**Fishery Data Series No. 20-19**

# Southeast Alaska Pot Shrimp Stock Status Prior to the 2019/20 Season

**by**

**Quinn Smith**

**December 2020**

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

## Symbols and Abbreviations

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

**Weights and measures (metric)**

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

**Weights and measures (English)**

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

**Time and temperature**

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

**Physics and chemistry**

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

**General**

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

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

*FISHERY DATA SERIES NO. 20-19*

# SOUTHEAST ALASKA POT SHRIMP STOCK STATUS PRIOR TO THE 2019/20 SEASON

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# ABSTRACT

Spot shrimp, *Pandalus platyceros*, and to a lesser extent coonstripe shrimp, *P. hysinotis*, are targeted by a pot fishery in Southeast Alaska. Spot shrimp are protandric hermaphrodites with narrow temperature and hard-bottom habitat requirements, and there is little Alaska-specific life history information. A fixed-quota harvest strategy is employed to manage the fishery; data are reviewed annually to determine stock status and guideline harvest levels (GHLs) are set within a guideline harvest range (GHR) and targeted inseason. The upper limits of GHRs were originally set based on historical harvest levels but have since been adjusted. Management is supported by a stock assessment program that includes fishery-independent pot surveys in 5 of 22 management areas (accounting for 57% of the 10-year average annual harvest), commercial catch sampling and logbooks, and commercial catch and effort data. Data on catch rate (survey, logbook and commercial), shrimp size, the size at which 50% are female ($L_{50}$), and estimates of harvest rate are analyzed annually. Data from the most current season are compared to established baselines and scored to designate a stock status of "good", "above average", "moderate", "below average", or "poor". For the 22 management areas in Southeast Alaska, stock status was poor in 2, below average in 3, moderate in 11, above average in 4, and good in 1. The 'Remainder of District 12'management area was closed for the 2018/19 season, so no stock statuses were calculated.

Keywords: Spot shrimp, *Pandalus platyceros*, stock assessment, Southeast Alaska, pot fishery

# INTRODUCTION

## LIFE HISTORY

Spot shrimp (*Pandalus platyceros*) are widely distributed within the North Pacific Ocean. They occur from the intertidal zone 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 3 months as plankton. 5 larval stages are reported, with stages I–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).

Life history information on spot shrimp, 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*.

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 1 or 2 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 3 or 4 years of age in British Columbia (Berkeley 1930). Interannual and spatial variability in the size at which shrimp transition from male to female, quantitatively expressed as the length at which 50% are female ($L_{50}$), has been well described for congeneric *P. borealis*. Multiple studies found that $L_{50}$ declines with increased growth rates, as a function of a substantial decrease in shrimp density (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, Alaska, 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. In British Columbia, females are not thought to survive long after the release of eggs. Whereas, in Alaska, multiple size classes of egged female shrimp have been documented during Alaska Department of Fish and Game (ADF&G) surveys. Many of these females are the equivalent of multiple molt increments larger than the largest males found in the area (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 Alaska 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 greater in higher latitudes with colder bottom water temperatures. A maximum age of 5 years has been reported in Canada (Butler 1964), whereas a tagging study from Prince William Sound, Alaska, estimated the maximum age at 7 or more years (Butler 1964; Kimker et al. 1996). Additionally, examinations of size frequency histograms in Prince William Sound indicated maximum age to be at least 10 years (Armstrong et al. 1995).

There is an ontogenetic change in the habitat of spot shrimp. Juvenile spot shrimp inhabit shallow water eelgrass and *Laminaria* spp. or *Agarum* spp. kelp, but at a size of approximately 20 mm carapace length (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).

Spot shrimp aggregations are likely best described as metapopulations. 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 locations (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" if oceanographic conditions allow.

Pandalid shrimp populations are vulnerable to water temperatures outside their narrow preference (3–6ºC for *P. borealis*). Delays may occur in both egg extrusion timing and in the number of breeding females associated with temperatures outside this range (Nunes 1984). Additionally, 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 STATUS PROGRAM DEVELOPMENT

The assessment program for spot shrimp in Southeast Alaska was initiated in 1996. It currently consists of pot surveys, commercial catch sampling both on-the-grounds and dockside, fish tickets, and logbooks. The spatial and temporal data coverage is inconsistent, as new programs have been introduced, and spatial data coverage has been increased incrementally with funding availability, and as fishery products and gear evolve.

The goals of the shrimp pot survey are to (1) estimate 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 spot shrimp bycatch species composition. 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 to (1) estimate spot shrimp carapace length (CL) frequency, either of the population using unsorted shrimp, or of the commercial harvest using sorted shrimp; and (2) estimate $L_{50}$.

Commercial catch sampling has been conducted from 4 different sample site types, some of which have been discontinued as the fishery and stock assessment program have evolved. The 4 types are: sampling of unsorted shrimp delivered to floating processors, sampling of sorted shrimp dockside (DS), sampling of unsorted shrimp onboard catcher–processors, and sampling of unsorted shrimp on the grounds (OTG) 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, commercial sampling onboard 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.

The Department first began taking biological samples from floating processors in 1997. Subsequently, the shrimp pot fishery intensified, 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. Dockside sampling 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 harvest that was processed onboard increased until 2002, when only Districts 6, 7, 8, 11, 14, and 15 were regularly sampled dockside. By 2007, this had decreased to Districts 6, 7, and 8. Since 2015, dockside samples have only been available from District 7. Sampling by observers stationed onboard catcher–processors (ONBD) was conducted in Districts 1 and 2 from 2000 to 2003, but this work ceased due to budget reductions in 2004. These data are not analyzed herein because of the very short time series. As the fishery intensified, on-the-grounds (OTG) sampling began in 1998, with dual objectives of obtaining catch rate 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, and 10, Tenakee Inlet, and Section 13-C have been sampled in this way; recent trips have focused on District 1, 2, Sections 3-A and 3-B/C, Districts 6, 7, 9, and 10, and Section 13-C.

Fish tickets, with 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 submit daily fish tickets since 2003. Other shrimp pot fishing vessels must record each landing on a fish ticket. Fish tickets do not require shrimp harvest to be recorded by size category.

A voluntary logbook program was initiated in 2005 with the objective of collecting size-specific spot shrimp catch-per-unit-effort (CPUE) data from catcher–processors. The level of voluntary logbook participation varied both spatially and temporally, and thus there is not an adequate time series to conduct comparisons in most areas. A regulation for mandatory catcher–processor logbooks was implemented starting with the 2015/16 season. Participating vessels provide ADF&G with their specific size category definitions at the beginning of the season and record their harvest by shrimp size category daily.

## MANAGEMENT PROGRAM

The Southeast Alaska pot shrimp fishery is managed inseason by emergency order to limit harvests in each management area within guideline harvest levels (GHLs) that are established by the department each season. Guideline harvest ranges (GHRs) were first established in regulation in 1997 following initial implementation of separate, district-specific GHRs by emergency order for the 1995/96 season (5 AAC 31.115, *Shrimp Pot Guideline Harvest Ranges for Registration Area A*). The lower limit of each GHR is zero (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 1994/95 seasons. Guideline harvest levels have been adjusted by the Board of Fisheries several times for many, but not all, management areas. A thorough review of the history of and rationale for GHL changes by management area, including the timing for creation of new management areas, is provided in the triennial Board of Fisheries report (Smith and Gray 2017). Recommendations for GHLs 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, and a stock status of "healthy" was associated with a GHL increase of 20%. These guidelines were in place through 2005. For 2006–2007, "poor" stock status was changed to a 20–40% reduction, "moderate" to a 0–20% reduction and "healthy" to a 20–40% increase. Beginning in 2010, 2 additional stock status classes—"above average" and "below average"—were added to bring the shrimp assessment in line with other shellfish assessment terminology. The current stock status definitions and associated GHL actions are shown in Table 3. Once established, GHLs for each management area are targeted for a period of 3 years unless there are compelling, data-supported reasons, to do otherwise.

## OBJECTIVES

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

# METHODS

A combination of fishery-independent (surveys) and fishery-dependent (logbook, fish ticket, OTG sampling, and dockside sampling [DS]) data were collected to assess the relative changes in abundance, and the overall stock condition of spot shrimp in Southeast Alaska. The current year's stock assessment, though similar in concept to previous years, has undergone substantial improvements in the form of data source weighting to provide a more consistent and logical framework from which more objective determinations of stock status can be made.

## ANALYSIS AREAS

The pot shrimp fishery is managed to a preseason GHL in distinct management areas (Figure 1). In 2018, the Board of Fisheries approved a proposal to combine portions of District 6, 8, and 10 into 4 separate GHL based management areas. This increased the number of management areas in the Southeast Alaska pot shrimp fishery from 21 to 22. For stock status analysis purposes, each management area was divided into 1–7 separate analysis areas based on combining adjacent subdistricts based on the distribution of fishing effort within the management area (Table 2). These analysis areas were then individually weighted by a long-term average of commercial harvest. This

provides a more accurate evaluation at the management area level, because harvest varies dramatically among subdistricts.

## STOCK STATUS MATRIX

Data are separated into 4 broad categories: catch rates, harvest rates, mean carapace lengths (CL), and $L_{50}$.

### Catch Rates

Catch rates 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, fishing behavior, gear type, animal behavior, and population size. Three independent catch rates were used depending on the data available: survey CPUE of ≥XL (≥40 mm CL) 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 catch rate data are by far the most standardized from year to year and provide the greatest resolution in detecting changes in population size. Survey effort and gear is consistent over years and sample sizes are standardized. Also, because shrimp are individually measured, catch rates can be separated by size class, and thus allow a focused view on large shrimp. This removes any potential bias of changes in catch rates 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. The long-term baseline to which the current year's data were compared using a *t*-test was initially set as the mean of the first 3 years of the survey. These baselines have occasionally been adjusted if it was apparent that the first 3 years were not an appropriate comparison. When this occurs, a 10- or 15-year mean was substituted for the initial 3-year mean. The short-term score was based on a linear regression analysis of the last 4 years (including the current year).

