreased to 40,000 pounds in response to poor stock status; management accuracy for this section has averaged +20% and harvest 52,000 pounds since the 2000/01 season. This district is divided into 2 analysis areas (Craig and Sea Otter Sound), with weights of 0.4, and 0.6 respectively. The analysis area composition of harvest in this section has changed substantially since the 1995/96 season, from coming primarily from the Craig analysis area to predominantly Sea Otter Sound.

The standardized commercial CPUE in Sections 3-B/C is declining for both analysis areas, but only for the Sea Otter Sound area is the decline significant (Figure 21).

It is not possible to detect trends in logbook CPUE as there was logbook data only from Sea Otter Sound in 2005.

The Leslie Depletion estimator for the Sea Otter Sound logbook data in 2005 showed a non-significant regression, so no harvest rate was estimated (Figure 22).

2007 mean carapace length data is available only for the Sea Otter Sound analysis area, and does not differ significantly from the long-term baseline (Figure 23).

2007 L_{50} data is available only for the Sea Otter Sound analysis area, and the sample size was insufficient to determine whether it differs significantly from the long-term baseline (Figure 24).

The overall matrix score is -0.60 (moderate) and has .25 (low) level of confidence. This is due to a significant decline of commercial CPUE in one analysis area while the other showed a non-significant decline, and stable mean carapace length and L_{50} from on-the-grounds sampling.

DISTRICT 4

The GHL for this district has been 20,000 pounds since GHLs were first established in the 1995 season. Excluding the current season, which is ongoing, management accuracy has been -17% while harvest has averaged 17,000 pounds since the 1998/99 season (Tables 11 and 12). This district is not divided into analysis areas.

The commercial CPUE for the 06/07 season is significantly below baseline and declining (Figure 25).

There is no other data available and there has been no harvest to date for the current season. Harvest for the past two seasons has not reached the GHL despite record numbers of landings.

The overall score for this district is -1.25 (poor), and level of confidence is .18 (low).

DISTRICT 5

The GHL for District 5 has remained unchanged at 20,000 lbs since 1995. Excluding the current season, which is ongoing, management accuracy has averaged -30%, and harvest 14,000 lbs since the 1998/99 season (Tables 13 and 14). This district is divided into 3 analysis areas: Affleck/Port Beauclerc, Rocky Pass, and Cape Pole to Point Baker with weights of 0.60, 0.35, and 0.05 respectively. The spatial composition of harvest is highly variable in this small-GHL district; but there appears to be a declining contribution of the Cape Pole and Rocky Pass analysis areas and increased reliance on the Affleck/Port Beauclerc area (Figure 26). In 2006/07 season, for the first time, 100% of the harvest came from this latter area and the district failed to reach its GHL. There has been no harvest at all in this district for the 2007/08 season.

Commercial CPUE data is all that is available from the three analysis areas (Affleck, Rocky Pass, and Cape Pole to Pt. Baker). CPUE data from all areas show no significant differences from their long-term averages and no short-term trends. The average combined CPUE for D5 is 1.93 lbs/pot (Figure 26).

The manager's score reflects that much of the sporadic harvest in past years is driven by market conditions, fuel, etc. and is considered a neutral indicator.

The overall matrix score is 0.00 (moderate) and has .17 (low) level of confidence.

DISTRICT 6

The GHL in District 6 was increased to 82,000 lbs in the 2005/2006 season, but remained constant at 68,000 lbs for the 10 prior seasons. Management accuracy since the 1998/99 season has averaged -4%, while harvest has averaged 68,000 lbs (Tables 15 and 16). District 6 is divided into 3 analysis areas (Sumner Strait, SW Etolin, and Upper Clarence) with weights of 0.07, 0.13, and 0.80 respectively. Although most of the harvest comes from the Upper Clarence analysis area, the spatial composition of harvest has been fairly stable. However, this area has failed to achieve even half of its GHL in twice the normal season in 2007/08 (Tables 15 and 16).

The commercial CPUE is at its baseline of 2.8 lbs/pot for Sumner Strait. The current season CPUE is nearly 1.5 lbs/pot lower than its long-term baseline for SW Etolin, and 1.1 lbs/pot lower in Upper Clarence. Both areas also show significant short-term declines in CPUE over the past four years (Tables 15 and 16; Figure 27).

There was no 2007 logbook data in this district so no score was applied. CPUEs between 2005 and 2006 did not differ significantly for any analysis areas.

The harvest rates for the Upper Clarence analysis area were estimated as 63% and 38% respectively of size XL and larger shrimp in 2005 and 2006 (Figure 28).

Mean carapace lengths for both on-the-grounds and dockside sampling show no difference from the long-term average and no short-term trends (Tables 15 and 16; Figures 29 and 30).

L_{50} data is significantly below (1.3 mm) the long-term baseline, but shows an increase over the short-term (Tables 15 and 16; Figure 31).

The manager's score reflects that although market conditions and fuel were significant factors, personal accounts also raised concern regarding poor stocks in SW Etolin and Upper Clarence; these are negative indicators for the two analysis areas.

The overall matrix score is -2.86 (poor) and has a 0.41 (moderate) level of confidence.

DISTRICT 7

The GHL in District 7 was reduced to 78,000 lbs beginning with the 2004 season, prior to this it was 104,000 lbs from the 2000 to 2003 seasons and 100,000 lbs from the 1995 to 1999 seasons. There has been a steady decline in the coonstripe harvest in this district. Management accuracy has averaged -6%, while harvest has averaged 86,000 lbs since the 1998/99 season (Tables 17 and 18). District 7 is divided into 4 analysis areas (Bradfield, Lower Ernest Sound, Upper Ernest Sound, and Zimovia Strait) with weights of 0.2, 0.2, 0.5, and 0.1 respectively. There have been no large changes in the analysis area composition of the harvest. The District 7 pot shrimp survey is conducted within the lower and upper Ernest Sound areas.

Survey CPUEs of shrimp ≥ XL are significantly below (40–50%) baseline and declining in lower Ernest Sound (Tables 17 and 18; Figure 32).

Commercial CPUEs are relatively stable for all areas except Upper Ernest Sound, which shows significantly higher CPUE than average and a short-term increase (Figure 33). In addition, logbook data from Upper Ernest Sound shows significantly greater catch of large shrimp compared to the past 2 years.

2007 depletion estimators for the Upper Ernest Sound analysis area did not result in a significant regression despite a fairly substantial amount of data, suggesting that harvest rate is fairly low

(Figure 34). This was also the case for Lower Ernest Sound, although it could have been a function of low data availability here. Harvest rates estimated by depletion method in 2005 for Bradfield were excessive (58%) while for Upper Ernest they were moderate (43%; Table 17, Figure 34).

Mean carapace lengths are mostly stable, with survey data showing a short-term significant increase for Upper Ernest Sound (Table 17, Figure 35) and on-the-grounds sampling showing no significant short or long-term effects (Tables 17 and 18; Figure 36) while dockside shows significant increases in both short and long-term for Bradfield (Tables 17 and 18; Figure 37).

Survey results show significant declines in L_{50} estimates for both lower and upper Ernest Sound, and on-the-grounds showed stable estimates for Bradfield and Zimovia Strait (Tables 17 and 18; Figures 38 and 39).

The manager's score reflects a mix of positive and neutral indicators. Reports of better than normal catches (though there was a lower effort) in Upper Ernest Sound provides a positive indicator, while low effort but some fishermen concern about the stock in Bradfield canceled to provide a neutral indicator.

The overall matrix score is +0.68 (moderate) and has a 0.66 (moderate) level of confidence. We note that there are discrepancies between survey and fishery dependent data (fish ticket, logbook, etc.) in the Ernest Sound area that need to be watched closely in subsequent seasons.

DISTRICT 8

The GHL in District 8 has been held steady at 20,000 lbs since the 1997/98 season, prior to that time a GHR of 75,000–100,000 lbs was established for Districts 6 and 8 combined. Management accuracy since the 1998/99 season has averaged -2%, while harvest has averaged 20,000 lbs (Tables 19 and 20). District 8 is divided into 3 analysis areas (Eastern Sumner, Frederick Sound, and Stikine Strait/Chichagof Pass) with weights of 0.70, 0.05, and 0.25 respectively. The Eastern Sumner analysis area contribution appears to be declining, while the Stikine Strait and Frederick Sound components have increased.

Commercial CPUEs in all areas are significantly below baseline and are declining in the Eastern Sumner and Stikine analysis areas (Figure 40).

Logbook data is not available for 2007 and fairly sparse for 2005 and 2006 (Figure 41).

Mean carapace lengths from dockside sampling are 4.5 mm below baseline in Eastern Sumner (Figure 42).

L_{50} data is stable (Figure 43). No other data is available.

The manager's score reflects a mix of positive and negative indicators. Fishermen's reports indicate better than normal catches in some instances and concern in others. Overall, these conflicting reports canceled one another to provide a neutral indicator.

The overall score is -2.43 (poor) and has a 0.37 (moderate) level of confidence.

DISTRICT 9

The GHL in District 9 increased from 15,000 to 18,000 lbs in the 2000/01 season. Management accuracy since the 1998/99 season has averaged +9%, while harvest has averaged 19,000 lbs (Tables 21 and 22; Figure 44). District 9 is divided into 4 analysis areas: Eliza Harbor, Keku

Strait/Port Camden, SE Baranof, and Western Kuiu, which have respective weights of 0.40, 0.025, 0.55, and 0.025. The analysis area composition of the harvest is variable; a majority of the fishing pressure comes from Eliza Harbor and SE Baranof.

The only data from this district is commercial CPUE, which shows a strong (1.8 lb/pot) drop compared to the long-term baseline in Eliza Harbor but is slightly above baseline (0.5 lb/pot) for SE Baranof. Both Eliza Harbor and SE Baranof have shown a steady increase in CPUE over the past 7 years (Figure 44).

There was no 2007 logbook data and insufficient data in 2005 and 2006 (Figure 45) to estimate harvest rate.

Very little local fisheries information exists for this district and thus is rated with manager's scores of 0.

The overall matrix score is -0.41 (moderate) and has a 0.17 (low) level of confidence. There is very little information for the district; the abrupt decline in CPUE for the Eliza Harbor analysis area warrants further attention, as this analysis area has been receiving more harvest pressure in recent seasons as harvest from SE Baranof declines. Additionally, the Western Kuiu analysis area is also receiving unprecedented high harvest pressure; these shifts could be indications of serial depletion.

DISTRICT 10

The GHL in District 10 increased from 30,000 to 35,000 in the 2000/01 season, to 36,000 in 2001/02 and again to 48,000 lbs in the 2004/05 season. Management accuracy has averaged +20%, while harvest has averaged 47,000 lbs since the 1998/99 season (Tables 23 and 24). District 10 is divided into 4 analysis areas (Farragut Bay, Hobart/Windham, Port Houghton, and SE Admiralty) with weights of 0.10, 0.35, 0.40, and 0.15 respectively. The analysis area composition of the harvest is complex but without trends.

Commercial CPUE data shows a significant reduction from the long-term baseline in Port Houghton, and a short-term decline in the Hobart/Windham areas (Figure 46).

There was logbook data only from 2005 (Figure 47), when a 56% harvest rate was estimated for Hobart/Windham.

No discernable changes in mean CL are present (Figures 48 and 49), whereas L_{50} data shows a decrease of 2.8 and 1 mm for Hobart and Port Houghton respectively (Figure 50).

The manager's score reflects a mix of positive and neutral indicators. Fishermen report good catches in Farragut Bay. The Hobart/Windham area has seen an increase in effort, but with room for some continued expansion and thus provides a neutral indicator. Port Houghton seems to remain strong (a positive indicator), with some evidence of increased effort and potential for future concern. The SE Admiralty area shows good catches, but with some fishermen concerns being raised, is a neutral indicator. The overall score is -0.99 (moderate) and has a .37 (moderate) level of confidence.

DISTRICT 11

The GHL of spot and coonstripe shrimp in District 11 has remained steady at 20,000 lbs since the 1995/96 season, but only recently is it achieving and exceeding this GHL. There has been a steady decline in the coonstripe and a corresponding increase in the spot shrimp harvest in this

district. Management accuracy since the 1998/99 season has averaged -4%, while harvest has averaged 19,000 lbs (Table 25 and 26). District 11 is divided into 3 analysis areas (Auke Bay, Seymour Canal, and Glacier-fed Bays) with respective weights of 0.25, 0.75, and 0.00, but a majority of the harvest comes from Seymour Canal and Auke Bay. Analysis area composition of the harvest shows an increasing amount coming from the Seymour Canal analysis area.

The commercial CPUEs are 2 lbs/pot above baseline in Seymour Canal and 0.5 lbs/pot above in Auke Bay. In addition, both CPUEs have increased over the short-term (Figure 51).

Logbook data from Seymour Canal shows a significant decline in the CPUE of large shrimp between the current season and the 2005/06 season and (Figure 52), no other data is available.

The manager's score reflects a mix of positive and neutral indicators reflected in manager's scores of 1 and 0. Seymour Canal remains stable (neutral), while Auke Bay shows increasing catch with an increasing CPUE, which seems to be a positive indicator.

The overall matrix score is 0.25 (moderate), yet has a 0.22 (low) level of confidence. This district has the best score of any district, but does not possess consistently good indicators.

DISTRICT 12

Tenakee

Tenakee was broken off from the rest of District 12 and given its own GHL of 20,000 lbs beginning with the 2001/02 season; the GHL was subsequently increased to 28,000 lbs beginning with the 2005/06 season. Management accuracy has averaged +11% since the 2001/02 season (Table **27**, Table **28**) while harvest has averaged 26,000 lbs. This district is divided into 2 analysis areas (East Tenakee and West Tenakee) with respective weights of 0.10 and 0.90. Analysis area composition of harvest shows a sharp decline from East Tenakee.

The survey CPUE of XL and larger-sized shrimp is significantly below baseline levels (Figure 54).

Commercial CPUE information is available only for the West Tenakee analysis area, but is significantly below the long-term baseline and decreasing significantly in the long-term as well (Tables 27 and 28; Figures 55 and 56).

There is no 2007 logbook information and insufficient logbook information to detect trends in 2005 and 2006.

An excessive harvest rate of 58% was estimated using a Leslie Depletion estimator on 2006 logbook data, but this value is not scored as it is not for the current season.

Mean carapace length is significantly below baseline and continuing to decline in the short-term for the East Tenakee, but not the West Tenakee analysis area (Figure 57).

Survey L_{50} is significantly below baseline for both analysis areas; however short-term trends in survey L_{50} are not significant (Figure 58).

The manager's score reflects a very similar trend of declines as does the quantitative data and thus provides additional negative indicators.

The overall score is -4.63 (poor) with a .52 (moderate) level of confidence.

Remainder of District 12

Remainder of District 12 was established with its own GHL of 15,000 lbs beginning with the 2001/02 season. Since then, management accuracy has averaged -5% (Tables 29 and 30) while harvest has averaged 14,000 lbs. This district is divided into 3 analysis areas (Freshwater Bay, Kelp Bay, and Pt. Couverden) with respective weights of 0.25, 0.75, and 0.00. The proportion of the harvest which comes from Kelp Bay relative to Freshwater Bay analysis area has increased.

The commercial CPUE is significantly below baseline for the Freshwater but not for the Kelp Bay area (Figure 59 and 60).

The manager's score reflects a negative indicator for Kelp Bay from fishermen reports and a neutral indicator for Freshwater Bay.

The overall score is -1.06 (poor), with a .18 (low) level of confidence.

DISTRICT 13

Sections 13-A/B

Sections 13-A/B were broken off from Section 13-C and given their own GHL of 15,000 lbs beginning with the 2000/01 season; prior to this time, the GHL for all of District 13 was 40,000 lbs. Management accuracy is -5% while harvest has averaged 14,000 lbs. Season length has dropped substantially over the past 3 seasons to 14 days for the 2007/08 season (Tables 31 and 32) This district is divided into 4 analysis areas (Crawfish, Larch/Branch Bays, Necker, and Whale Bay) with weights of 0.27, 0.06, 0.27, and 0.40 respectively. The composition of harvest shows declining catch from Whale and Crawfish Bay analysis areas; the Necker area harvest is increasing.

CPUE data shows a significant short-term decline for the Crawfish Inlet analysis area but Necker and Whale Bay areas do not exhibit significant changes (Figure 61). There are no significant changes relative to the long-term baseline (Figure 61).

There is logbook data only for the Crawfish analysis area in 2005 and none in 2007, so it is not possible to compare CPUEs with other years.

Modeling the 2005 Crawfish analysis area logbook data using a Leslie depletion estimator, the harvest rate for that year was estimated at 49%, which is deemed moderate; however, it was not scored as it is 2-year-old information (Figure 62).

The overall matrix score is -.11 (moderate) and has .18 (low) confidence. There is no significant change in commercial CPUE relative to the long-term baseline, although there is a short-term decline in one analysis area, and the managers' score for that area is -1. Sections 13-A/B are at the lower limit of management's ability to target and there is very little information.

Section 13-C

Section 13-C was broken off from Sections 13-A/B and given its own GHL of 30,000 lbs beginning with the 2000/01 season, prior to this time the GHL for all of District 13 was 40,000 lbs; subsequently the GHL was again increased to 42,000 lbs in 2004 (Tables 33 and 34). Management accuracy has averaged +3%, while harvest has averaged 35,000 lbs since the 2000/01 season. This district is divided into 2 analysis areas (Hoonah Sound and Peril Strait) with weights of 0.80 and 0.20 respectively. Analysis area composition of the harvest shows a decreasing Peril Strait and increasing Hoonah Sound component of the harvest.

Survey CPUE for the Hoonah Sound analysis area is significantly below the long-term baseline although the short-term trend is not significant (Tables 37 and 38; Figure 63).

The commercial CPUE does not differ significantly from the long-term baseline for either the Hoonah Sound or Peril Strait analysis areas, but short-term trends are significant and declining for the Hoonah Sound area (Figure 64).

There was no 2007 logbook data; however the sparse data available shows an increase in the CPUE of XL and larger shrimp between 2005 and 2006.

Although there was no 2007 logbook data, the harvest rate for Hoonah Sound in 2006 was estimated at 47%, which is deemed moderate; however it was not scored, as it is 1-year-old information (Figure 65).

Survey data show that the mean carapace length for the Hoonah Sound analysis area is significantly below baseline, but the short-term trend is not significant (Figure 66).

Data from on-the-grounds sampling shows that the mean carapace length for the Hoonah Sound analysis area is significantly below baseline and the short-term trend is significantly declining; for the Peril Strait area, 2007 is not below baseline but there is a significant short-term declining trend in mean carapace length (Figure 67).

The survey L_{50} is significantly below baseline but shows no significant short-term trends (Figure 68).

The overall matrix score is -4.0 (poor) and has .53 (moderate) level of confidence.

DISTRICT 14

In response to concerns over fishery performance, the GHL of spot shrimp in District 14 was reduced from 20,000 to 15,000 lbs beginning with the 2006/07 season, however even with this reduction the catch did not attain the GHL for the past 2 seasons. Management accuracy has averaged -22%, while harvest has averaged 15,000 since the 2001/02 season (Tables 35 and 36). This district is divided into 2 analysis areas (Eastern Icy Strait, and Port Frederick) with weights of 0.80 and 0.20 respectively. The analysis area composition of harvest shows no trends (Figures 69, 70, 71 and 72).

The manager's score reflects a mix of negative and neutral indicators. Fishermen's reports indicate poor catches in Port Frederick and stable fishing in Icy Straits.

The overall score is -1.40 (poor) with a .21 (low) level of confidence.

DISTRICT 15

The GHL of coonstripe shrimp in District 15 was 20,000 lbs through the 2004/05 season; it was reduced to 15,000 lbs for the 2005/06 season in response to conservation concerns. Management accuracy averaged -20% and harvest 16,000 lbs from 1998/99 through 2005/06 seasons (Tables 37 and 38). This district is divided into 4 analysis areas (Chilkat Inlet, Chilkoot Inlet, Lutak Inlet, and Taiya Inlet) with weights of 0.30, 0.20, 0.10, and 0.40 respectively. Analysis area composition of harvest has been variable, sequentially peaking and declining in Chilkat, Lutak, Chilkoot and Taiya Inlets (Figure 73).

The season has been closed in this district for 2 years beginning in 2006/07. Stock status at the time of closure was poor. There is no information since the closure and we recommend that the

fishery remain closed for an additional season, opening to test for stock recovery with mandatory logbooks for a limited period in the 2009/10 season.

DISTRICT 16

The GHL of coonstripe shrimp in District 16 has been 20,000 lbs since it was first established. Management accuracy averaged -23% while harvest averaged 15,000 lbs from 1998/99 through 2004/05 seasons (Tables 39 and 40). This district is divided into 2 analysis areas (Lituya Bay, and Rest of 16) with weights of 1.00 and 0.00 respectively. Throughout the history of its exploitation all of the harvest has come from Lituya Bay (Figures 74, 75, and 76).

The season has been closed in this district for 3 years beginning in 2005/06. Stock status at the time of closure was poor. There is no information since the closure and we recommend a limited reopening with mandatory logbooks for the 2008/09 season to test for stock recovery. Decision rules to evaluate the results should be established prior to the re-opening.

REFERENCES CITED

Abramson, N. J., and P. K. Tomlinson. 1972. An application of yield models to a California ocean shrimp population. Fisheries Bulletin 70:1021–1041.

Berkeley, A. A. 1930. The post-embryonic development of the common pandalids of British Columbia. Contributions to Canadian Biology 6:79–163.

Bishop, G. H., and J. Stratman. 2006. Report to the Alaska Board of Fisheries, 2006. Shrimp, Dungeness crab and scallop fisheries of Southeast Alaska. Alaska Department of Fish and Game, Fishery Management Report No. 06-03, Anchorage.

Butler, T. H. 1964. Growth, reproduction, and distribution of pandalid shrimps in British Columbia. Journal of the Fisheries Research Board of Canada 21:1403–1452.

Butler, T. H. 1980. Shrimps of the Pacific coast of Canada. Department of Fisheries and Oceans, Canadian Bulletin of Fisheries and Aquatic Sciences, No. 202, Ottawa.

Chew, K. K., D. Holland, J. W. Wells, D. H. McKenzie, and C. K. Harris. 1974. Depth distribution and size of spot shrimp, *Pandalus platyceros* trawled in Dabob Bay of Hood Canal, Washington, from 1966 to 1972. Proceedings of the National Shellfish Association 64:28–32.

Clark, J. E., and D. C. Love. 2003. Southeast Alaska pot shrimp research. Pages 39 – 57 In Nearshore Marine Research in Alaska: Final Comprehensive Progress Report, August 1, 2000 – June 30, 2002 NOAA Cooperative Agreement NA06FN0385: Project 4: Southeast Alaska Pot Shrimp Research. Alaska Department of Fish and Game, Division of Commercial Fisheries, Juneau.

Clarke, S. H., S. Cadrin, D. F. Schick, P. J. Diodati, M. P. Armstrong, and D. McCarron. 2000. The Gulf of Maine northern shrimp (*Pandalus borealis*) fishery: A review of the record Journal of Northwest Atlantic Fishery Science 27:193–226.

Haynes, E. B. 1985. Morphological development, identification, and biology of larvae of Pandalidae, Hippolytidae, and Crangonidae (Crustacea, Decapoda) of the northern North Pacific Ocean. Fishery Bulletin 83:253–288.

Hoenig, J. M. 1983. Empirical use of longevity data to estimate mortality rates. Fisheries Bulletin U.S. 82:898–903.

Hynes, F. W. 1930. Shrimp fishery of Southeast Alaska. Appendix to the Report of the U.S. Commissioner of Fisheries for 1929. #B.F. Doc. No. # 1052. Bureau of Fisheries.

International Council for the Exploration of the Sea (ICES). 2000. Report of the Pandalus Assessment Working Group. ICES CM #2000 ACFM:02. International Council for the Exploration of the Sea.

REFERENCES CITED (Continued)

Kimker, A. T., W. E. Donaldson, and W. R. Bechtol. 1996. Spot shrimp growth in Unakwik Inlet, Prince William Sound, Alaska. Alaska Fishery Research Bulletin 3:8

Koeller, P. A., M. Covey, and M. King. 2003. Is size at sex transition an indicator of growth or abundance in pandalid shrimp? Fisheries Research 65:217–230.

Love, D. C., and G. H. Bishop. 2005. Pot shrimp stock assessment survey results from 1996 – 2003 in Districts 3, 7, 12, and 13 of Southeastern Alaska. Alaska Department of Fish and Game, Fishery Data Series No. 05-32, Anchorage.

Marliave, J. B., and M. Roth. 1995. *Agarum* kelp beds as nursery habitat of spot prawns *Pandalus platyceros* Brandt, 1851 (Decapoda, Caridea). Crustaceana 68:27–37.

Mohn, R. K., D. G. Parsons, and L. Savard. 1992. Shrimp management alternatives. Canadian Technical Report of Fisheries and Aquatic Sciences #1884. Canadian Atlantic Fisheries Scientific Advisory Committee.

Nunes, P. 1984. Reproductive and larval biology of northern shrimp, *Pandalus borealis* Kroyer, in Relation to Temperature. Master of Science thesis. University of Alaska, Fairbanks, Fairbanks.

Orensanz, J. M., J. L. Armstrong, D. A. Armstrong, and R. Hilborn. 1998. Crustacean resources are vulnerable to serial depletion - The multifaceted decline of crab and shrimp fisheries in the greater Gulf of Alaska. Reviews in Fish Biology and Fisheries 8:117–176.

Price, V. A., and K. K. Chew. 1972. Laboratory rearing of spot shrimp larvae (*P. platyceros*) and description of stages. Journal of the Fisheries Research Board of Canada 29:413–422.

Siddon, C., J. Bednarski, and G. H. Bishop. 2009. Southeast Alaska Tanner Crab 2006 stock assessment and recommendations for the 2007 commercial fishery. Alaska Department of Fish and Game, Fishery Data Series No. 09-18, Anchorage.

Skuladottir, U. 1979. Comparing several methods of assessing the maximum sustainable yield of *P. borealis* in Arnarfijopur. Rapp. P.-V Reun. Cons. Perm. Int. Explor. Mer 175:240–252.

Wieland, K. 2004. Length at sex transition in northern shrimp (*Pandalus borealis*) off West Greenland in relation to changes in temperature and stock size. Fisheries Research 29:49–56.

TABLES AND FIGURES

Table 1.–Analysis area definitions for the shrimp pot fishery in Southeast Alaska.

Management Unit	Analysis Area	Subdistricts
District 1	Back Behm Canal	101-75,77,80
	East Behm	101-51,53,55,60,71,73
	West Behm Canal	101-85,90,95
	Boca de Quadra	101-30
	Inner Ketchikan Inlets	101-27,40,43,44,45,46,48
	Portland Canal	101-10,11,13,15
	Revilla Channel/Gravina	101-21,23,22,25,29,41
District 2	Lower Clarence	102-10,15,20,30
	Lyman Cleveland shoreline	102-70,80
	Middle Clarence	102-40,50,60
Section 3-A	Hetta Inlet	103-25
	Lower Cordova Bay	103-11,15
	Mid Cordova Bay	103-21,23
	Upper Cordova Bay	103-30,40
Sections 3-B/C	Craig	103-50,60,70,80
	Sea Otter Sound	103-90
District 4	D 4	104,10,20,30,35,40,50
District 5	Affleck/Port Beauclerc	105-10,20
	Cape Pole to Point Baker	105-41,42,43,50
	Rocky Pass	105-31,32
District 6	Sumner Strait	106-41,42,43,44
	SW Etolin	106-20,22,25
	Upper Clarence	106-10,30
District 7	Bradfield	107-40,45
	Lower Ernest Sound	107-10
	Upper Ernest Sound	107-20
	Zimovia Strait	107-30,35
District 8	Eastern Sumner	108-30,40
	Frederick Sound	108-41,50,60
	Stikine Strait/Chichagof Pass	108-10,20
District 9	Eliza Harbor	109-30
	Keku Strait/Port Camden	109-40,41,42,43
	SE Baranof	109-10,11,20
	Western Kuiu (Saginaw to Table)	109-44,45,51,52,61,62,63
District 10	Farragut Bay	110-11,12,13,14,15,16,17
	Hobart/Windham	110-31,32,33
	Port Houghton	110-34
	SE Admiralty (Pybus to Pt Hugh)	110-21,22,23,24
District 11	Auke Bay	111-50,55
	Seymour Canal	111-11,14
	Glacier-fed Bays	111-21,33,34,35
Tenakee	East Tenakee	112-41,42
	West Tenakee	112-43,44,45,46,47,48

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Table 1.–Page 2 of 2.

Management Unit	Analysis Area	Subdistricts
Remainder of	Freshwater Bay	112-50
District 12	Kelp Bay	112-11,21,22
	Pt. Couverden	112-61
Section 13-A/B	Crawfish	113-31,32,33
	Larch/ Branch Bays	113-11,12,13
	Necker	113-34
	Whale Bay	113-22,21
Section 13-C	Hoonah Sound	113-55,56,57,58
	Peril Strait	113-51,52,53,54,59
District 14	Eastern Icy Strait	114-25,80
	Port Frederick	114-27,31,32,33,34
District 15	Chilkat Inlet	115-32
	Chilkoot Inlet	115-34
	Lutak Inlet	115-33
	Taiya Inlet	115-35
District 16	Lituya Bay	116-13
	Rest of 16	116-11,12,14

Table 2.–Score, stock status, and confidence information summarized from Tables 3 to 40, and standardized score. The standardized score is used to compare among districts and ranges from +1 to -1. The standardized score is calculated as the score divided by the total possible score for a given management unit.

Management Unit	Score	Stock Status	Confidence	Std. Score
District 1	-1.22	Poor	0.18	-0.54
District 2	-0.24	Moderate	0.27	-0.07
Section 3-A	-4.49	Poor	0.41	-0.53
Sections 3-B/C	-0.60	Moderate	0.25	-0.17
District 4	-1.25	Poor	0.18	-0.56
District 5	0.00	Moderate	0.17	0.00
District 6	-2.86	Poor	0.41	-0.57
District 7	0.68	Moderate	0.66	0.06
District 8	-2.43	Poor	0.37	-0.51
District 9	-0.42	Moderate	0.17	-0.19
District 10	-0.99	Moderate	0.37	-0.21
District 11	0.25	Moderate	0.22	0.08
Tenakee	-4.63	Poor	0.52	-0.77
Remainder of District 12	-1.06	Poor	0.18	-0.47
Sections 13-A/B	-0.11	Moderate	0.18	-0.05
Section 13-C	-4.00	Poor	0.53	-0.57
District 14	-1.40	Poor	0.21	-0.56
District 15	0.25	Unknown	0.15	0.11
District 16	-1.25	Unknown	0.18	-0.56

Table 3.–District 1 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	145,000	145,000	164,000	164,000	164,000	164,000	164,000	164,000	164,000	164,000
Actual GHL (lbs spot)	145,000	145,000	164,000	164,000	164,000	164,000	164,000	164,000	98,400	98,400
Recommend. GHL or stock status						uncertain	moderate	moderate	98,400	poor
Season length (days)	97	130	41	50	52	49	80	75	47	229
Landings (number)	303	238	185	423	470	557	604	583	432	336
Harvest (lbs spot)	158,348	154,980	159,316	169,544	152,022	170,113	159,234	160,546	141,871	87,581

Table 4.–District 1 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting								
			Back Behm Canal 0.26			East Behm Canal 0.20			West Behm Canal 0.12		
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score
CPUE ≥XL (2007)	survey	CR									
4-yr trend in CPUE											
Std. Comm. CPUE	fish tix		2.7	[redacted]	-1	3.1	[redacted]	-1	2.9	[redacted]	-1
4-yr trend in CPUE				No trend	0		No trend	0.00		No trend	0.00
CPUE ≥XL (2005)	logbook		23	[redacted]		54	[redacted]		11	[redacted]	
CPUE ≥XL (2006)			35	[redacted]		23	[redacted]		0		
CPUE ≥XL (2007)			0			0			0		
hrvst rt on ≥XL (2005)		HR	23	0.55		54	n.s.		11	0.60	
hrvst rt on ≥XL (2006)			35	0.70		23	n.s.		0		
hrvst rt on ≥XL (2007)			0			0			0		
mean CL (2007)	survey	CL									
4-yr trend in CL											
mean CL (2007)	OTG										
4-yr trend in CL											
mean CL (2007)	DS										
4-yr trend in CL											
L_{50} (2007)	survey	L_{50}									
4-yr trend in L50											
L_{50} (2007)	OTG/DS		46.1								
4-yr trend in L_{50}											
Manager's score					0			-1			-1
Score					-1			-2.00			-2.00
Max. possible score				2.25			2.25			2.25	
Stock Status Confidence					0.18			0.18			0.18

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Table 4.–Page 2 of 2.

Stock Status Parameters	Analysis Area / Area Weighting: Boca de Quadra 0.05 Baseline/ boat* days	Value	Score	Inner Ketchikan Inlets 0.20 Baseline/ boat* days	Value	Score	Portland Canal 0.15 Baseline/ boat* days	Value	Score	Revilla Channel/Gravina 0.02 Baseline/ boat* days	Value	Score	Total Score
CPUE ≥XL (2007)													
4-yr trend in CPUE													
Std. Comm. CPUE	2.60	[redacted]	-1	2.6	[redacted]	-1	2.9	[redacted]	-1	2.9	[redacted]	-1	-1.00
4-yr trend in CPUE		No trend	0.00		Sig. Dec.	-0.25		No trend	0.00		No trend	0.00	-0.05
CPUE ≥XL (2005)	18	[redacted]		5	[redacted]		10	[redacted]					
CPUE ≥XL (2006)	0			0			0						
CPUE ≥XL (2007)	0			0			0						
hrvst rt on ≥XL (2005)	18	0.70		5	n.s.		10	n.s.					
hrvst rt on ≥XL (2006)	0			0			0						
hrvst rt on ≥XL (2007)	0			0			0						
mean CL (2007)													
4-yr trend in CL mean CL (2007)													
4-yr trend in CL mean CL (2007)				39.4									
4-yr trend in CL L_{50} (2007)													
4-yr trend in L_{50} L50 (2007)				44.3									
4-yr trend in L_{50}													
Manager's score			0			0			1			0	-0.17
Score			-1.00			-1.25			0.00			-1.00	**-1.22**
Max. possible score		2.25			2.25			2.25			2.25		2.25
Stock Status							Good: >	0.75		Poor: <	-0.75		**Poor**
Confidence			0.18			0.18			0.18			0.18	0.18

Table 5.–District 2 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	65,000	65,000	86,000	86,000	86,000	86,000	86,000	86,000	120,000	120,000
Actual GHL (lbs spot)	65,000	65,000	86,000	86,000	86,000	86,000	86,000	86,000	86,000	86,000
Recommend. GHL or stock status						uncertain	moderate	moderate	86,000	poor
Season length (days)	97	34	29	28	30	21	13	14	20	107
Landings (number)	176	123	120	163	144	187	163	150	189	175
Harvest (lbs spot)	75,321	76,091	121,953	103,774	89,581	96,687	88,258	83,052	99,092	89,786

Table 6.–District 2 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting									
			Lower Clarence 0.19			**Middle Clarence 0.80**			**Lyman Cleveland Shoreline 0.01**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR										
4-yr trend in CPUE												
Std. Comm. CPUE	fish tix		4.3	[redacted]	-1	4.9	[redacted]	0		[redacted]		-0.19
4-yr trend in CPUE				Sig. Dec.	-0.25		No trend	0.00				-0.05
CPUE ≥XL (2005)	logbook		0			19	[redacted]					
CPUE ≥XL (2006)			5	[redacted]		23	[redacted]					
CPUE ≥XL (2007)			0			0						
hrvst rt on ≥XL (2005)		HR	0			19	0.60					
hrvst rt on ≥XL (2006)			5	n.s.		23	n.s.					
hrvst rt on ≥XL (2007)			0			0						
mean CL (2007)	survey	CL										
4-yr trend in CL												
mean CL (2007)	OTG					38	40	0				0.00
4-yr trend in CL								0.00				0.00
mean CL (2007)	DS											
4-yr trend in CL												
L_{50} (2007)	survey	L_{50}										
4-yr trend in L_{50}												
L50 (2007)	OTG/DS					39.7						
4-yr trend in L_{50}												
Manager's score					0			0			0	0.00
Score					-1.25			0.00			0.00	**-0.24**
Max. possible score				2.25			3.50			1.00		3.50
Stock Status					Good: >	1.17		Poor: <	-1.17			**Moderate**
Confidence					0.18			0.29			0.06	0.27

Table 7.–Section 3-A matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR			264,000	264,000	264,000	264,000	264,000	264,000	264,000	264,000
Actual GHL (lbs spot)			264,000	264,000	264,000	264,000	198,000	198,000	198,000	198,000
Recommend. GHL or stock status						211,000	poor	poor	118,800	poor
Season length (days)	14	12	14	28	41	47	20	15	18	229
Landings (number)	15	14	54	123	121	86	88	138	89	78
Harvest (lbs spot)	205,818	226,900	266,837	255,370	264,653	284,808	256,392	202,186	205,435	182,145
Survey cost recovery (lbs)		11,816	884	2,279	2,256	1,964		1,695	0	0

Table 8.–Section 3-A matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting					
			Hetta Inlet 0.20			**Lower Cordova Bay 0.20**		
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**
CPUE ≥XL (2007)	survey	CR	3034	443	-1			
4-yr trend in CPUE				No trend	0.00			
Std. Comm. CPUE	fish tix		7.00	[redacted]	-1	6.4	[redacted]	-1
4-yr trend in CPUE				Sig. Dec.	-0.25		No trend	0.00
CPUE ≥XL (2005)	logbook					13	[redacted]	
CPUE ≥XL (2006)						16	[redacted]	
CPUE ≥XL (2007)						25	[redacted]	-1
hrvst rt on ≥XL (2005)		HR				13	n.s.	
hrvst rt on ≥XL (2006)						16	n.s.	
hrvst rt on ≥XL (2007)						25	n.s.	
mean CL (2007)	survey	CL	37.6	34.3	-1			
4-yr trend in CL				Sig. Inc	0.25			
mean CL (2007)	OTG		37.4			38.2		
4-yr trend in CL				No trend	0.00		No trend	0.00
mean CL (2007)	DS							
4-yr trend in CL								
L_{50} (2007)	survey	L_{50}	38.5	38.0-39.2	0			
4-yr trend in L_{50}				No trend	0.00			
L_{50} (2007)	OTG/D		37.2			38.9		
4-yr trend in L_{50}	S							
Manager's score					0			0
Score					-3.00			-2.00
Max. possible score				6.25			3.50	
Stock Status					Good: >	2.83		Poor: <
Confidence					0.59			0.29

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Table 8.–Page 2 of 2.