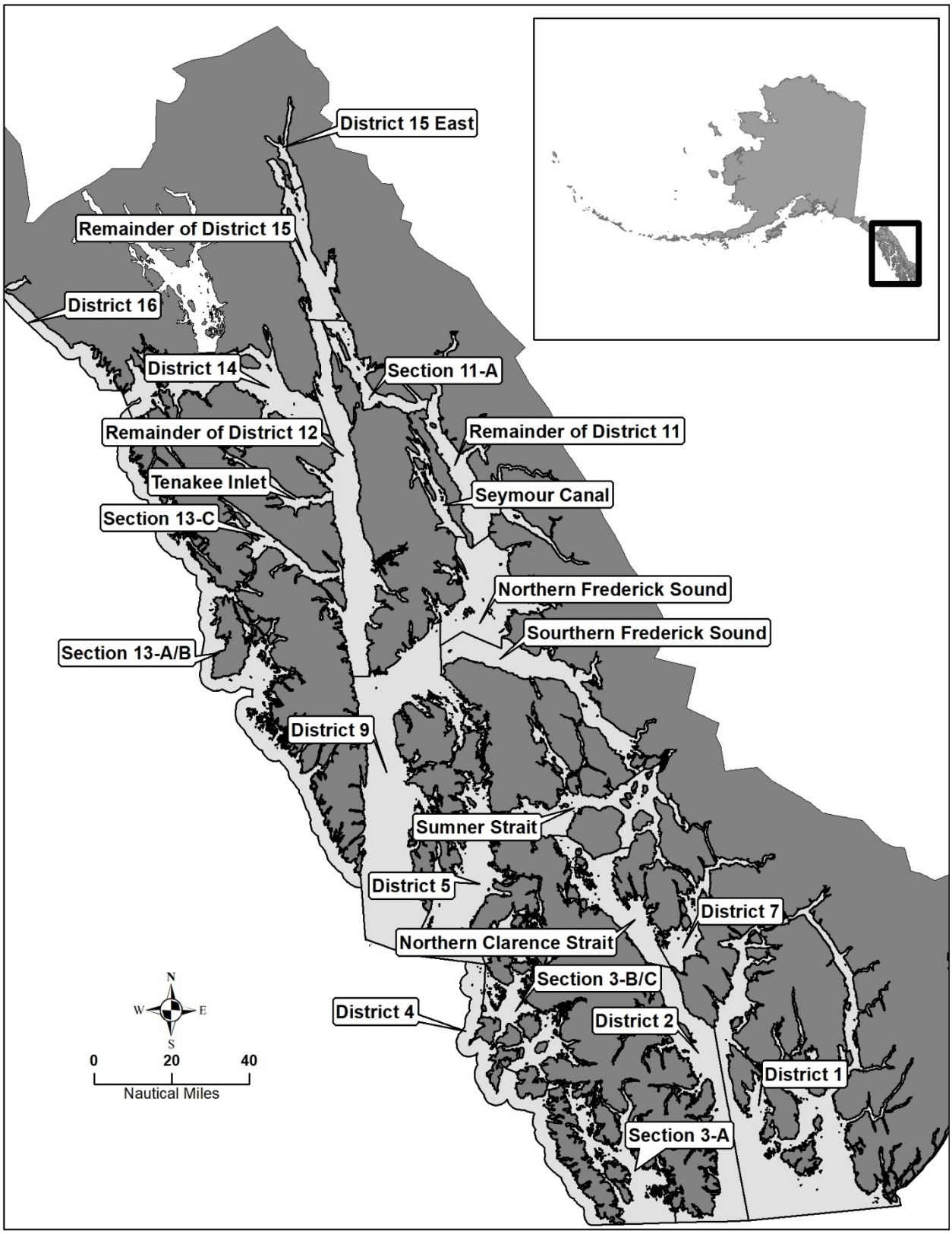


Figure 1.–Management areas for the Southeast Alaska pot shrimp fishery.

Commercial catch rate information is difficult to interpret even when standard and accurate measures of effort exist. This is because commercial fishermen can increase effort and efficiency 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). Because the shrimp pot fishery in Southeast Alaska has had accurate units of effort since the 1996/97 season, and the species has a limited distribution, commercial catch rate is an insensitive index and declines in catch rate 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 catch rates is much higher than that of survey CPUE. This often leads to 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 lack of standardization and potential non-independence of data. To improve the utility of commercial CPUE data, a standardized catch rate is used to describe trends in CPUE. Commercial catch rates were standardized by effort. The season with the smallest effort (fewest pot lifts) was used as the standard and all other years' data were scaled to match this effort as closely as possible. All data were sorted by date to ensure CPUE was calculated from the first pot lifts of the season. The long-term baseline to which the current year's data were compared using a *t*-test 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 linear regression analysis of the last 4 years (including the current year).

The catch rates calculated from commercial logbooks provide a compromise between the unbiased, high resolution survey data, and the biased, lower resolution commercial data. Because size class information is recorded on logbooks, CPUE of large shrimp can be calculated. Also, because commercial fishing occurs over a much broader scale, the spatial extent of the data should be better; however, voluntary logbook data are available for only the most recent 3 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, whereas no difference was scored as 0, and an increase scored as +1.

## Harvest Rates

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. The current system for applying a score value to the calculated harvest rate is based on the work of Kimker et al. (1996), who found that the maximum age of *P. platyceros* in Prince William Sound exceeded 7 years; we used 8 as the maximum age, and applied the equation of Hoenig (1983) to estimate natural mortality (M) at M = 0.55. We set fishing mortality rate (F) equal to natural mortality rate (M), which yields a limit annual harvest rate of 42%. In addition, 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 have a similar life history, maximum age, and natural mortality to *P. platyceros*. In Maine, Clarke et al. (2000) found that F = 0.34, or an annual mortality of 29% was sustainable yield and egg-per-recruit modeling. They estimated the maximum age at 5 years, so that species could likely support a more aggressive harvest strategy than the more long-lived spot shrimp. In eastern Canada, a 35% target exploitation rate has been used for *P. borealis* stocks with natural mortality in the range of M = 0.5–0.8 (Mohn et al. 1992). However, that practice lost acceptance when the exploitation rate 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, $F_{MSY}$ (F that produces maximum sustainable long-term yield), 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 0.4 or 33% annually with M assumed to be 0.2. A limit reference point called $F_{0.1}$ is the fishing mortality rate at which the slope of a yield-per-recruit curve is 10% of its original value. 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 follows: 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 a limit reference ($F_{limit}$) specific to Southeast Alaska using the empirical relationship between stock trends and harvest rate estimates.

## Carapace Length

Measurements of carapace length (CL) provide estimates of the relative population structure. Mean carapace length is used to index changes in population structure. Decreases in mean CL may 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. Interpretation is further confounded because pre- and postseason shrimp pot surveys conducted in Districts 3 and 7 showed that the removal of large shrimp increases the catchability, and hence the catch rate, 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 examine the difference between the current year sample mean and the long-term baseline. Baselines for commercial samples consisted of the mean of the first 3 sampled years for each area having 3 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 3 years with a sample size of 200 or more shrimp.

### $L_{50}$

The unique plasticity of the size at sex change of this genus makes the length at which 50% are female ($L_{50}$) useful as an indicator of population status. Decreases in $L_{50}$ result in decreased population fecundity, because 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 are minimally affected by catchability issues, and changes in $L_{50}$ are more easily interpreted. However, because change in reproductive age is a population level response, changes in $L_{50}$ data are likely to respond more slowly than other metrics. To detect changes in $L_{50}$, the confidence interval around the current year sample mean was compared with the long-term baseline value. If the lower bound of the 95% confidence interval is greater than the baseline, it is scored +1; if the baseline is greater than the upper bound, it is scored -1; and if it lies

within the lower and upper bound, it is scored 0. Baselines established for commercial samples consisted of the mean of the first 3 sampled years for each area having 3 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 3 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 can provide useful insight into the overall stock assessment, especially in data-poor areas. Information such as changing markets, fuel prices, and weather can help interpret changes in season length, overall harvest, distribution of harvest, and effort. Direct communication with commercial fishing operators (managers) can provide impressions of stock health. These "manager 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 types 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.

## Overall Scoring

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: catch rate, harvest rate, mean carapace length, and $L_{50}$. In assessing stock status, each response variable was scored independently and weighted based on the historic correlation between the response variable and the standardized district score (see detail below). If the current year's response was significantly above the long-term baseline, it was scored +1; if no difference was found, it was scored 0; and if it was significantly lower than the baseline, it was scored -1. Short-term trends were scored as +0.25, 0, or -0.25 for significant increase, no change, or significant decrease, respectively.