Stock Status Parameters	Source	Data Type	Analysis Area / Area Weighting: Mid-Cordova Bay 0.10 — Baseline / boat*days	Mid-Cordova Bay 0.10 — Value	Mid-Cordova Bay 0.10 — Score	Upper Cordova Bay 0.50 — Baseline / boat*days	Upper Cordova Bay 0.50 — Value	Upper Cordova Bay 0.50 — Score	Total Score
CPUE ≥XL (2007)	survey	CR	787	63	-1				-1.00
4-yr trend in CPUE				No trend	0.00				0.00
Std. Comm. CPUE	fish tix		6.0	[redacted]	-1	5.90	[redacted]	0	-0.50
4-yr trend in CPUE				Sig. Dec.	-0.25		No trend	0.00	-0.08
CPUE ≥XL (2005)	logbook		10	[redacted]		18	[redacted]		
CPUE ≥XL (2006)			14	[redacted]		15	[redacted]		
CPUE ≥XL (2007)			0			0			-1.00
hrvst rt on ≥XL (2005)		HR	10	0.52		18	0.76		
hrvst rt on ≥XL (2006)			14	n.s.		15	0.88		
hrvst rt on ≥XL (2007)			0			0			
mean CL (2007)	survey	CL	33.8	30.8	-1				-1.00
4-yr trend in CL				Sig. Dec	-0.25				0.08
mean CL (2007)	OTG					37.5	34.9	-1	-1.00
4-yr trend in CL				No trend	0.00		No trend	0.00	0.00
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}	36.2	35.4-36.6	0				0.00
4-yr trend in L_{50}				No trend	0.00				0.00
L_{50} (2007)	OTG/D		38.5			36.6			
4-yr trend in L_{50}	S						No trend	0.00	0.00
Manager's score					0			0	0.00
Score					-3.50			-1.00	**-4.49**
Max. possible score				6.25			3.75		8.50
Stock Status			-2.83						**Poor**
Confidence					0.59			0.35	0.41

Table 9.–Sections 3-B/C matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR			50,000	50,000	50,000	50,000	50,000	50,000	70,000	70,000
Actual GHL (lbs spot)			20,000	50,000	50,000	50,000	50,000	50,000	50,000	40,000
Recommend. GHL or stock status						uncertain	uncertain	uncertain	30,000	poor
Season length (days)			15	46	21	14	14	6	47	132
Landings (number)			187	417	507	493	421	312	355	252
Harvest (lbs spot)	7,960	7,026	36,508	62,721	53,553	64,839	46,497	56,051	47,309	44,703

Table 10.–Sections 3-B/C matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting						
			Craig 0.40			**Sea Otter Sound 0.60**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey								
4-yr trend in CPUE									
Std. Comm. CPUE	fish tix		4.2	[redacted]	0	5	[redacted]	-1	-0.60
4-yr trend in CPUE		CR		No trend	0.00		No trend	0.00	0.00
CPUE ≥XL (2005)	logbook					11	[redacted]		
CPUE ≥XL (2006)						0			
CPUE ≥XL (2007)						0			
harvest rt. on ≥XL (2005)		HR				11	n.s.		
harvest rt. on ≥XL (2006)						0			
hrvst rt on ≥XL (2007)						0			
mean CL (2007)	survey	CL							
4-yr trend in CL									
mean CL (2007)	OTG					37.9	38.9	0	0.00
4-yr trend in CL								0.00	0.00
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG /					42.5			
4-yr trend in L_{50}	DS								
Manager's score					0			0	0.00
Score					0.00			-1.00	**-0.60**
Max. possible score				2.25			3.5		3.5
Stock Status			Good: >	1.17		Poor: <	-1.17		**Moderate**
Confidence					0.18			0.29	0.25

Table 11.–District 4 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	28,000	28,000
Actual GHL (lbs spot)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Recommend. GHL or stock status						uncertain	uncertain	uncertain	20,000	poor
Season length (days)	335	230	213	229	151	213	150	213	229	229
Landings (number)	23	39	22	51	28	53	57	75	68	
Harvest (lbs spot)	6,071	16,612	20,343	10,337	22,153	20,364	19,296	18,579	15,085	174

Table 12.–District 4 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting			
			District 4			
			1.00			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR				
4-yr trend in CPUE						
Std. Comm. CPUE	fish tix		2.5	[redacted]	-1	-1.00
4-yr trend in CPUE				Sig. Dec.	-0.25	-0.25
CPUE ≥XL (2005)	logbook			**data from 06–07**		
CPUE ≥XL (2006)						
CPUE ≥XL (2007)						
hrvst rt on ≥XL (2005)		HR				
hrvst rt on ≥XL (2006)						
hrvst rt on ≥XL (2007)						
mean CL (2007)	survey	CL				
4-yr trend in CL						
mean CL (2007)	OTG					
4-yr trend in CL						
mean CL (2007)	DS					
4-yr trend in CL						
L_{50} (2007)	survey	L_{50}				
4-yr trend in L_{50}						
L_{50} (2007)	OTG/DS					
4-yr trend in L_{50}						
Manager's score					0	0.00
Score					**-1.25**	**-1.25**
Max. possible score				2.25		2.25
Stock Status	Good: >	0.75	Poor: <	-0.75	**Poor**	**Poor**
Confidence					0.18	0.18

Table 13.–District 5 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Actual GHL (lbs spot)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Recommend. GHL or stock status						uncertain	uncertain	uncertain	20,000	poor
Season length (days)	335	230	229	229	228	229	222	151	229	229
Landings (number)	11	13	20	30	96	84	117	49	41	0
Harvest (lbs spot)	5,471	11,719	13,791	7,857	19,049	17,733	21,498	19,282	10,216	0

Table 14.–District 5 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$.

			Analysis Area / Area Weighting									
			Affleck/Port Beauclerc 0.60			**Rocky Pass 0.35**			**Cape Pole to Point Baker 0.05**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR										
4-yr trend in CPUE												
Std. Comm. CPUE	fish tix		1.7	[redacted]	0	2.0	[redacted]	0	0.8	[redacted]		0.00
4-yr trend in CPUE				No trend	0.00		No trend	0.00		No trend	0.00	0.00
CPUE ≥XL (2005)	logbook		**data from 06-07**			**data from 05-06**			**data from 04-05**			
CPUE ≥XL (2006)												
CPUE ≥XL (2007)												
hrvst rt on ≥XL (2005)		HR										
hrvst rt on ≥XL (2006)												
hrvst rt on ≥XL (2007)												
mean CL (2007)	survey	CL										
4-yr trend in CL												
mean CL (2007)	OTG											
4-yr trend in CL												
mean CL (2007)	DS											
4-yr trend in CL												
L_{50} (2007)	survey	L_{50}										
4-yr trend in L_{50}												
L_{50} (2007)	OTG/ DS											
4-yr trend in L_{50}												
Manager's scores					0			0			0	0.00
Score					0.00			0.00			0.00	**0.00**
Max. possible score				2.25			2.25			1.25		2.25
Stock Status					Good: >	0.75		Poor: <	-0.75			**Moderate**
Confidence					0.18			0.29			0.06	0.27

Table 15.–District 6 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	65,000	65,000	68,000	68,000	68,000	68,000	68,000	68,000	82,000	82,000
Actual GHL (lbs spot)	65,000	65,000	68,000	68,000	68,000	68,000	68,000		82,000	82,000
Recommend. GHL or stock status						uncertain	moderate	poor	49,200	poor
Season length (days)	137	137	51	27	26	24	21	77	39	151
Landings (number)	137	101	86	166	174	173	141	220	241	133
Harvest (lbs spot)	64,010	67,005	77,318	70,919	68,293	69,808	65,487	81,955	80,650	36,763

Table 16.–District 6 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting									
			Sumner Strait 0.07			**SW Etolin 0.13**			**Upper Clarence 0.80**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR										
4-yr trend in CPUE												
Std. Comm. CPUE	fish tix		2.8	[redacted]	0	3.9	[redacted]	-1	4.3	[redacted]	-1	-0.93
4-yr trend in CPUE				NA			Sig. Dec.	-0.25		Sig. Dec.	-0.25	-0.25
CPUE ≥XL (2005)	logbook		1	[redacted]		18	[redacted]		115	[redacted]		
CPUE ≥XL (2006)			8	[redacted]		23	[redacted]		104	[redacted]		
CPUE ≥XL (2007)			0			0			0			
hrvst rt on ≥XL (2005)		HR	1			18			115	0.63		
hrvst rt on ≥XL (2006)			8			23			104	0.38		
hrvst rt on ≥XL (2007)			0			0						
mean CL (2007)	survey	CL										
4-yr trend in CL												
mean CL (2007)	OTG								37.2	37.1	0	0.00
4-yr trend in CL										No trend	0.00	0.00
mean CL (2007)	DS								43.6	38.9		
4-yr trend in CL										No trend	0.00	0.00
L_{50} (2007)	survey	L_{50}										
4-yr trend in L_{50}												
L_{50} (2007)	OTG/DS								41.2	39.9	-1	-1.00
4-yr trend in L_{50}										Sig. Inc	0.25	0.25
Manager's scores					0			-1			-1	-0.93
Score					0.00			-2.25			-3.00	**-2.86**
Max. possible score				2.00			2.25			5.00		5.00
Stock Status					Good:	>1.67		Poor: <	-1.67			**Poor**
Confidence					0.12			0.18			0.47	0.41

Table 17.–District 7 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	100,000	100,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000	104,000
Actual GHL (lbs spot)	100,000	100,000	104,000	104,000	104,000	104,000	78,000	78,000	78,000	78,000
Recommend. GHL or stock status						104,000	poor	poor	62,400	moderate
Season length (days)	92	55	34	71	39	113	37	30	22	59
Landings (number)	309	207	171	440	418	468	301	249	191	222
Harvest (lbs spot)	63,870	75,868	100,768	103,328	99,250	104,394	80,072	79,927	80,491	76,613
Harvest (lbs coonstripe)	35,975	24,673	14,881	24,804	14,262	17,268	10,899	7,983	6,795	8,155
Harvest (lbs spot and coonstripe)	99,845	100,541	115,649	128,132	113,512	121,662	90,971	87,910	87,286	84,768
Survey cost recovery (lbs spot)		240	306	472	556	494	378	612	148	188

Table 18.–District 7 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting					
			Bradfield 0.20			**Lower Ernest Sound 0.20**		
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**
CPUE ≥XL (2007)	survey	CR				363	188	-1
4-yr trend in CPUE							Sig. Dec	-0.25
Std. Comm. CPUE	fish tix		2.6	[redacted]	0	3.2	[redacted]	0
4-yr trend in CPUE				No trend	0		No trend	0
CPUE ≥XL (2005)	logbook		14	[redacted]		15	[redacted]	
CPUE ≥XL (2006)			0			3	[redacted]	
CPUE ≥XL (2007)			0			11	[redacted]	0
hrvst rt on ≥XL (2005)		HR	14	0.58		15		
hrvst rt on ≥XL (2006)			0			3		
hrvst rt on ≥XL (2007)			0			11		
mean CL (2007)	survey	CL				31.2	30.5	0
4-yr trend in CL							No trend	0.00
mean CL (2007)	OTG							
4-yr trend in CL				No trend	0.00			
mean CL (2007)	DS		45.4	47.3	1			
4-yr trend in CL				Sig. Inc	0.25			
L_{50} (2007)	survey	L_{50}				37.9	36.1-37.5	-1
4-yr trend in L_{50}							No trend	0.00
L_{50} (2007)	OTG/D		46.7	47.6	0			
4-yr trend in L_{50}	S			No trend	0.00			
Manager's score					0			0
Score					1.25			-2.25
Max. possible score				5.00			7.00	
Stock Status					Good: >	3.58		Poor: <
Confidence					0.47			0.59

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			Analysis Area / Area Weighting						
			Upper Ernest Sound 0.50			Zimovia Strait 0.10			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR	525	284	-1				-1.00
4-yr trend in CPUE				Sig. Dec	-0.25				-0.07
Std. Comm. CPUE	fish tix		3.2	[redacted]	1	1.70	[redacted]	0	0.50
4-yr trend in CPUE				Sig. Inc	0.25		No trend	0	0.13
CPUE ≥XL (2005)	logbook		60	[redacted]		14	[redacted]		
CPUE ≥XL (2006)			57	[redacted]		0			
CPUE ≥XL (2007)			35	[redacted]	1	0			0.71
hrvst rt on ≥XL (2005)		HR	60	0.43		14			
hrvst rt on ≥XL (2006)			57			0			
hrvst rt on ≥XL (2007)			35			0			
mean CL (2007)	survey	CL	36.7	37.2	0				0.00
4-yr trend in CL				Sig. Inc	0.25				0.18
mean CL (2007)	OTG		40.7	44.9	0				0.00
4-yr trend in CL				No trend	0.00				0.00
mean CL (2007)	DS		43.2			42.9	45.0	0	0.67
4-yr trend in CL				No trend	0.00		No trend	0.00	0.06
L_{50} (2007)	survey	L_{50}	42	39-40	-1				-1.00
4-yr trend in L_{50}				No trend	0.00				0.00
L_{50} (2007)	OTG/DS		43.2			44.3	44.5	0	0.00
4-yr trend in L_{50}				No trend	0.00		No trend	0.00	0.00
Manager's score					1			0	0.50
Score					1.50			0.00	**0.68**
Max. possible score				8.75			4.75		10.75
Stock Status			-3.58						**Moderate**
Confidence					0.82			0.41	0.66

Table 19.–District 8 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	28,000	28,000
Actual GHL (lbs spot)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Recommend. GHL or stock status						uncertain	moderate	moderate	20,000	moderate
Season length (days)	29	22	23	35	31	18	37	37	30	151
Landings (number)	92	90	79	94	110	91	105	113	108	110
Harvest (lbs spot)	15,797	20,816	21,708	17,464	22,105	20,867	18,935	21,494	21,256	15,346

Table 20.–District 8 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting									
Analysis Area			**Eastern Sumner**			**Frederick Sound**			**Stikine Strait/Chichagof Pass**			
Area Weighting			**0.70**			**0.05**			**0.25**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR										
4-yr trend in CPUE												
Std. Comm. CPUE	fish tix		2.70	[redacted]	-1	2.5	[redacted]	-1	2.3	[redacted]	-1	-1.00
4-yr trend in CPUE				Sig. Dec	-0.25		[redacted]			Sig. Dec.	-0.25	-0.25
CPUE ≥XL (2005)	logbook		2	[redacted]		8	[redacted]		2	[redacted]		
CPUE ≥XL (2006)			0			6	[redacted]		0			
CPUE ≥XL (2007)			0			0			0			
hrvst rt on ≥XL (2005)		HR	2			8			2			
hrvst rt on ≥XL (2006)			0			6			0			
hrvst rt on ≥XL (2007)			0			0			0			
mean CL (2007)	survey	CL										
4-yr trend in CL												
mean CL (2007)	OTG											
4-yr trend in CL												
mean CL (2007)	DS		46.2	41.7	-1				44			-1.00
4-yr trend in CL				Sig. Dec	-0.25					No trend	0.00	-0.18
L_{50} (2007)	survey	L_{50}										
4-yr trend in L_{50}												
L_{50} (2007)	OTG/DS		45.2	45.3	0				44.3			0.00
4-yr trend in L_{50}				No trend	0.00					No trend	0.00	0.00
Manager's score					0			0			0	0.00
Score					-2.50			-1.00			-1.25	**-2.43**
Max. possible score				4.75			2.00			2.75		4.75
Stock Status					Good:	>1.58		Poor:	<-1.58			**Poor**
Confidence					0.41			0.12			0.29	0.37

Table 21.–District 9 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	15,000	15,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Actual GHL (lbs spot)	15,000	15,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000	18,000
Recommend. GHL or stock status						uncertain	moderate	uncertain	18,000	moderate
Season length (days)	63	57	32	25	32	24	30	19	16	14
Landings (number)	36	914	15	39	34	53	45	40	32	27
Harvest (lbs spot)	17,781	18,284	20,765	18,243	15,713	17,904	17,911	20,252	24,113	17,336

Table 22.–District 9 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores.

			Analysis Area / Area Weighting					
			Eliza Harbor 0.40			Keku Strait/Port Camden 0.025		
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score
CPUE ≥XL (2007)	survey	CR						
4-yr trend in CPUE								
Std. Comm. CPUE	fish tix		5.50	3.71	-1		NA	
4-yr trend in CPUE				No trend	0			
CPUE ≥XL (2005)	logbook		8	2.6				
CPUE ≥XL (2006)			0					
CPUE ≥XL (2007)			0					
hrvst rt on ≥XL (2005)		HR	8					
hrvst rt on ≥XL (2006)			0					
hrvst rt on ≥XL (2007)			0					
mean CL (2007)	survey	CL						
4-yr trend in CL								
mean CL (2007)	OTG							
4-yr trend in CL								
mean CL (2007)	DS							
4-yr trend in CL								
L_{50} (2007)	survey	L_{50}						
4-yr trend in L_{50}								
L_{50} (2007)	OTG/DS							
4-yr trend in L_{50}								
Manager's score					0			0
Score					-1.00			0.00
Max. possible score				2.25			1.00	
Stock status					Good: >	0.75		
Confidence					0.18			0.06

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Stock Status Parameters	Source	Data Type	Analysis Area / Area Weighting: SE Baranof 0.55 — Baseline / boat*days	Value	Score	Western Kuiu 0.025 — Baseline / boat*days	Value	Score	Total Score
CPUE ≥XL (2007)	survey	CR							
4-yr trend in CPUE			**data from 06-07**						
Std. Comm. CPUE	fish tix		3.9	4.4	0		NA		-0.42
4-yr trend in CPUE				No trend	0				0.00
CPUE ≥XL (2005)	logbook		7	1.5					
CPUE ≥XL (2006)			3	3.4					
CPUE ≥XL (2007)			0						
hrvst rt on ≥XL (2005)		HR	7						
hrvst rt on ≥XL (2006)			3						
hrvst rt on ≥XL (2007)			0						
mean CL (2007)	survey	CL							
4-yr trend in CL									
mean CL (2007)	OTG								
4-yr trend in CL									
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG/DS								
4-yr trend in L_{50}									
Manager's score					0			0	0.00
Score					0.00			0.00	**-0.42**
Max. possible score				2.25			1.00		2.25
Stock status			Poor: <	-0.75					**Moderate**
Confidence					0.18			0.06	0.17

Table 23.–District 10 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	30,000	30,000	35,000	36,000	36,000	36,000	36,000	36,000	58,000	58,000
Actual GHL (lbs spot)	30,000	30,000	35,000	36,000	36,000	36,000	48,000	48,000	48,000	48,000
Recommend. GHL or stock status						uncertain	good	moderate	38,400	moderate
Season length (days)	51	30	26	14	16	12	11	8	8	9
Landings (number)	78	52	86	69	109	104	78	67	73	63
Harvest (lbs spot)	30,182	36,976	46,099	38,156	54,706	61,631	51,592	53,292	51,409	44,233

Table 24.–District 10 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting					
			Farragut Bay 0.10			Hobart/Windham 0.35		
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score
CPUE ≥XL (2007)	survey	CR						
4-yr trend in CPUE								
Std. Comm. CPUE	fish tix		3.90	[redacted]	0	4.6	[redacted]	0
4-yr trend in CPUE				No trend	0		Sig. Dec	-0.25
CPUE ≥XL (2005)	logbook					7	[redacted]	
CPUE ≥XL (2006)						0		
CPUE ≥XL (2007)						0		
hrvst rt on ≥XL (2005)		HR				7	56.0	
hrvst rt on ≥XL (2006)						0		
hrvst rt on ≥XL (2007)						0		
mean CL (2007)	survey	CL						
4-yr trend in CL								
mean CL (2007)	OTG					40.7	41.8	0
4-yr trend in CL				No trend	0.00		No trend	0.00
mean CL (2007)	DS							
4-yr trend in CL								
L_{50} (2007)	survey	L_{50}						
4-yr trend in L_{50}								
L_{50} (2007)	OTG/DS					41.3	38.5	-1
4-yr trend in L_{50}							No trend	0.00
Manager's score					1			0
Score					1.00			-1.25
Max. possible score				2.50			4.75	
Stock Status					Good: >	1.58		Poor: <
Confidence					0.24			0.41

–continued–

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			Analysis Area / Area Weighting						
			Port Houghton 0.40			SE Admiralty 0.15			
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score	Total Score
CPUE ≥XL (2007)	survey	CR							
4-yr trend in CPUE									
Std. Comm. CPUE	fish tix		5.6	[redacted]	-1	5.60	[redacted]	0	-0.40
4-yr trend in CPUE				No trend	0		No trend	0	-0.09
CPUE ≥XL (2005)	logbook								
CPUE ≥XL (2006)									
CPUE ≥XL (2007)									
hrvst rt on ≥XL (2005)		HR							
hrvst rt on ≥XL (2006)									
hrvst rt on ≥XL (2007)									
mean CL (2007)	survey	CL							
4-yr trend in CL									
mean CL (2007)	OTG		40.6	41.7	0				0.00
4-yr trend in CL				No trend	0.00				0.00
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG/DS		41.5	40.5	-1				-1.00
4-yr trend in L_{50}				No trend	0.00		No trend	0.00	0.00
Manager's score					1			0	0.50
Score					-1.00			0.00	**-0.99**
Max. possible score				4.75			2.50		4.75
Stock Status			-1.58						**Moderate**
Confidence					0.41			0.24	0.37

Table 25.–District 11 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Actual GHL (lbs spot and coonstripe)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Recommend. GHL or stock status						uncertain	moderate	uncertain	16,000	moderate
Season length (days)	335	230	133	116	73	48	43	43	19	15
Landings (number)	47	44	29	90	76	62	52	44	35	32
Harvest (lbs spot)	4,138	3,091	17,051	15,927	19,126	18,852	20,833	23,328	23,529	20,717
Harvest (lbs coonstripe)	4,791	5,057	2,792	8,366	334	3,162	930	262	0	24
Harvest (lbs spot and coonstripe)	8,929	8,148	19,843	24,293	19,460	22,014	21,763	23,590	23,529	20,741

Table 26.–District 11 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting									
			Auke Bay 0.25			**Seymour Canal 0.75**			**Glacier-fed Bays 0.00**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR										
4-yr trend in CPUE												
Std. Comm. CPUE	fish tix		2.2	[redacted]	0	6.9	[redacted]	1				0.75
4-yr trend in CPUE				Sig. Inc.	0.25		Sig. Inc.	0.25				0.25
CPUE ≥XL (2005)	logbook					15	[redacted]					
CPUE ≥XL (2006)						11	[redacted]					
CPUE ≥XL (2007)						11	[redacted]	-1				-1.00
hrvst rt on ≥XL (2005)		HR				15	n.s.					
hrvst rt on ≥XL (2006)						11	n.s.					
hrvst rt on ≥XL (2007)						11	n.s.					
mean CL (2007)	survey	CL										
4-yr trend in CL												
mean CL (2007)	OTG											
4-yr trend in CL												
mean CL (2007)	DS											
4-yr trend in CL												
L_{50} (2007)	survey	L_{50}										
4-yr trend in L_{50}												
L_{50} (2007)	OTG/DS		41.2			40.6						
4-yr trend in L_{50}												
Manager's score				Good	1		OK	0				0.25
Score					1.25			0.25			0.00	**0.25**
Max. possible score				2.25			3.25			0.00		3.25
Stock Status					Good: >	1.08		Poor:	<-1.08			**Moderate**
Confidence					0.18			0.24			0.00	0.22

Table 27.–Tenakee matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR				20,000	20,000	20,000	20,000	20,000	34,000	34,000
Actual GHL (lbs spot)				20,000	20,000	20,000	20,000	28,000	28,000	28,000
Recommend. GHL or stock status						20,000	moderate	good	28,000	moderate
Season length (days)	15	9	7	6	6	6	3	5	4	3
Landings (number)	22	21	31	34	35	40	23	45	34	26
Harvest (lbs)	28,583	21,850	25,613	19,777	21,558	30,494	23,729	36,435	30,032	18,086
Survey cost recovery (lbs)		2,537			2,739	3,156	4,318	2,377	2,978	1,380

Table 28.–Tenakee matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting						
			East Tenakee 0.10			West Tenakee 0.90			
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score	Total Score
CPUE ≥XL (2007)	survey	CR	1687	[redacted]	-1	3239	[redacted]	-1	-1.00
4-yr trend in CPUE				Sig. Dec.	-0.25		Sig. Dec.	-0.25	-0.25
Std. Comm. CPUE	fish tix		5.9				[redacted]	-1	-1.00
4-yr trend in CPUE							Sig. Dec.	-0.25	-0.25
CPUE ≥XL (2005)	logbook					1	[redacted]		
CPUE ≥XL (2006)						6	[redacted]		
CPUE ≥XL (2007)						0			
hrvst rt on ≥XL (2005)		HR				1			
hrvst rt on ≥XL (2006)						6	0.58		
hrvst rt on ≥XL (2007)						0			
mean CL (2007)	survey	CL	35.4	32.4	-1	38.9	39.4	0	-0.10
4-yr trend in CL				Sig. Dec.	-0.25		No trend	0.00	-0.03
mean CL (2007)	OTG					41.1			
4-yr trend in CL									
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}	40.4	38.3-39.5	-1	43.0	41.1-41.8	-1	-1.00
4-yr trend in L_{50}				No trend	0.00		No trend	0.00	0.00
L_{50} (2007)	OTG/DS								
4-yr trend in L_{50}									
Manager's score					-1			-1	-1.00
Score					-4.50			-4.50	**-4.63**
Max. possible score				4.75			6.00		6.00
Stock Status			Good: >	2.00		Poor: <	-2.00		**Poor**
Confidence					0.41			0.53	0.52

Table 29.–Remainder of District 12 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR				15,000	15,000	15,000	15,000	15,000	15,000	15,000
Actual GHL (lbs spot)				15,000	15,000	15,000	15,000	15,000	15,000	15,000
Recommend. GHL or stock status						15,000	uncertain	uncertain	15,000	moderate
Season length (days)	0	0	0	90	31	37	23	16	12	10
Landings (number)	10	4	0	55	55	68	51	34	39	28
Harvest (lbs)	1,390	1,589		14,175	16,904	19,605	17,627	13,521	18,552	12,582

Table 30.–Remainder of District 12 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting									
			Freshwater Bay 0.25			Kelp Bay 0.75			Pt. Couverden 0.00			
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score	Total Score
CPUE ≥XL (2007)	survey	CR										
4-yr trend in CPUE												
Std. Comm. CPUE	fish tix		2.3	[redacted]	-1	3.2	[redacted]	0				-0.25
4-yr trend in CPUE				Sig. Dec.	-0.25		No trend	0				-0.06
CPUE ≥XL (2005)	logbook					10	[redacted]					
CPUE ≥XL (2006)						0						
CPUE ≥XL (2007)						0						
hrvst rt on ≥XL (2005)		HR				10						
hrvst rt on ≥XL (2006)						0						
hrvst rt on ≥XL (2007)						0						
mean CL (2007)	survey	CL										
4-yr trend in CL												
mean CL (2007)	OTG											
4-yr trend in CL												
mean CL (2007)	DS											
4-yr trend in CL												
L_{50} (2007)	survey	L_{50}										
4-yr trend in L_{50}												
L_{50} (2007)	OTG/											
4-yr trend in L_{50}	DS											
Manager's score					0			-1			0	-0.75
Score					-1.25			-1.00			0.00	**-1.06**
Max. possible score				2.25			2.25			1.00		2.25
Stock Status					Good:	>0.75		Poor:	-0.75			**Poor**
Confidence					0.18			0.18			0.06	0.18

Table 31.–Sections 13-A/B matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Actual GHL (lbs spot)			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Recommend. GHL or stock status						15,000	uncertain	moderate	15,000	moderate
Season length (days)	7	152	151	151	97	152	152	30	17	14
Landings (number	39	34	45	46	69	65	54	37	19	17
Harvest (lbs spot)	13,924	14,114	12,914	13,878	14,066	13,606	18,306	13,194	16,819	11,270

Table 32.–Sections 13-A/B matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting					
			Crawfish 0.30			**Larch/Branch Bays 0.00**		
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**
CPUE ≥XL (2007)	survey	CR						
4-yr trend in CPUE								
Std. Comm. CPUE	fish tix		2.1	[redacted]	0		NA	
4-yr trend in CPUE				Sig. Dec.	-0.25			
CPUE ≥XL (2005)	logbook		9	[redacted]				
CPUE ≥XL (2006)			0					
CPUE ≥XL (2007)			0					
hrvst rt on ≥XL (2005)		HR	9	0.49				
hrvst rt on ≥XL (2006)			0					
hrvst rt on ≥XL (2007)			0					
mean CL (2007)	survey	CL						
4-yr trend in CL								
mean CL (2007)	OTG							
4-yr trend in CL								
mean CL (2007)	DS							
4-yr trend in CL	.							
L_{50} (2007)	survey	L_{50}						
4-yr trend in L_{50}								
L_{50} (2007)	OTG/DS							
4-yr trend in L_{50}								
Manager's score					-1			0
Score					-1.25			0.00
Max. possible score				2.25			1.00	
Stock Status				Good: >	0.75			
Confidence					0.18			0.06

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Stock Status Parameters	Source	Data Type	Analysis Area / Area Weighting: Necker 0.30 Baseline / boat*days	Necker 0.30 Value	Necker 0.30 Score	Whale Bay 0.40 Baseline / boat*days	Whale Bay 0.40 Value	Whale Bay 0.40 Score	Total Score
CPUE ≥XL (2007)	survey	CR							
4-yr trend in CPUE									
Std. Comm. CPUE	fish tix		3.30	[redacted]	0	1.8	[redacted]	0	0.00
4-yr trend in CPUE				No trend	0		No trend	0	-0.11
CPUE ≥XL (2005)	logbook								
CPUE ≥XL (2006)									
CPUE ≥XL (2007)									
hrvst rt on ≥XL (2005)		HR							
hrvst rt on ≥XL (2006)									
hrvst rt on ≥XL (2007)									
mean CL (2007)	survey	CL							
4-yr trend in CL									
mean CL (2007)	OTG								
4-yr trend in CL									
mean CL (2007)	DS								
4-yr trend in CL	.								
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG/ DS								
4-yr trend in L_{50}									
Manager's score					1			0	0.00
Score					1.00			0.00	**-0.11**
Max. possible score				2.25			2.25		2.25
Stock Status					Poor: <	-0.75			**Moderate**
Confidence					0.18			0.18	0.18

Table 33.–Section 13-C matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	25,000	25,000	30,000	30,000	30,000	30,000	30,000	30,000	50,000	50,000
Actual GHL (lbs spot)			30,000	30,000	30,000	30,000	42,000	42,000	42,000	34,000
Recommend. GHL or stock status						30,000	good	moderate	42,000	poor
Season length (days)		5	5	4	5	5	5	6	5	7
Landings (number)		62	30	42	53	54	38	63	41	29
Harvest (lbs spot)	50,391	30,569	33,001	25,822	38,318	42,240	34,270	43,605	36,449	29,395
Survey cost recovery (lbs)		1,167	2,474	1,646	2,096	2,438	2,198	1,845	2,057	1,570

Table 34.–Section 13-C matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting						
			Hoonah Sound 0.80			Peril Strait 0.20			
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score	Total Score
CPUE ≥XL (2007)	survey	CR	1554	1059	-1				-1.00
4-yr trend in CPUE				No trend	0.00				0.00
Std. Comm. CPUE	fish tix		5.1	[redacted]	0	4.20	[redacted]	0	0.00
4-yr trend in CPUE				Sig. Dec	-0.25		No trend	0.00	-0.20
CPUE ≥XL (2005)	logbook		4	[redacted]					
CPUE ≥XL (2006)			4	[redacted]					
CPUE ≥XL (2007)			0						
hrvst rt on ≥XL (2005)		HR	4						
hrvst rt on ≥XL (2006)			4	0.47					
hrvst rt on ≥XL (2007)			0						
mean CL (2007)	survey	CL	37.8	36.1	-1				-1.00
4-yr trend in CL				Sig. Inc.	0.25				0.25
mean CL (2007)	OTG		40.7	38.4	-1	36.1	34.9	0	-0.80
4-yr trend in CL				Sig. Dec	-0.25		Sig. Dec	-0.25	-0.25
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}	42.1	39.2-39.6	-1				-1.00
4-yr trend in L_{50}				NA					
L_{50} (2007)	OTG/								
4-yr trend in L_{50}	DS								
Manager's score					0			0	0.00
Score					-4.25			-0.25	**-4.00**
Max. possible score				7.00			3.50		7.00
Stock Status			Good: >	2.33		Poor: <	-2.33		**Poor**
Confidence					0.59			0.29	0.53

Table 35.–District 14 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Actual GHL (lbs spot)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	15,000	15,000
Recommend. GHL or stock status						20,000	moderate	uncertain	10,000	poor
Season length (days)	151	230	229	194	110	107	68	151	151	151
Landings (number)	68	2	68	113	99	108	114	76	74	45
Harvest (lbs spot)	6,651	240	17,639	25,004	19,903	19,590	21,282	15,845	13,259	13,054

Table 36.–District 14 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting						
			Eastern Icy Strait 0.80			**Port Frederick 0.20**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR							
4-yr trend in CPUE							**data from 06-07**		
Std. Comm. CPUE	fish tix		1.7	[redacted]	-1	2	[redacted]		-1
4-yr trend in CPUE				Sig. Dec.	-0.25		No trend	0.00	-0.20
CPUE ≥XL (2005)	logbook		0						
CPUE ≥XL (2006)			3	[redacted]					
CPUE ≥XL (2007)			3						
hrvst rt on ≥XL (2005)		HR	0						
hrvst rt on ≥XL (2006)			3						
hrvst rt on ≥XL (2007)			3						
mean CL (2007)	survey	CL							
4-yr trend in CL									
mean CL (2007)	OTG								
4-yr trend in CL									
mean CL (2007)	DS		40.4						
4-yr trend in CL				No trend	0.00				0.00
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG/DS		40.5						
4-yr trend in L_{50}									
Manager's score					0			-1	-0.20
Score					-1.25			-1.00	**-1.40**
Max. possible score				2.50			1.25		2.50
Stock Status			Good: >	0.83		Poor: <	-0.83		**Poor**
Confidence					0.24			0.12	0.21

Table 37.–District 15 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Actual GHL (lbs coonstripe)	20,000	20,000	20,000	20,000	20,000	20,000	20,000	15,000	Closed	Closed
Recommend. GHL or stock status						20,000	poor	poor	Close	Keep closed
Season length (days)	335	178	73	163	129	230	226	151	0	0
Landings (number)	159	153	92	79	71	41	43	36	0	0
Harvest (lbs coonstripe)	22,704	24,668	24,119	18,918	19,559	6,873	6,278	4,230	0	0

Table 38.–District 15 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and $\mathbf{L_{50}}$. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting					
			Chilkat Inlet 0.30			Chilkoot Inlet 0.20		
Stock Status Parameters	Source	Data Type	Baseline / boat*days	Value	Score	Baseline / boat*days	Value	Score
CPUE ≥XL (2005)	survey	CR						
4-yr trend in CPUE				data from 05-06			data from 05-06	
Std. Comm. CPUE	fish tix		1.40	[redacted]	1	1.90	NA	
4-yr trend in CPUE				No trend	0		NA	
CPUE ≥XL (2005)	logbook							
CPUE ≥XL (2006)								
CPUE ≥XL (2007)								
hrvst rt on ≥XL (2005)		HR						
hrvst rt on ≥XL (2006)								
hrvst rt on ≥XL (2007)								
mean CL (2005)	survey	CL						
4-yr trend in CL								
mean CL (2005)	OTG							
4-yr trend in CL								
mean CL (2005)	DS							
4-yr trend in CL								
L_{50} (2007)	survey	L_{50}						
4-yr trend in L_{50}								
L_{50} (2007)	OTG/DS							
4-yr trend in L_{50}								
Manager's score					0			0
Score					1.00			0.00
Max. possible score				2.25			1.00	
Stock Status							Good: >	0.75
Confidence					0.18			0.06

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Analysis Area Area Weighting			Analysis Area / Area Weighting Lutak Inlet 0.10			Taiya Inlet 0.40			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline / boat*days**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2005)	survey	CR							
4-yr trend in CPUE				data from 05-06			data from 05-06		
Std. Comm. CPUE	fish tix		1.50	[redacted]	0	1.90	[redacted]	0	0.38
4-yr trend in CPUE				No trend	0		Sig. Dec.	-0.25	-0.13
CPUE ≥XL (2005)	logbook								
CPUE ≥XL (2006)									
CPUE ≥XL (2007)									
hrvst rt on ≥XL (2005)		HR							
hrvst rt on ≥XL (2006)									
hrvst rt on ≥XL (2007)									
mean CL (2005)	survey	CL							
4-yr trend in CL									
mean CL (2005)	OTG			34.5			35.0		
4-yr trend in CL									
mean CL (2005)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG/DS						32.8		
4-yr trend in L_{50}									
Manager's score					0			0	0.00
Score					0.00			-0.25	**0.25**
Max. possible score				2.25			2.25		2.25
Stock Status[a]					Poor:	<-0.75			**Moderate**
Confidence					0.18			0.18	0.15

[a] for the 2006-07 commercial season

Table 39.–District 16 matrix, Part A. A 10-season history of shrimp fishery and stock assessment recommendations.