Evaluating the influence of each index on the total score is not straightforward because they are on different scales (e.g., carapace length vs. catch rate) and each index is evaluated and scored twice based on the baseline and short-term tests. Therefore, it was determined that the score for each index would be evaluated for its influence on the total district or section score calculation. Pairwise multivariate correlation analyses were performed with all indices, comparing them to each other and to the district wide total score and the districtwide standardized score. The pairwise part of this analysis allowed for a review of the indices to determine if any were redundant (highly correlated to each other and therefore not providing any unique information) or non-informative (having the same score every year and therefore not having a correlation coefficient). The correlation between each index and the standardized district score correlation was used to determine the weighting scheme. A regional weighting scheme was determined by comparing the mean, mode, median, and weighted mean of the correlation coefficients for each district. In this regional weighting scheme, survey catch rate, logbook data, and the short-term trend in carapace length from on the grounds samples were weighted 1. The short-term trend in standardized commercial CPUE, mean carapace length data from the surveys, $L_{50}$ data from the surveys, and manager scores were weighted 0.66. Whereas long-term comparisons of standardized commercial CPUE and $L_{50}$ data taken on the grounds were weighted 0.33. For full details on this evaluation see Smith (2018).

The total analysis area score was the weighted sum of the long- and short-term scores for each response variable for each management area (weighted by analysis area and response variable). The possible range of scores for a given area was divided into 3 equal categories: "poor" for the lowest 1/5 of possible scores, "below average" for the next 1/5, "moderate" for the middle 1/5, "above average" for the next highest 1/5, and "good" for the highest 1/5 of the possible scores. For example, if the scores ranged from +5 to -5, the categories would be as follows: "poor" is less than -3, "below average" is -3 to -1, "moderate" is -1 to +1, "above average" is +1 to +3, and "good" is greater than +3. For ease of regionwide interpretation, the overall scores for each district were also standardized to range from +1 to -1.

# RESULTS AND DISCUSSION

## REGIONAL OVERVIEW

The regionwide stock status score decreased in the 2018/19 season. The mean standardized stock health score for all districts in 2018/19 is -0.01 on a scale of -1 to 1, with -1 representing all scores in the matrix being negative, and 1 representing all scores in the matrix being positive; this is down from 0.10 in 2017/18 (Table 1). The regionwide decrease was mainly driven by decreased scores in Districts 2, 7, 9, 16 as well as in the Northern Clarence and Southern Frederick Sound areas. These decreases were partially offset by improvements in Districts 1, 3, Section 13-C, and the Sumner Strait area. Of the total regional GHL, 4% came from areas with "good" stock status (down from 11% in 2017/18); 20% came, from areas with "above average" stock status (down from 32%); 58% came from areas with "moderate" stock status (strong increase from 31%); 17% came from areas with "below average" stock status (down from 22%); and 2% came from areas classified as "poor" (slight decrease from 4%). The Remainder of District 12, and the Auke Bay portion of District 11 have been closed since the 2015/16 fishing season to allow for stock recovery. Total 2018/19 GHL for the region was 534,500 lb, a 2% decrease from the 2017/18 season. A total of 487,510 lb (91% of the GHL) were harvested.

Survey results show mixed positive and negative indicators. District 1 showed decreases in catch rates of large (≥40.5 g) and small (<40.5 g) class shrimp in Back Behm Canal and an increase in large class, but a decrease in small class in West Behm Canal. District 2 showed decreased catch rates of large and small class shrimp in Kasaan Bay and a slight increase in large class and decrease in small class in Cholmondeley Sound. In District 3, Hetta Inlet showed a decrease in the catch rate of large and small class shrimp, while catch rates of large and small class increased in Mid Cordova Bay. In District 7, Lower Ernest Sound showed increases in catch rates on large and small class shrimp, whereas both size class catch rates declined in Upper Ernest Sound. Catch rates of both size classes increased in West Tenakee Inlet. While catch rates of large class shrimp increased in Hoonah Sound, small class catch rated decreased to the lowest level in the history of the survey.

On-the-grounds (OTG) sampling was available in 9 of the 45 analysis areas that had fishing effort. Dockside sampling had less coverage with data from only 1 analysis area.

A mandatory logbook requirement for catcher–processors went into effect for the 2015/16 season and logbook data availability expanded to 15 analysis areas that now have sufficient data and model fit to conduct harvest rate estimations on ≥XL size class shrimp. Fourteen analysis areas had the 3 years of logbook data required for catch rate analysis.

Catch per unit effort (CPUE) data derived from fish tickets were significantly below the long-term baseline in 24% (13/54) of the analysis areas open to fishing, an increase from 20% in the 2017/18

season. Commercial CPUEs were significantly above the long-term baseline in 17% (12/54) of the analysis areas, a decrease from 24% in the 2017/18 season. The percentage of analysis areas with no effort this season remains at 19%, a decrease from 22% in the 2016/17 and 2017/18 seasons.

Manager scores were positive for 5 analysis areas (down from 11 in 2017/18), neutral for 40 (up from 39), and negative for 8 (up from 3). This gives an overall average score of -0.04, down from 0.15 during the 2017/18 season.

## STOCK STATUS

A summary of stock status, stock status score, confidence level, and a standardized score by management area is provided in Table 1. Details for each management area and associated management units follow.

Table 1.–Score, stock status, and confidence information summarized from Tables 4–47, and standardized (Std.) 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 area. A standardized score of ≥0.6 gives a stock status of Good, 0.2 to 0.59 is Above Average, -0.19 to 0.19 is Moderate, -0.2 to -0.59 is Below Average, and less than or equal to -0.6 is Poor.

| Management Area | Score | Stock Status | 2016/17 Std. Score | 2017/18 Std. Score | 2018/19 Std. Score | Confidence | Upper End GHR | 2018/19 GHL | 2018/19 Harvest | % GHL Taken |
|---|---|---|---|---|---|---|---|---|---|---|
| District 1 | 0.95 | Moderate | 0.21 | -0.23 | 0.13 | 0.38 | 164,000 | 64,000 | 59,092 | 92% |
| District 2 | -0.08 | Moderate | 0.12 | 0.57 | -0.01 | 0.47 | 120,000 | 29,400 | 31,423 | 107% |
| Section 3A | 0.63 | Moderate | -0.10 | -0.12 | 0.11 | 0.41 | 264,000 | 114,000 | 105,958 | 93% |
| Sections 3-B and C | -0.40 | Moderate | 0.00 | -0.34 | -0.18 | 0.24 | 70,000 | 30,000 | 21,733 | 72% |
| District 4 | 0.00 | Moderate | -0.31 | -0.16 | 0.00 | 0.20 | 28,000 | 20,000 | 14,313 | 72% |
| District 5 | 0.67 | Above Average | 0.00 | 0.23 | 0.31 | 0.16 | 20,000 | 12,000 | 1,713 | 14% |
| Northern Clarence | -1.47 | Below Average | NA | 0.91 | -0.33 | 0.45 | 60,000 | 34,300 | 38,180 | 111% |
| District 7 | 2.16 | Above Average | 0.17 | 0.43 | 0.27 | 0.61 | 104,000 | 74,300 | 78,775 | 106% |
| Sumner Strait | 1.80 | Good | NA | 0.34 | 0.83 | 0.19 | 25,000 | 15,000 | 17,017 | 113% |
| District 9 | -0.87 | Poor | -0.69 | -0.60 | -0.74 | 0.12 | 18,000 | 6,500 | 5,442 | 84% |
| Southern Frederick Sound | 0.88 | Above Average | NA | 0.76 | 0.31 | 0.30 | 20,000 | 12,000 | 10,846 | 90% |
| Northern Frederick Sound | -1.88 | Below Average | NA | -0.07 | -0.43 | 0.42 | 50,000 | 35,000 | 39,984 | 114% |
| Seymour | 0.33 | Moderate | -0.44 | 0.38 | 0.11 | 0.33 | 30,000 | 12,000 | 11,456 | 95% |
| Remainder of District 11 | 0.67 | Above Average | -1.00 | 0.46 | 0.31 | 0.07 | 15,000 | 4,000 | * | * |
| Tenakee | -0.58 | Moderate | 0.61 | 0.02 | -0.17 | 0.36 | 34,000 | 7,500 | * | * |
| Remainder of District 12 | 0.00 | CLOSED | NA | NA | NA | 0.00 | 15,000 | Closed | 0 | Closed |
| Sections 13-A/B | 0.14 | Moderate | -0.14 | 0.21 | 0.12 | 0.18 | 15,000 | 15,000 | 12,913 | 86% |
| Section 13-C | -0.13 | Moderate | -0.68 | -0.66 | -0.04 | 0.33 | 50,000 | 16,000 | 14,316 | 89% |
| District 14 | 0.33 | Moderate | NA | NA | 0.33 | 0.09 | 20,000 | 7,500 | 5,039 | 67% |
| District 15 East | 0.25 | Moderate | -0.28 | -0.27 | 0.12 | 0.16 | 20,000 (all 15) | 3,500 | 3,882 | 111% |
| Remainder of District 15 | -0.67 | Below Average | 0.00 | NA | -0.40 | 0.18 | 20,000 (all 15) | 7,500 | * | * |
| District 16 | -0.93 | Poor | 0.00 | NA | -0.93 | 0.12 | 20,000 | 15,000 | * | * |
| Mean | 0.08 | Moderate | -0.16 | 0.10 | -0.01 | 0.26 | 1,162,000 | 534,500 | 487,510 | 91% |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 2.–Modified analysis area definitions for the shrimp pot fishery in Southeast Alaska with weights and 2018/19 manager scores.

| Management area | Analysis area | Subdistricts | Weight | 2018/19 Score |
|---|---|---|---|---|
| District 1 | Back Behm Canal | 75, 77, 80 | 0.26 | 0 |
| | East Behm Canal | 51, 53, 55, 60, 71, 73 | 0.20 | 0 |
| | West Behm Canal | 85, 90, 95 | 0.12 | 0 |
| | Boca de Quadra | 30 | 0.05 | 0 |
| | Inner Ketchikan Inlets | 27, 40, 43, 44, 45, 46, 48 | 0.20 | 0 |
| | Portland Canal | 10, 11, 13, 15 | 0.15 | 0 |
| | Revilla Channel/Gravina Island | 21, 23, 22, 25, 29, 41 | 0.02 | 0 |
| District 2 | Lower Clarence Strait | 10, 15, 20 | 0.04 | 0 |
| | Moira Sound | 30 | 0.17 | 0 |
| | Cholmondeley Sound | 40 | 0.29 | 0 |
| | Kasaan Bay | 60 | 0.48 | -1 |
| | Middle Clarence Strait | 60 | 0.02 | 0 |
| Section 3-A | Hetta Inlet | 50, 70, 80 | 0.20 | 0 |
| | Lower Cordova Bay | 25 | 0.20 | 0 |
| | Mid Cordova Bay | 11, 15 | 0.10 | 0 |
| | Upper Cordova Bay | 21, 23 | 0.50 | 0 |
| Sections 3-B/C | Craig | 30, 40 | 0.40 | 0 |
| | Sea Otter Sound | 50, 60, 70, 80 | 0.60 | -1 |
| District 4 | D 4 | 90 | 1.00 | 0 |
| District 5 | Affleck/Port Beauclerc | 10, 20, 30, 35, 40, 50 | 0.60 | 0 |
| | Cape Pole to Point Baker | 10, 20 | 0.05 | 0 |
| | Rocky Pass | 41, 42, 43, 50 | 0.35 | 0 |
| North Clarence | SW Etolin Island | 106-20, 22, 25 | 0.10 | 0 |
| | Upper Clarence Strait | 106-10, 30 | 0.90 | -1 |
| District 7 | Bradfield Canal | 40, 45 | 0.20 | 0 |
| | Lower Ernest Sound | 10 | 0.20 | 1 |
| | Upper Ernest Sound | 20 | 0.50 | 0 |
| | Zimovia Strait | 30, 35 | 0.10 | 0 |
| Sumner Strait | Western Sumner Strait | 106-41, 42, 43, 44 | 0.20 | 0 |
| | Eastern Sumner Strait | 108-30, 40 | 0.49 | 1 |
| | Stikine Strait/ Chichagof Pass | 108-10, 20 | 0.31 | 1 |
| District 9 | Eliza Harbor | 30 | 0.40 | 0 |
| | Keku Strait/Port Camden | 40, 41, 42, 43, 50 | 0.025 | 0 |
| | SE Baranof Island | 10, 11, 13, 20 | 0.55 | -1 |
| | Western Kuiu (Saginaw to Table) | 44–63 | 0.025 | 0 |
| Southern Frederick Sound | Frederick Sound | 108-41, 50, 60 | 0.43 | 0 |
| | Farragut Bay | 110-11–17 | 0.57 | 0 |
| Northern Frederick Sound | Hobart/Windham Bays | 110-31, 32, 33 | 0.44 | 1 |
| | Port Houghton | 110-34 | 0.41 | 1 |
| | SE Admiralty (Pybus to Pt Hugh) | 110-21–24 | 0.15 | 0 |
| Seymour | Seymour Canal | 11–14 | 1.00 | -0.5 |
| Remainder District 11 | Auke Bay | 50, 55 | 0.75 | NA |
| | Glacier-fed Bays | 20, 21, 33–35 | 0.25 | -0.5 |

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Table 2.–Page 2 of 2.

| Management area | Analysis area | Subdistricts | Weight | 2018/19 Score |
|---|---|---|---|---|
| Tenakee Inlet | East Tenakee Inlet | 41, 42 | 0.10 | NA |
| | West Tenakee Inlet | 43, 44, 45, 46, 47, 48 | 0.90 | 0 |
| Remainder District 12 | Freshwater Bay | 50 | 0.20 | NA |
| | Kelp Bay | 11, 21, 22 | 0.70 | NA |
| | Pt. Couverden | 61 | 0.10 | NA |
| Section 13-A/B | Crawfish Bay | 31, 32, 33 | 0.30 | 0 |
| | Larch/ Branch Bays | 11, 12, 13 | 0.00 | 0 |
| | Necker Bay | 34 | 0.30 | 0 |
| | Whale Bay | 22, 21 | 0.40 | 0 |
| Section 13-C | Hoonah Sound | 55, 56, 57, 58 | 0.80 | 0 |
| | Peril Strait | 51, 52, 53, 54, 59 | 0.20 | -1 |
| District 14 | Eastern Icy Strait | 25, 80 | 0.80 | 0 |
| | Port Frederick | 31–34, 27 | 0.20 | NA |
| District 15 East | Chilkoot Inlet | 34 | 0.25 | NA |
| | Lutak Inlet | 33 | 0.20 | NA |
| | Taiya Inlet | 35 | 0.55 | 0 |
| District 15-Remainder | Chilkat Inlet | 32 | 1.00 | 0 |
| District 16 | Lituya Bay | 13 | 1.00 | -1 |

*Note*: "NA" = not applicable due to inadequate information available to create a score.

Table 3.–Stock status definitions and guideline associated actions for the pot shrimp fishery in Southeast Alaska.

| Stock Status | Rational | Range of Action |
|---|---|---|
| Good | Scores greater than 80% of possible maximum | 0–40% harvest increase |
| Above Average | Scores between 60% and 80% of possible maximum | 0–20% harvest increase |
| Moderate | Scores between 40% and 60% of possible maximum | 0–20% harvest reduction |
| Below Average | Scores between 20% and 40% of possible maximum | 0–30% harvest reduction to closure |
| Poor | Scores equal to and below 20% of possible maximum | 0–40% harvest reduction to closure |

# KETCHIKAN MANAGEMENT AREA

## District 1

The GHL in District 1 has changed 4 times since the 1998/99 season. Due to changes in the estimation of tail weight to whole weight, the GHL for this district increased 13% from 145,000 to 164,000 lb for the 2000/01 fishing season. Before this time tail weight was assumed to be approximately 66% of whole weight; after a large-scale sampling effort, this was revised to 50%, which subsequently increased the GHL because tail weight is extrapolated to whole weight for the purposes of catch accounting. The GHL was kept unchanged through the 2005/06 season (Table 4). In response to poor fishery performance, the GHL was reduced 40% to 98,400 lb beginning with the 2006/07 fishing season. The GHL was further reduced 20% to 78,700 lb for the 2008/09 fishing season and 36% to 50,000 lb beginning in the 2009/10 fishing season. Due to strengthening stock health, the GHL was increased 28% prior to the 2015/16 season to 64,000 lb.

Rather than targeting a specific GHL, managers have used set closure dates to control harvest. Harvest has averaged 60,080 lb (108% of GHL) over the last 10 years. 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; Table 2).

The survey catch rate of large class shrimp in Back Behm Canal increased slightly after 2 years of sharp declines. It remains below baseline and is now at its 2nd lowest level since the survey began. Back Behm Canal continues to show a significant declining 4-year trend. Catch rate of large class shrimp declined in for the 2nd year in West Behm Canal and remains at baseline level, with no significant 4-year trend (Figure 2). Mean survey CL increased and is at baseline in both areas. Back Behm Canal still shows a significantly increasing 4-year trend, while West Behm Canal shows a significantly decreasing 4-year trend. The $L_{50}$ is at baseline in both areas (Figure 3).

The 2018/19 season standardized districtwide commercial CPUE is down from last season (Figure 4) due to declines in fishery performance in Back Behm Canal, West Behm Canal, Portland Canal, and Inner Ketchikan Inlets. Analysis of area specific commercial CPUE is significantly above the long-term baseline in Boca de Quadra, below baseline in West Behm Canal, and at baseline in all other areas, except Revilla Channel/Gravina, which had no effort (Table 5). No analysis areas showed a significant 4-year trend (Table 5, Figure 5).

Analysis of commercial logbook harvest data showed increased catch rates of large class shrimp in Portland Canal and no change in catch rates in West Behm Canal. Back Behm Canal had a 32%, and Portland Canal a 20% (both low) harvest rate of large class shrimp (Table 5).

On-the-grounds samples showed mean CL to have declined in Back Behm Canal and increased in West Behm Canal, where it is now above baseline (Figure 6). On-the-grounds $L_{50}$ was at baseline in both Back Behm and West Behm Canals (Figure 7).

Manager scores were neutral for all analysis areas (Table 5).

The overall matrix score for District 1 is 0.95 (Moderate) up from -1.59 (Below Average) in 2017/18. This change is due to logbook harvest rate decreases from excessive in Portland Canal to low in both Back Behm and Portland Canals. District 1 data has moderate confidence (0.38).