Season	98/99	99/00	00/01	01/02	02/03	03/04	04/05	05/06	06/07	07/08
Upper end regulatory GHR	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Actual GHL (lbs coonstripe)	20,000	20,000	20,000	20,000	20,000	20,000	15,000	Closed	Closed	Closed
Recommend. GHL or stock status						uncertain	poor	poor	Keep closed	Keep closed
Season length (days)	264	76	51	66	151	152	151	0	0	0
Landings (numbers)	43	28	3	30	51	41	26	0	0	0
Harvest (lbs coonstripe)	15,415	16,053	17,867	18,490	16,504	14,476	6,612	Closed	Closed	Closed

Table 40.–District 16 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area. Data sources are from ADF&G shrimp survey, fish ticket, logbook, and on the grounds (OTG) and dockside (DS) sampling of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length, and L_{50}. Score for each analysis area is the sum of all individual scores. Blacked out values are confidential data, due to fewer than three participants.

			Analysis Area / Area Weighting						
			Lituya Bay 1.00			**Rest of 16 0.00**			
Stock Status Parameters	**Source**	**Data Type**	**Baseline / boat*days**	**Value**	**Score**	**Baseline**	**Value**	**Score**	**Total Score**
CPUE ≥XL (2007)	survey	CR							
4-yr trend in CPUE				**data from 04-05**					
Std. Comm. CPUE	fish tix		4.0	[redacted]	-1				-1.00
4-yr trend in CPUE				Sig. Dec.	-0.25				-0.25
CPUE ≥XL (2005)	logbook								
CPUE ≥XL (2006)									
CPUE ≥XL (2007)									
hrvst rt on ≥XL (2005)		HR							
hrvst rt on ≥XL (2006)									
hrvst rt on ≥XL (2007)									
mean CL (2007)	survey	CL							
4-yr trend in CL									
mean CL (2007)	OTG								
4-yr trend in CL									
mean CL (2007)	DS								
4-yr trend in CL									
L_{50} (2007)	survey	L_{50}							
4-yr trend in L_{50}									
L_{50} (2007)	OTG/								
4-yr trend in L_{50}	DS								
Manager's score					0				0.00
Score					-1.25			0.00	**-1.25**
Max. possible score				2.25			0.00		2.25
Stock Status [a]			Good: >	0.75		Poor: <	-0.75		**Poor**
Confidence					0.18			0.00	0.18

[a] for the 05-06 commercial season

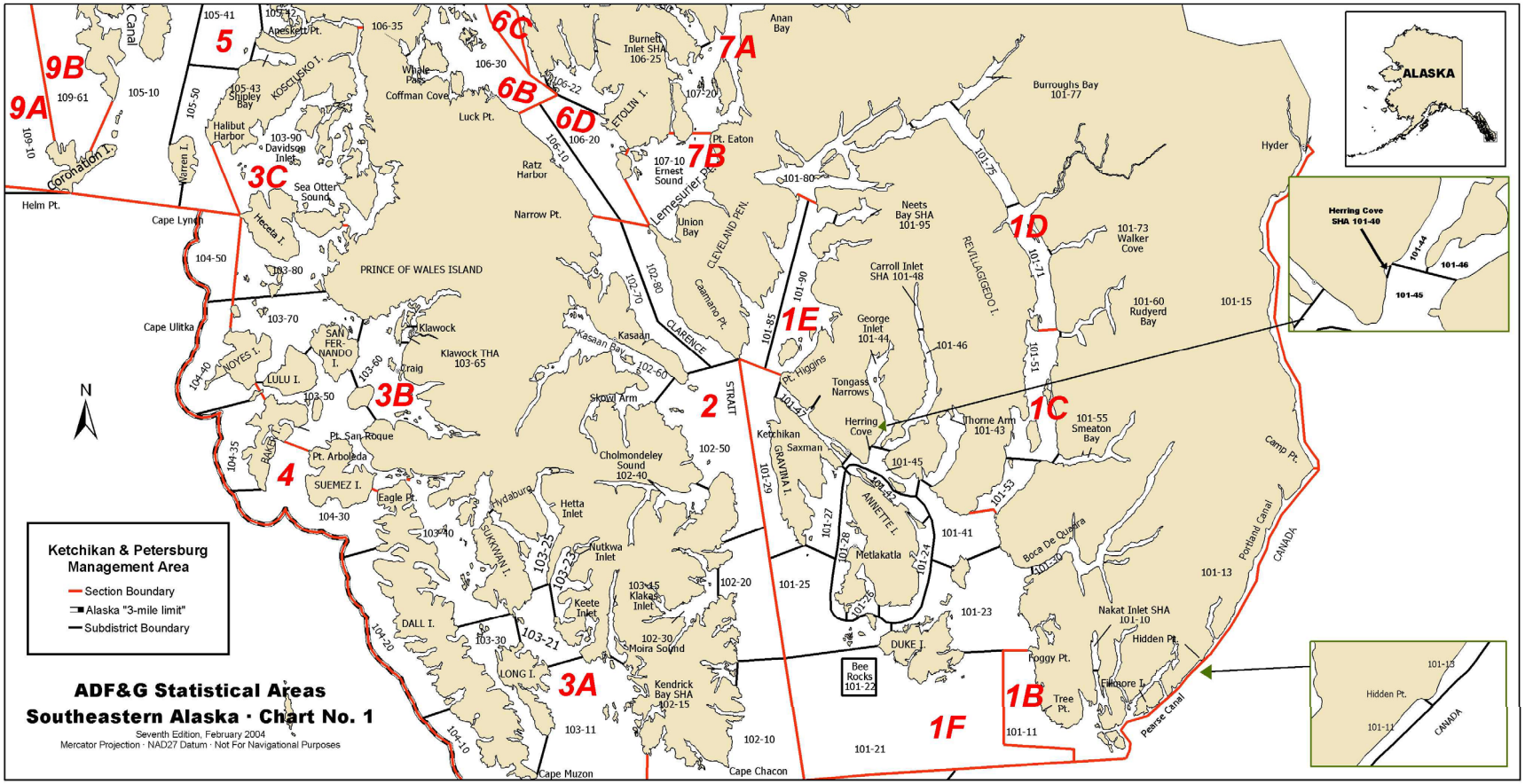

Figure 1.–ADF&G Statistical area map number 1, southern Southeast Alaska.

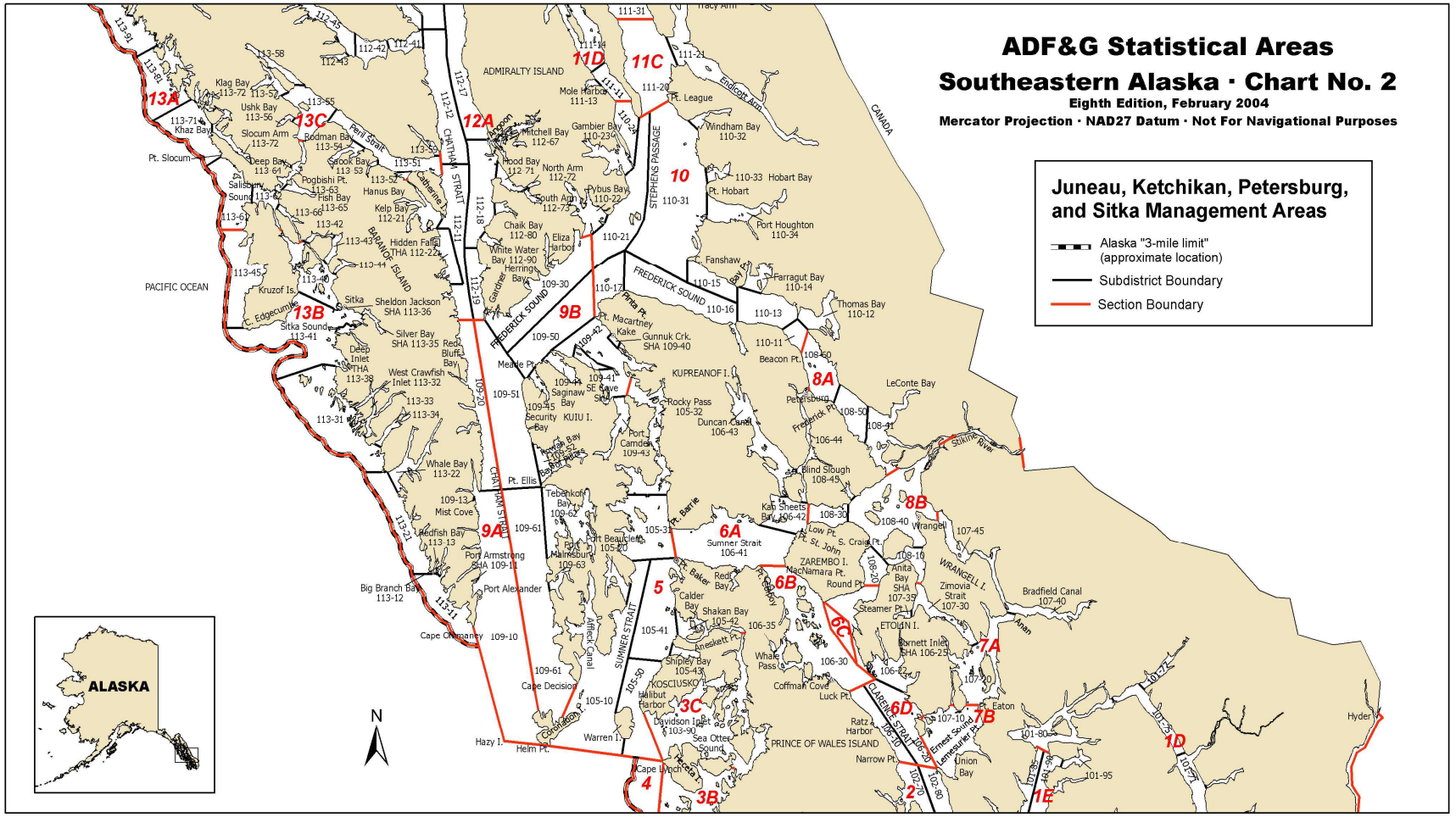

Figure 2.–ADF&G Statistical area map number 2, central Southeast Alaska.

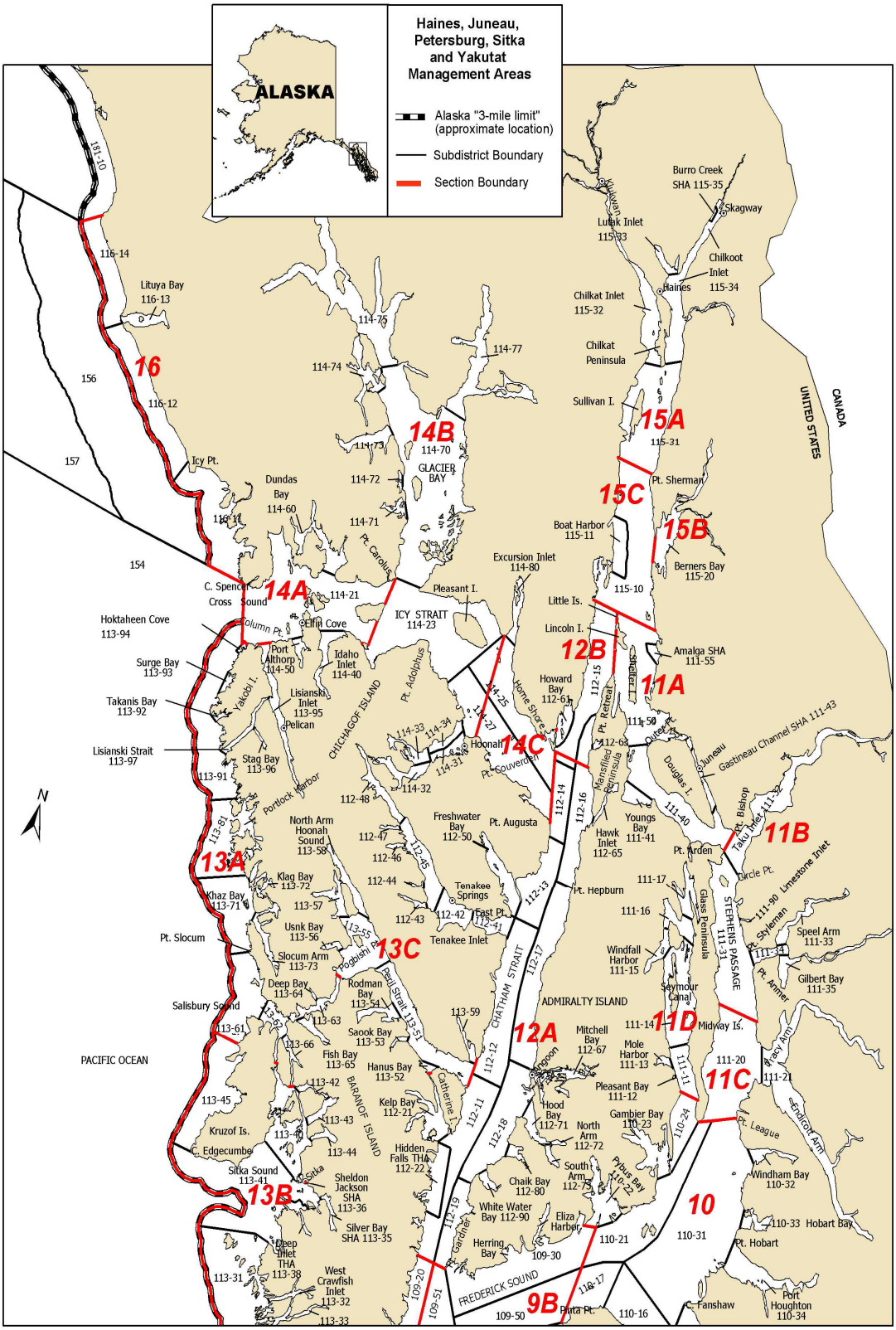

Figure 3.–ADF&G Statistical area map number 3, northern Southeast Alaska.

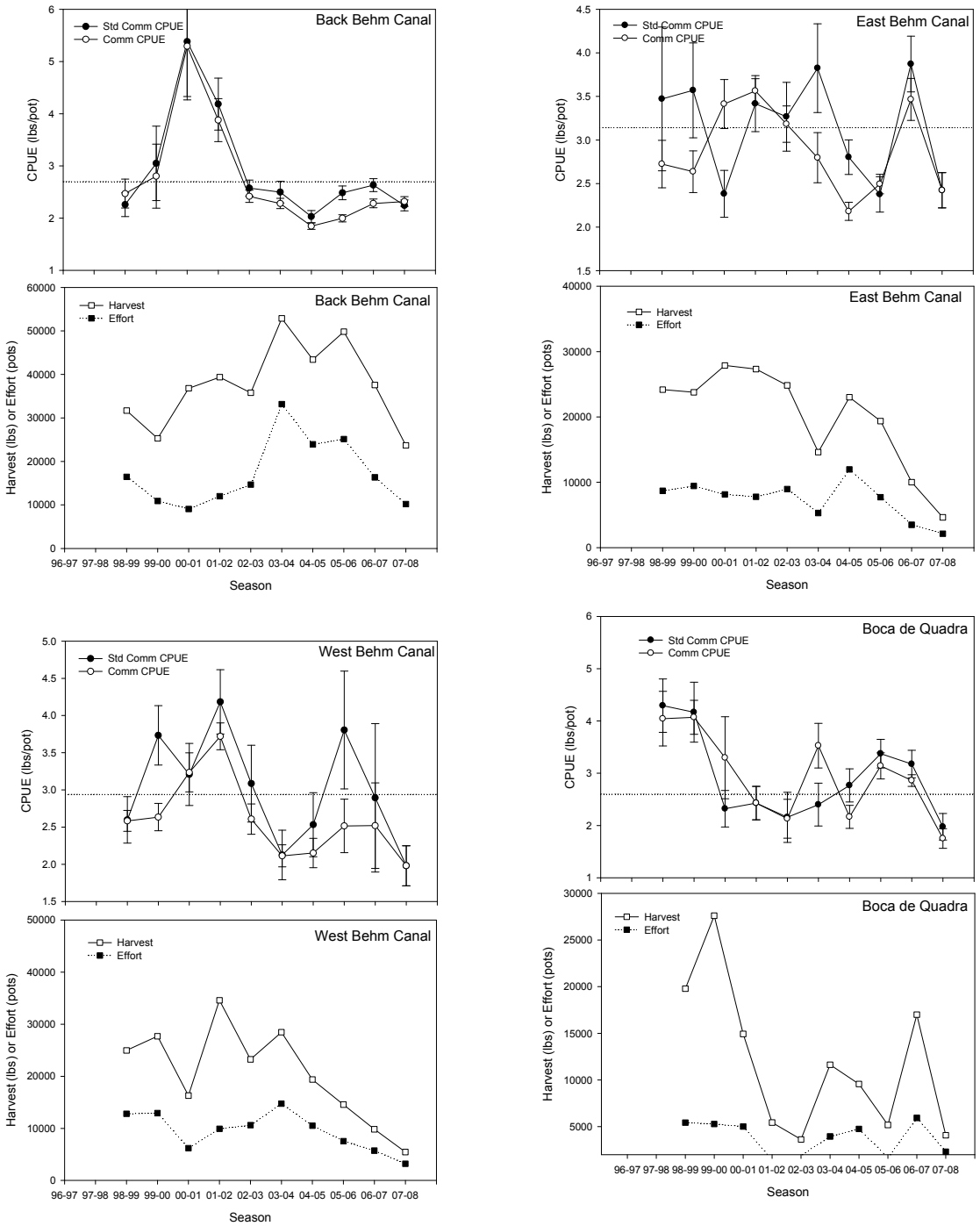

Figure 4.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Behm Canal and Boca de Quadra, District 1, 1998–2007.

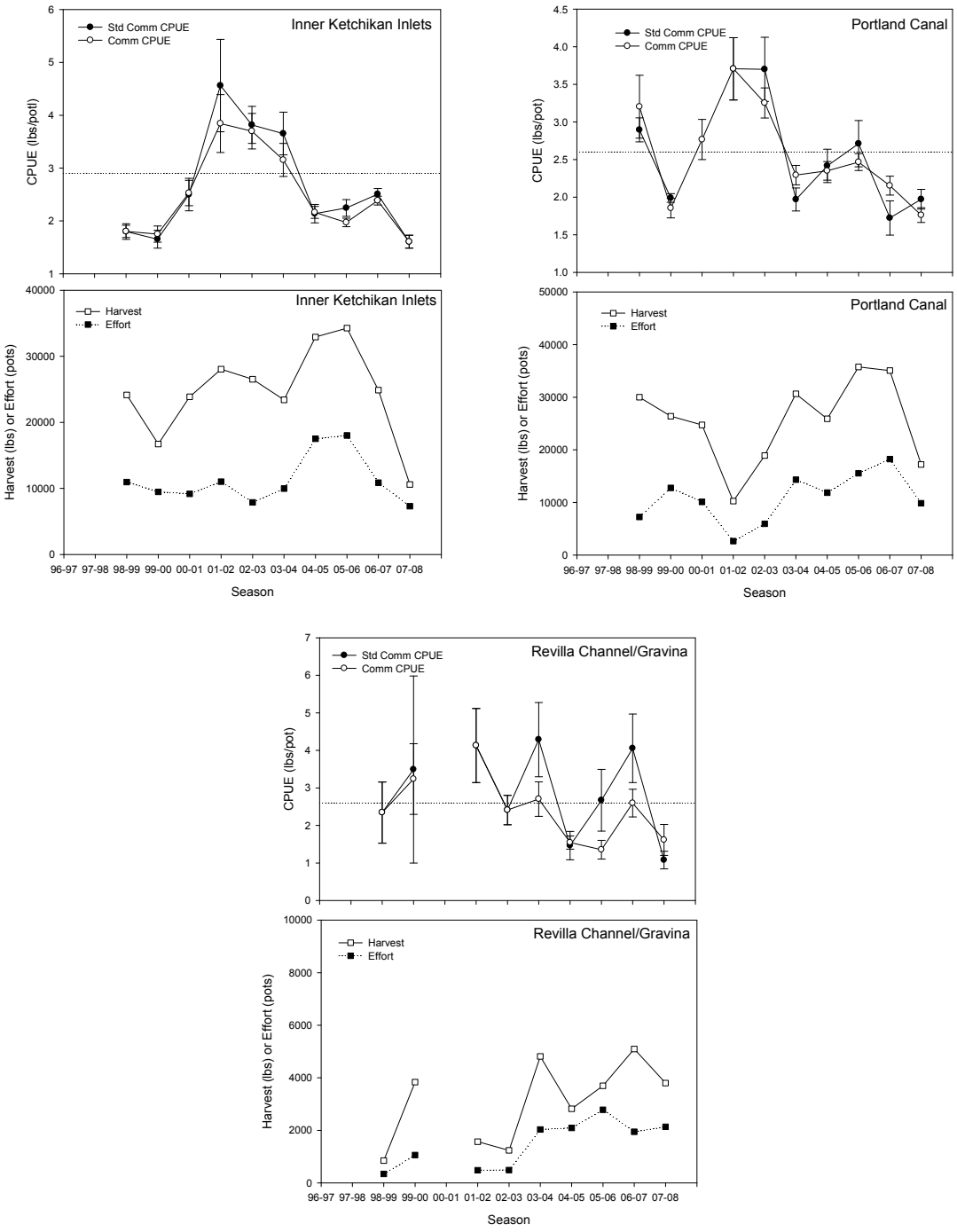

Figure 5.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted lines represent the long-term baseline), and the commercial harvest and effort by analysis area in inner Ketchikan inlets, Portland Canal, and Revilla Channel, of District 1, 1998–2007.

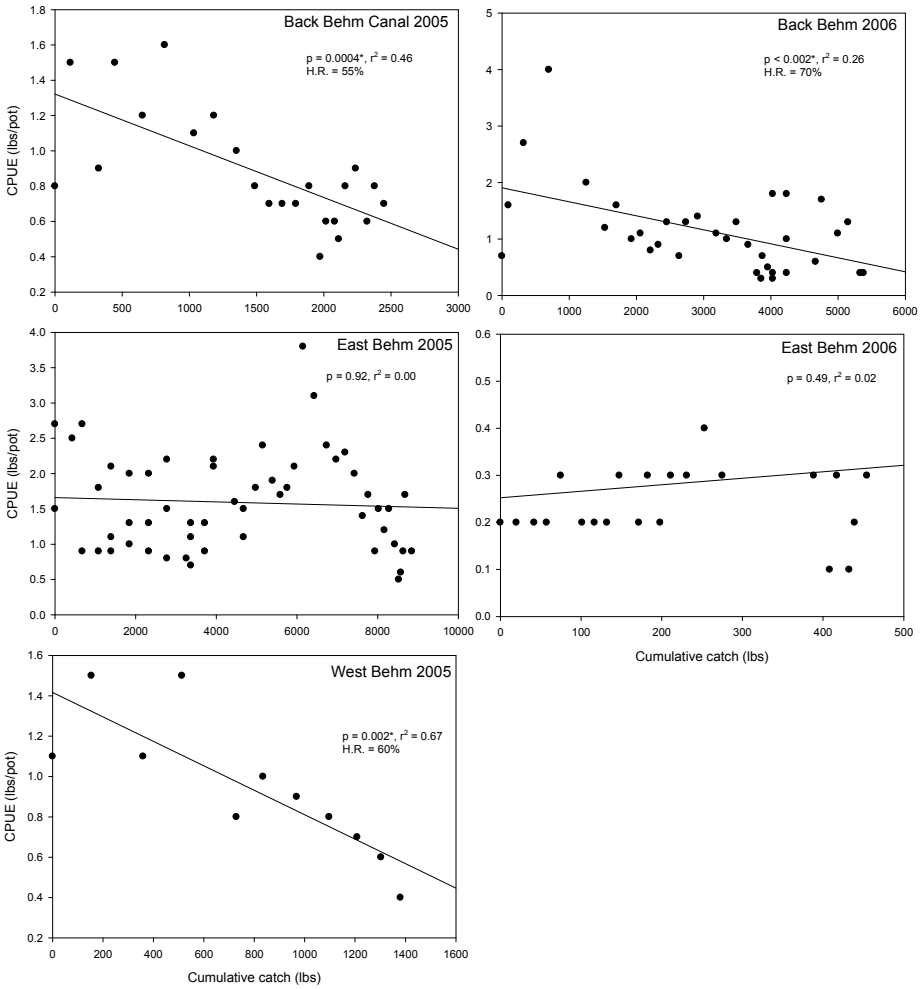

Figure 6.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in Behm Canal, District 1, 2005–2007.

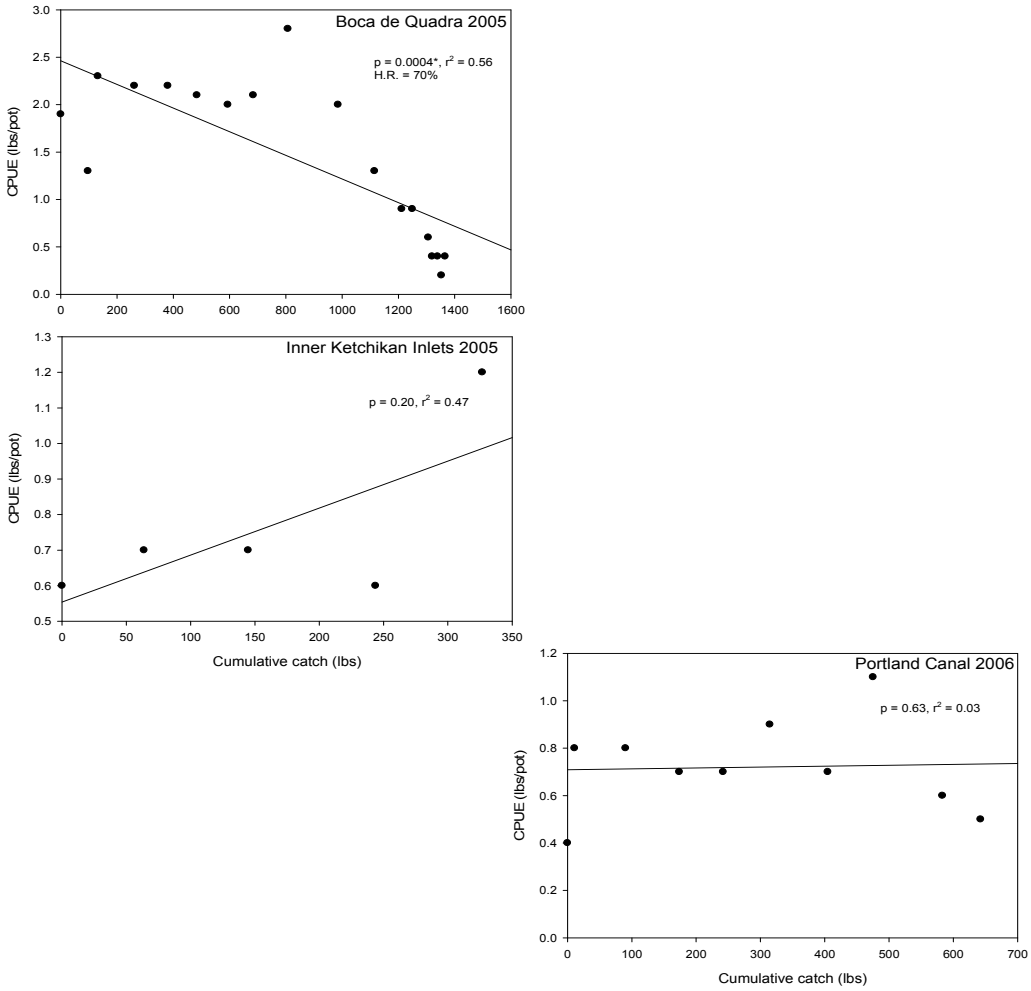

Figure 7.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data within District 1 during 2005 to 2007, in Boca de Quadra, inner Ketchikan inlets, and Portland Canal.

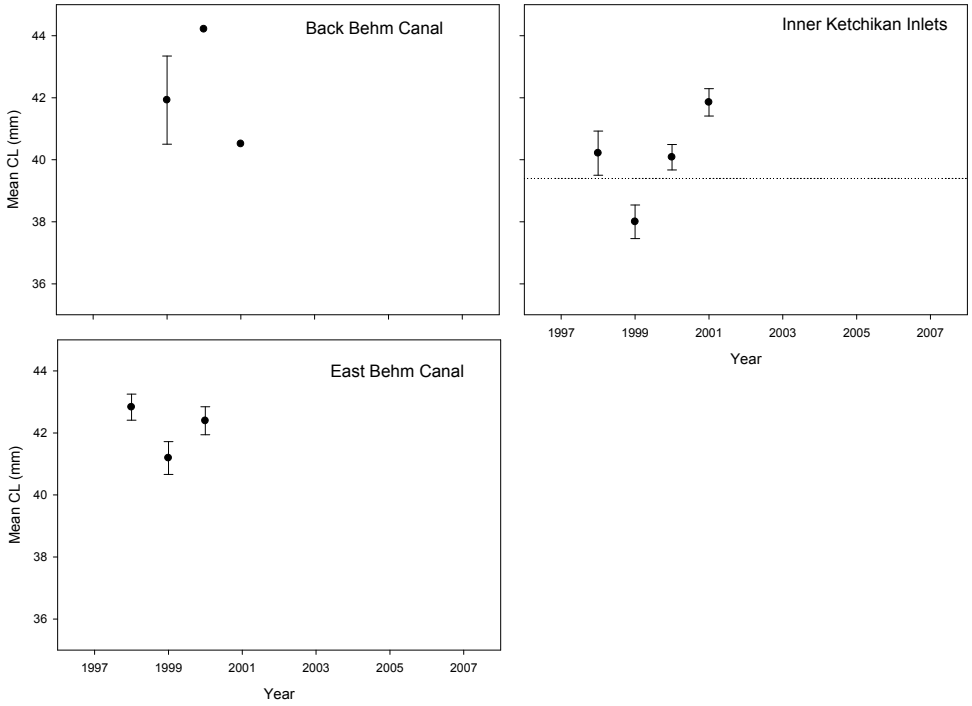

Figure 8.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 1, 1997–2007. Dotted line for inner Ketchikan inlets represents the long-term baseline.

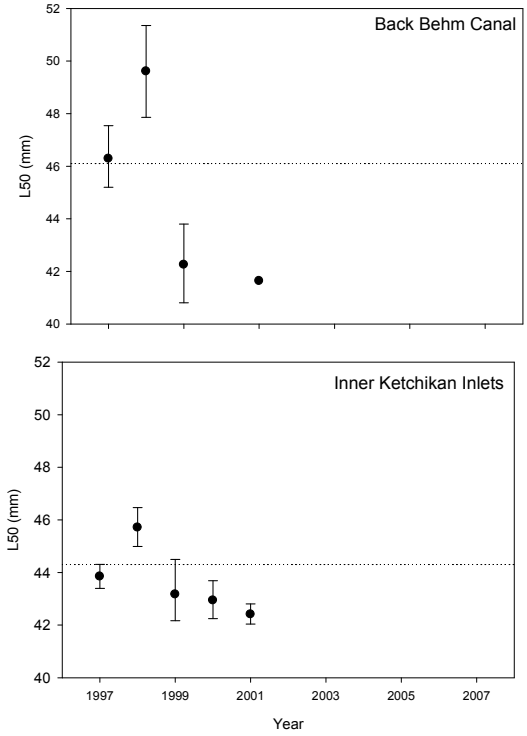

Figure 9.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 1, 1997–2007. Dotted line represents the long-term baseline.

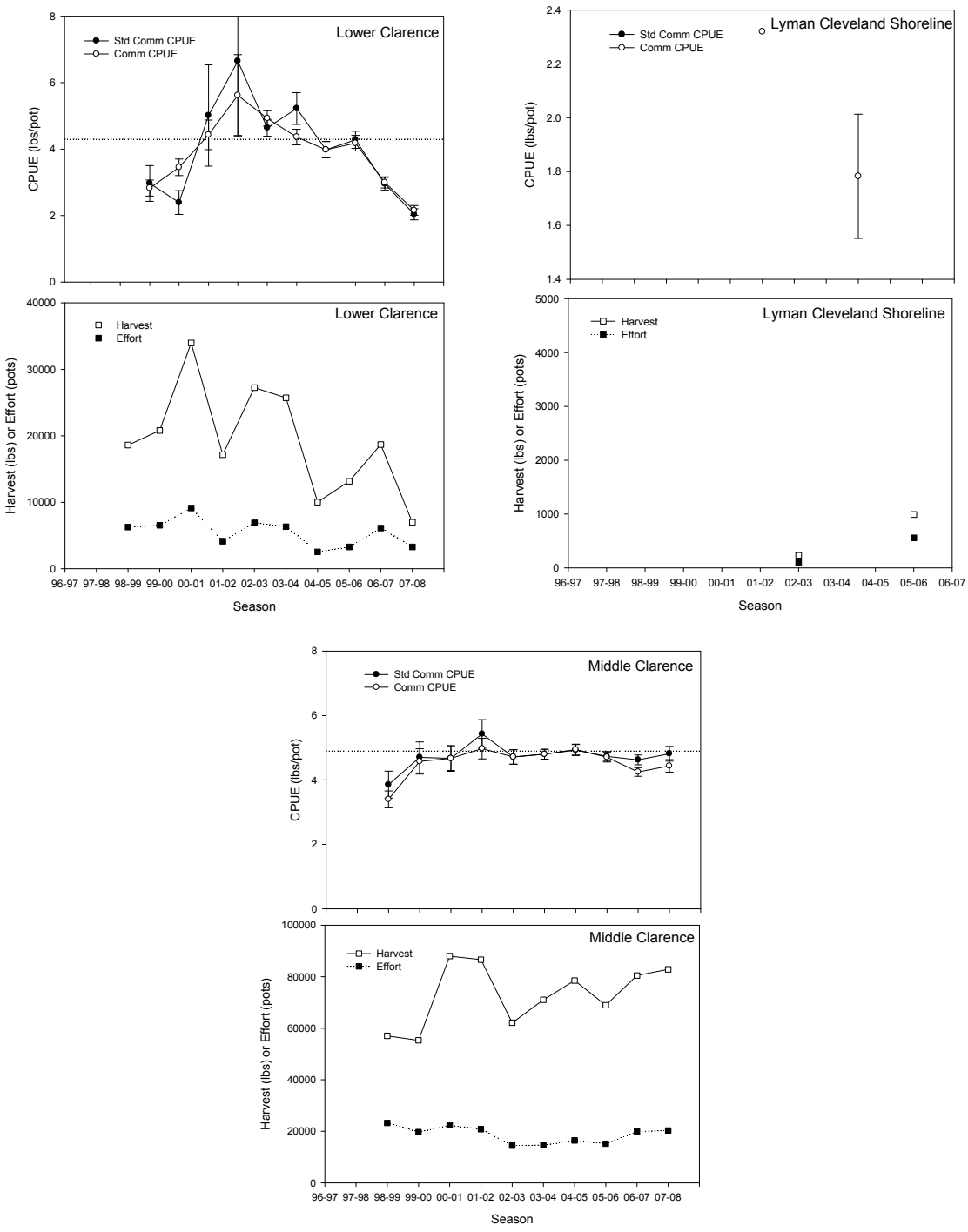

Figure 10.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted lines in CPUE graphs represent the long-term baseline) and the commercial harvest and effort by analysis area in District 2, 1998–2007.

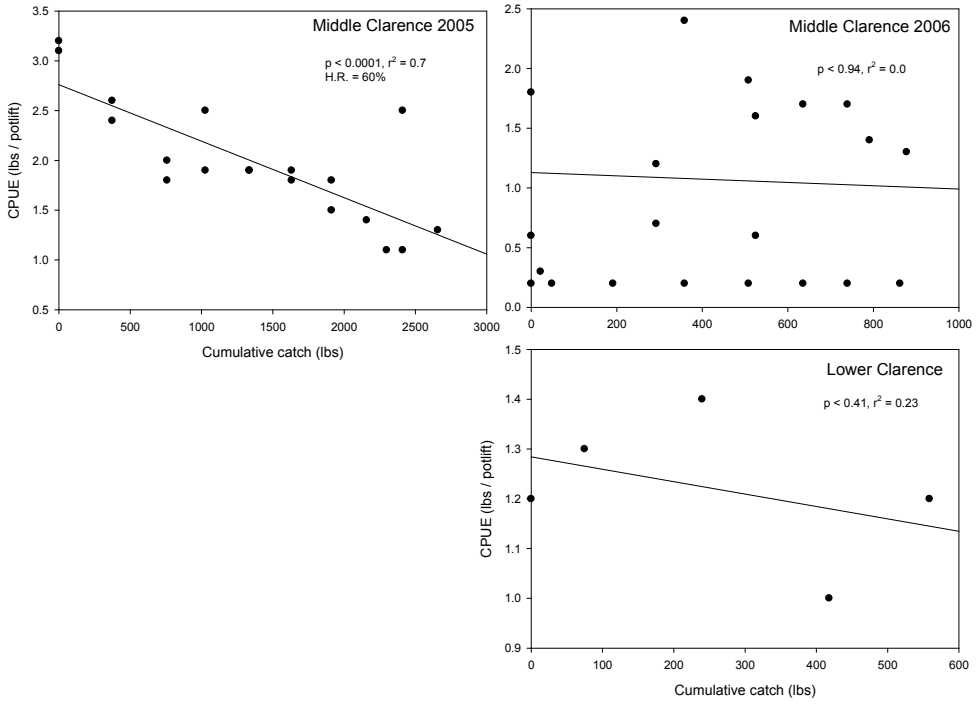

Figure 11.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 2, 2005–2007.