Table 4.–District 1 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2007/08 | 2006/07 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 |
| Actual GHL (lb spot shrimp) | 164,000 | 164,000 | 98,400 | 98,400 | 78,700 | 50,000 | 50,000 | 50,000 |
| Recommended GHL or stock status | Moderate | Moderate | Poor | Poor | Poor | Below Average | Below Average | Below Average |
| Season length (days) | 80 | 75 | 229 | 47 | 120 | 38 | 38 | 26 |
| Landings (number) | 604 | 583 | 336 | 432 | 218 | 153 | 131 | 131 |
| Harvest (lb spot shrimp) | 159,234 | 160,546 | 87,581 | 141,871 | 53,364 | 46,837 | 37,129 | 54,971 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 | 164,000 |
| Actual GHL (lb spot shrimp) | 50,000 | 50,000 | 50,000 | 64,000 | 64,000 | 64,000 | 64,000 |
| Recommended GHL or stock status | Moderate | Moderate | Moderate | Moderate | Above Average | Below Average | Moderate |
| Season length (days) | 21 | 14 | 14 | 19 | 13 | 13 | 15 |
| Landings (number) | 141 | 114 | 134 | 154 | 168 | 146 | 160 |
| Harvest (lb spot shrimp) | 70,354 | 54,033 | 68,192 | 61,959 | 74,923 | 73,319 | 59,092 |

Table 5.–District 1 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Back Behm Canal | | | East Behm Canal | | | West Behm Canal | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.26 | | | 0.20 | | | 0.12 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | 4.4 | 2.6 | -1.00 | – | – | – | 1.9 | 2.2 | 0.00 |
| 4-yr trend in catch rate | survey | | Sig. dec. | -0.25 | – | – | – | | No trend | 0.00 |
| Std. Comm. CPUE | fish tickets | 2.6 | 2.8 | 0.00 | 2.8 | * | 0.00 | 2.9 | 2.1 | -1.00 |
| 4-yr trend in CPUE | fish tickets | | No trend | 0.00 | – | No trend | 0.00 | – | No trend | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – | No trend | 0.00 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | 11.0% | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | 32.0% | 1.00 | – | – | – | – | – | – |
| Mean CL | survey | 38.3 | 39.1 | 0.00 | – | – | – | 37.5 | 37.6 | 0.00 |
| 4-yr trend in CL | survey | | Sig. inc. | 0.25 | – | – | – | – | Sig. dec. | 0.25 |
| Mean CL | OTG | 41.2 | 40.2 | 0.00 | – | – | – | 42.2 | 44.6 | 1.00 |
| 4-yr trend in CL | OTG | – | No trend | 0.00 | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | 41.2 | 44.0 | 0.00 | – | – | – | 42.7 | 43.4 | 0.00 |
| $L_{50}$ | OTG/DS | 46.1 | 41.7 | 0.00 | – | – | – | 42.8 | 42.7 | 0.00 |
| Manager score | | – | – | 0.00 | – | – | 0.00 | – | – | 0.00 |
| Score | – | – | – | 0.00 | – | – | 0.00 | – | – | -0.25 |
| Max. possible score | – | – | – | 9.00 | – | – | 2.25 | – | – | 8.75 |
| Stock Status | – | – | – | – | – | – | – | – | – | – |
| Confidence | – | – | – | 0.71 | – | – | 0.18 | – | – | 0.65 |

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Table 5.–Page 2 of 3.

| Analysis Area | | Boca de Quadra | | | Inner Ketchikan Inlets | | | Portland Canal | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.05 | | | 0.20 | | | 0.15 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.8 | * | 1.00 | 2.9 | 2.9 | 0.00 | 2.5 | 2.5 | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | No trend | 0.00 | – | No trend | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – | Sig. inc. | 1.00 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – | 54.0% | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – | 20.0% | 1.00 |
| Mean CL | survey | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | 39.4 | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | 44.3 | – | – | – | – | – |
| Manager score | – | – | – | 0.00 | – | – | 0.00 | – | – | 0.00 |
| Score | – | – | – | 0.00 | – | – | 0.00 | – | – | 2.00 |
| Max. possible score | – | – | – | 2.00 | – | – | 2.25 | – | – | 4.25 |
| Stock Status | – | – | – | – | – | – | – | – | – | – |
| Confidence | – | – | – | 0.12 | – | – | 0.18 | – | – | 0.29 |

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Table 5.–Page 3 of 3.

| Analysis Area | | Revilla Channel/Gravina | | | |
|---|---|---|---|---|---|
| Area weighting | | | 0.02 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | -0.68 |
| 4-yr trend in catch rate | survey | – | – | – | -0.17 |
| Std. Comm. CPUE | fish tickets | 3.0 | No effort | – | -0.02 |
| 4-yr trend in CPUE | fish tickets | – | – | – | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | 0.56 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | 1.00 |
| Mean CL | survey | – | – | – | 0.00 |
| 4-yr trend in CL | survey | – | – | – | 0.06 |
| Mean CL | OTG | – | – | – | 0.21 |
| 4-yr trend in CL | OTG | – | – | – | 0.00 |
| Mean CL | DS | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – |
| $L_{50}$ | survey | – | – | – | 0.00 |
| $L_{50}$ | OTG/DS | – | – | – | 0.00 |
| Manager score | | – | – | 0.00 | 0.00 |
| Score | | – | – | 0.00 | 0.95 |
| Max. possible score | | – | – | 1.00 | 7.17 |
| Stock Status | | – | – | – | Moderate |
| Confidence | | – | – | 0.06 | 0.38 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

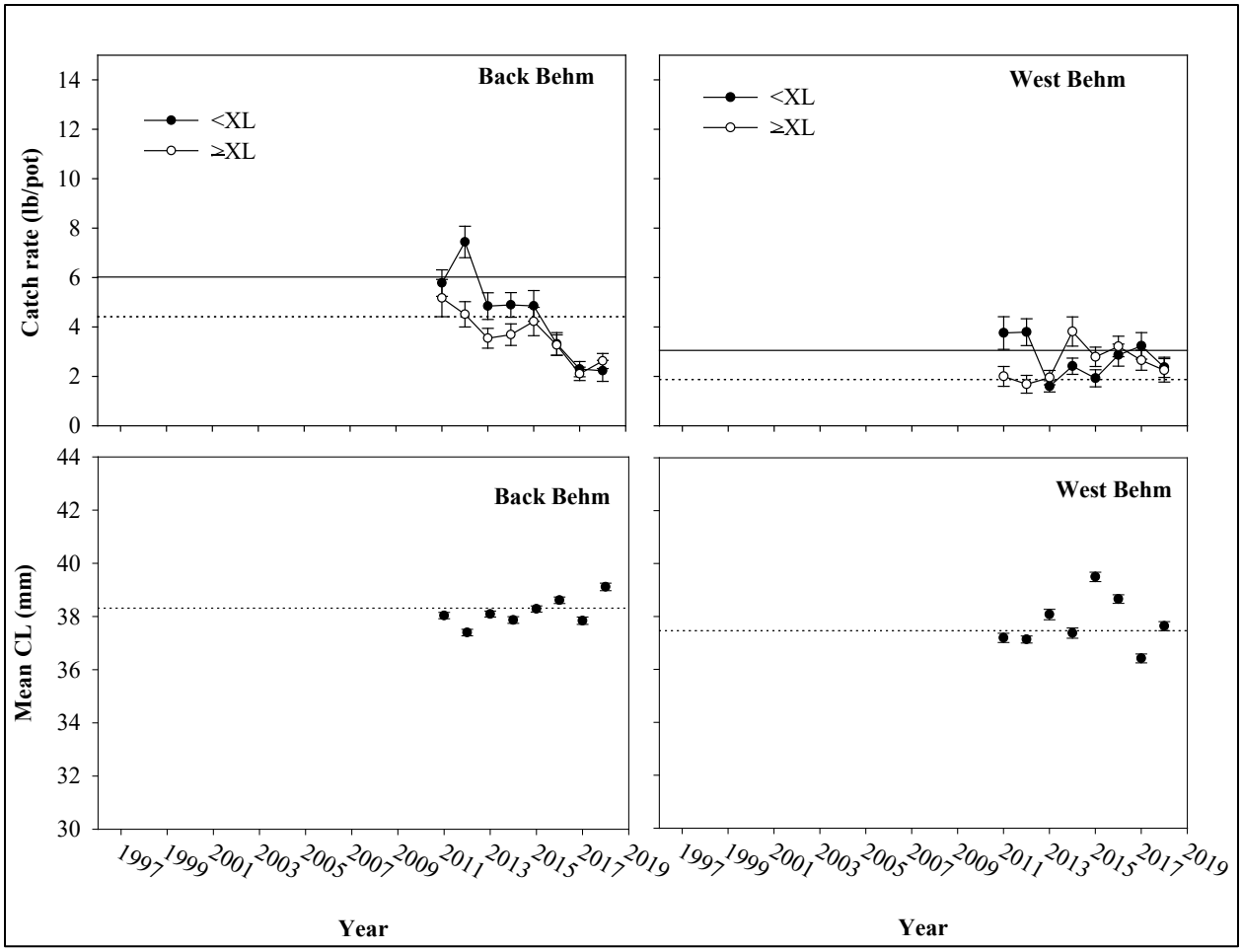


Figure 2.–Mean and standard error of spot shrimp catch rate (upper panels), and carapace length (CL) (lower panels) from preseason surveys in District 1, 2011–2018. Lines represent the long-term baselines.

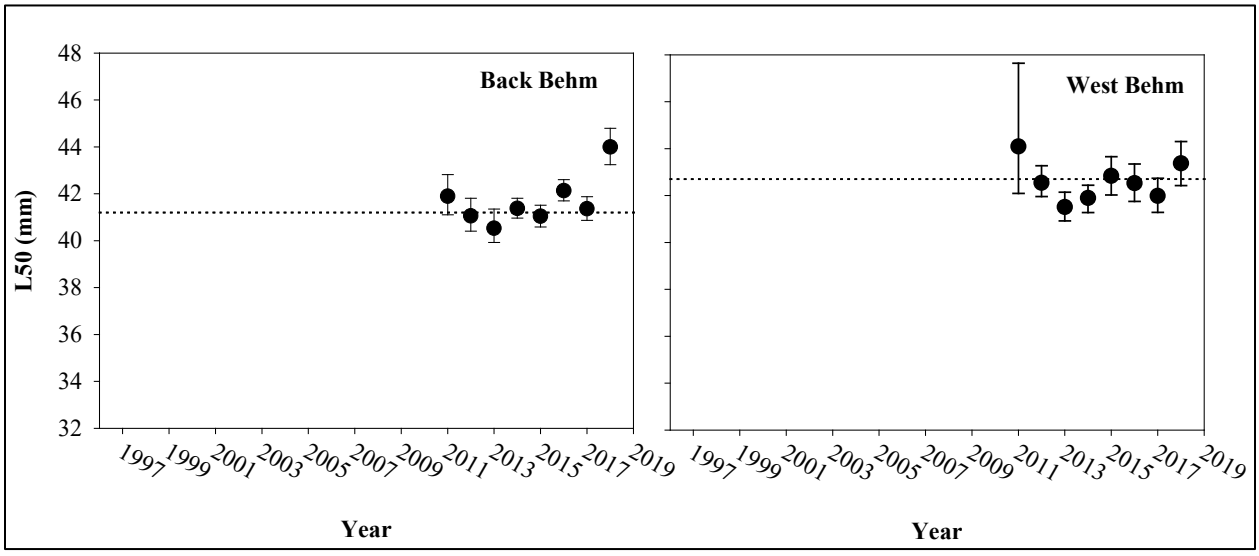


Figure 3.–$L_{50}$ and 95% confidence intervals of spot shrimp from preseason surveys in District 1, 2011–2018. Dotted line represents the long-term baseline.

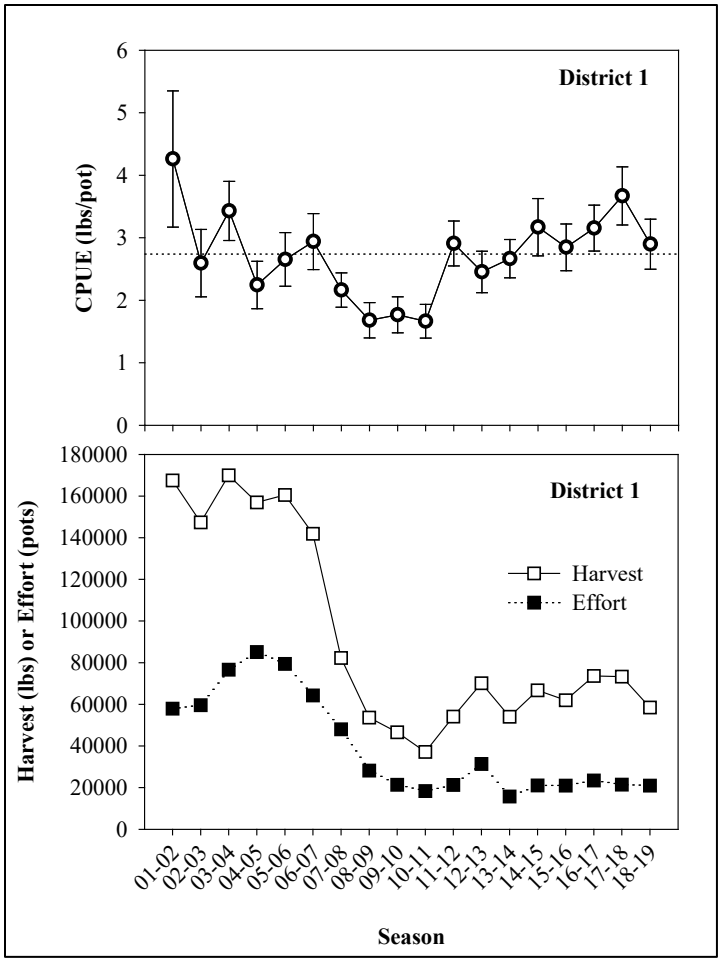


Figure 4.–Districtwide commercial CPUE and effort data for District 1, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

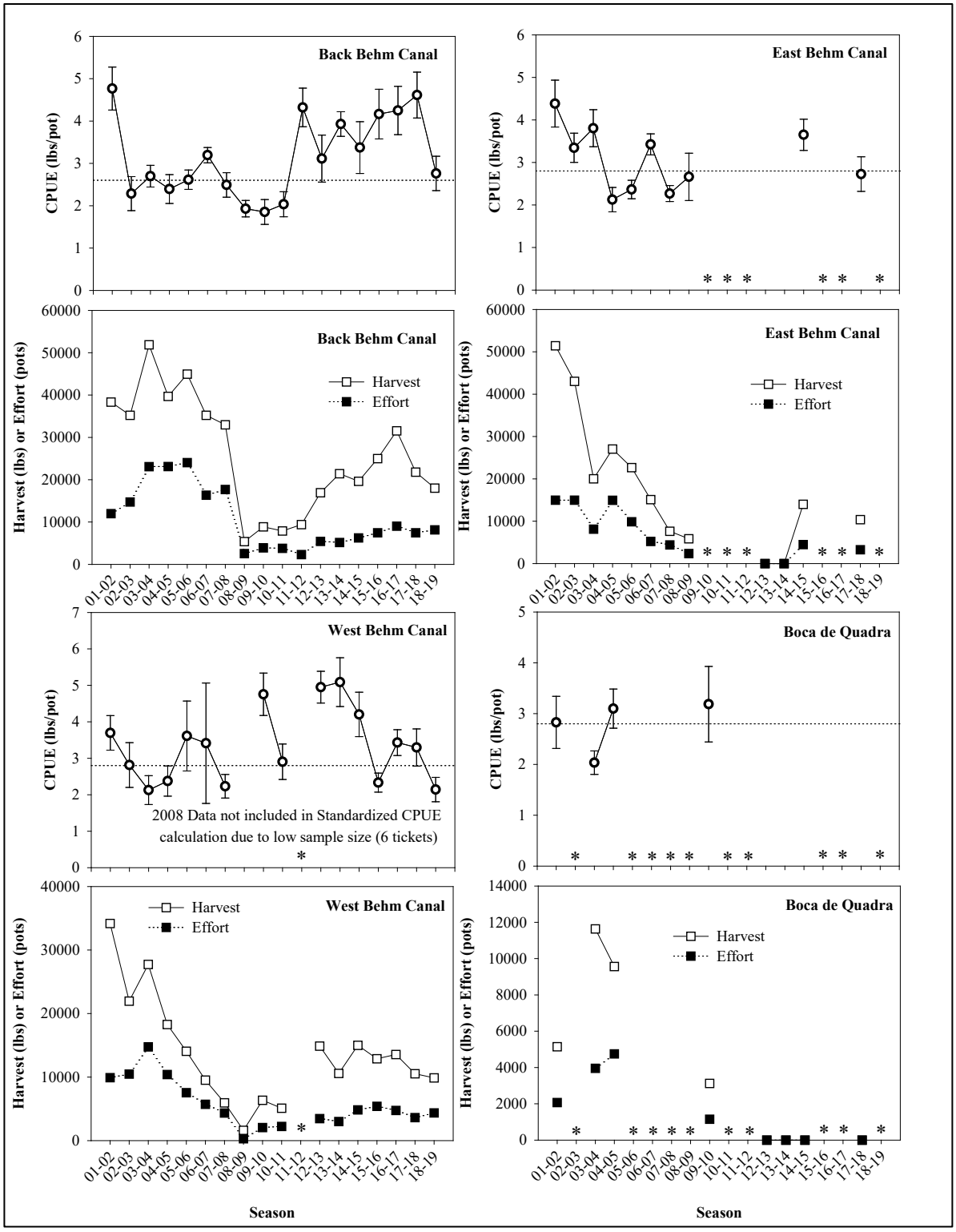


Figure 5.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 1, 2001/02–2018/19 seasons.

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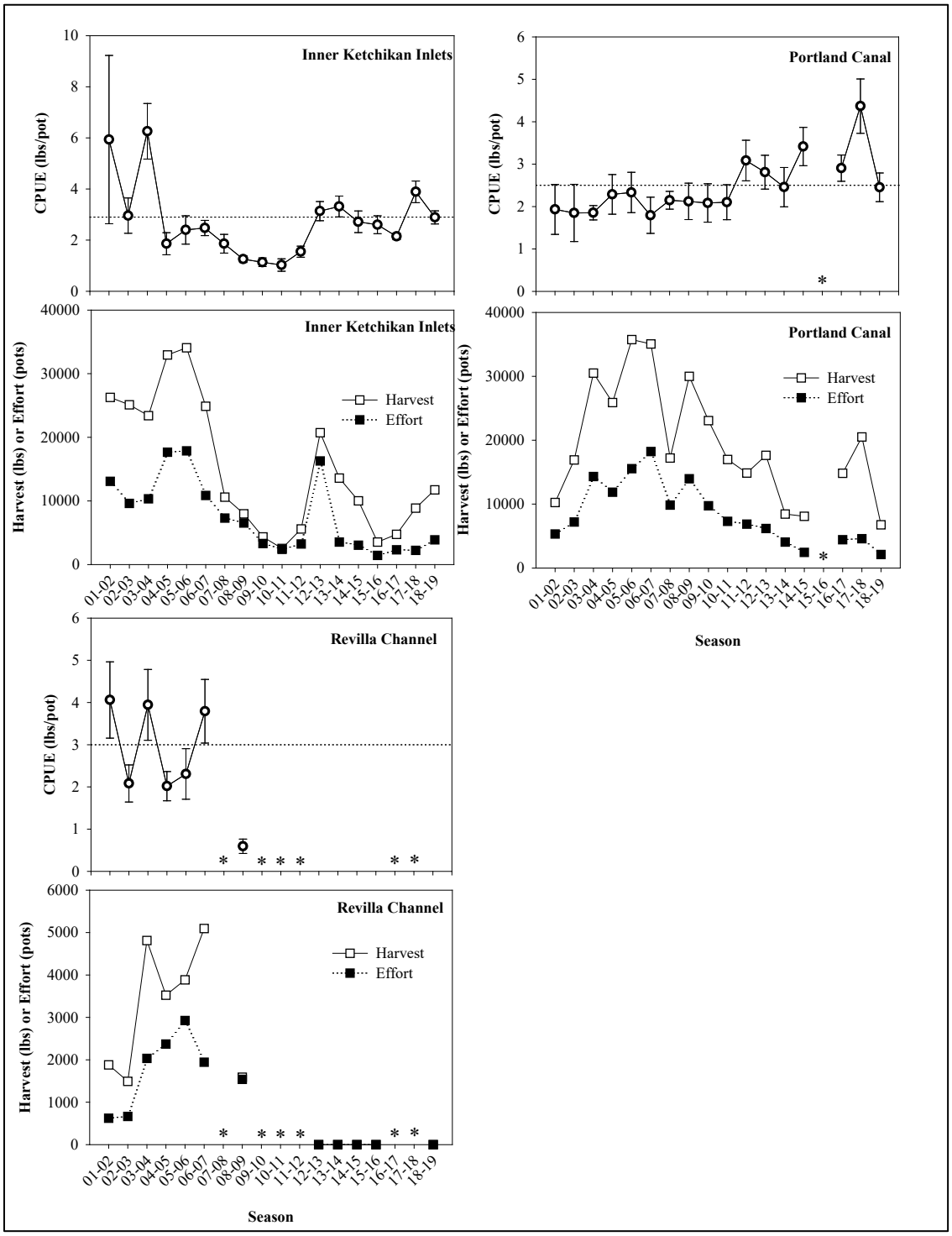
Figure 5.–Page 2 of 2.