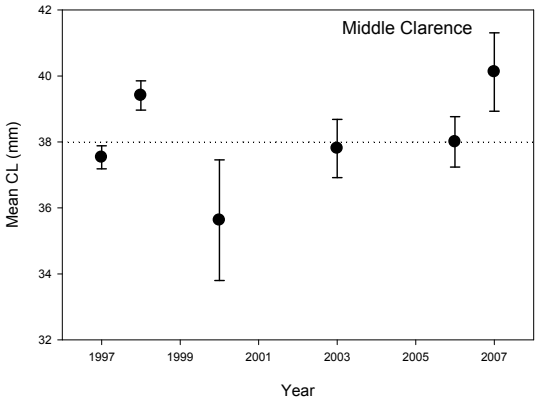

Figure 12.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 2, 1997–2007. Dotted line represents the long-term baseline.

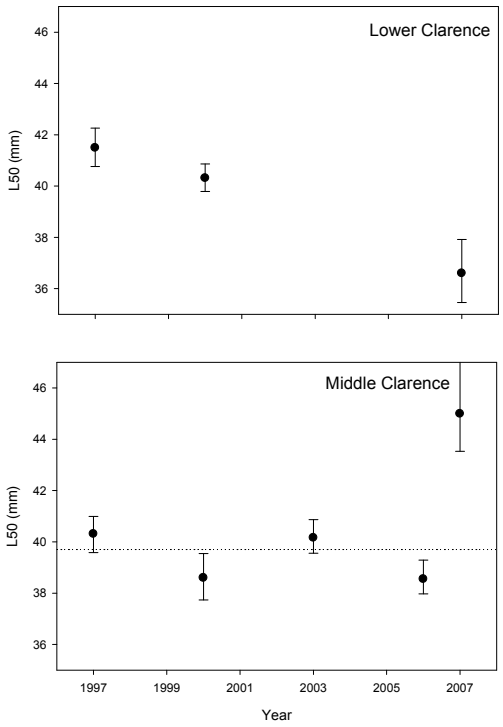

Figure 13.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 2, 1997–2007. Dotted line represents the long-term baseline.

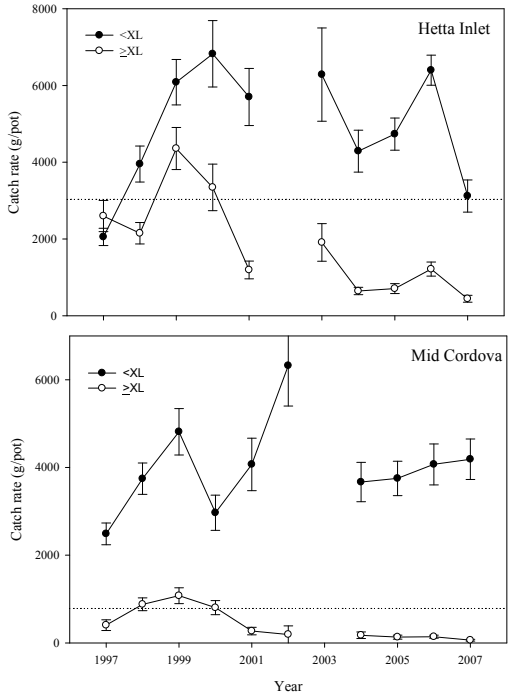

Figure 14.–Mean and standard error of spot shrimp CPUE from preseason surveys in Section 3-A, 1997–2007. Dotted line represents the long-term baseline.

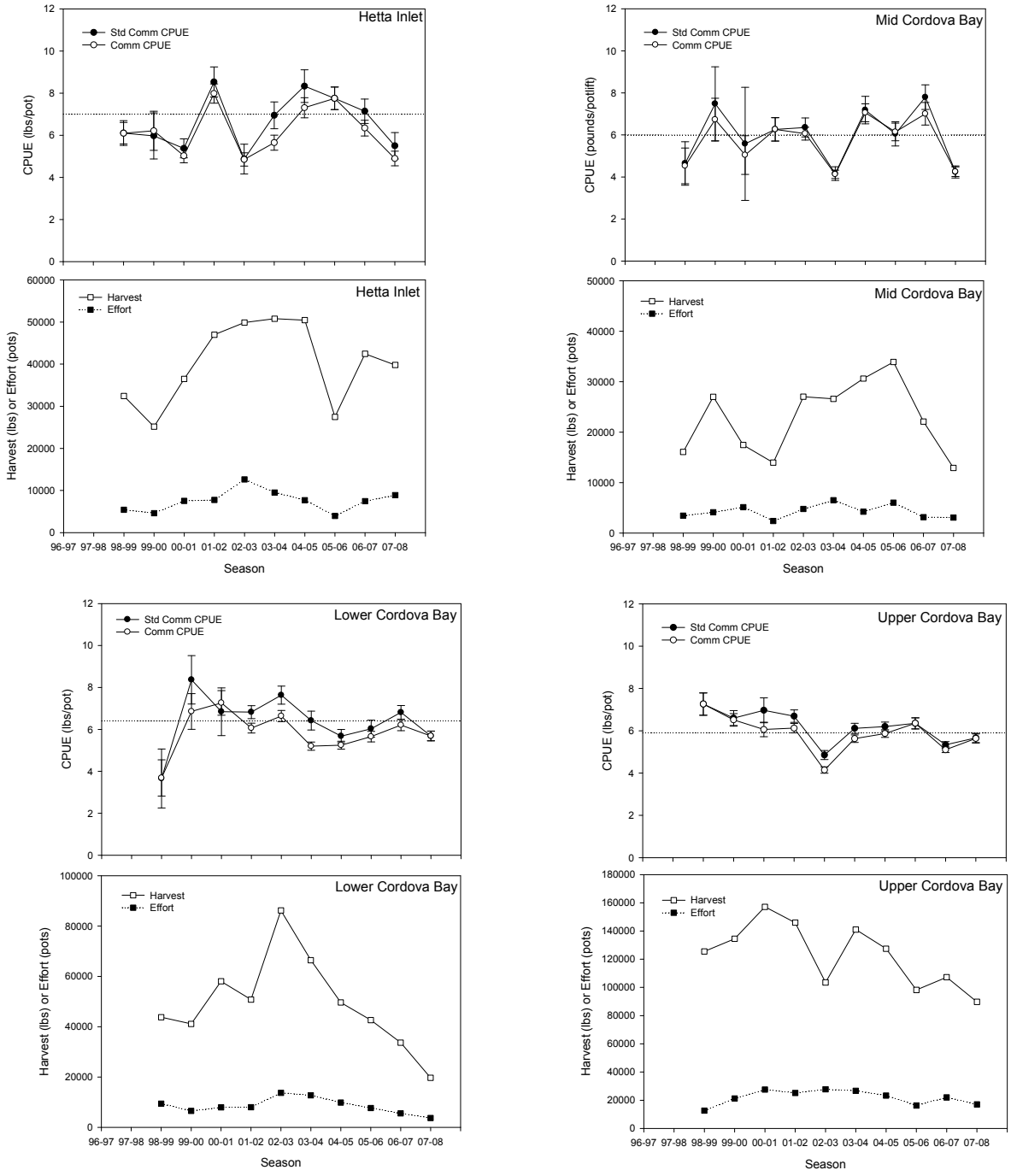

Figure 15.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline), and the commercial harvest and effort by analysis area in Section 3-A, 1998–2007.

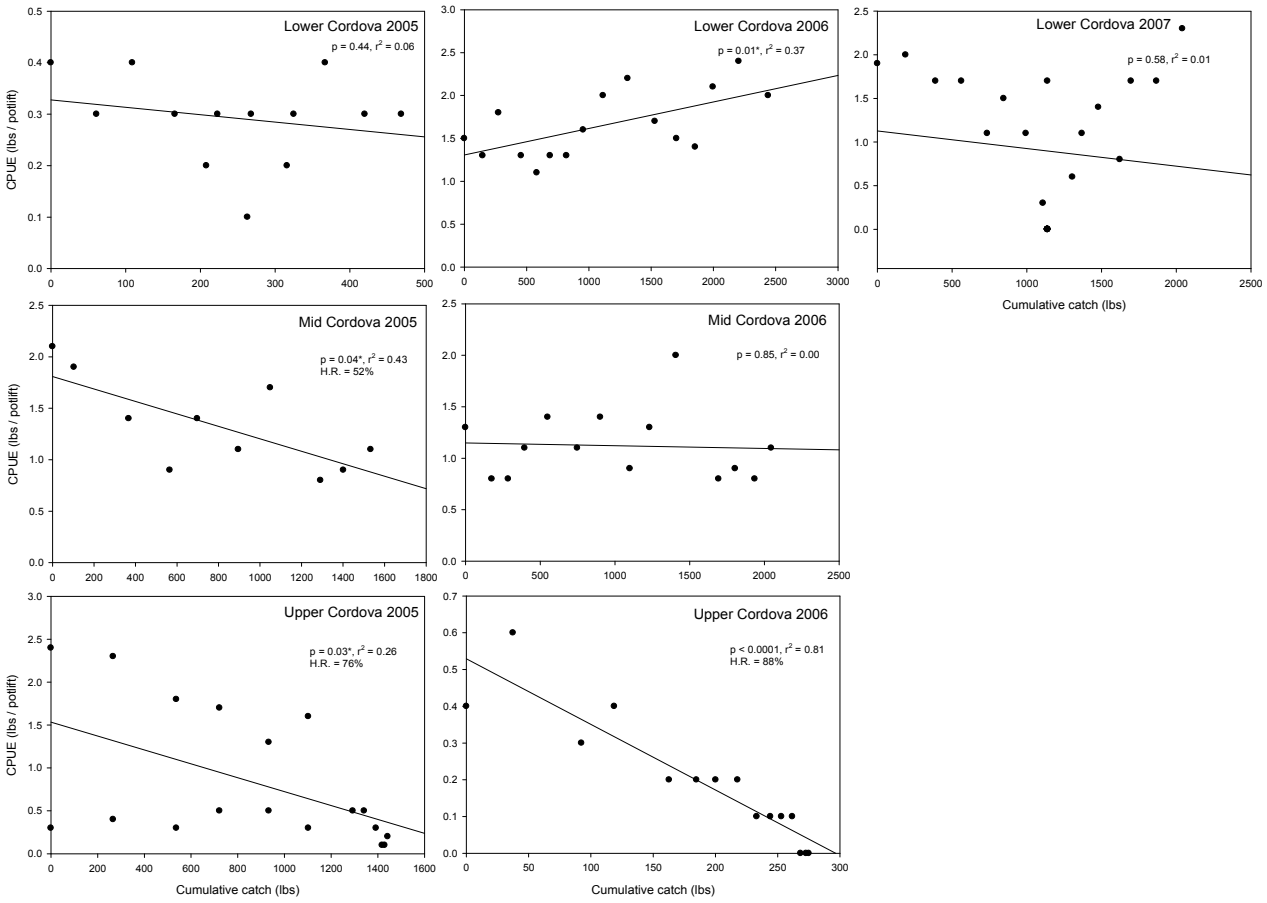

Figure 16.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in Section 3A, 2005–2007.

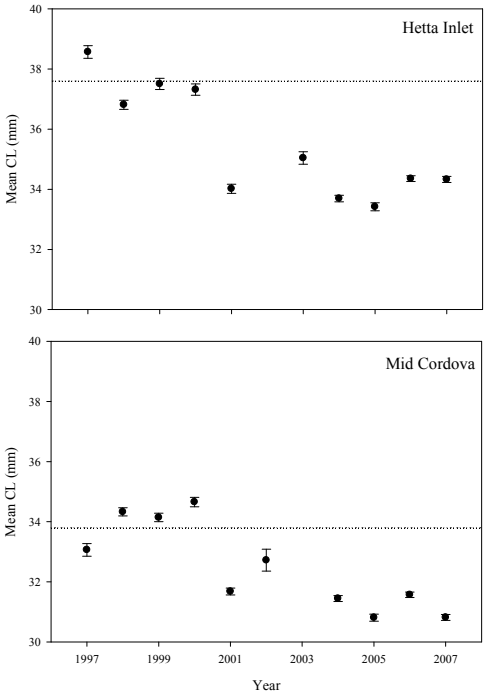

Figure 17.–Mean and standard error of spot shrimp carapace length from preseason surveys in Section 3-A, 1997–2007. Dotted line represents the long-term baseline.

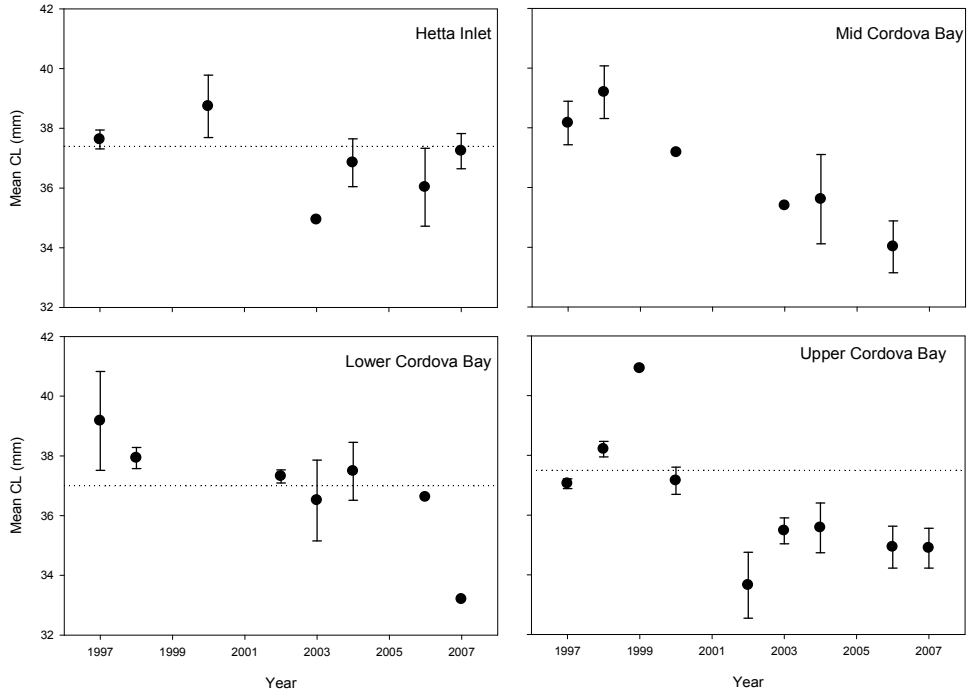

Figure 18.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Section 3-A, 1997–2007. Dotted line represents the long-term baseline.

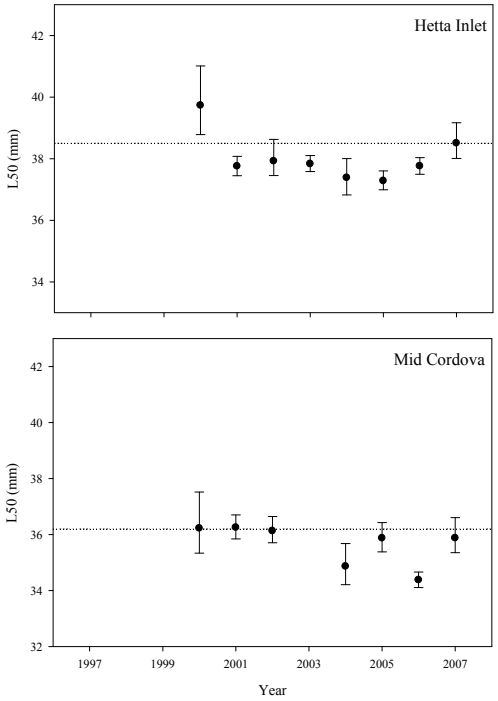

Figure 19.–L_{50} and 95% confidence intervals of spot shrimp from preseason surveys in Section 3-A, 1997–2007. Dotted line represents the long-term baseline.

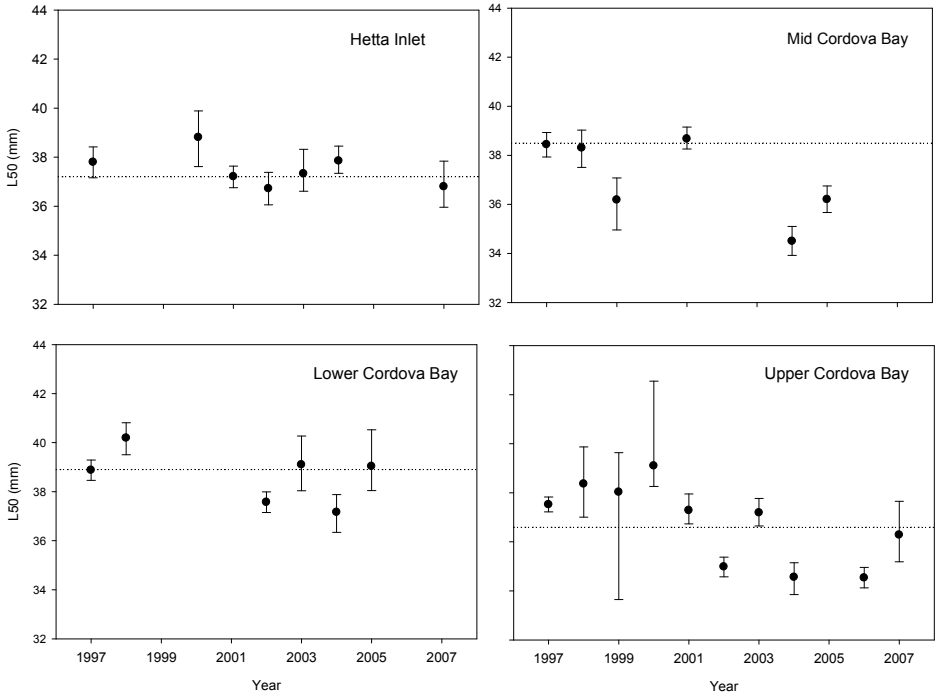

Figure 20.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Section 3-A, 1997–2007. Dotted line represents the long-term baseline.

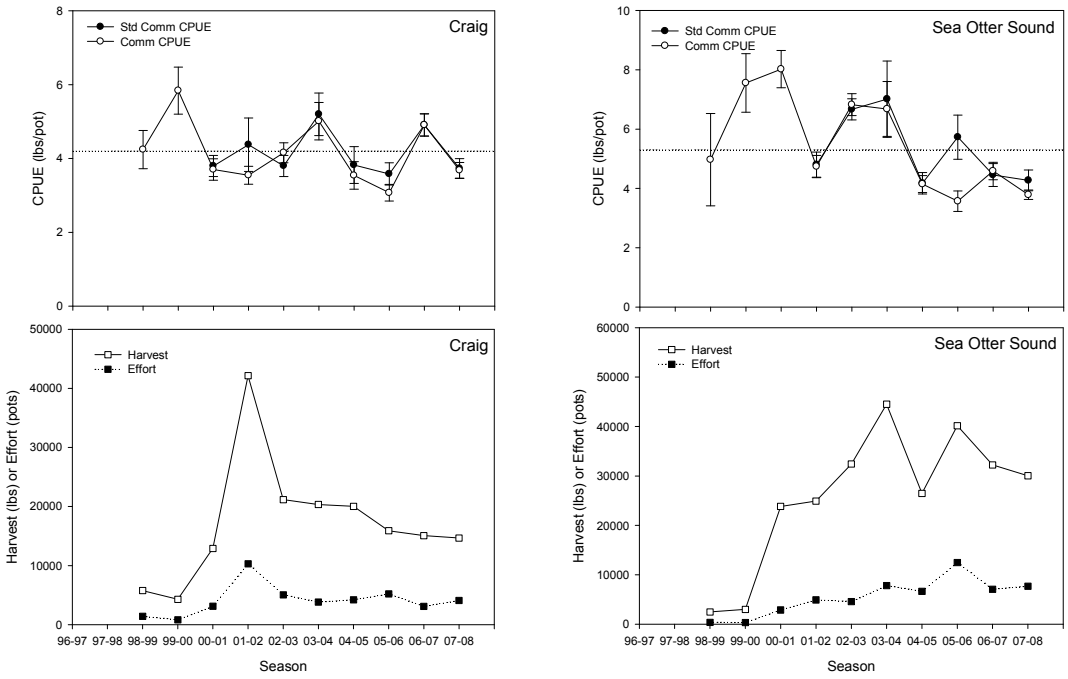

Figure 21.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Sections 3-B/C, 1997–2007.

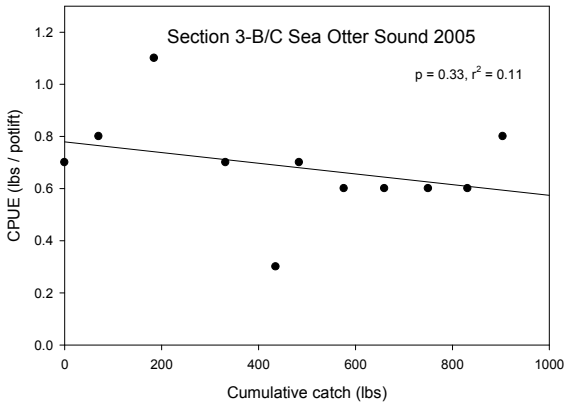

Figure 22.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in Sections 3-B/C, 2005–2007.

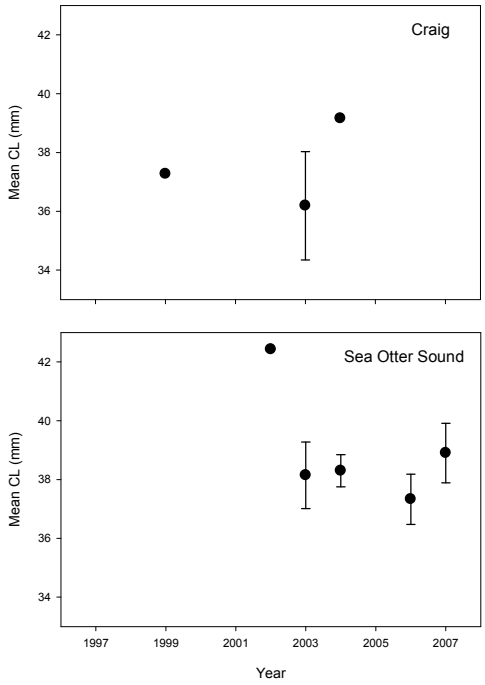

Figure 23.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Sections 3-B/C, 1997–2007. Dotted line represents the long-term baseline.

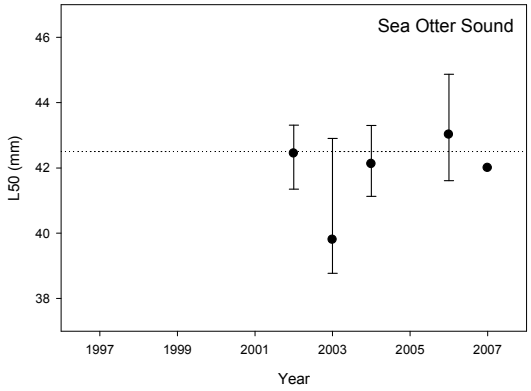

Figure 24.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Sections 3-B/C, 1997–2007. Dotted line represents the long-term baseline.

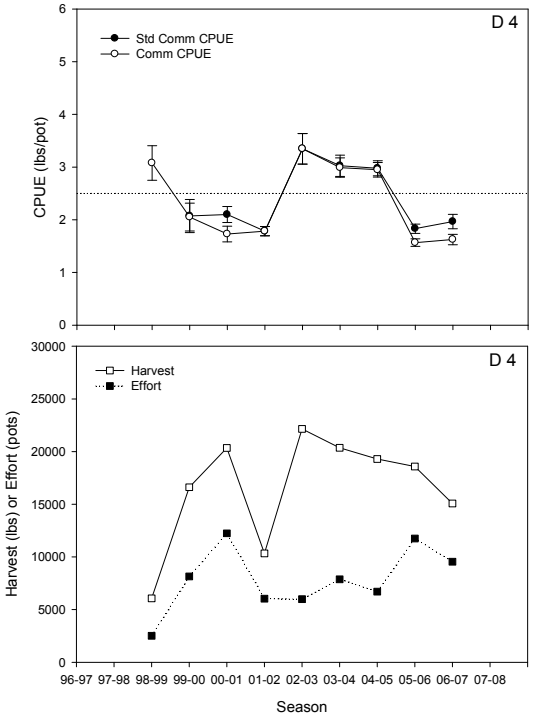

Figure 25.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 4, 1998–2007.

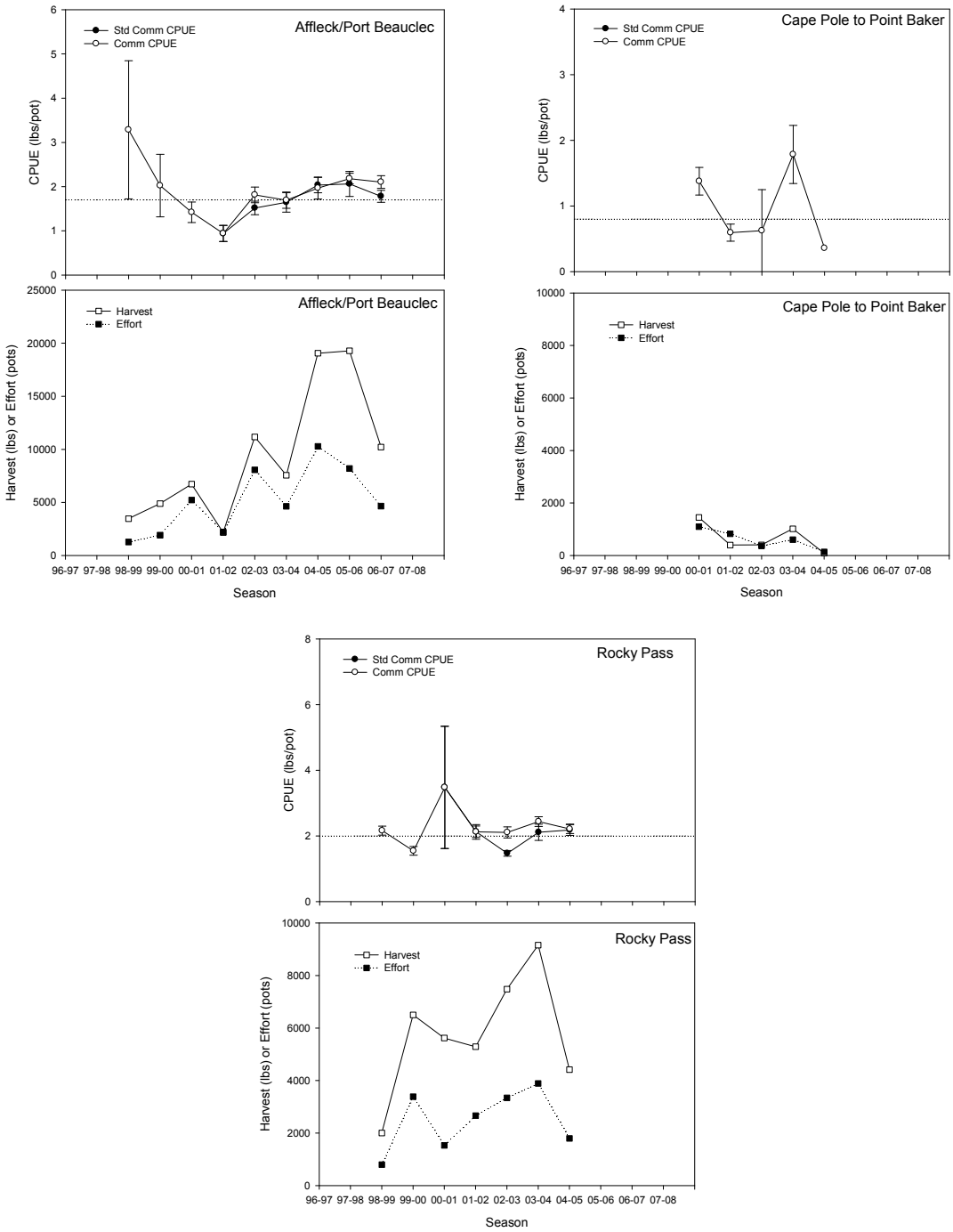

Figure 26.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 5, 1998–2007.

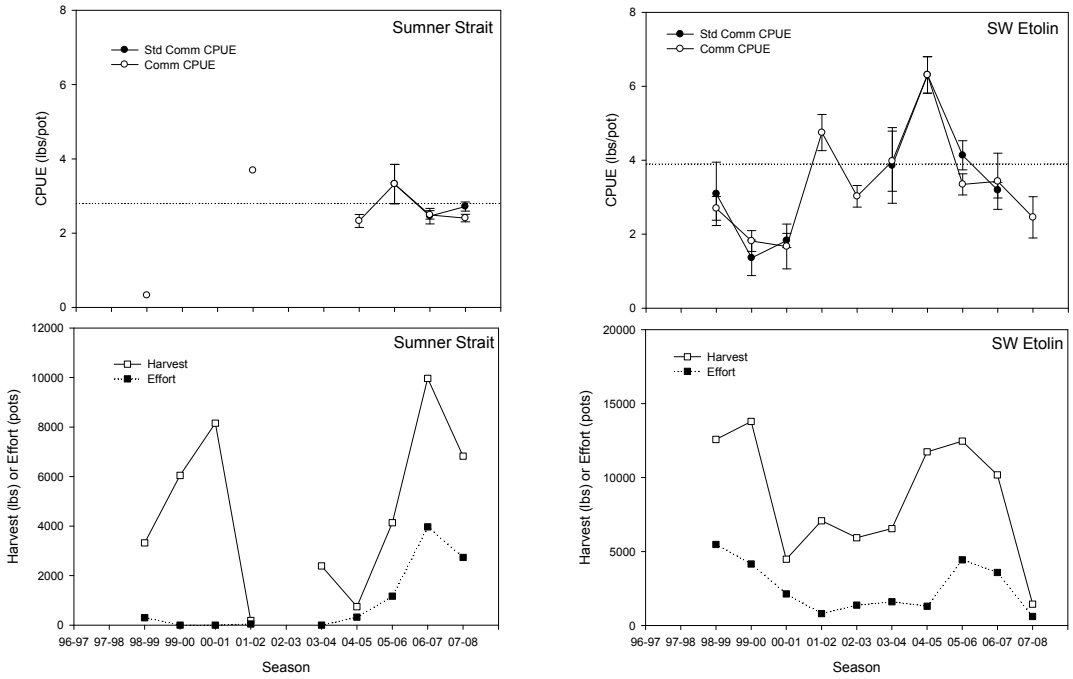

Figure 27.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 6, 1998–2007.

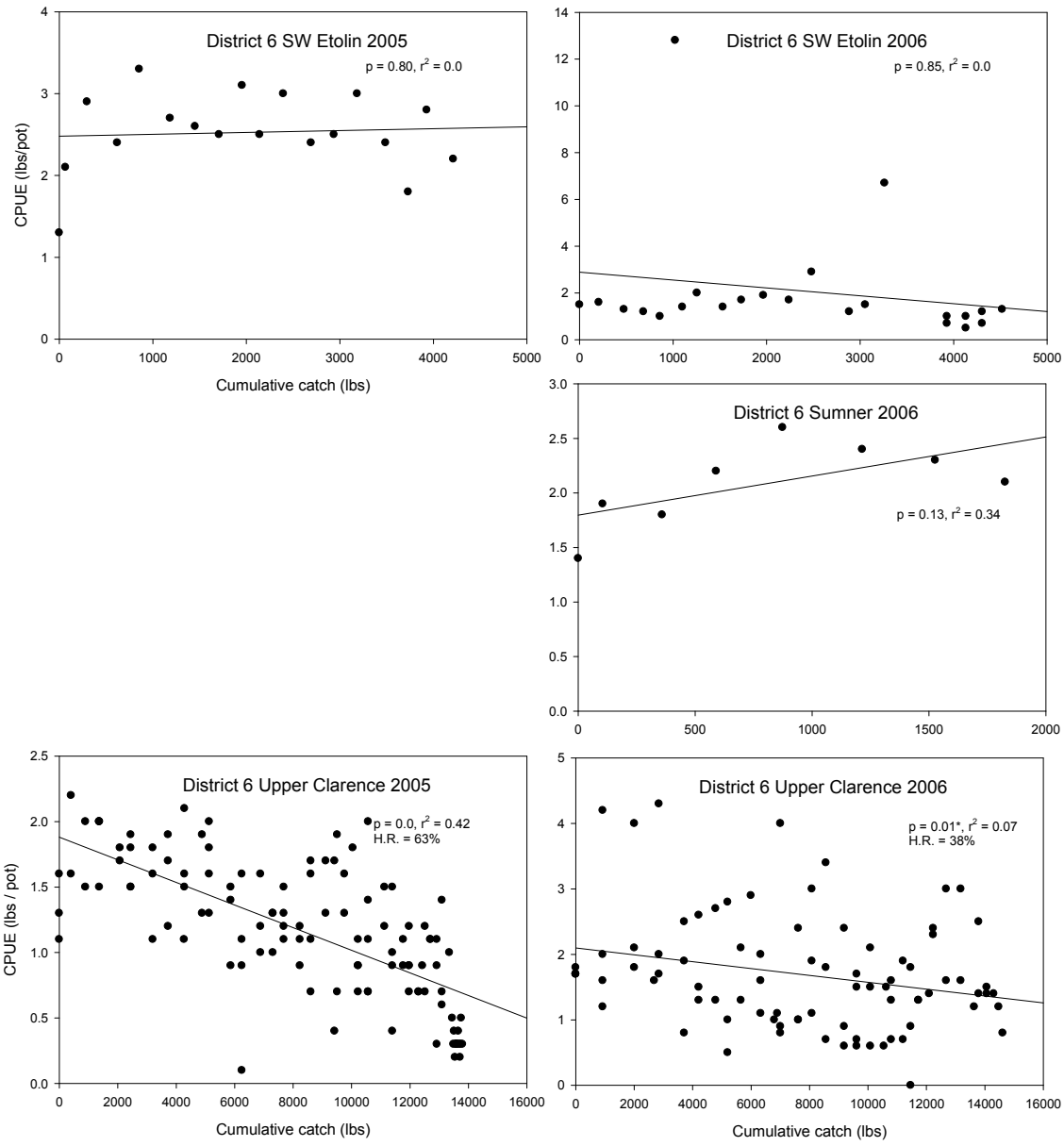

Figure 28.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 6, 2005–2007.

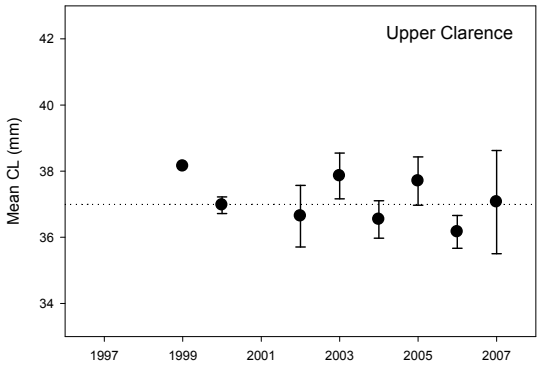

Figure 29.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 6, 1997–2007. Dotted line represents the long-term baseline.

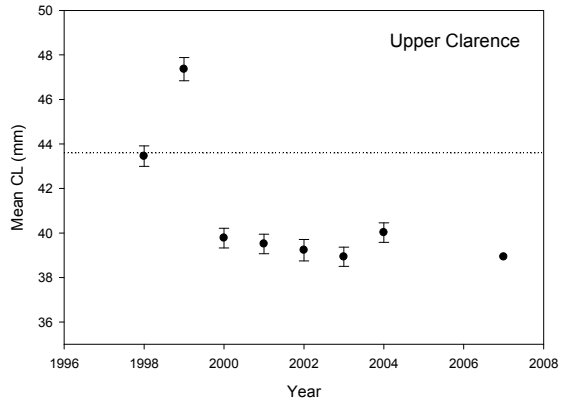

Figure 30.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 6, 1997–2007. Dotted line represents the long-term baseline.

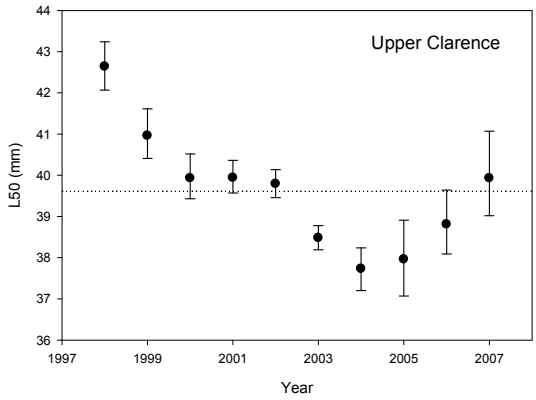

Figure 31.– L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 6, 1997–2007. Dotted line represents the long-term baseline.

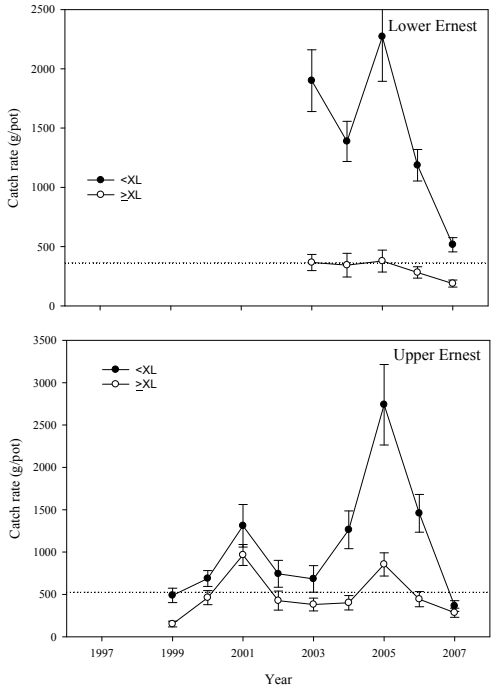

Figure 32.–Mean and standard error of spot shrimp CPUE from preseason surveys in District 7, 1997–2007. Dotted line represents the long-term baseline.

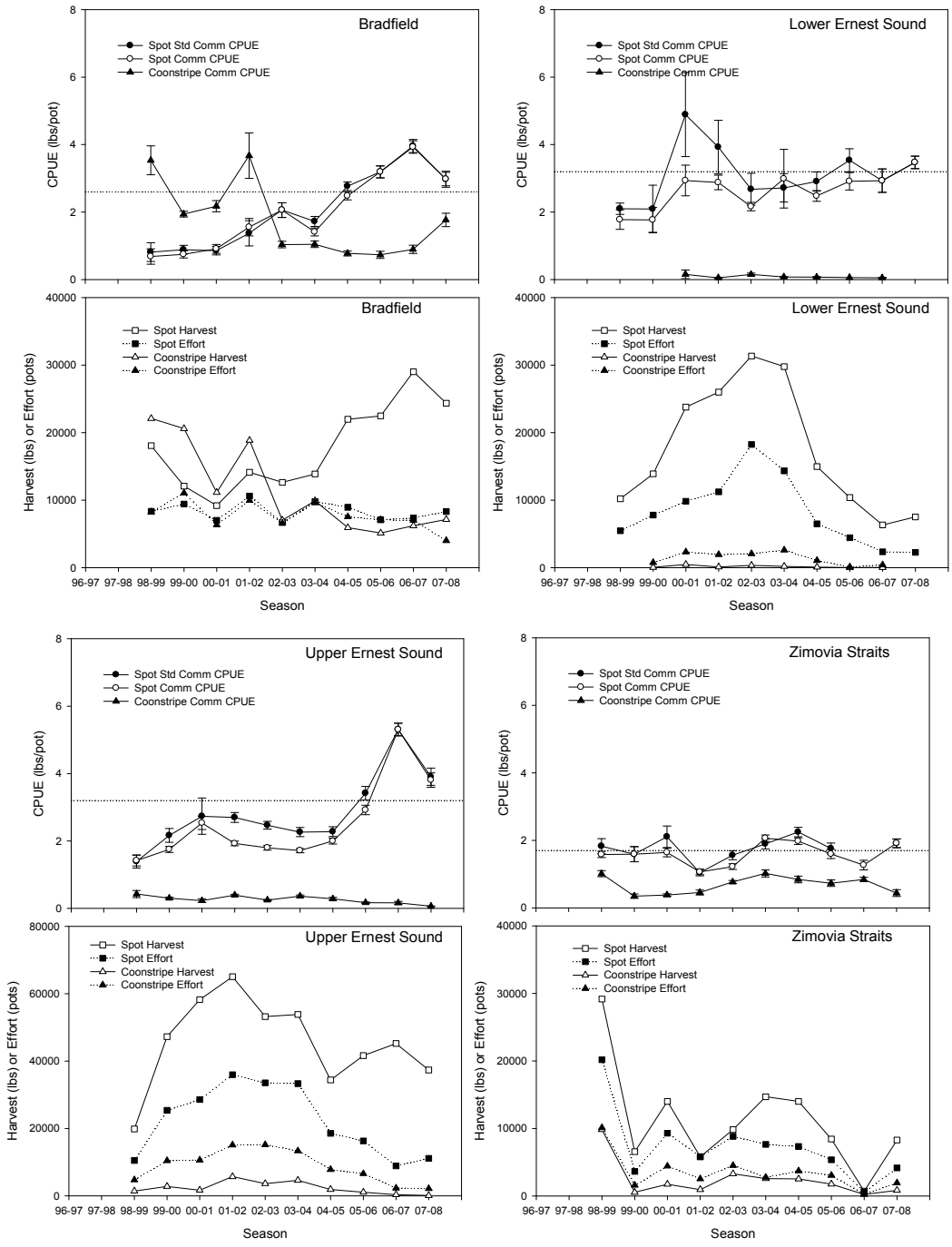

Figure 33.–Mean and standard error of spot and coonstripe shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 7, 1998–2007.

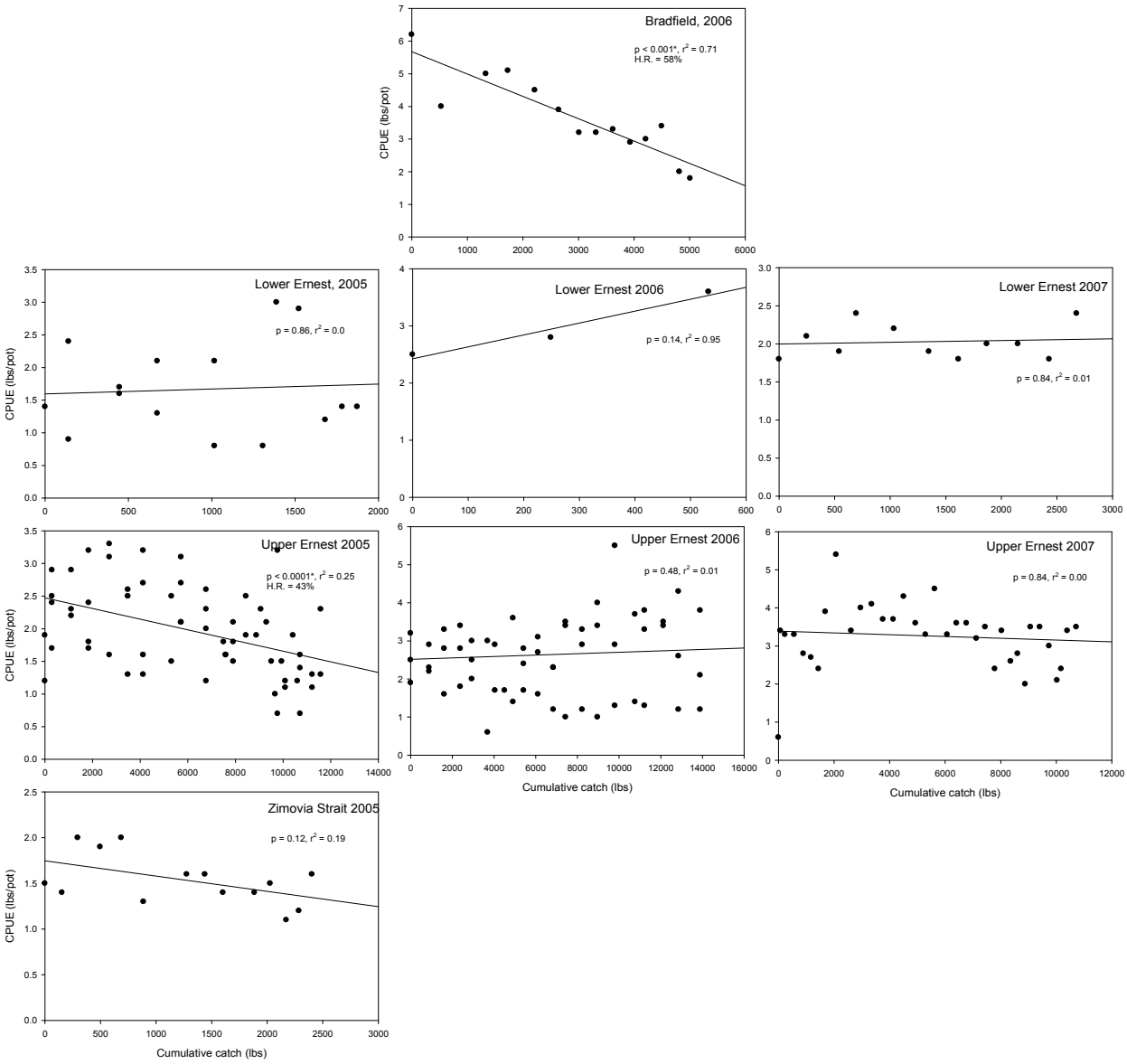

Figure 34.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 7, 2005–2007.

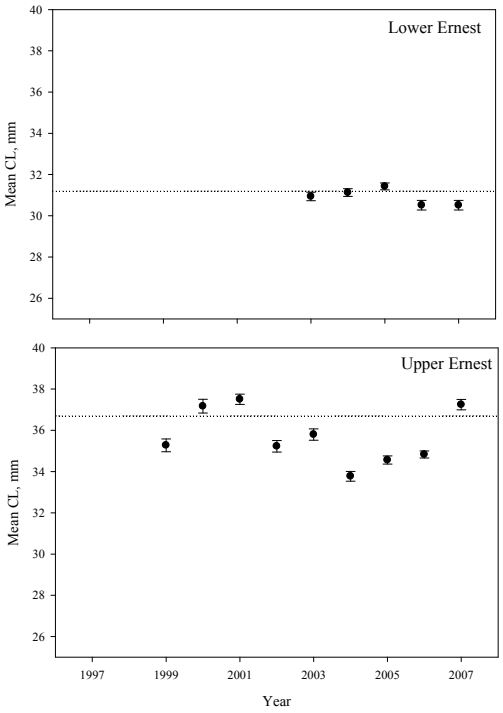

Figure 35.–Mean and standard error of spot shrimp carapace length from preseason surveys in District 7, 1997–2007. Dotted line represents the long-term baseline.

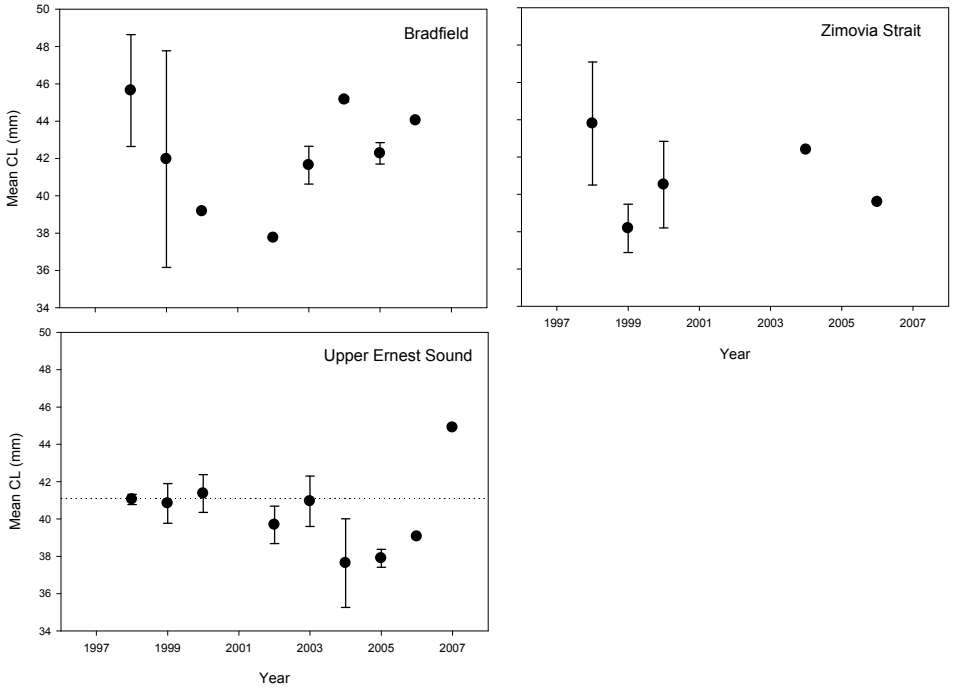

Figure 36.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 7, 1997–2007. Dotted line represents the long-term baseline.

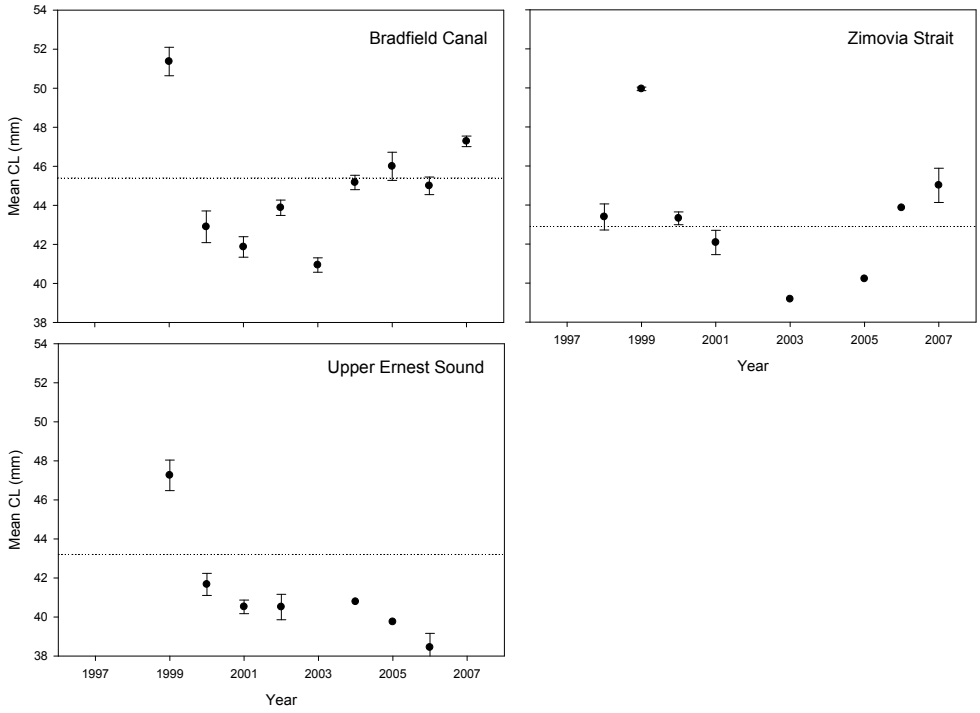

Figure 37.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 7, 1997–2007. Dotted line represents the long-term baseline.

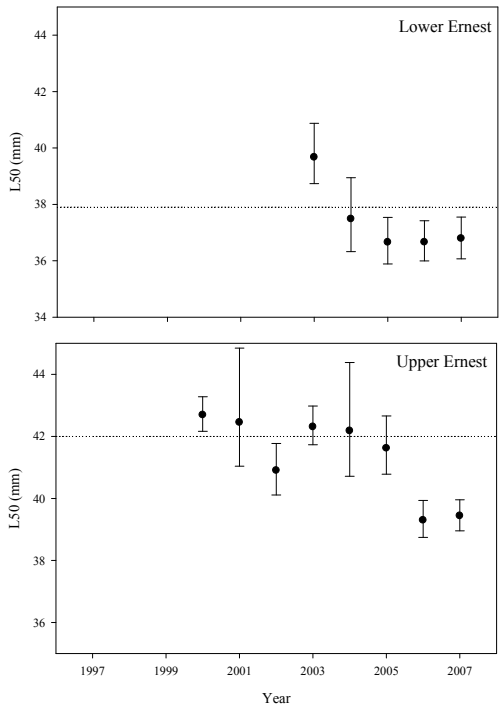

Figure 38.–L_{50} and 95% confidence intervals of spot shrimp from preseason surveys in District 7, 1997–2007. Dotted line represents the long-term baseline.

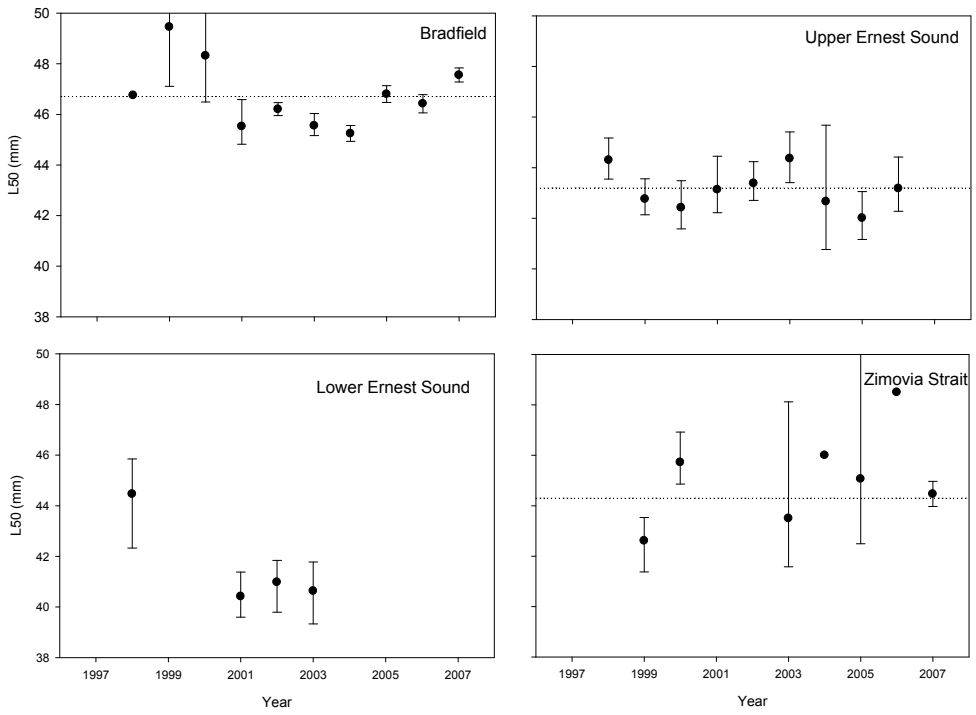

Figure 39.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 7, 1997–2007. Dotted line represents the long-term baseline.

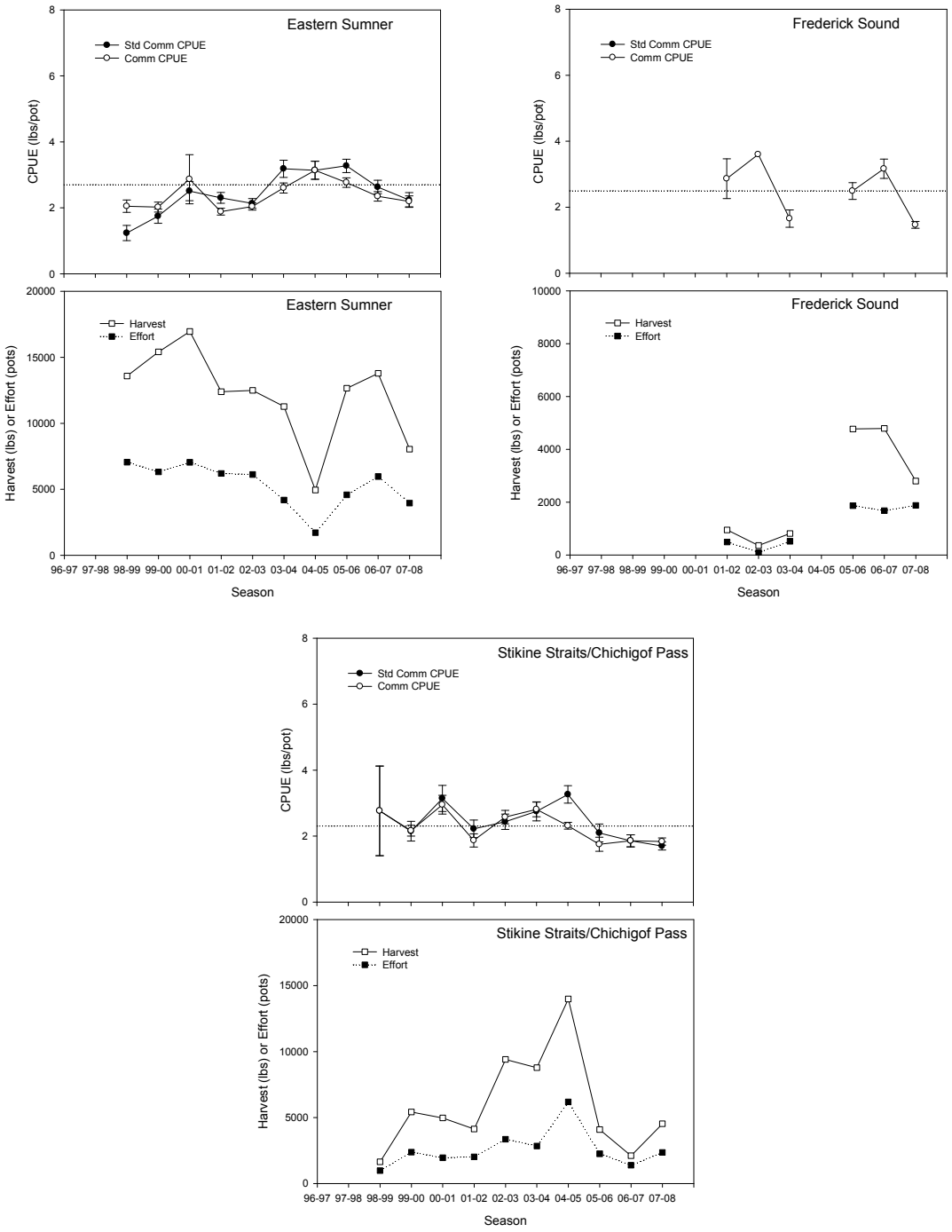

Figure 40.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 8, 1998–2007.

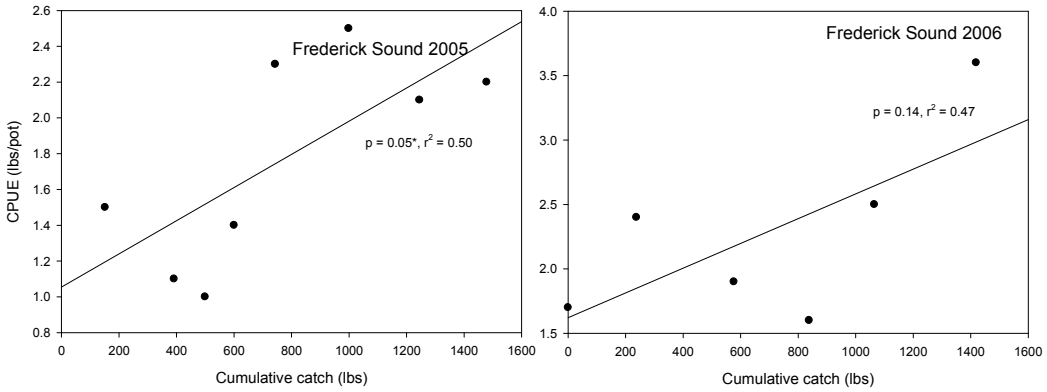

Figure 41.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 8, 2005–2007.

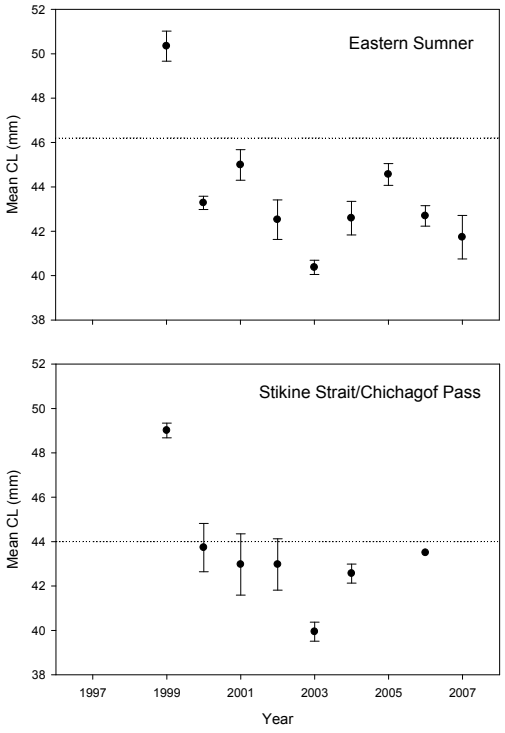

Figure 42.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 8, 1997–2007. Dotted line represents the long-term baseline.

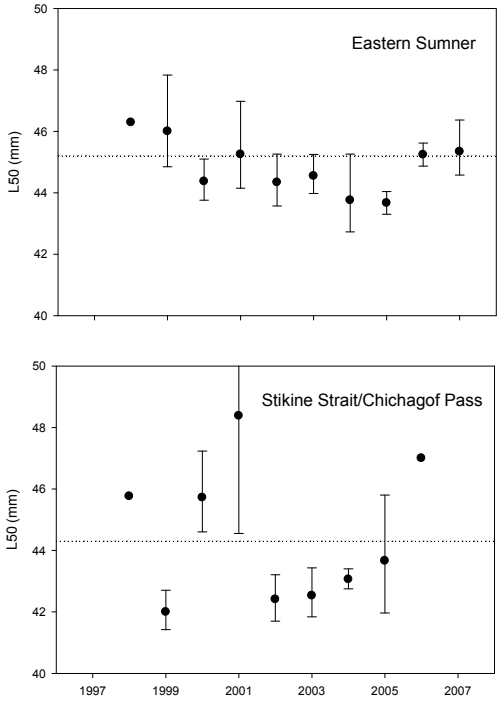

Figure 43.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 8, 1997–2007. Dotted line represents the long-term baseline.

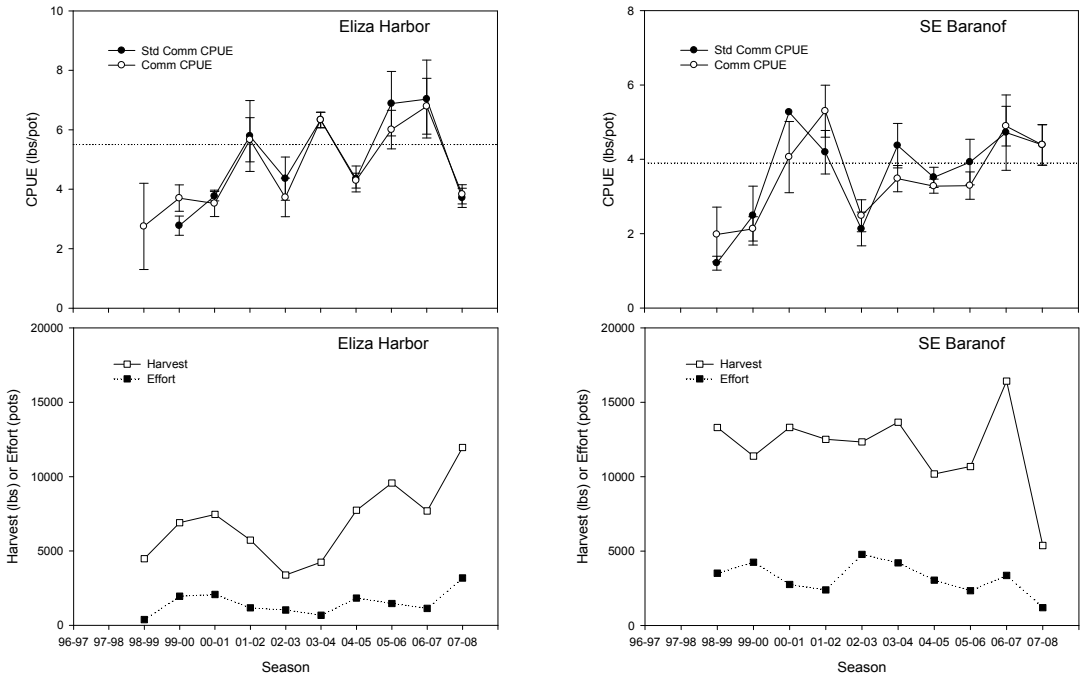

Figure 44.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 9, 1998–2007.

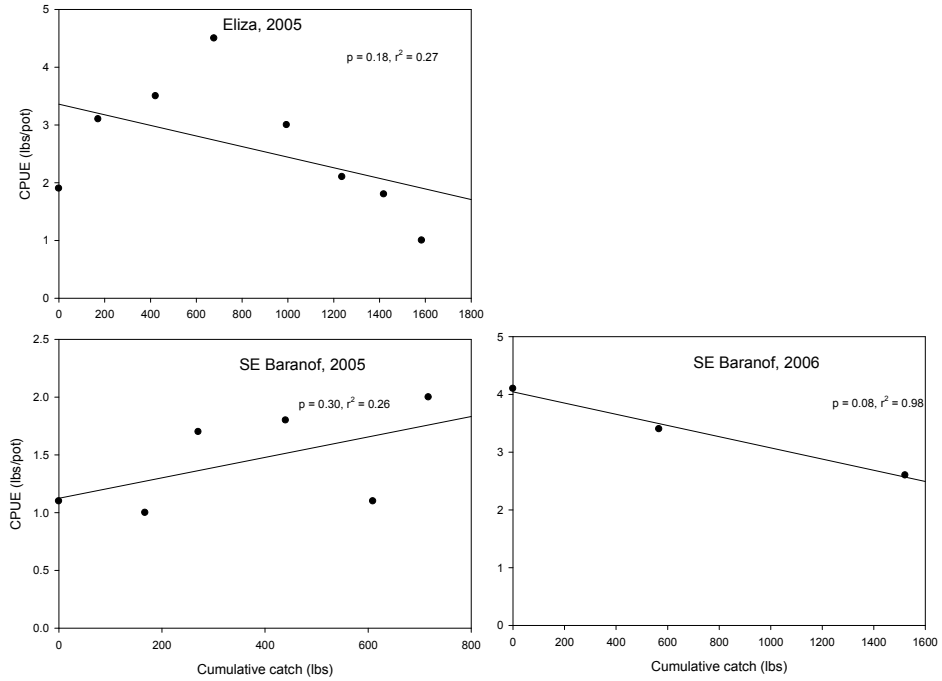

Figure 45.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 9, 2005–2007.

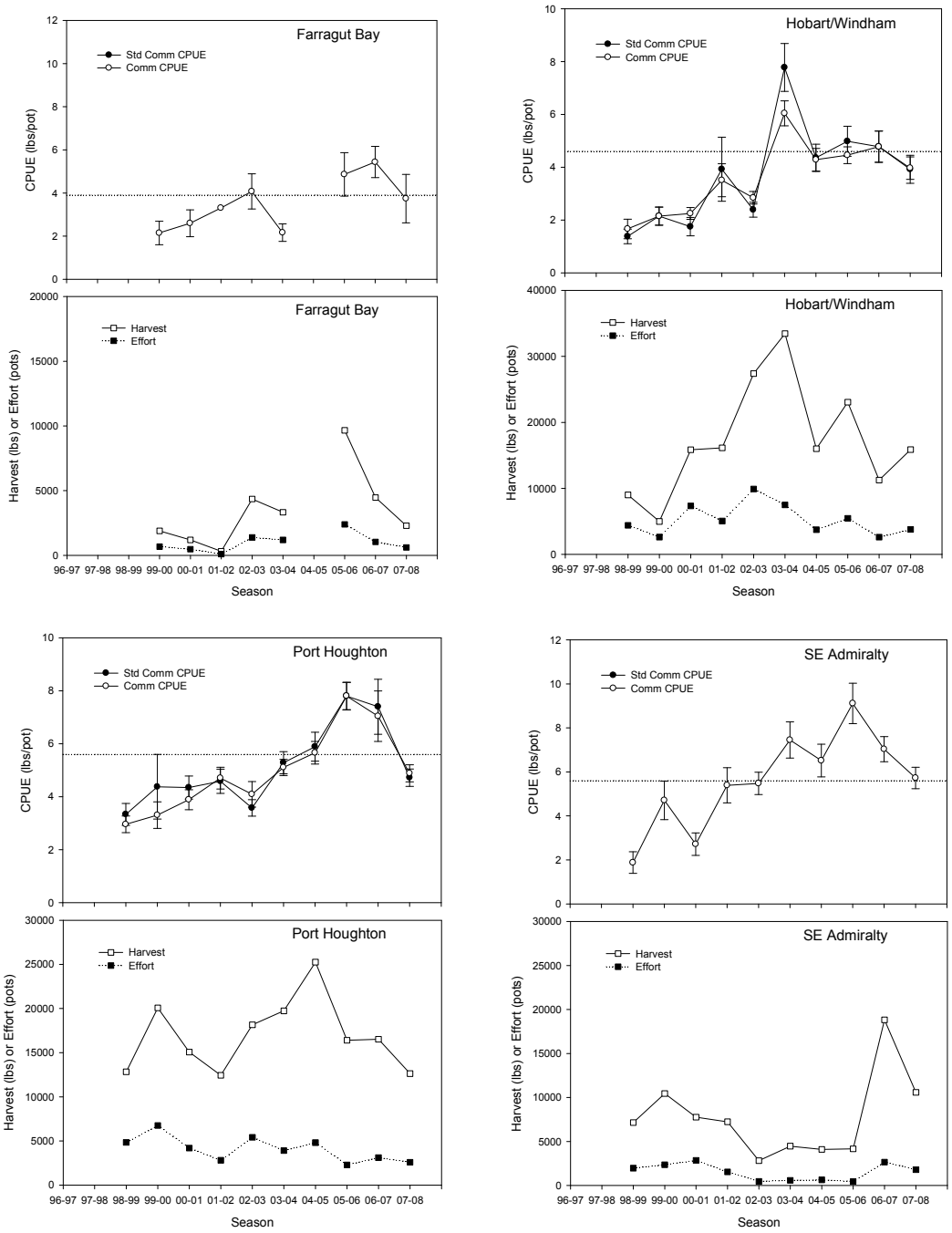

Figure 46.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 10, 1998–2007.

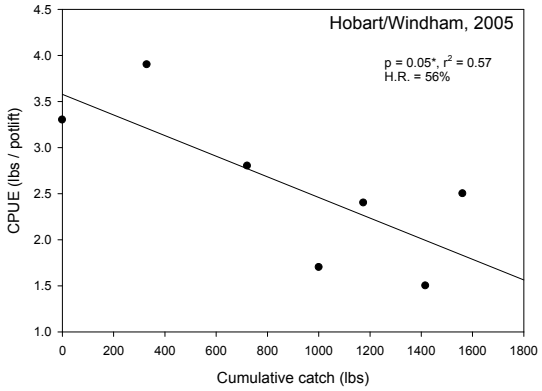

Figure 47.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 10, 2005–2007.

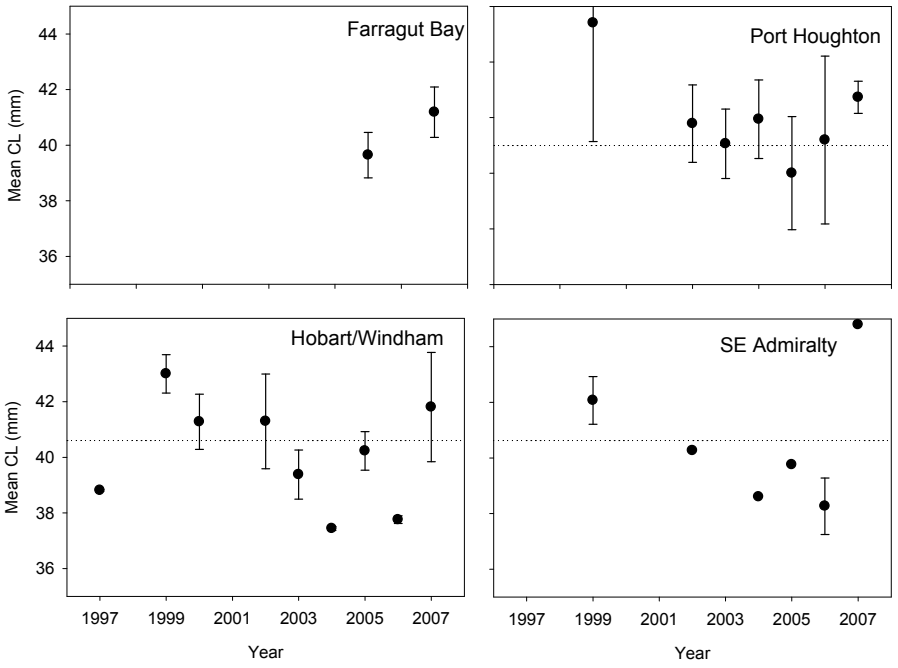

Figure 48.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 10, 1997–2007. Dotted line represents the long-term baseline.

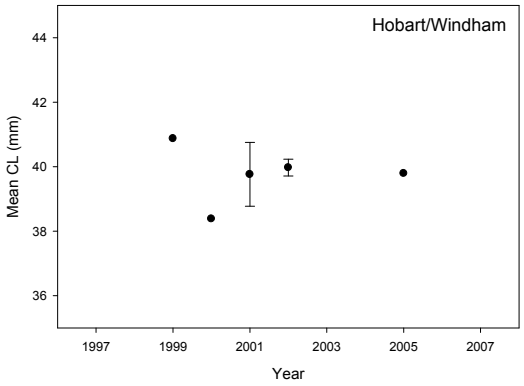

Figure 49.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 10, 1997–2007.