*Note*: * indicates confidential data with less than 3 permits participating.

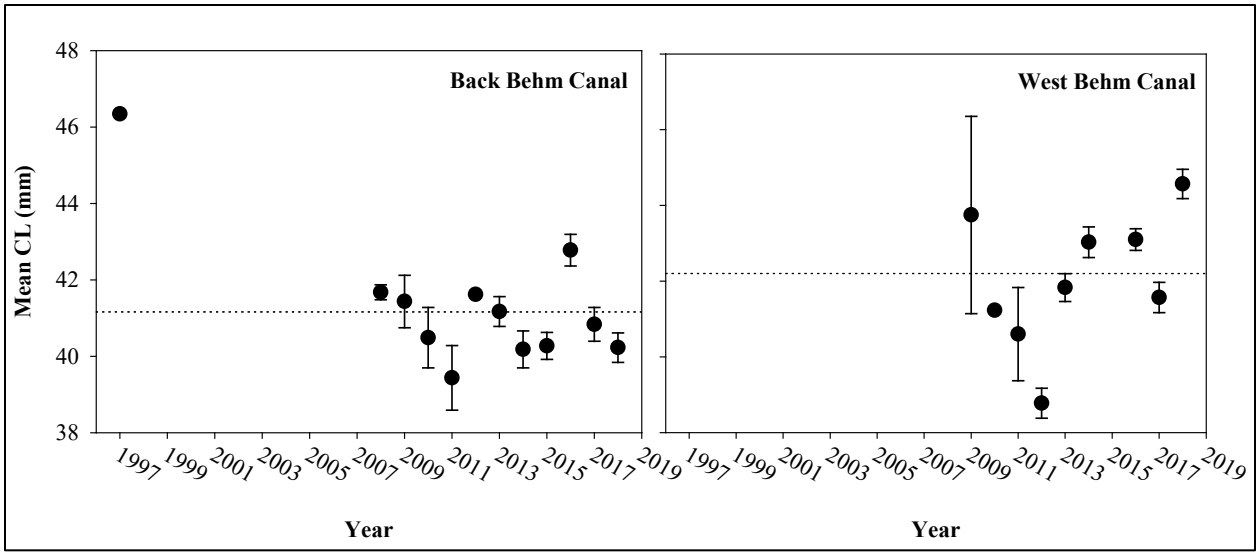



Figure 6.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 1, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

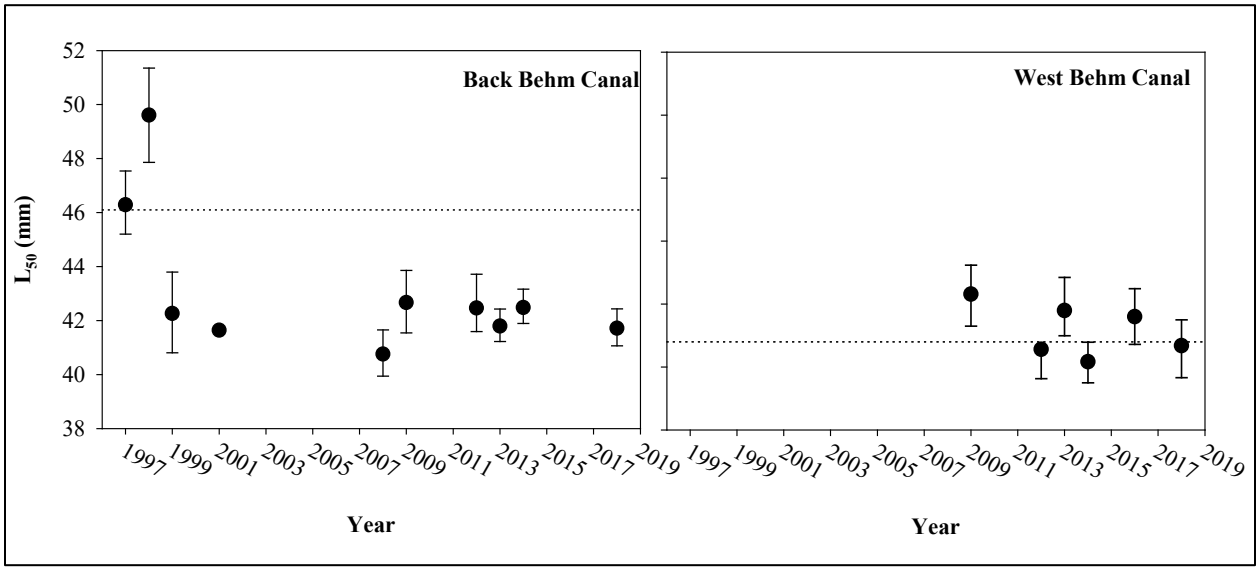



Figure 7.–$L_{50}$ and 95% confidence intervals of spot shrimp from on-the-grounds and dockside sampling in District 1, 1997/98–2018/19 season. Dotted line represents the long-term baseline. Only analysis areas with baselines or 2018/19 season data are shown.

## District 2

The GHL in District 2 has changed 5 times since the 1998/99 season. First, due to changes in the estimation of tail weight to whole weight, the GHL for this district increased 32% from 65,000 to 86,000 lb in the 2000/01 fishing season. Before this time tail weight was assumed to be approximately 66% of whole weight; after a large-scale sampling effort this was revised to 50%, which subsequently increased the GHL as tail weight is extrapolated to whole weight for the purposes of catch accounting. The GHL was subsequently reduced 25% back to 65,000 lb for the 2009/10 fishing season (Table 6). Due to negative survey indicators the GHL was reduced 20% prior to the 2014/15 season. Due to extremely poor survey results prior to the 2015/16 season, Kasaan Bay was closed and the GHL reduced an additional 20%. Due to continuing stock declines in Kasaan Bay and in Cholmondeley sound, the GHL was reduced 30% to 30,000 lb prior to the 2016/17 season. Harvest has averaged 52,500 lb (102% of GHL) over the last 10 years. This district is divided into 5 analysis areas: Cholmondeley Sound, Kasaan Bay, Lower Clarence Strait, Middle Clarence Strait, and Moria Sound (Table 2).

Survey catch rate of large class shrimp declined substantially in Kasaan Bay and was flat in Cholmondeley Sound. Catch rates of large class shrimp are at baseline in both areas and showing a significant 4-year increase in Cholmondeley Sound. The catch rate of small class shrimp decreased in both areas and is at the lowest level in the survey history in Cholmondeley Sound. Mean carapace length was flat in both areas. The $L_{50}$ remains above baseline in Kasaan Bay and at baseline in Cholmondeley Sound (Table 7, Figures 8 and 9).

Districtwide standardized CPUE increased slightly from the 2017/18 season (Figure 10). This slight incline is due to the increase in standardized commercial CPUE in Moria Sound (Table 7 and Figure 11). Standardized commercial CPUE in Cholmondeley Sound decreased and is now below baseline, but still shows a significant 4-year increase.

On-the-grounds sampling showed mean carapace length to be above baseline in Cholmondeley Sound, with $L_{50}$ at baseline levels (Table 7, Figures 12 and 13).

Logbook derived catch rate trends in Cholmondeley Sound showed a decrease from the previous seasons (Table 7).

Manager scores were negative for Kasaan Bay and neutral for all other areas in this district.

The overall matrix score for District 2 is -0.08 (Moderate), which was down severely from 3.72 (Above Average) in 2017/18. This decrease is due to declining commercial CPUE and logbook indicators in Cholmondeley Sound. District 2 data has moderate confidence (0.47).