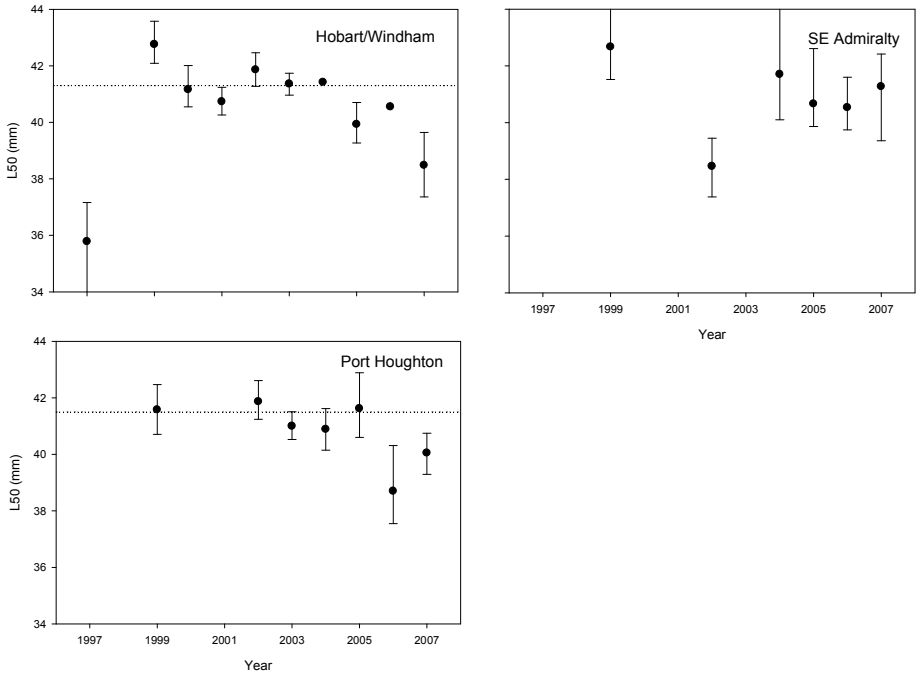

Figure 50.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 10, 1997–2007. Dotted line represents the long-term baseline.

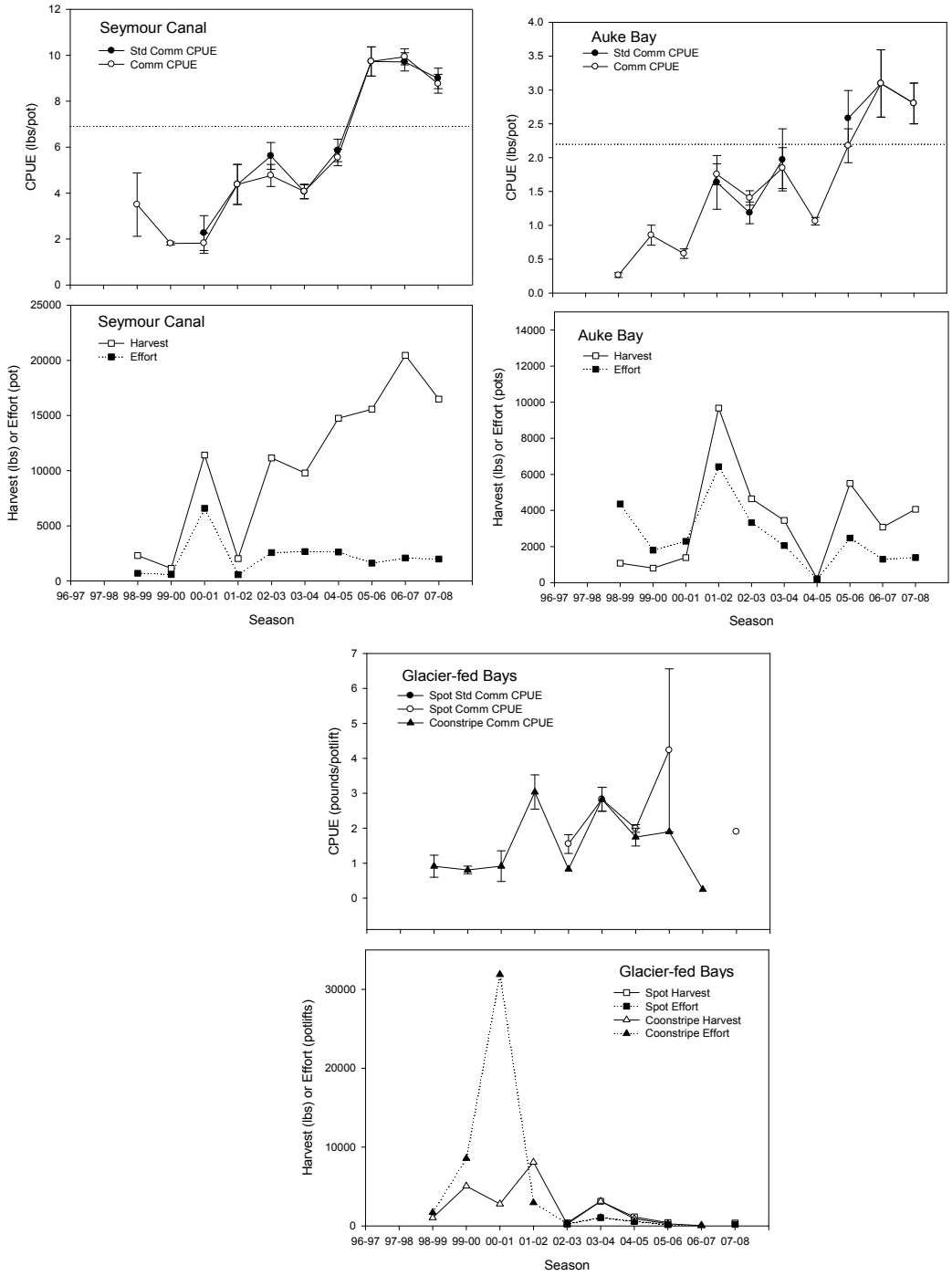

Figure 51.–Mean and standard error of spot and coonstripe shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 11, 1998–2007.

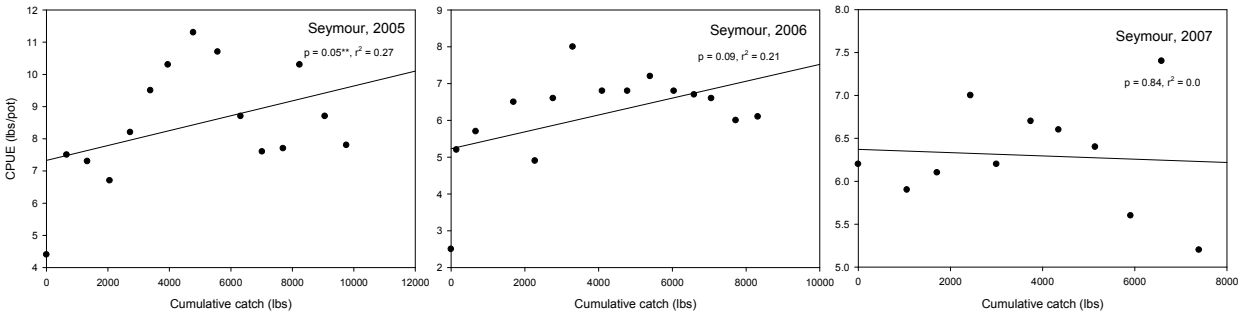

Figure 52.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 11, 2005–2007.

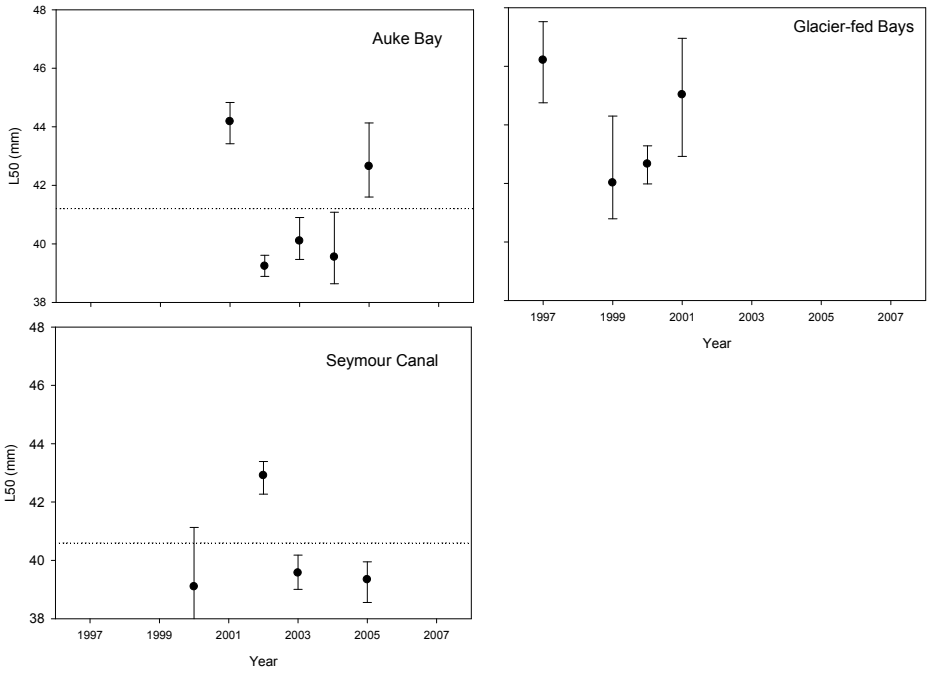

Figure 53.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 11, 1997–2007. Dotted line represents the long-term baseline.

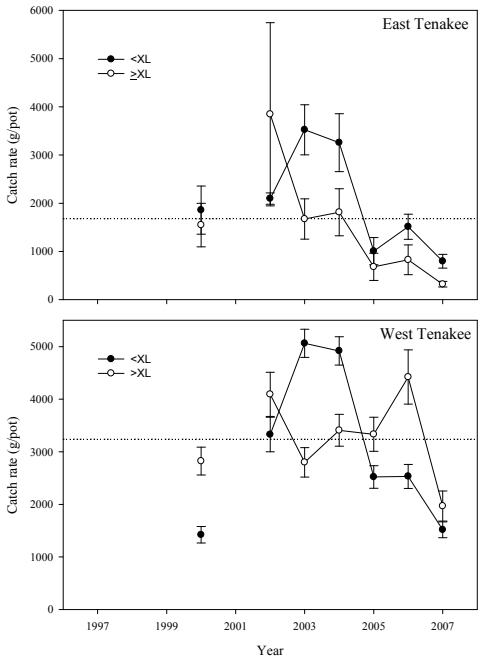

Figure 54.–Mean and standard error of spot shrimp CPUE from preseason surveys in Tenakee Inlet, 1997–2007. Dotted line represents the long-term baseline.

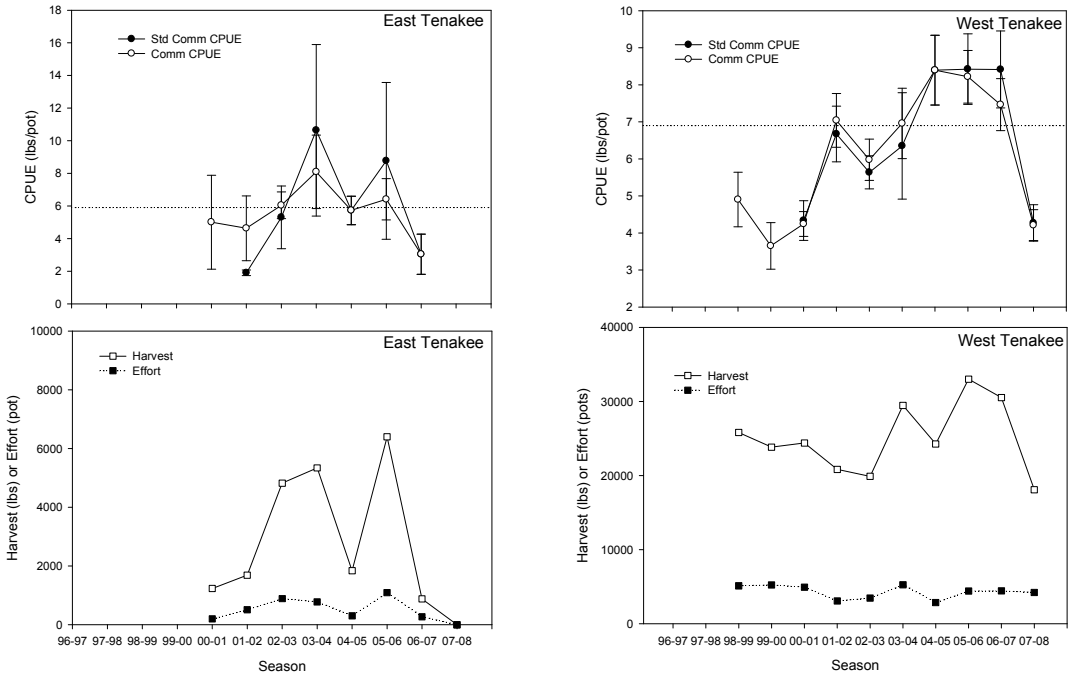

Figure 55.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Tenakee Inlet, 1998–2007.

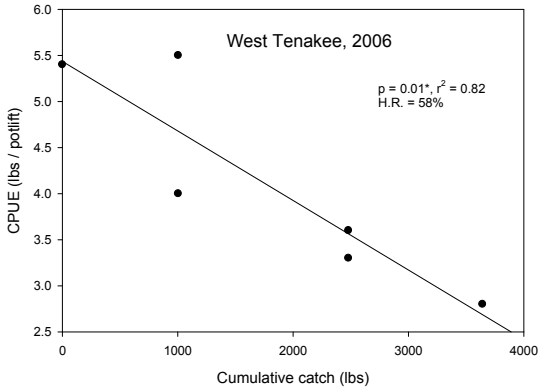

Figure 56.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in Tenakee Inlet, 2005–2007.

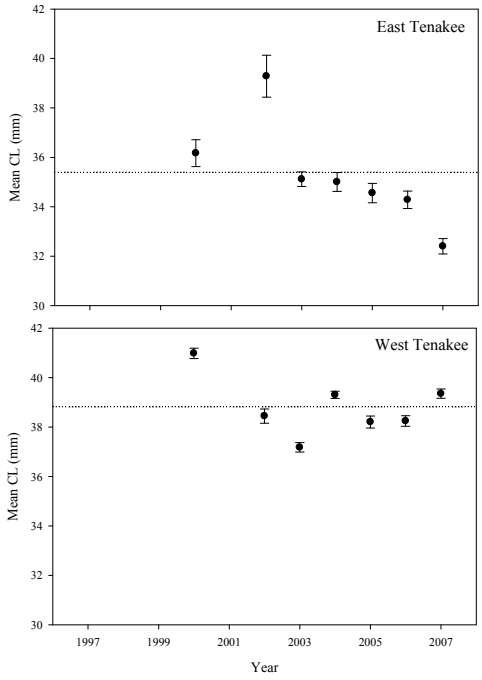

Figure 57.–Mean and standard error of spot shrimp carapace length from preseason surveys in Tenakee Inlet, 1997–2007. Dotted line represents the long-term baseline.

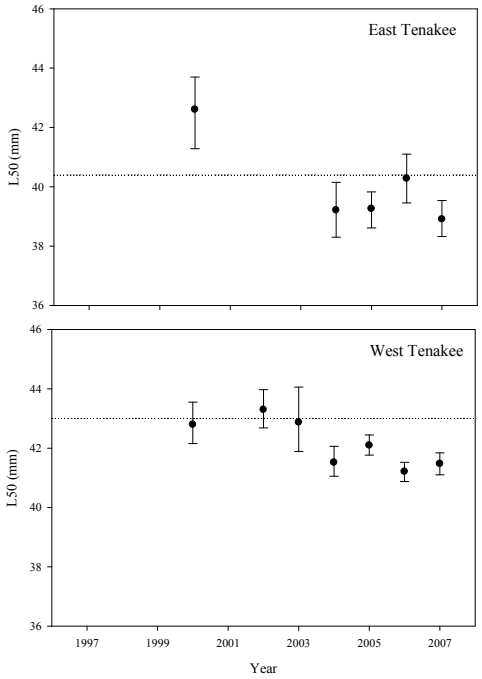

Figure 58.–L_{50} and 95% confidence intervals of spot shrimp from preseason surveys in Tenakee Inlet, 1997–2007. Dotted line represents the long-term baseline.

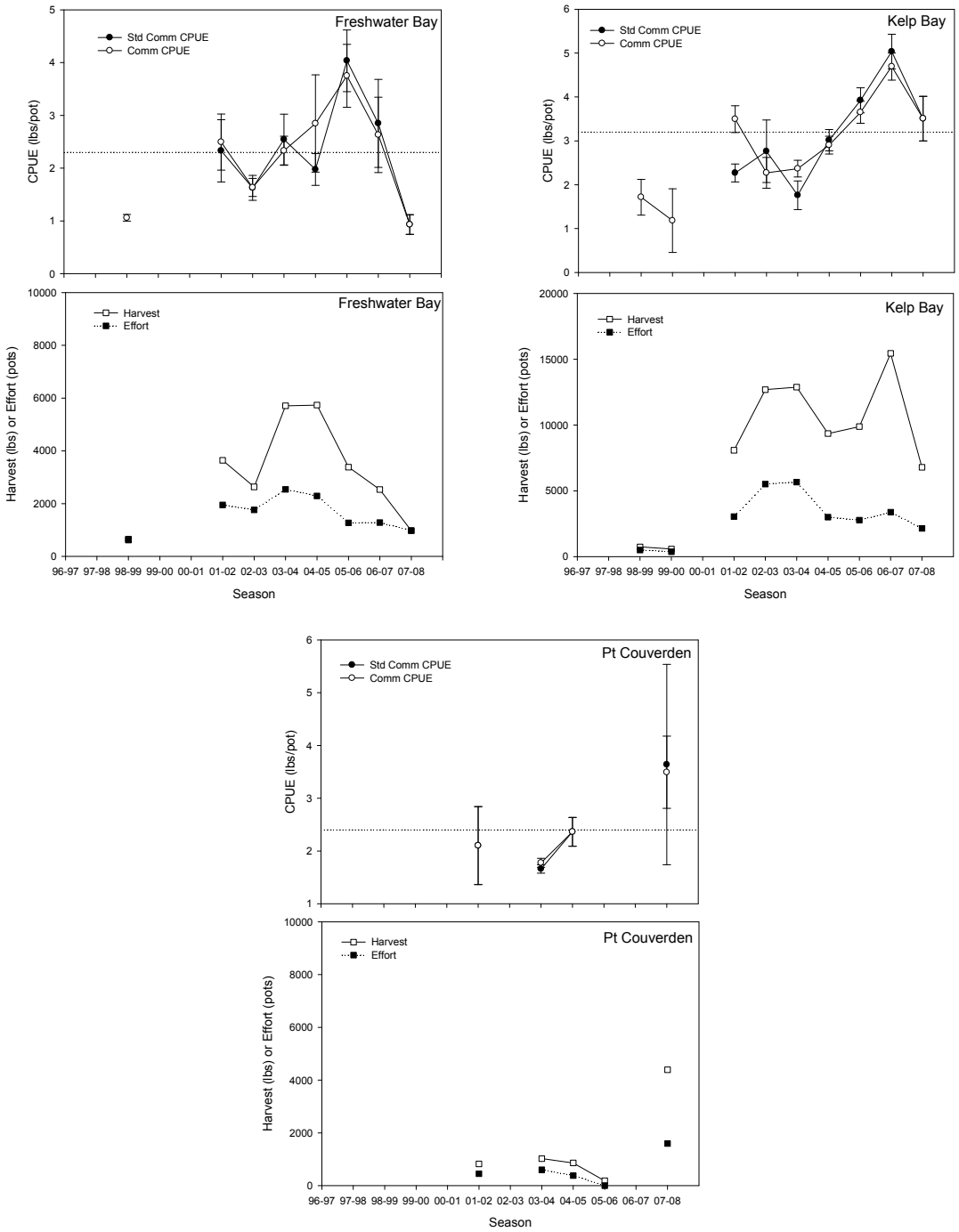

Figure 59.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in the remainder of District 12, 1998–2007.

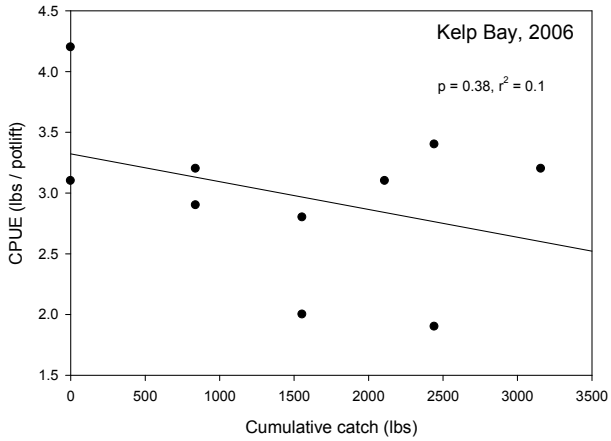

Figure 60.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in the remainder of District 12, 2005–2007.

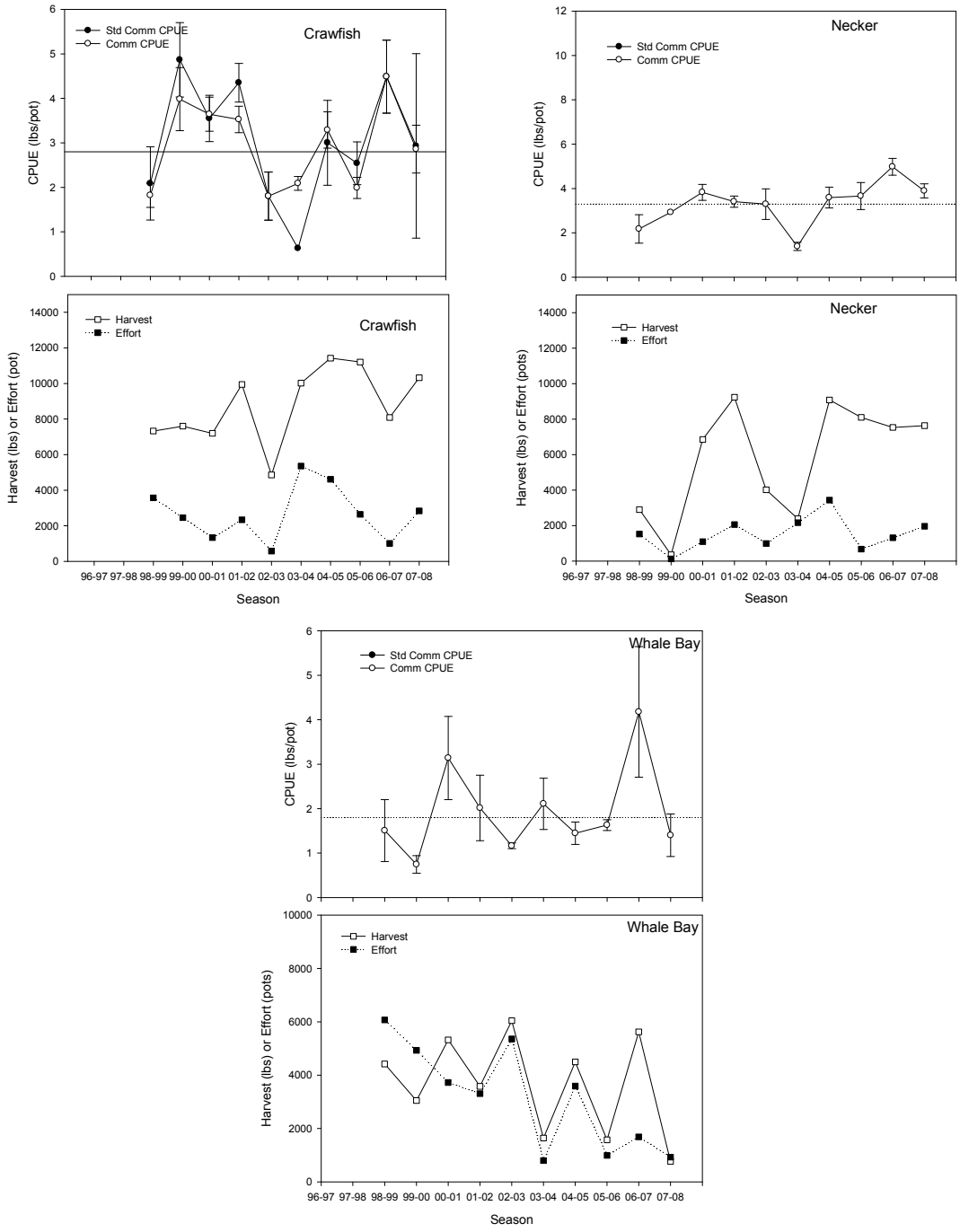

Figure 61.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Sections 13-A/B, 1998–2007.

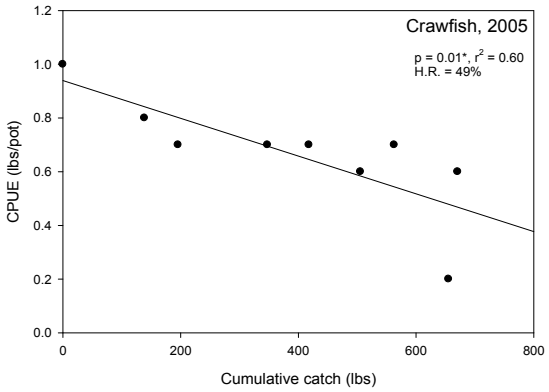

Figure 62.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in Sections 13-A/B, 2005–2007.

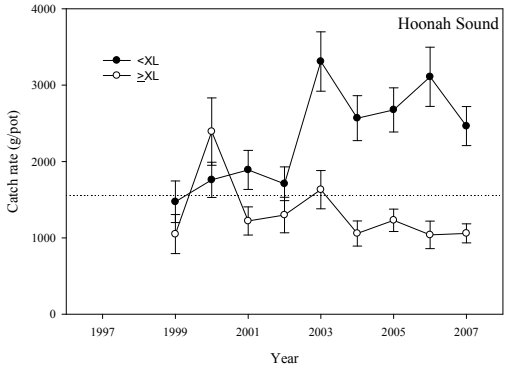

Figure 63.–Mean and standard error of spot shrimp CPUE from preseason surveys in Section 13-C, 1997–2007. Dotted line represents the long-term baseline.

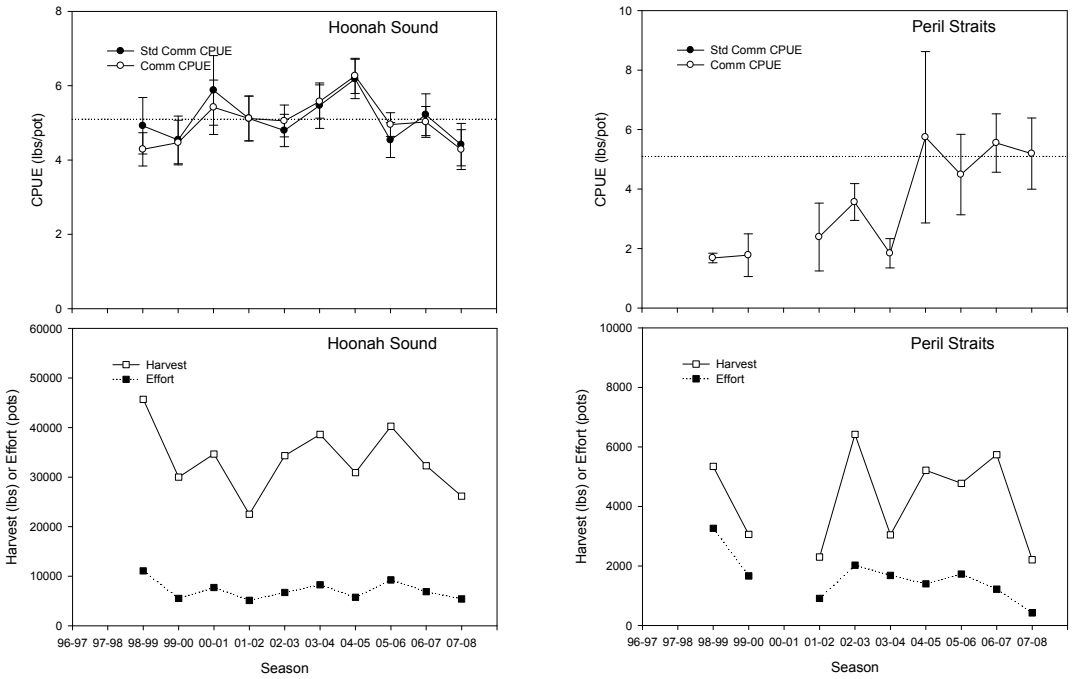

Figure 64.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Section 13-C, 1998–2007.

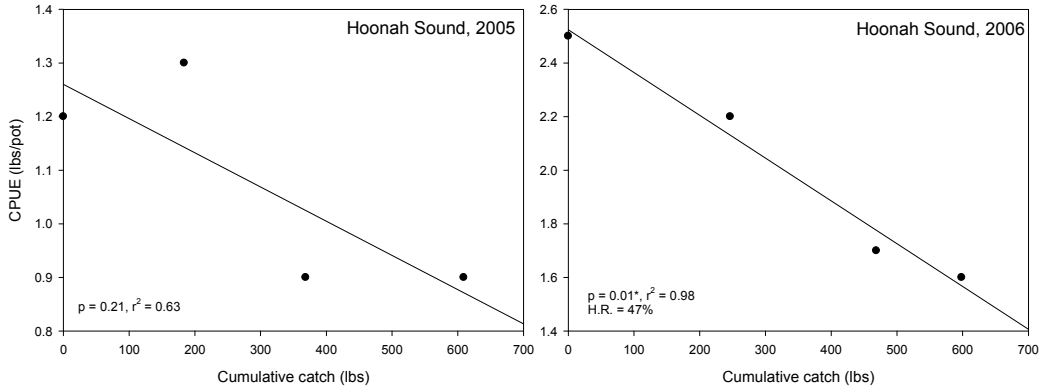

Figure 65.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in Section 13-C, 2005–2007.

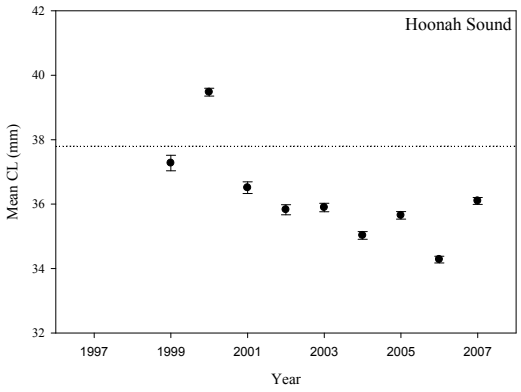

Figure 66.–Mean and standard error of spot shrimp carapace length from preseason surveys in Section 13-C, 1997–2007. Dotted line represents the long-term baseline.

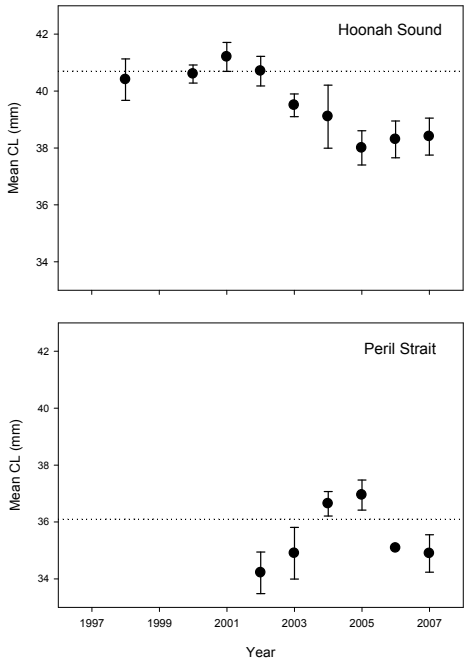

Figure 67.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Section 13-C, 1997–2007. Dotted line represents the long-term baseline.

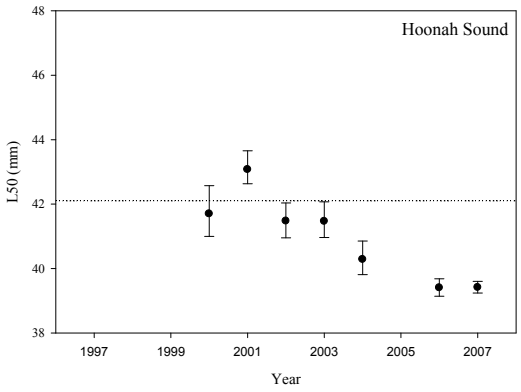

Figure 68.–L_{50} and 95% confidence intervals of spot shrimp from preseason surveys in Section 13-C, 1997–2007. Dotted line represents the long-term baseline.

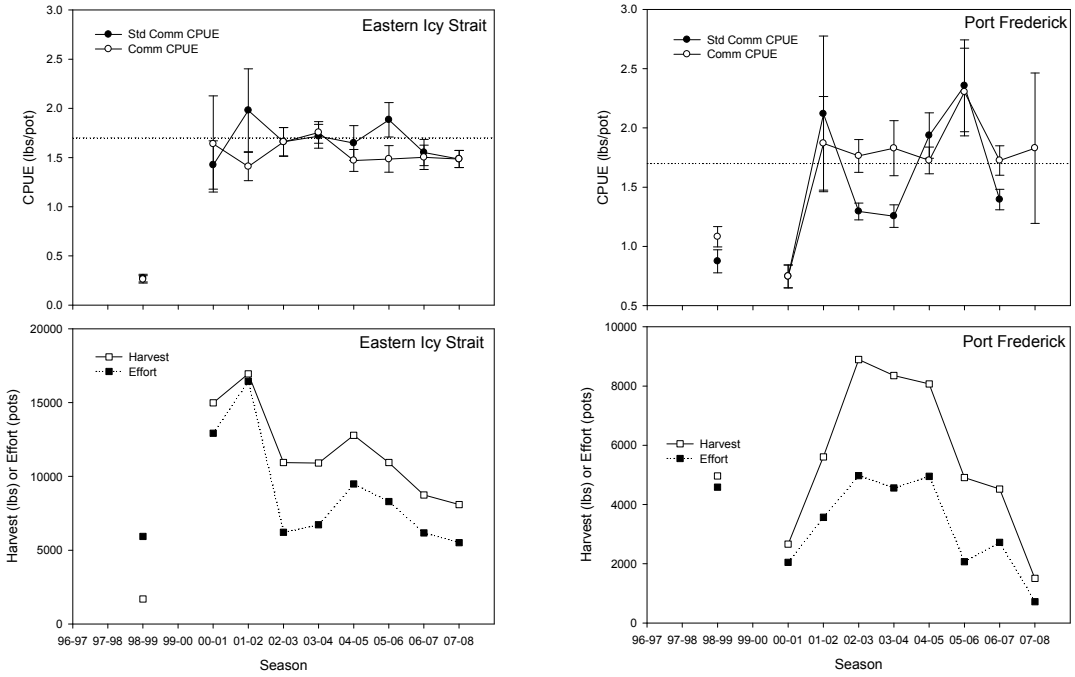

Figure 69.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 14, 1998–2007.

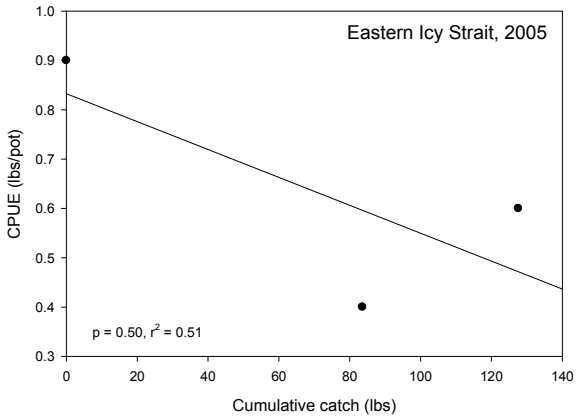

Figure 70.–Depletion estimator of harvest rate of spot shrimp ≥XL size class from commercial logbook data in District 14, 2005–2007.

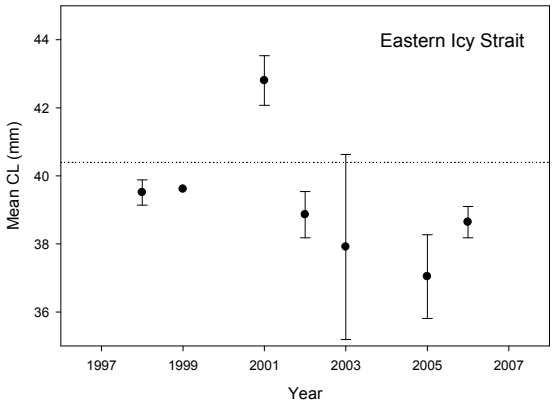

Figure 71.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 14, 1997–2007. Dotted line represents the long-term baseline.

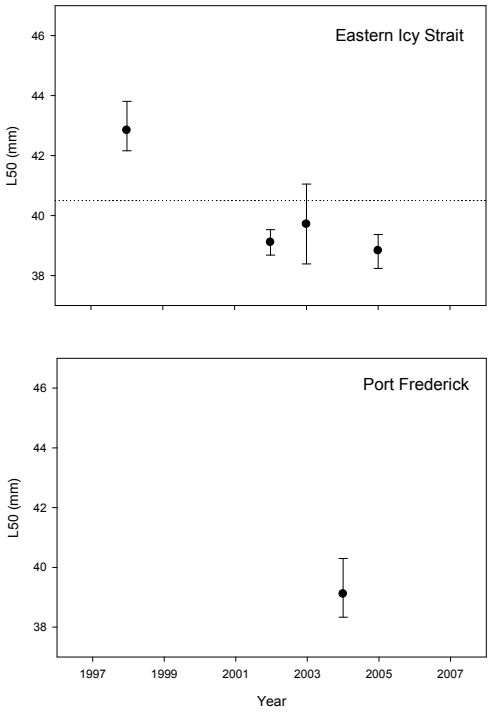

Figure 72.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 14, 1997–2007. Dotted line represents the long-term baseline.

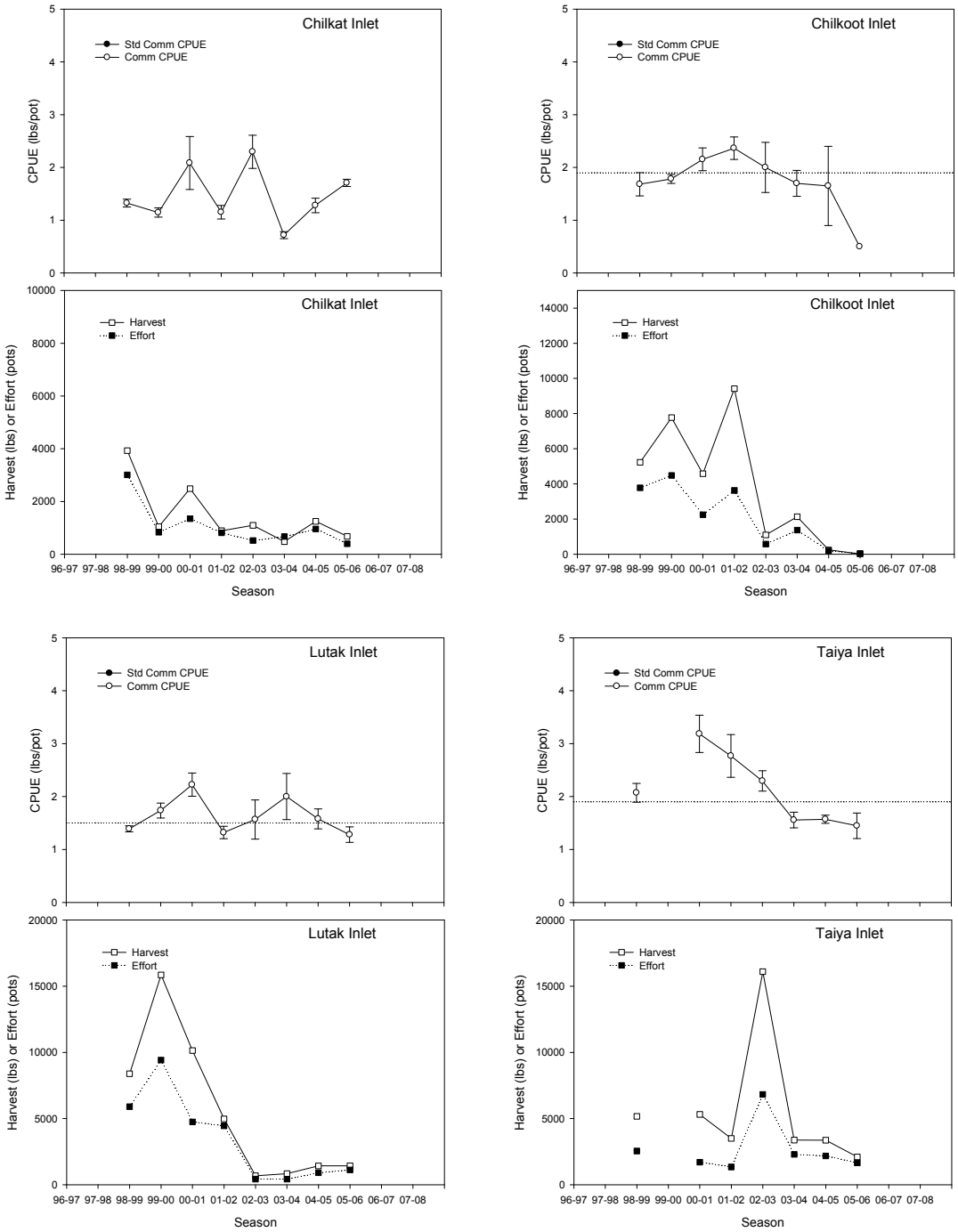

Figure 73.–Mean and standard error of coonstripe shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 15, 1998–2007.

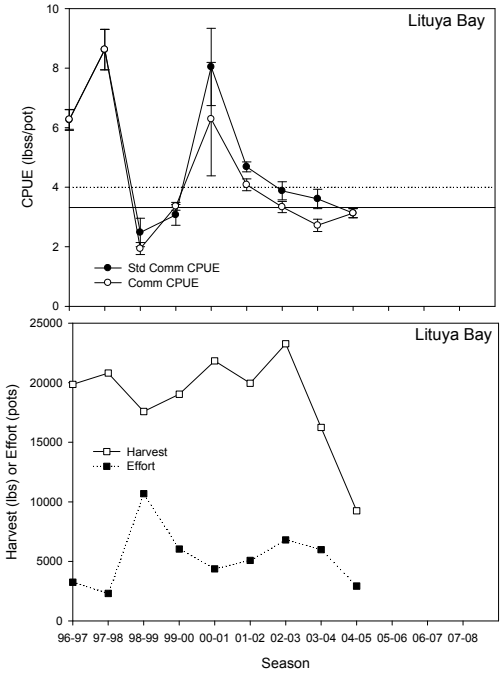

Figure 74.–Mean and standard error of spot shrimp CPUE from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 16, 1998–2007.

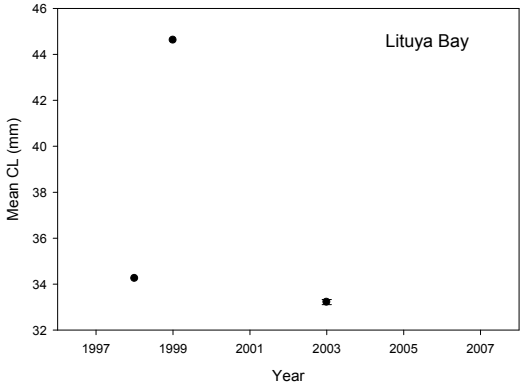

Figure 75.–Mean and standard error of spot shrimp carapace length from dockside sampling in District 16, 1997–2007. Dotted line represents the long-term baseline.

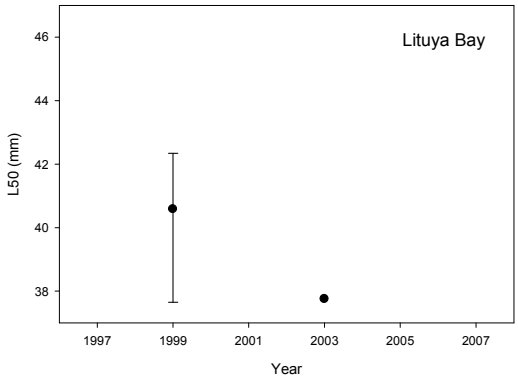

Figure 76.–L_{50} and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 16, 1997–2007. Dotted line represents the long-term baseline.

APPENDICES

Appendix A.–Results of Leslie depletion estimator regressions of cumulative catch versus CPUE for the spot shrimp pot fishery, and subsequent harvest rate estimates by analysis area for size ≥XL, 2005/06–2007/08 seasons. The sample size, n is the number of logbook boat-days. Note that significant (α=.05) regressions with negative slopes are shown in bold.

Management Unit	Analysis Area	Season	p	r^2	Slope	Intercept	n, boat-days	Population (lbs)	Total catch (lbs)	Harvest rate
District 1	Back Behm Canal	**2005/06**	**0.000380**	**0.46**	**-0.0002922**	**1.3247**	**23**	**4,534**	**2,516**	**0.55**
		2006/07	**0.001821**	**0.26**	**-0.0002478**	**1.9113**	**35**	**7,713**	**5,433**	**0.70**
	Boca de Quadra	**2005/06**	**0.000380**	**0.56**	**-0.0012961**	**2.5796**	**18**	**1,990**	**1,390**	**0.70**
	East Behm Canal	2005/06	0.921194	0.00	-3.3859E-06	1.5702	54	463,750	8,932	0.02
		2006/07	0.488764	0.02	0.0002249	0.2379	23	-1,058	474	-0.45
	Inner Ketchikan Inlets	2005/06	0.199848	0.47	0.00138144	0.538	5	-389	491	-1.26
	Portland Canal	2006/07	0.626510	0.03	-0.0001444	0.7918	10	5,483	693	0.13
	West Behm Canal	**2005/06**	**0.002148**	**0.67**	**-5.91E-04**	**1.4098**	**11**	**2,385**	**1,420**	**0.60**
District 2	Middle Clarence	**2005/06**	**7.00E-06**	**0.70**	**-0.0005934**	**2.7557**	**19**	**4,644**	**2,791**	**0.60**
		2006/07	0.942079	0.00	0.000044382	0.9207	23	-20,744	1,902	-0.09
	Lower Clarence	2006/07	0.413449	0.23	-0.0003624	1.3202	5	3,643	678	0.19
Section 3-A	Lower Cordova Bay	2005/06	0.439826	0.06	-0.000116	0.3387	13	2,920	509	0.17
		2006/07	0.012084	0.37	0.00030922	1.3069	16	-4,226	2,638	-0.62
		2007/08	0.575905	0.01	-1.96E-04	1.1571	25	5,918	2,272	0.38
	Mid Cordova Bay	**2005/06**	**0.038838**	**0.43**	**-0.0005319**	**1.7264**	**10**	**3,246**	**1,687**	**0.52**
		2006/07	0.853722	0.00	-0.000026845	1.1488	14	42,794	2,200	0.05
	Upper Cordova Bay	**2005/06**	**0.029757**	**0.26**	**-0.000803**	**1.5336**	**18**	**1,910**	**1,458**	**0.76**
		2006/07	**0.000065**	**0.81**	**-0.0016187**	**0.5123**	**15**	**316**	**277**	**0.88**
Sections 3-B/C	Sea Otter Sound	2005/06	0.329113	0.11	-0.0002169	0.7873	11	3,630	1,010	0.28
District 5	Affleck/Port Beauclerc	2005/06	0.266963	0.54	-0.0023807	0.2794	4	117	77	0.66
District 6	Sumner Strait	2006/07	0.131488	0.34	3.08E-04	1.8622	23	-6,054	2,104	-0.35
	SW Etolin	2005/06	0.800702	0.00	-0.000020721	2.5889	8	124,939	4,435	0.04
		2006/07	0.847899	0.00	-0.00003478	1.6926	18	48,665	4,646	0.10
	Upper Clarence	**2005/06**	**0.000000**	**0.42**	**-8.40E-05**	**1.8371**	**118**	**21,860**	**13,820**	**0.63**
		2006/07	**0.013573**	**0.07**	**-0.0000554**	**2.1393**	**107**	**38,615**	**14,696**	**0.38**
District 7	Bradfield	**2006/07**	**0.000139**	**0.71**	**-0.0005909**	**5.3124**	**14**	**8,990**	**5,177**	**0.58**
	Lower Ernest Sound	2005/06	0.861619	0.00	-0.000052375	1.6452	15	31,412	1,962	0.06
		2006/07	0.139096	0.95	0.00208378	2.4242	3	-1,163	889	-0.76
		2007/08	0.836178	0.01	1.77688E-05	2.0083	11	-113,022	3,012	-0.03

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Appendix A.–Page 2 of 2.

Management Unit	Analysis Area	Season	p	r^2	Slope	Intercept	n, boat-days	Population (lbs)	Total catch (lbs)	Harvest rate
District 7	Upper Ernest Sound	**2005/06**	**0.000049**	**0.25**	**-0.0000894**	**2.5295**	**60**	**28,295**	**12,173**	**0.43**
		2006/07	0.477532	0.01	2.46E-05	2.388	57	-97,136	14,685	-0.15
		2007/08	0.839291	0.00	-8.9483E-06	3.3034	35	369,163	11,057	0.03
	Zimovia	2005/06	0.118987	0.19	-0.0001485	1.6832	14	11,335	2,559	0.23
District 8	Eastern Sumner	2005/06		1	0.00550964	0.8	2	-145	152	-1.05
	Frederick Sound	2005/06	0.050491	0.50	0.00085582	1.1342	8	-1,325	1,540	-1.16
	Frederick Sound	2006/07	0.135098	0.47	0.00096073	1.6211	6	-1,687	1,918	-1.14
	Stikine Strait/Chichagof Pass	2005/06			0	0.4	2		66	
District 9	Eliza Harbor	2005/06	0.182272	0.27	-0.0009634	3.2911	8	3,416	1,705	0.50
	SE Baranof	2005/06	0.29677	0.26	0.00087475	1.131	6	-1,293	906	-0.70
	SE Baranof	2006/07	0.08355	0.98	-9.63E-04	4.0142	3	4,170	1,889	0.45
District 10	Hobart/Windham	**2005/06**	**0.049688**	**0.57**	**-0.0011175**	**3.577**	**7**	**3,201**	**1,808**	**0.56**
District 11	Seymour Canal	**2005/06**	**0.046361**	**0.27**	**0.00030809**	**6.7432**	**15**	**-21,887**	**10,384**	**-0.47**
		2006/07	0.088062	0.21	0.00018269	5.4791	15	-29,991	8,930	-0.30
		2007/08	0.840674	0.00	-0.000016747	6.3205	11	377,412	8,012	0.02
Tenakee	West Tenakee	**2006/07**	**0.012676**	**0.82**	**-7.39E-04**	**5.3719**	**6**	**7,266**	**4,185**	**0.58**
Remainder of District 12	Kelp Bay	2006/07	0.377012	0.10	-0.0001919	3.2253	10	16,807	3,589	0.21
Section 13-C	Hoonah Sound	2005/06	0.207049	0.63	-0.0006712	1.2449	4	1,855	728	0.39
		2006/07	**0.010271**	**0.98**	**-1.58E-03**	**2.5248**	**4**	**1,596**	**755**	**0.47**
Section 13-A/B	Crawfish	**2005/06**	**0.014386**	**0.60**	**-0.0006347**	**0.9198**	**9**	**1,449**	**715**	**0.49**
District 14	Eastern Icy Strait	2006/07	0.496368	0.51	-0.0027654	0.8255	3	299	192	0.64

Appendix B.–CPUE of spot shrimp of sizes ≥XL by analysis area for 2005/06–2007/08 seasons and the significance of their differences. Note that significant (α=.05) regressions with negative slopes are shown in bold.

Management Unit	Analysis Area	Season	Mean CPUE	n	Std Err Mean	ANOVA p	Q	Tukey HSD
District 1	Back Behm Canal	2005/06	0.89	23	0.07	0.139724		
		2006/07	1.13	35	0.13	0.139724		
	Boca de Quadra	2005/06	1.44	18	0.19			
	East Behm Canal	**2005/06**	**1.59**	**54**	**0.09**	**1.87E-13**		
		2006/07	**0.28**	**23**	**0.04**	**1.87E-13**		
	Inner Ketchikan Inlets	2005/06	0.76	5	0.11			
	Portland Canal	2006/07	0.72	10	0.06			
	West Behm Canal	2005/06	0.95	11	0.10			
District 2	Middle Clarence	**2005/06**	**1.98**	**19**	**0.14**	**0.000668**		
		2006/07	**1.07**	**23**	**0.19**	**0.000668**		
	Lower Clarence	2006/07	1.22	5	0.07			
Section 3-A	Lower Cordova Bay	**2005/06**	**0.29**	**13**	**0.02**	**6.47E-07**	**2.41398**	**C**
		2006/07	**1.66**	**16**	**0.10**	**6.47E-07**	**2.41398**	**A**
		2007/08	**0.90**	**25**	**0.16**	**6.47E-07**	**2.41398**	**B**
	Mid Cordova Bay	2005/06	1.33	10	0.14	0.208456		
		2006/07	1.12	14	0.09	0.208456		
	Upper Cordova Bay	**2005/06**	**0.84**	**18**	**0.18**	**0.003741**		
		2006/07	**0.19**	**15**	**0.04**	**0.003741**		
Sections 3-B/C	Sea Otter Sound	2005/06	0.68	11	0.06			
District 5	Affleck/Port Beauclerc	2005/06	0.20	4	0.04			
District 6	SW Etolin	2005/06	2.53	18	0.11	0.496995		
		2006/07	2.10	23	0.55	0.496995		
	Sumner Strait	**2005/06**	**0.40**	**1**		**0.004081**		
		2006/07	**2.09**	**8**	**0.13**	**0.004081**		
	Upper Clarence	2005/06	1.16	115	0.05	0.092932		
		2006/07	1.35	104	0.10	0.092932		
District 7	Bradfield	2006/07	3.68	14	0.32			
	Lower Ernest Sound	**2005/06**	**1.67**	**15**	**0.18**	**0.003519**	**2.48489**	**B**
		2006/07	**2.97**	**3**	**0.33**	**0.003519**	**2.48489**	**A**
		2007/08	**2.03**	**11**	**0.07**	**0.003519**	**2.48489**	**B**
	Upper Ernest Sound	**2005/06**	**1.97**	**60**	**0.09**	**1.02E-08**	**2.36741**	**C**
		2006/07	**2.64**	**57**	**0.16**	**1.02E-08**	**2.36741**	**B**
		2007/08	**3.26**	**35**	**0.14**	**1.02E-08**	**2.36741**	**A**
	Zimovia	2005/06	1.54	14	0.07			
District 8	Eastern Sumner	2005/06	1.00	2	0.20			
	Frederick Sound	2005/06	1.76	8	0.21	0.165093		
		2006/07	2.28	6	0.30	0.165093		
	Stikine Strait,Chichagof Pass	2005/06	0.40	2	0.00			
District 9	Eliza Harbor	2005/06	2.61	8	0.40			
	SE Baranof	**2005/06**	**1.45**	**6**	**0.18**	**0.001575**		
		2006/07	**3.37**	**3**	**0.43**	**0.001575**		
District 10	Hobart/Windham	2005/06	2.59	7	0.32			
District 11	Seymour Canal	**2005/06**	**8.45**	**15**	**0.46**	**6.26E-05**	**2.43883**	**A**
		2006/07	**6.16**	**15**	**0.33**	**6.26E-05**	**2.43883**	**B**
		2007/08	**6.30**	**11**	**0.19**	**6.26E-05**	**2.43883**	**B**

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Appendix B.–Page 2 of 2.

Management Unit	Analysis Area	Season	Mean CPUE	n	Std Err Mean	ANOVA p	Q	Tukey HSD
Tenakee	West Tenakee	**2005/06**	**0.70**	**1**		**0.037**		
		2006/07	**4.10**	**6**	**0.46**	**0.037**		
Remainder of District 12	Kelp Bay	2006/07	2.98	10	0.21			
Section 13-C	Hoonah Sound	**2005/06**	**1.08**	**4**	**0.10**	**0.008**		
		2006/07	**2.00**	**4**	**0.21**	**0.008**		
Section 13-A/B	Necker, Crawfish	2005/06	0.67	9	0.07			
District 14	Eastern Icy Strait	2006/07	0.63	3	0.15			

Appendix C.–CPUE of spot shrimp of sizes XL, XXL, XXXL and Jumbo combined (≥XL) from preseason surveys of Section 3-A, District 7, District 12, and Section 13-C by analysis area for 1997–2007. Bolded years were used to calculate the long-term baseline.

Management Unit	Analysis Area	Year	Mean	SE
Section 3-A	Hetta Inlet	**1997**	2,597	406
		1998	2,150	278
		1999	4,355	548
		2000	3,343	606
		2001	1,193	233
		2002		
		2003	1,910	489
		2004	642	96
		2005	707	130
		2006	1,215	183
		2007	443	90
	Mid Cordova	**1997**	405	123
		1998	880	144
		1999	1,077	180
		2000	804	161
		2001	271	86
		2002	193	193
		2003		
		2004	175	75
		2005	132	45
		2006	142	36
		2007	63	20
District 7	Lower Ernest	**2003**	366	68
		2004	344	100
		2005	378	92
		2006	282	48
		2007	188	30
	Upper Ernest	**1999**	150	34
		2000	461	84
		2001	965	124
		2002	426	113
		2003	381	76
		2004	401	86
		2005	854	137
		2006	443	90
		2007	283	54

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Management Unit	Analysis Area	Year	Mean	SE
Tenakee	East Tenakee	**2000**	1,549	452
		2001		
		2002	3,847	1899
		2003	1,673	418
		2004	1,813	487
		2005	680	282
		2006	826	309
		2007	320	59
	West Tenakee	**2000**	2,824	265
		2001		
		2002	4,093	420
		2003	2,799	281
		2004	3,408	302
		2005	3,333	323
		2006	4,421	516
		2007	1,968	286
Section 13-C	Hoonah Sound	**1999**	1,049	256
		2000	2,393	442
		2001	1,221	186
		2002	1,299	232
		2003	1,631	251
		2004	1,058	165
		2005	1,230	146
		2006	1,038	181
		2007	1,059	126

Appendix D.–Baseline mean CPUE of spot shrimp of sizes ≥XL from preseason surveys of Section 3-A, District 7, District 12, and Section 13-C by analysis area.

Management Unit	Analysis Area	Years	CPUE, g/pot
Section 3-A	Hetta Inlet	1997–1999	3,034
	Mid Cordova	1997–1999	787
District 7	Lower Ernest	2003–2005	363
	Upper Ernest	1999–2001	525
Tenakee	East Tenakee	2000, 2003, 2004	1,678
	West Tenakee	2000, 2002, 2003	3,239
Section 13-C	Hoonah Sound	1999–2001	1,554

Appendix E.–Mean spot shrimp carapace length and its standard error and sample size for onboard floating processors (SST 1) and on-the-grounds (SST 2) length frequency data (with size-at sex data combined where a t-test indicates no significant difference at the p=.05 level) by district and analysis area in Southeast Alaska, Registration Area A. Bolded seasons were used to calculate baselines.

Management Unit	Analysis Area	Season	Mean CL (mm)	n (trips)	S.E. Mean CL	n, Shrimp
District 1	Back Behm Canal	1997/98	46.3	1		201
	Boca de Quadra	1997/98	41.9	3	0.64	296
	Inner Ketchikan Inlets	1997/98	44.2	18	0.23	967
District 2	Lower Clarence	1997/98	39.1	25	0.25	1494
		2003/04	37.2	2	0.39	186
	Middle Clarence	**1997/98**	**37.5**	**41**	**0.35**	**1,994**
		1998/99	**39.4**	**10**	**0.45**	**500**
		2000/01	35.6	2	1.83	114
		2003/04	**37.8**	**5**	**0.88**	**347**
		2006/07	38.0	7	0.76	373
		2007/08	40.2	4	1.19	320
Section 3-A	Hetta Inlet	**1997/98**	**37.6**	**15**	**0.32**	**750**
		2000/01	38.7	2	1.05	167
		2001/02	**37.7**	**3**	**0.78**	**196**
		2003/04	34.9	1		141
		2004/05	**36.8**	**5**	**0.80**	**298**
		2006/07	36.0	2	1.31	163
		2007/08	37.2	2	0.59	99
	Lower Cordova Bay	**1997/98**	**39.3**	**14**	**0.5**	**593**
		1998/99	**38.1**	**10**	**0.31**	**600**
		2002/03	**37.3**	**3**	**0.22**	**272**
		2003/04	36.5	3	1.35	274
		2004/05	37.5	3	0.97	286
		2006/07	36.6	1		74
		2007/08	33.2	1		102
	Mid Cordova Bay	1997/98	38.2	8	0.73	433
		1998/99	39.4	4	0.73	300
		2000/01	37.2	1		52
		2003/04	35.4	1		60
		2004/05	35.6	2	1.50	140
		2006/07	34.0	2	0.87	136
	Upper Cordova Bay	**1997/98**	**37.0**	**92**	**0.16**	**4,584**
		1998/99	**38.2**	**36**	**0.26**	**1,850**
		1999/00	41.0	1		100
		2000/01	**37.2**	**5**	**0.45**	**234**
		2002/03	33.6	2	1.1	95
		2003/04	35.5	7	0.43	448
		2004/05	35.6	5	0.83	539
		2006/07	34.9	8	0.7	550
		2007/08	34.9	4	0.67	318

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Management Unit	Analysis Area	Season	Mean CL (mm)	n (trips)	S.E. Mean CL	n, Shrimp
Sections 3-B/C	Craig	1999/00	37.9	1		101
		2003/04	36.2	2	1.84	181
		2004/05	39.2	1		160
	Sea Otter Sound	2002/03	42.4	1		150
		2003/04	**38.1**	**4**	**1.13**	**227**
		2004/05	**38.3**	**5**	**0.55**	**368**
		2006/07	**37.3**	**5**	**0.85**	**376**
		2007/08	38.9	4	1.01	365
District 6	SW Etolin	2002/03	38.0	1		56
		2006/07	37.1	1		63
	Sumner Strait	2004/05	42.9	1		24
	Upper Clarence	1999/00	38.2	1		70
		2000/01	**37.0**	**3**	**0.25**	**146**
		2002/03	**36.6**	**5**	**0.93**	**428**
		2003/04	**37.9**	**5**	**0.69**	**388**
		2004/05	36.5	6	0.56	903
		2005/06	37.7	5	0.73	482
		2006/07	36.2	4	0.5	506
		2007/08	37.1	3	1.56	406
District 7	Bradfield	1998/99	45.6	2	3	53
		1999/00	42.0	3	5.8	93
		2000/01	39.2	1		43
		2002/03	37.7	1		133
		2003/04	41.6	2	1.01	214
		2004/05	45.1	2	0.12	196
		2005/06	42.3	2	0.58	194
		2006/07	44.0	1		118
		1998/99	42.5	1		60
	Lower Ernest Sound	2000/01	37.5	1		46
		2002/03	39.8	1		87
		2003/04	40.2	1		113
		2006/07	39.3	1		108
	Upper Ernest Sound	**1998/99**	**41.0**	**6**	**0.28**	**461**
		1999/00	40.8	2	1.06	159
		2000/01	**41.4**	**5**	**1.01**	**350**
		2002/03	**39.7**	**5**	**1.00**	**199**
		2003/04	41.1	6	1.19	353
		2004/05	37.6	4	2.37	298
		2005/06	37.9	4	0.48	438
	Upper Ernest Sound	2006/07	39.1	1		131
		2007/08	44.9	1		95
	Zimovia	1998/99	43.8	2	3.29	36
		1999/00	38.2	2	1.29	86
		2000/01	40.5	2	2.32	92
		2004/05	42.4	1		93
		2006/07	39.6	1		87

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Management Unit	Analysis Area	Season	Mean CL (mm)	n (trips)	S.E. Mean CL	n, Shrimp
District 8	Eastern Sumner	1998/99	40.9	2	0.49	68
	Stikine Strait/Chichagof Pass	1998/99	36.3	1		50
		2002/03	38.4	1		122
		2005/06	40.2	1		115
District 9	Eliza Harbor	1998/99	41.0	12	0.33	600
		2000/01	41.5	1		84
		2002/03	39.0	1		57
		2007/08	39.0	1		138
	Keku Strait/Port Camden	2000/01	41.1	1		48
	SE Baranof	2002/03	40.1	1		144
District 10	Farragut Bay	2000/01	39.9	2	1.87	100
		2002/03	40.1	1		60
		2003/04	40.3	1		212
		2005/06	**40.0**	**4**	**0.74**	**305**
		2006/07	**41.4**	**2**	**0.44**	**222**
		2007/08	41.2	2	0.90	206
	Hobart/Windham	1997/98	39.3	2	0.24	198
		1999/00	43.0	2	0.69	114
		2000/01	**41.3**	**4**	**0.99**	**200**
		2002/03	**41.3**	**5**	**1.7**	**249**
		2003/04	**39.4**	**5**	**0.88**	**546**
		2004/05	37.4	2	0.07	204
		2005/06	40.2	4	0.69	359
		2006/07	37.8	2	0.14	260
		2007/08	41.8	2	1.97	172
	Port Houghton	1999/00	44.1	2	2.6	183
		2002/03	**40.8**	**3**	**1.39**	**146**
		2003/04	**40.1**	**5**	**1.25**	**267**
		2004/05	**40.9**	**3**	**1.41**	**371**
		2005/06	39.0	4	2.03	300
		2006/07	40.2	2	3.02	182
		2007/08	41.7	2	0.58	145
	SE Admiralty	1999/00	42.1	2	0.86	136
		2002/03	40.3	1		110
		2004/05	38.6	1		106
		2005/06	39.8	1		145
		2006/07	38.3	2	1.01	155
		2007/08	44.8	1		188
District 11	Glacier-fed Bays	1997/98	49.6	6	1.80	216
Tenakee	West Tenakee	**1999/00**	**41.1**	**4**	**1.14**	**436**
		2000/01	**41.7**	**4**	**0.86**	**332**
		2001/02	**40.4**	**3**	**0.68**	**558**
		2003/04	39	8	0.59	849
		2005/06	40.2	16	0.44	800

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Management Unit	Analysis Area	Season	Mean CL (mm)	n (trips)	S.E. Mean CL	n, Shrimp
Section 13-C	Hoonah Sound	**1998/99**	**40.4**	**4**	**0.73**	**451**
		2000/01	**40.6**	**8**	**0.32**	**543**
		2001/02	**41.2**	**6**	**0.51**	**595**
		2002/03	40.7	12	0.52	607
		2003/04	39.5	8	0.40	633
		2004/05	39.1	6	1.11	600
		2005/06	38.0	10	0.60	500
		2006/07	38.3	9	0.65	839
		2007/08	38.4	8	0.65	808
	Peril Strait	2002/03	34.2	2	0.73	204
		2003/04	34.9	2	0.91	200
		2004/05	**36.6**	**3**	**0.43**	**300**
		2005/06	**36.9**	**4**	**0.53**	**200**
		2006/07	35.1	1		200
		2007/08	**34.9**	**3**	**0.66**	**300**

Appendix F.–Mean spot shrimp carapace length and its standard error and sample size for dockside length frequency and size-at-sex samples combined where a t-test indicates no significant difference at the p=.05 level, in Southeast Alaska, Registration Area A. Bolded seasons were used to calculate baselines.

Management Unit	Analysis Area	Season	Mean CL (mm)	SE CL	n trips	n shrimp
District 1	Back Behm Canal	1998/99	47.2	1.39	3	150
		1999/00	41.9	1.42	6	299
		2000/01	44.2		1	50
		2001/02	40.5		1	94
	East Behm Canal	1998/99	42.8	0.42	2	100
		1999/00	41.2	0.53	4	300
		2000/01	42.4	0.45	10	750
	Inner Ketchikan Inlets	**1998/99**	**40.2**	**0.71**	**10**	**490**
		1999/00	**38.0**	**0.54**	**5**	**248**
		2000/01	**40.1**	**0.41**	**9**	**846**
		2001/02	41.9	0.44	16	1,366
		baseline	**39.4**			
	Portland Canal	1998/99	42.7	1.08	3	297
District 2	Middle Clarence	2001/02	42.2		1	50
	Lower Clarence	2000/01	43.0		1	100
Section 3-A	Mid Cordova Bay	1999/00	36.5		1	100
		2000/01	40.6		1	48
District 4	District 4	1999/00	37.8		1	47
		2000/01	36.4	0.70	2	100
District 6	Upper Clarence	**1998/99**	**43.5**	**0.46**	**13**	**700**
		1999/00	**47.4**	**0.52**	**12**	**600**
		2000/01	**39.8**	**0.44**	**10**	**500**
		2001/02	39.5	0.44	13	649
		2002/03	39.2	0.48	17	850
		2003/04	38.9	0.43	14	700
		2004/05	40.0	0.44	4	200
		2007/08	38.9		1	107
		baseline	**43.6**			

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Management Unit	Analysis Area	Season	Mean CL (mm)	SE CL	n trips	n shrimp
District 7	Bradfield	**1999/00**	**51.4**	**0.73**	**20**	**1,000**
		2000/01	**42.9**	**0.81**	**16**	**800**
		2001/02	**41.9**	**0.52**	**32**	**1,600**
		2002/03	43.9	0.39	26	1,300
		2003/04	40.9	0.37	24	1,200
		2004/05	45.2	0.37	13	650
		2005/06	46.0	0.72	12	1,199
		2006/07	45.0	0.45	13	1,349
		2007/08	47.3	0.27	18	901
		baseline	**45.4**			
	Upper Ernest Sound	**1999/00**	**47.3**	**0.78**	**11**	**550**
		2000/01	**41.7**	**0.57**	**5**	**250**
		2001/02	40.5	0.35	3	150
		2002/03	**40.5**	**0.65**	**5**	**250**
		2004/05	40.8		1	100
		2005/06	39.8		1	101
		2006/07	38.4	0.72	6	600
		baseline	**43.2**			
	Zimovia	**1998/99**	**43.4**	**0.67**	**11**	**550**
		1999/00	50.0	0.09	3	150
		2000/01	**43.3**	**0.33**	**8**	**400**
		2001/02	**42.1**	**0.62**	**5**	**250**
		2003/04	39.2		1	100
		2005/06	40.2		1	100
		2006/07	43.9		1	100
		2007/08	45.0	0.88	6	600
		baseline	**42.9**			
District 8	Eastern Sumner	**1999/00**	**50.3**	**0.68**	**14**	**700**
		2000/01	**43.3**	**0.30**	**19**	**950**
		2001/02	**45.0**	**0.69**	**7**	**350**
		2002/03	42.5	0.89	11	550
		2003/04	40.4	0.32	22	1100
		2004/05	42.6	0.76	2	100
		2005/06	44.6	0.49	15	750
		2006/07	42.7	0.46	18	1799
		2007/08	41.7	0.98	5	500
		baseline	**46.2**			
	Stikine Strait / Chichagof Pass	**1999/00**	**49.0**	**0.33**	**12**	**600**
		2000/01	43.7	1.09	2	100
		2001/02	43.0	1.38	3	150
		2002/03	**43.0**	**1.16**	**7**	**350**
		2003/04	**39.9**	**0.43**	**10**	**500**
		2004/05	42.6	0.43	19	950
		2006/07	43.5		1	100
		2007/08	47.3	0.27	18	901
		baseline	**44.0**			

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Management Unit	Analysis Area	Season	Mean CL (mm)	SE CL	n trips	n shrimp
District 10	Hobart/Windham	1999/00	40.9		1	50
		2000/01	38.4		1	100
		2001/02	39.8	0.99	2	596
		2002/03	40.0	0.26	2	114
		2005/06	39.8		1	123
	Port Houghton	1999/00	40.1	0.42	2	199
District 11	Auke Bay	2000/01	43.9		1	50
		2001/02	44.7	1.80	3	675
		2002/03	38.8	1.04	5	1,054
		2003/04	39.3	2.42	2	237
		2005/06	39.9		1	161
	Glacier-fed Bays	1999/00	43.0	4.09	2	173
		2000/01	45.9	1.60	5	249
		2001/02	47.7		1	121
	Seymour Canal	2000/01	40.0		1	50
		2001/02	40.1	0.48	2	100
Remainder of	Kelp Bay	2003/04	40.5		1	38
District 12	Pt. Couverden	2003/04	39.4	1.86	2	232
Sections 13-A/B	Necker, Crawfish	2003/04	36.4		1	99
	South Arm	2000/01	42.8		1	70
District 14	Eastern Icy Strait	**1998/99**	**39.5**	**0.37**	**3**	**300**
		1999/00	39.6		1	100
		2001/02	**42.8**	**0.73**	**3**	**150**
		2002/03	**38.9**	**0.68**	**9**	**1,731**
		2003/04	37.9	2.72	3	91
		2005/06	37.0	1.23	2	302
		2006/07	38.6	0.46	3	177
		baseline	**40.4**			
	Port Frederick	2002/03	42.4		1	183
		2003/04	42.4		1	95
District 16	Lituya Bay	1998/99	34.3		1	50
		1999/00	44.6		1	102
		2003/04	33.2	0.11	2	40

Appendix G.–Preseason survey mean carapace length and standard error (SE) and sample size by analysis area, year and mesh size for Southeast Alaska, Registration Area A. Bolded years were used to calculate baselines.

Management Unit	Analysis Area	Year	Mesh Size 1.125			Mesh Size 1.75		
			n	Mean	SE	n	Mean	SE
Section 3-A	Hetta Inlet	**1997**	**675**	**38.6**	**0.21**	**206**	**39.8**	**0.30**
		1998	**1097**	**36.8**	**0.15**	**981**	**39.1**	**0.13**
		1999	**789**	**37.5**	**0.18**	**657**	**40.0**	**0.17**
		2000	564	37.3	0.19	568	38.5	0.17
		2001	996	34.0	0.15	932	36.0	0.13
		2002						
		2003	476	35.0	0.21	474	35.6	0.20
		2004	1935	33.7	0.11	1652	36.8	0.09
		2005	1197	33.4	0.13	1265	35.1	0.11
		2006	2077	34.4	0.10	1609	37.3	0.10
		2007	1584	34.3	0.10	680	36.9	0.14
	Mid Cordova	**1997**	**531**	**33.1**	**0.21**	**467**	**36.7**	**0.17**
		1998	**1237**	**34.3**	**0.14**	**938**	**37.2**	**0.13**
		1999	**1101**	**34.1**	**0.14**	**913**	**36.9**	**0.13**
		2000	1034	34.7	0.16	905	36.8	0.13
		2001	1302	31.7	0.11	866	34.9	0.14
		2002	154	32.7	0.36	157	37.2	0.26
		2003						
		2004	2052	31.5	0.10	1109	35.3	0.10
		2005	1313	30.8	0.12	970	34.6	0.12
		2006	2053	31.6	0.09	1291	34.7	0.10
		2007	1556	30.8	0.10	657	35.1	0.14
District 7	Lower Ernest	**2003**	**1264**	**30.9**	**0.21**	**1003**	**35.3**	**0.19**
		2004	**1771**	**31.1**	**0.19**	**1016**	**36.3**	**0.20**
		2005	**1890**	**31.4**	**0.17**	**1118**	**36.9**	**0.20**
		2006	2721	30.5	0.23	1023	37.0	0.20
		2007	1523	30.5	0.23	755	37.8	0.25
	Upper Ernest	**1999**	**584**	**35.3**	**0.31**	**678**	**37.0**	**0.26**
		2000	**366**	**37.2**	**0.33**	**338**	**38.7**	**0.32**
		2001	**950**	**37.5**	**0.25**	**793**	**39.4**	**0.21**
		2002	901	35.2	0.28	977	37.7	0.22
		2003	813	35.8	0.27	788	38.3	0.22
		2004	1354	33.8	0.24	1003	37.5	0.24
		2005	1672	34.6	0.20	1518	37.4	0.20
		2006	2173	34.8	0.17	1455	37.4	0.18
		2007	809	37.3	0.25	982	38.7	0.22

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Management Unit	Analysis Area	Year	Mesh Size 1.125			Mesh Size 1.75		
			n	Mean	SE	n	Mean	SE
Tenakee	East Tenakee	**2000**	**271**	**36.2**	**0.54**	**208**	**39.3**	
		2001						
		2002	**146**	**39.3**	**0.85**	**111**	**40.7**	
		2003	**671**	**35.1**	**0.30**	**533**	**37.8**	
		2004	544	35.0	0.38	578	38.7	
		2005	430	34.6	0.39	525	37.9	
		2006	538	34.3	0.35	511	37.8	
		2007	698	32.4	0.31	366	36.7	
	West Tenakee	**2000**	**1279**	**41.0**	**0.21**	**1176**	**41.7**	
		2001						
		2002	**1057**	**38.5**	**0.29**	**869**	**41.6**	
		2003	**1555**	**37.2**	**0.19**	**1660**	**38.2**	
		2004	2295	39.3	0.15	2377	40.3	
		2005	1229	38.2	0.24	1337	40.9	
		2006	1584	38.3	0.22	1525	41.2	
		2007	2068	39.4	0.19	1980	41.2	
Section 13-C	Hoonah Sound	**1999**	**528**	**37.3**	**0.24**	**352**	**38.4**	
		2000	**1895**	**39.5**	**0.12**	**1703**	**40.4**	
		2001	**1394**	**36.5**	**0.18**	**1169**	**39.2**	
		2002	1894	35.8	0.16	1648	38.4	
		2003	1953	35.9	0.13	1874	38.4	
		2004	2228	35.0	0.12	2415	37.9	
		2005	2741	35.7	0.12	3065	38.1	
		2006	2775	34.3	0.10	2593	37.2	
		2007	2639	36.1	0.11	2266	38.5	

Appendix H.–Mean coonstripe shrimp carapace length and its standard error and sample size for on-the-grounds (SST 2) and dockside (SST 3) length frequency samples in District 15 of Southeast Alaska, Registration Area A.

Analysis Area	Season	Sample site type	Mean CL (mm)	SE Mean CL	n (trips)	n (shrimp)
Chilkat Inlet	1998/99	3	31.0	1.74	2	150
	1999/00		34.1		1	181
	2001/02		32.1		1	50
Chilkoot Inlet	1998/99		36.7		1	50
	1999/00		34.5	0.51	2	172
	2000/01		34.1		1	142
	2001/02		36.1		1	50
	2003/04		35.2		1	130
Lutak Inlet	1998/99		32.9	0.11	2	100
	1999/00		34.6	0.81	5	391
	2000/01		31.1	0.41	4	469
	2001/02		33.3	0.76	2	87
	2004/05		34.0		1	70
	2005/06	2	34.5		1	100
Taiya Inlet	1999/00	3	33.4		1	53
	2000/01		35.9		1	72
	2001/02		34.2	0.18	2	121
	2003/04		33.7		1	98
	2005/06	2	35.0		1	299

Appendix I.–Baseline mean carapace length for commercial spot shrimp samples, Project 20, in sample site types 1 and 2, floating processor, and on-the-grounds sampling, in Districts 1–16 of Southeast Alaska, Registration Area A. Data from the earliest 3 analysis area/season combinations with 3 or more trips and 200 or more shrimp each were used for the analysis.

Management Unit	Analysis Area	Mean CL (mm)	n (trips)	n (shrimp)
District 2	Middle Clarence	38.2	56	2,841
Section 3-A	Hetta Inlet	37.4	23	1,244
	Lower Cordova Bay	38.2	27	1,465
	Upper Cordova Bay	37.5	133	6,668
Sections 3-B/C	Sea Otter Sound	37.9	14	971
District 6	Upper Clarence	37.2	13	962
District 7	Upper Ernest Sound	40.7	16	1,010
District 10	Hobart/Windham	40.7	14	995
	Port Houghton	40.6	11	784
Tenakee	West Tenakee	41.1	11	1,326
Section 13-C	Hoonah Sound	40.7	18	1,589
	Peril Strait	36.1	10	800

Appendix J.–Baseline mean carapace length for commercial spot shrimp samples, Project 20, in sample site type 3, dockside sampling, in Districts 1–16 of Southeast Alaska, Registration Area A. Data from the earliest 3 analysis area/season combinations with 3 or more trips and 200 or more shrimp each were used for the analysis.

Management Unit	Analysis Area	Mean CL (mm)
District 1	Inner Ketchikan Inlets	39.4
District 6	Upper Clarence	43.6
District 7	Bradfield	45.4
	Upper Ernest Sound	43.2
	Zimovia Strait	42.9
District 8	Eastern Sumner	46.2
	Stikine Strait/Chichagof Pass	44.0
District 14	Eastern Icy Strait	40.4

Appendix K.–Baseline mean carapace length for preseason spot shrimp survey small mesh pots, by analysis area.

Management Unit	Analysis Area	Baseline years	Mean CL (mm)
District 3	Hetta Inlet	1997–1999	37.6
	Mid Cordova	1997–1999	33.8
District 7	Lower Ernest	2003–2005	31.2
	Upper Ernest	1999–2001	36.7
Tenakee	East Tenakee	2000, 2003, 2004	35.4
	West Tenakee	2000, 2002, 2003	38.9
District 13	Hoonah Sound	1999–2001	37.8

Appendix L.–Results of a t-test comparing the 2007 mean carapace length with the long-term baseline for commercial spot shrimp samples, Project 20, in sample site types 1 and 2, on-the-grounds sampling, in Districts 1–16 of Southeast Alaska, Registration Area A. Note that significant (α=.05) t-tests are shown in bold.

		2007 CL (mm)			Baseline mean	
Management Unit	Analysis Area	Mean	Std Err	n (trips)	CL (mm)	p
District 2	Middle Clarence	40.1	1.19	4	38.2	0.2043
Section 3-A	Hetta Inlet		0.59	2		
	Upper Cordova Bay	**34.9**	**0.67**	**4**	**37.5**	**0.0300**
	Lower Cordova Bay			1		
Sections 3-B/C	Sea Otter Sound	38.9	1.01	4	37.9	0.3967
District 6	Upper Clarence	37.1	1.56	3	37.0	0.9709
District 7	Upper Ernest Sound	44.9		1	41.1	
District 9	Eliza Harbor			1		
District 10	Farragut Bay		0.90	2		
	Hobart/Windham	41.8	1.97	2	40.6	0.6498
	Port Houghton	41.7	0.58	2	40.0	0.2054
	SE Admiralty			1		
Section 13-C	Hoonah Sound	**38.0**	**0.72**	**6**	**40.7**	**0.0142**
	Peril Strait	34.9	0.66	3	36.2	0.1849
	South Arm	39.7	1.46	2	40.6	0.6395

Appendix M.–Results of a t-test comparing the 2007 mean carapace length with the long-term baseline for commercial spot shrimp samples, Project 20, in sample site type 3, dockside sampling, in Districts 1–16 of Southeast Alaska, Registration Area A**. Note that significant (α=.05) t-tests are shown in bold.**

Management Unit	Analysis Area	2007 CL (mm)			Baseline mean CL (mm)	T value	p
		Mean	Std Err	n (trips)			
District 6	Upper Clarence	38.9		1	43.6		
District 7	Bradfield	**47.3**	**0.27**	**18**	**45.4**	**6.875**	**<.0001**
	Zimovia	45.0	0.88	6	42.9	2.395	0.0621
District 8	Eastern Sumner	**41.7**	**0.98**	**5**	**46.2**	**-4.5674**	**0.0103**

Appendix N.–Results of a t-test comparing the 2007 mean carapace length with the long-term baseline for spot shrimp preseason survey by analysis area, Southeast Alaska, Registration Area A.

Management Unit	Analysis Area	2007	Baseline	p-value	trend
Section 3-A	Hetta Inlet	34.3	37.6	<0.001	-1
	Mid Cordova	30.8	33.8	<0.001	-1
District 7	Lower Ernest	30.5	31.2	<0.001	0
	Upper Ernest	37.2	36.7	0.0036	0
Tenakee	East Tenakee	32.4	35.4	<0.001	-1
	West Tenakee	39.4	38.9	<0.001	0
Section 13-C	Hoonah Sound	36.1	37.8	<0.001	-1

Appendix O.–Results of a regression of mean carapace length on season for 2004–2007 commercial spot shrimp samples, Project 20, on floating processors and on-the-grounds sampling (sample site types 1 and 2), in Districts 1–16 of Southeast Alaska, Registration Area A**. Note that significant (α=.05) regressions with negative slopes are shown in bold.**

Management Unit	Analysis Area	p	r^2	Slope	Intercept	n trips
District 2	Middle Clarence	0.149598	0.22	2.1	-4212.2	11
	Hetta Inlet	0.998615	0.00	0.0	35.2	9
	Lower Cordova Bay	0.138598	0.57	-1.2	2405.0	5
	Mid Cordova Bay	0.454817	0.30	-0.8	1630.5	4
	Sea Otter Sound	0.871668	0.00	0.1	-89.9	14
	Upper Cordova Bay	0.514150	0.03	-0.3	540.9	17
District 6	Upper Clarence	0.963290	0.00	0.0	3.0	18
District 7	Bradfield	0.397469	0.24	-0.9	1826.2	5
	Upper Ernest Sound	0.118356	0.28	1.9	-3769.4	10
	Zimovia		1.00	-1.4	2848.9	2
District 10	Farragut Bay	0.305341	0.34	0.8	-1508.8	5
	Hobart/Windham	0.160943	0.23	1.0	-1866.9	10
	Port Houghton	0.743529	0.01	0.3	-577.4	11
	SE Admiralty	0.297239	0.35	1.5	-2931.2	5
Section 13-C	Hoonah Sound	0.482641	0.02	-0.3	560.5	30
	Peril Strait	**0.029344**	**0.43**	**-0.7**	**1416.1**	**11**
	South Arm	0.711959	0.19	0.6	-1189.6	3

Appendix P.–Results of a regression of mean carapace length on season for 2004–2007 commercial spot shrimp samples, Project 20, from dockside sampling (sample site type 3), in Districts 1–16 of Southeast Alaska, Registration Area A**.** Note that significant (α=.05) regressions are shown in bold.

Management Unit	Analysis Area	p	r^2	F value	Slope	Intercept	n (trips)
District 6	Upper Clarence	0.353	0.285	1.200	-0.36264	766.7534	5
District 7	Bradfield	**0.005**	**0.134**	**8.386**	**0.593514**	**-1144.39**	**56**
	Upper Ernest Sound	0.196	0.259	2.106	-1.19298	2431.567	8
	Zimovia	0.075	0.433	4.592	2.194194	-4358.66	8
District 8	Eastern Sumner	**0.016**	**0.143**	**6.351**	**-1.05432**	**2157.867**	**40**
	Stikine Strait/Chichagof Pass	0.633	0.012	0.235	0.466974	-893.254	20
District 14	Eastern Icy Strait	0.239	0.416	2.139	1.593381	-3157.69	5

Appendix Q.–Results of a regression of mean carapace length on season for 2004–2007 spot shrimp preseason survey samples, Southeast Alaska, Registration Area A.

Management Unit	Analysis Area	r^2	p-value	trend
Section 3-A	Hetta Inlet	0.0048	<0.001	yes
	Mid Cordova	0.0012	0.0036	yes
District 7	Lower Ernest	0.0000	0.5572	no
	Upper Ernest	0.0183	<0.001	yes
Tenakee	East Tenakee	0.0129	<0.001	yes
	West Tenakee	0.0002	0.1070	no
Section 13-C	Hoonah Sound	0.0006	0.0091	yes

Appendix R.–Statistically significant results of inverse prediction of L_{50}, from a logistic regression of carapace length on sex from commercial sampling (project 20) of spot shrimp at sample site types 1, 2, and 3 (floating processor, on-the-grounds, and dockside) in Southeast Alaska, Registration Area A, 1997–2007 seasons. Bolded seasons are those used to calculate the long-term baseline (the first 3 sampled seasons with ≥ 100 shrimp).

Management Unit	Analysis Area	Season	Prob> Chi Sq	Chi square	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
District 1	Back Behm Canal	**1997/98**	**6.48E-22**	**92.576**	**101**	**46.3**	**45.2**	**47.5**
		1998/99	**5.62E-21**	**88.301**	**100**	**49.6**	**47.9**	**51.4**
		1999/00	**8.04E-30**	**128.662**	**246**	**42.3**	**40.8**	**43.8**
		2001/02	2.20E-16	67.4173	49	41.6		
	Boca de Quadra	1997/98	7.49E-35	151.667	147	42.1	41.3	42.9
	East Behm Canal	1999/00	3.36E-12	48.467	100	41.8	39.7	43.9
		2000/01	3.06E-47	208.409	250	42.9	42.0	43.9
	Inner Ketchikan Inlets	**1997/98**	**2.25E-81**	**365.042**	**470**	**43.9**	**43.4**	**44.3**
		1998/99	**7.23E-49**	**215.860**	**300**	**45.7**	**45.0**	**46.5**
		1999/00	**2.58E-25**	**108.081**	**205**	**43.2**	**42.2**	**44.5**
		2000/01	8.15E-66	293.605	395	42.9	42.3	43.7
		2001/02	1.07E-114	518.150	726	42.4	42.0	42.8
	Portland Canal	1998/99	6.74E-38	165.608	150	45.8	44.6	46.8
District 2	Middle Clarence	**1997/98**	**1.24E-42**	**187.290**	**227**	**40.3**	**39.6**	**41.0**
		2000/01	**3.12E-17**	**71.268**	**100**	**38.6**	**37.7**	**39.6**
		2003/04	**2.97E-41**	**180.974**	**279**	**40.2**	**39.6**	**40.9**
		2006/07	1.80E-19	81.452	105	38.6	38.0	39.3
		2007/08	6.95E-05	15.825	40	45.0	43.5	48.9
	Lower Clarence	1997/98	6.87E-36	156.416	244	41.5	40.8	42.3
		2000/01	1.26E-42	187.265	199	40.3	39.8	40.9
		2007/08	1.47E-12	50.093	62	36.6	35.5	37.9
Section 3-A	Hetta Inlet	**1997/98**	**6.84E-27**	**115.277**	**176**	**37.8**	**37.2**	**38.4**
		2000/01	7.80E-10	37.810	50	38.8	37.6	39.9
		2001/02	**1.63E-38**	**168.424**	**196**	**37.2**	**36.8**	**37.6**
		2002/03	**7.45E-21**	**87.744**	**127**	**36.7**	**36.1**	**37.4**
		2003/04	2.09E-16	67.520	93	37.3	36.6	38.3
		2004/05	2.27E-29	126.600	170	37.9	37.3	38.5
		2007/08	7.28E-12	46.951	50	36.8	36.0	37.8
	Lower Cordova Bay	**1997/98**	**1.19E-73**	**329.581**	**456**	**38.9**	**38.5**	**39.3**
		1998/99	**2.57E-20**	**85.297**	**100**	**40.2**	**39.5**	**40.8**
		2002/03	**4.70E-35**	**152.595**	**255**	**37.6**	**37.2**	**38.0**
		2003/04	4.59E-16	65.9639	88	39.1	38.0	40.3
		2004/05	3.16E-16	66.702	67	37.2	36.3	37.9
		2005/06	1.79E-15	63.288	140	39.0	38.1	40.5
	Mid Cordova Bay	**1997/98**	**9.59E-49**	**215.299**	**275**	**38.4**	**37.9**	**38.9**
		1998/99	**1.48E-16**	**68.193**	**100**	**38.3**	**37.5**	**39.0**
		1999/00	8.52E-11	42.134	50	36.2	35.0	37.1
		2001/02	**9.47E-41**	**178.668**	**254**	**38.7**	**38.3**	**39.2**
		2004/05	3.59E-18	75.534	101	34.5	33.9	35.1
		2005/06	8.93E-19	78.283	99	36.2	35.7	36.8
	Upper Cordova Bay	**1997/98**	**3.28E-108**	**488.336**	**671**	**37.5**	**37.2**	**37.8**
		1998/99	2.32E-06	22.309	50	38.4	37.0	39.9
		1999/00	0.00011	14.944	50	38.0	33.7	39.6
		2000/01	8.01E-13	51.280	50	39.1	38.3	42.6

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Management Unit	Analysis Area	Season	Prob> Chi Sq	Chi square	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
	Upper Cordova Bay	**1997/98**	**3.28E-108**	**488.336**	**671**	**37.5**	**37.2**	**37.8**
		1998/99	2.32E-06	22.309	50	38.4	37.0	39.9
		1999/00	0.00011	14.944	50	38.0	33.7	39.6
		2000/01	8.01E-13	51.280	50	39.1	38.3	42.6
		2001/02	**1.63E-27**	**118.119**	**166**	**37.3**	**36.7**	**38.0**
		2002/03	**7.39E-46**	**202.068**	**315**	**35.0**	**34.6**	**35.4**
		2003/04	1.97E-39	172.627	186	37.2	36.7	37.8
		2004/05	1.46E-22	95.5213	162	34.6	33.9	35.2
		2006/07	2.12E-56	250.409	307	34.5	34.1	35.0
		2007/08	6.73E-14	56.144	66	36.3	35.2	37.7
Sections 3-B/C	Craig	1999/00	3.97E-12	48.1407	51	36.7		
		2004/05	2.76E-24	103.382	89	38.7	38.0	39.3
	Sea Otter Sound	**2002/03**	**4.33E-19**	**79.712**	**100**	**42.4**	**41.4**	**43.3**
		2003/04	7.86E-12	46.801	55	39.8	38.8	42.9
		2004/05	**1.03E-23**	**100.767**	**154**	**42.1**	**41.1**	**43.3**
		2006/07	**9.94E-17**	**68.9817**	**111**	**43.0**	**41.6**	**44.9**
		2007/08	3.09E-08	30.651	98	42.0		
District 4	District 4	2000/01	1.47E-15	63.670	115	36.5	35.7	37.3
District 5	Affleck/Pt Beauclerc	2000/01	2.28E-09	35.714	50	37.4	35.0	39.2
District 6	SW Etolin	2002/03	6.90E-17	69.700	59	37.0		
	Upper Clarence	**1998/99**	**2.46E-35**	**153.876**	**150**	**42.6**	**42.1**	**43.2**
		1999/00	**1.78E-26**	**113.381**	**178**	**41.0**	**40.4**	**41.6**
		2000/01	**5.35E-61**	**271.497**	**497**	**39.9**	**39.4**	**40.5**
		2001/02	7.70E-91	408.518	764	39.9	39.6	40.4
		2002/03	1.32E-137	623.461	1031	39.8	39.5	40.1
		2003/04	8.20E-141	638.208	1003	38.5	38.2	38.8
		2004/05	3.07E-56	249.666	397	37.7	37.2	38.2
		2005/06	3.59E-25	107.427	157	38.0	37.1	38.9
		2006/07	6.78E-29	124.430	202	38.8	38.1	39.6
		2007/08	5.23E-23	97.558	207	39.9	39.0	41.1
District 7	Bradfield	1998/99	2.00E-12	49.485	44	46.8		
		1999/00	3.76E-17	70.898	59	49.5	47.1	51.7
		2000/01	**2.08E-19**	**81.159**	**804**	**48.3**	**46.5**	**51.0**
		2001/02	**3.28E-25**	**107.607**	**649**	**45.5**	**44.8**	**46.6**
		2002/03	**4.31E-229**	**1,044.256**	**1385**	**46.2**	**46.0**	**46.5**
		2003/04	4.95E-126	570.253	1205	45.6	45.2	46.0
		2004/05	5.12E-136	616.161	755	45.2	44.9	45.6
		2005/06	6.48E-144	652.471	680	46.8	46.5	47.1
		2006/07	3.02E-143	649.396	649	46.4	46.1	46.8
		2007/08	1.43E-193	880.845	900	47.6	47.3	47.8

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Management Unit	Analysis Area	Season	Prob> Chi Sq	Chi square	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
District 7	Lower Ernest Sound	1998/99	1.20E-14	59.536	52	44.5	42.3	45.9
		2001/02	1.38E-21	91.078	212	40.4	39.6	41.4
		2002/03	2.94E-09	35.222	35	41.0	39.8	41.8
		2003/04	5.79E-16	65.508	63	40.6	39.3	41.8
	Upper Ernest Sound	**1998/99**	**3.63E-32**	**139.383**	**168**	**44.3**	**43.6**	**45.2**
		1999/00	**6.65E-43**	**188.532**	**236**	**42.8**	**42.1**	**43.6**
		2000/01	**1.94E-37**	**163.502**	**323**	**42.4**	**41.6**	**43.5**
		2001/02	2.05E-19	81.193	175	43.1	42.2	44.5
		2002/03	8.47E-33	142.274	358	43.4	42.7	44.2
		2003/04	9.76E-35	151.141	257	44.4	43.4	45.4
		2004/05	1.79E-10	40.684	126	42.7	40.8	45.7
		2005/06	1.15E-32	141.668	245	42.0	41.2	43.1
		2006/07	4.85E-30	129.665	300	43.2	42.3	44.4
	Zimovia	**1999/00**	**4.58E-28**	**120.639**	**106**	**42.6**	**41.4**	**43.5**
		2000/01	**8.67E-25**	**105.6799**	**346**	**45.7**	**44.9**	**46.9**
		2003/04	**7.77E-07**	**24.41446**	**50**	**43.5**	**41.6**	**48.1**
		2004/05	3.17E-09	35.075	42	46.0		
		2005/06	4.05E-08	30.127	50	45.1	42.5	50.6
		2006/07	4.68E-13	52.335	50	48.5		
		2007/08	1.53E-68	306.122	300	44.5	44.0	45.0
District 8	Eastern Sumner	1998/99	3.75E-08	30.275	31	46.3		
		1999/00	**1.07E-17**	**73.385**	**177**	**46.0**	**44.9**	**47.8**
		2000/01	**1.22E-65**	**292.794**	**946**	**44.4**	**43.8**	**45.1**
		2001/02	**7.50E-16**	**64.997**	**296**	**45.3**	**44.2**	**47.0**
		2002/03	7.80E-53	234.050	547	44.3	43.6	45.3
		2003/04	1.17E-81	366.342	902	44.6	44.0	45.3
		2004/05	4.10E-13	52.596	101	43.8	42.7	45.3
		2005/06	3.32E-119	538.868	750	43.7	43.3	44.0
		2006/07	1.12E-141	642.175	899	45.2	44.9	45.6
		2007/08	6.97E-32	138.089	250	45.3	44.6	46.4
	Stikine Strait / Chichagof Pass	1998/99	0.000277	13.209	21	45.8		
		1999/00	**1.13E-22**	**96.027**	**158**	**42.0**	**41.4**	**42.7**
		2000/01	5.55E-12	47.483	91	45.7	44.6	47.2
		2001/02	**0.002117**	**9.446**	**174**	**48.4**	**44.6**	**65.1**
		2002/03	**4.69E-51**	**225.892**	**390**	**42.4**	**41.7**	**43.2**
		2003/04	3.82E-40	175.895	448	42.5	41.8	43.4
		2004/05	1.66E-151	687.376	952	43.1	42.8	43.4
		2005/06	1.27E-09	36.860	54	43.7	42.0	45.8
		2006/07	2.23E-14	58.314	50	47.0		
District 9	Eliza Harbor	1998/99	4.65E-30	129.750	145	42.9	42.3	43.5
		2000/01	1.36E-09	36.729	34	39.7	38.2	49.0
		2001/02	1.26E-09	36.879	42	41.5	40.2	43.8
		2002/03	1.52E-21	90.891	105	41.1	40.3	42.1
		2007/08	4.87E-14	56.783	48	40.5	39.3	42.0

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Appendix R.–Page 4 of 5.

Management Unit	Analysis Area	Season	Prob> Chi Sq	Chi square	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
District 9	SE Baranof	2001/02	2.43E-09	35.597	41	40.8	40.0	43.7
		2002/03	4.87E-15	61.314	60	39.4	38.0	40.5
District 10	Farragut Bay	2005/06	0.000016	18.652	68	41.2	39.7	44.0
	Hobart/Windham	1997/98	3.05E-08	30.67286	98	35.8	33.4	37.2
		1999/00	3.06E-19	80.39897	81	42.8	42.1	43.6
		2000/01	**1.15E-26**	**114.251**	**133**	**41.2**	**40.6**	**42.0**
		2001/02	**3.73E-68**	**304.342**	**306**	**40.7**	**40.3**	**41.2**
		2002/03	**2.07E-82**	**369.803**	**363**	**41.9**	**41.3**	**42.5**
		2003/04	1.55E-63	283.146	236	41.4	41.0	41.7
		2004/05	6.20E-10	38.2578	46	41.4		
		2005/06	6.33E-27	115.433	147	39.9	39.3	40.7
		2006/07	2.73E-12	48.872	50	40.6		
		2007/08	1.09E-18	77.889	92	38.5	37.4	39.6
	Port Houghton	**1999/00**	**7.87E-25**	**105.871**	**149**	**41.6**	**40.7**	**42.5**
		2002/03	**1.01E-39**	**173.963**	**181**	**41.9**	**41.2**	**42.6**
		2003/04	**6.82E-54**	**238.903**	**291**	**41.0**	**40.5**	**41.5**
		2004/05	1.38E-27	118.452	136	40.9	40.2	41.6
		2005/06	1.05E-13	55.268	98	41.6	40.6	42.9
		2006/07	3.59E-16	66.450	59	38.7	37.6	40.3
		2007/08	2.51E-35	153.843	155	40.1	39.3	40.8
	SE Admiralty	1999/00	1.79E-13	54.224	60	42.7	41.5	44.1
		2002/03	1.01E-11	46.314	52	38.5	37.4	39.5
		2004/05	3.21E-08	30.576	48	41.7	40.1	45.8
		2005/06	2.90E-08	30.775	45	40.7	39.9	42.6
		2006/07	7.81E-19	78.548	104	40.5	39.7	41.6
		2007/08	1.51E-12	50.0386	60	41.3	39.4	42.4
	Auke Bay	**2001/02**	**1.24E-71**	**320.312**	**306**	**44.2**	**43.4**	**44.8**
		2002/03	**3.00E-92**	**414.994**	**564**	**39.2**	**38.9**	**39.6**
		2003/04	**1.80E-42**	**186.551**	**239**	**40.1**	**39.5**	**40.9**
		2004/05	3.41E-20	84.733	121	39.6	38.6	41.1
		2005/06	2.58E-17	71.645	88	42.7	41.6	44.1
	Glacier-fed Bays	1997/98	6.04E-20	83.606	106	46.2	44.8	47.5
		1999/00	7.69E-15	60.413	92	42.0	40.8	44.3
		2000/01	3.36E-27	116.689	147	42.7	42.0	43.3
		2001/02	1.06E-12	50.729	62	45.0	42.9	47.0
	Seymour Canal	2000/01	1.67E-11	45.324	50	39.1	37.8	41.1
		2002/03	**2.75E-34**	**149.083**	**149**	**42.9**	**42.3**	**43.4**
		2003/04	**2.26E-65**	**291.569**	**351**	**39.6**	**39.0**	**40.2**
		2005/06	**1.10E-43**	**192.116**	**234**	**39.3**	**38.6**	**40.0**
Tenakee	West Tenakee	1999/00	1.07E-08	32.717	77	44.1	42.8	46.7
		2001/02	1.40E-23	100.171	94	43.6	42.7	44.5
Remainder of	Freshwater Bay	2001/02	1.74E-19	81.518	180	42.9	41.9	44.4
District 12	Kelp Bay	2001/02	2.48E-07	26.619	35	37.6	35.5	41.7
	Pt. Couverden	2003/04	9.73E-33	141.999	135	40.3	39.1	41.4

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Management Unit	Analysis Area	Season	Prob> Chi Sq	Chi square	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
Sections 13-A/B	Necker, Crawfish	1998/99	1.45E-11	45.596	100	42.8		
	Whale Bay	1998/99	5.44E-12	47.520	50	45.1	42.8	47.0
		2000/01	1.55E-13	54.506	59	41.5	40.0	43.4
Section 13-C	Hoonah Sound	2001/02	1.00E-31	137.364	149	42.1	41.4	42.7
		2002/03	8.59E-76	339.406	358	41.1	40.6	41.5
	South Arm	2001/02	9.43E-30	128.346	150	41.6	41.0	42.1
		2002/03	1.16E-50	224.096	252	43.0	42.5	43.4
	Peril Strait	2002/03	2.41E-20	85.423	102	37.3	36.6	38.6
District 14	Eastern Icy Strait	**1998/99**	**5.98E-27**	**115.544**	**150**	**42.8**	**42.2**	**43.8**
		2002/03	**1.62E-68**	**306.008**	**339**	**39.1**	**38.7**	**39.5**
		2003/04	**2.39E-14**	**58.184**	**119**	**39.7**	**38.4**	**41.1**
		2005/06	7.86E-33	142.423	146	38.8	38.2	39.4
	Port Frederick	2004/05	3.64E-19	80.053	179	39.1	38.3	40.3
District 16	Lituya Bay	1999/00	3.87E-09	34.689	55	40.6	37.7	42.3
		2003/04	0.095891	2.773	2	37.8		

Appendix S.–Results of inverse prediction of L_{50}, from a logistic regression of carapace length on sex for spot shrimp sampled during the preseason survey (project 26) of spot shrimp in Southeast Alaska, Registration Area A, 1997–2007 commercial seasons. Bolded years are those used to calculate the long-term baseline.

Management Unit	Analysis Area	Year	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
Section 3-A	Hetta Inlet	**2000**	98	39.7	38.8	41.0
		2001	390	37.8	37.4	38.1
		2002	189	37.9	37.5	38.6
		2003	1,049	37.8	37.6	38.1
		2004	200	37.4	36.8	38.0
		2005	402	37.3	37.0	37.6
		2006	688	37.8	37.5	38.0
		2007	923	38.5	38.1	38.9
	Mid Cordova	**2000**	100	36.2	35.3	37.5
		2001	408	36.3	35.8	36.7
		2002	186	36.1	35.7	36.6
		2004	201	34.9	34.2	35.7
		2005	372	35.9	35.4	36.4
		2006	735	34.4	34.1	34.7
		2007	1,078	35.9	35.5	36.4
District 7	Lower Ernest	**2003**	458	39.7	38.7	40.9
		2004	388	37.5	36.3	38.9
		2005	484	36.7	35.9	37.5
		2006	647	36.7	36.0	37.4
		2007	556	36.8	36.1	37.5
	Upper Ernest	**2000**	410	42.7	42.2	43.3
		2001	69	42.5	41.0	44.8
		2002	228	40.9	40.1	41.8
		2003	676	42.3	41.7	43.0
		2004	237	42.2	40.7	44.4
		2005	529	41.6	40.8	42.7
		2006	622	39.3	38.7	39.9
		2007	486	39.4	39.0	40.0

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Management Unit	Analysis Area	Year	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
Tenakee	East Tenakee	**2000**	50	42.6	41.3	43.7
		2004	99	39.2	38.3	40.1
		2005	171	39.3	38.6	39.8
		2006	186	40.3	39.5	41.1
		2007	250	38.9	38.3	39.5
	West Tenakee	**2000**	84	42.8	42.2	43.5
		2002	405	43.3	42.7	44.0
		2003	224	42.9	41.9	44.1
		2004	290	41.5	41.1	42.1
		2005	548	42.1	41.8	42.4
		2006	840	41.2	40.9	41.5
		2007	748	41.5	41.1	41.8
Section 13-C	Hoonah Sound	**2000**	231	41.7	41.0	42.6
		2001	275	43.1	42.6	43.7
		2002	406	41.5	41.0	42.0
		2003	404	41.5	41.0	42.1
		2004	364	40.3	39.8	40.9
		2006	1,005	39.4	39.1	39.7
		2007	2,442	39.4	39.2	39.6

Appendix T.–Statistically significant results of inverse prediction of L_{50}, from a logistic regression of carapace length on sex from commercial sampling (project 20) of coonstripe shrimp at sample site type 2 (dockside) in District 15 of Southeast Alaska, Registration Area A, 1999–2005 seasons.

Analysis Area	Season	Chi Square	Prob>Chi Sq	n (shrimp)	L_{50} CL (mm)	L_{50} LL	L_{50} UL
Chilkat Inlet	1999/00	38.15388	6.54E-10	81	29.5	28.3	30.2
Chilkoot Inlet	1999/00	12.13804	0.000494	48	29.8	24.2	31.3
	2000/01	6.794102	0.009146	49	28.7	-1.5	30.9
Lutak Inlet	1999/00	35.66141	2.35E-09	100	30.5	29.4	31.0
	2000/01	82.93474	8.48E-20	149	29.8	29	30.4
Taiya Inlet	2005/06	54.20708	1.80E-13	149	32.8	32.1	33.2

Appendix U.–Baseline L_{50}s for spot shrimp commercial samples (Project 20) in Districts 1–16. The mean of the first 3 seasons with a sample size of 200 or more shrimp is used.

Management Unit	Analysis Area	Mean L_{50} (mm)
District 1	Back Behm Canal	46.1
	Inner Ketchikan Inlets	44.3
District 2	Middle Clarence	39.7
Section 3-A	Hetta Inlet	37.2
	Lower Cordova Bay	38.9
	Mid Cordova Bay	38.5
	Upper Cordova Bay	36.6
Sections 3-B/C	Sea Otter Sound	42.5
District 6	Upper Clarence	41.2
District 7	Bradfield	46.7
	Upper Ernest Sound	43.2
	Zimovia Strait	44.3
District 8	Eastern Sumner	45.2
	Stikine Strait/Chichagof	44.3
District 10	Hobart/Windham	41.3
	Port Houghton	41.5
District 11	Auke Bay	41.2
	Seymour Canal	40.6
District 14	Eastern Icy Strait	40.5

Appendix V.–Baseline L_{50}s for preseason spot shrimp surveys, Project 26, and the years it was calculated from for Districts 3, 7, 12, and 13 of Southeast Alaska, Registration Area A.

Management Unit	Analysis Area	Years	Mean L_{50} (mm)
Section 3-A	Hetta Inlet	2000–2002	38.5
	Mid Cordova	2000–2002	36.2
District 7	Lower Ernest	2003–2005	37.9
	Upper Ernest	2000–2002	42.0
Tenakee	East Tenakee	2000, 2004, 2005	40.4
	West Tenakee	2000, 2002, 2003	43.0
Section 13-C	Hoonah Sound	2000–2002	42.1

Appendix W.–Results of a regression of mean L_{50} on season for 2004/05 to 2007/08 commercial spot shrimp samples, Project 20, at sample site types 1, 2, and 3 (floating processor, on-the-grounds, and dockside) in Districts 1–16 of Southeast Alaska, Registration Area A. Note that significant (α=.05) regressions are shown in bold.

Management Unit	Analysis Area	p value	RSquare	n	F value	Intercept	Slope
Section 3-A	Upper Cordova Bay	0.4627	0.5584	3	1.264	-951.76	0.4920
Sections 3-B/C	Sea Otter Sound	0.9503	0.0060	3	0.006	-14.61	0.0284
District 6	Upper Clarence	**0.0342**	**0.9326**	**4**	**27.698**	**-1,455.50**	**0.7450**
District 7	Bradfield	0.1221	0.7706	4	6.721	-1,269.68	0.6562
	Upper Ernest Sound	0.7061	0.1983	3	0.247	-481.17	0.2612
	Zimovia	0.9137	0.0074	4	0.015	284.78	-0.1190
District 8	Eastern Sumner	0.1047	0.8015	4	8.075	-1,220.89	0.6309
	Stikine	0.2438	0.8603	3	6.160	-3,900.92	1.9678
	Strait/Chichagof Pass						
District 10	Hobart/Windham	0.1454	0.7302	4	5.413	1683.31	-0.8193
	Port Houghton	0.4398	0.3137	4	0.914	1128.54	-0.5426
	SE Admiralty	0.6641	0.1127	4	0.254	324.83	-0.1415

Appendix X.–Results of a regression of mean L_{50} on year for 2004 to 2007 preseason survey, Project 26, in Districts 3, 7, 12, and 13 of Southeast Alaska, Registration Area A. Note that significant (α=.05) regressions are shown in bold.

Management Unit	Analysis Area	R-square	p-value
Section 3-A	Hetta Inlet	0.0001	0.937
	Mid Cordova	0.0182	0.130
District 7	Lower Ernest	0.0271	**0.040**
	Upper Ernest	0.0272	**0.047**
Tenakee	East Tenakee	0.1890	**0.001**
	West Tenakee	0.0289	**0.024**
Section 13-C	Hoonah Sound	0.0036	0.762