Table 6.–District 2 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 86,000 | 86,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 |
| Actual GHL (lb spot shrimp) | 86,000 | 86,000 | 86,000 | 86,000 | 86,000 | 65,000 | 65,000 | 65,000 |
| Recommended GHL or stock status | Moderate | Moderate | Moderate | Poor | Moderate | Below Average | Below Average | Moderate |
| Season length (days) | 13 | 14 | 20 | 113 | 122 | 33 | 33 | 20 |
| Landings (number) | 163 | 150 | 189 | 175 | 219 | 140 | 149 | 127 |
| Harvest (lb spot shrimp) | 88,258 | 83,052 | 99,092 | 89,786 | 87,936 | 64,965 | 68,893 | 75,425 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 120,000 | 12,000 |
| Actual GHL (lb spot shrimp) | 65,000 | 65,000 | 52,000 | 42,000 | 30,000 | 30,000 | 30,000 |
| Recommend. GHL or stock status | Below Average | Below Average | Poor | Below Average | Moderate | Above Average | Moderate |
| Season length (days) | 15 | 19 | 17 | 26 | 13 | 15 | 11 |
| Landings (number) | 111 | 154 | 110 | 93 | 44 | 41 | 58 |
| Harvest (lb spot shrimp) | 74,631 | 62,250 | 50,826 | 39,203 | 30,630 | 27,173 | 31,423 |

Table 7.–District 2 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Cholmondeley Sound | | | Kasaan Bay | | | Lower Clarence | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.29 | | | 0.48 | | | 0.04 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | 3.2 | 3.5 | 0.00 | 1.4 | 1.2 | 1.00 | – | – | – |
| 4-yr trend in catch rate | survey | – | Sig. inc. | 0.25 | – | Sig. inc. | 0.25 | – | – | – |
| Std. Comm. CPUE | fish tickets | 5.0 | 4.4 | -1.00 | 5.0 | * | 0.00 | 3.1 | No effort | – |
| 4-yr trend in CPUE | fish tickets | – | Sig. inc. | 0.25 | – | – | – | – | – | – |
| Catch rate ≥XL | logbook | – | Sig. dec. | -1.00 | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | 30% | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – | – | – |
| Mean CL | survey | 35.2 | 35.9 | 0.00 | 35.5 | 36.0 | 0.00 | – | – | – |
| 4-yr trend in CL | survey | | Sig. inc. | 0.25 | – | Sig. inc. | 0.25 | – | – | – |
| Mean CL | OTG | 37.8 | 38.5 | 1.00 | 39.5 | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | 39.3 | 39.4 | 0.00 | 38.2 | 39.3 | 1.00 | – | – | – |
| $L_{50}$ | OTG/DS | 39.3 | 40.1 | 0.00 | 39.7 | – | – | – | – | – |
| Manager score | | – | – | 0.00 | – | – | -1.00 | – | – | 0.00 |
| Score | | – | – | -0.25 | – | – | 0.00 | – | – | 0.00 |
| Max. possible score | | – | – | 8.75 | – | – | 5.50 | – | – | 1.00 |
| Stock Status | | – | – | – | – | – | – | – | – | – |
| Confidence | | – | – | 0.65 | – | – | 0.41 | – | – | 0.06 |

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Table 7.–Page 2 of 2.

| Analysis Area | | Middle Clarence | | | Moria Sound | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.02 | | | 0.17 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | 0.00 |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | 0.09 |
| Std. Comm. CPUE | fish tickets | 2.7 | No effort | – | 4.9 | * | 0.00 | -0.10 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | No trend | 0.00 | 0.11 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | -1.00 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | 0.00 |
| 4-yr trend in CL | survey | – | – | – | – | – | – | 0.06 |
| Mean CL | OTG | – | – | – | 36.0 | – | – | 0.67 |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | 0.42 |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | 0.00 |
| Manager score | | – | – | 0.00 | – | – | 0.00 | -0.32 |
| Score | | – | – | 0.00 | – | – | -1.20 | -0.08 |
| Max. possible score | | – | – | 1.00 | – | – | 2.25 | 5.92 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.06 | – | – | 0.18 | 0.47 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

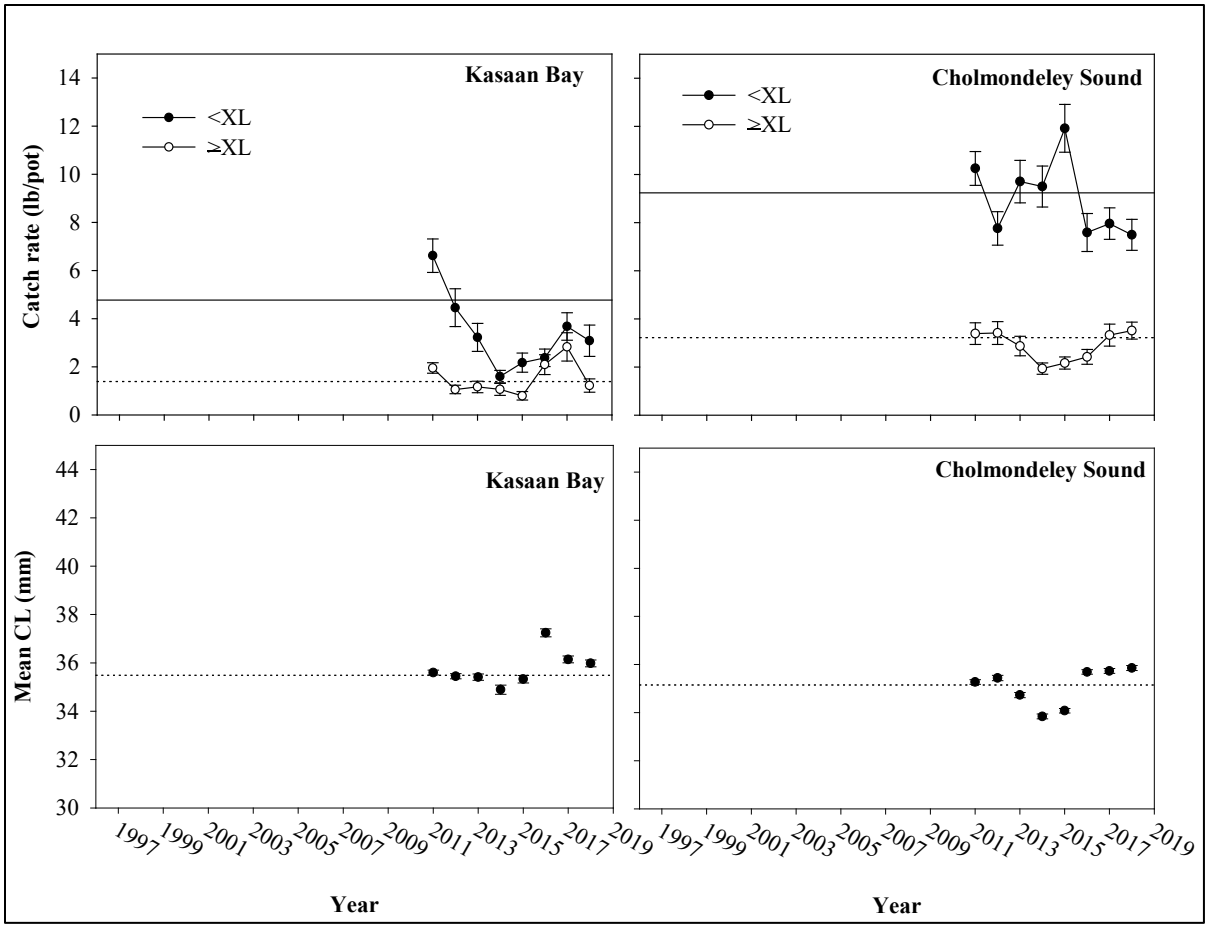


Figure 8.–Mean and standard error of spot shrimp catch rate (upper panels), and carapace length (lower panels) from preseason surveys in District 2, 2011–2018. Lines represent the long-term baselines.

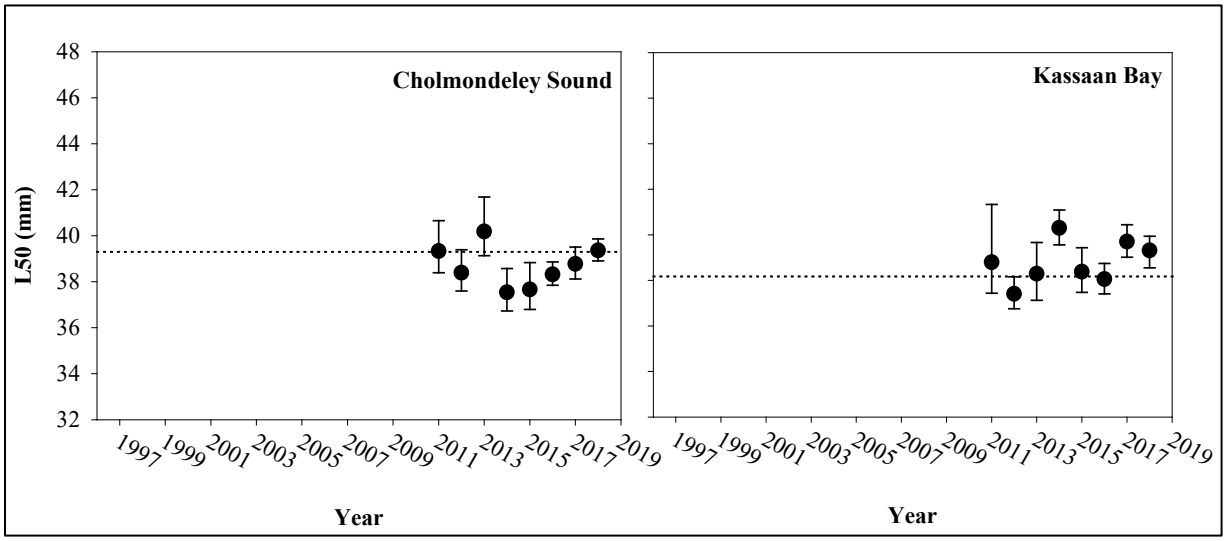


Figure 9.–$L_{50}$ and 95% confidence intervals of spot shrimp from preseason surveys in District 2, 2011–2018. Dotted line represents the long-term baseline.

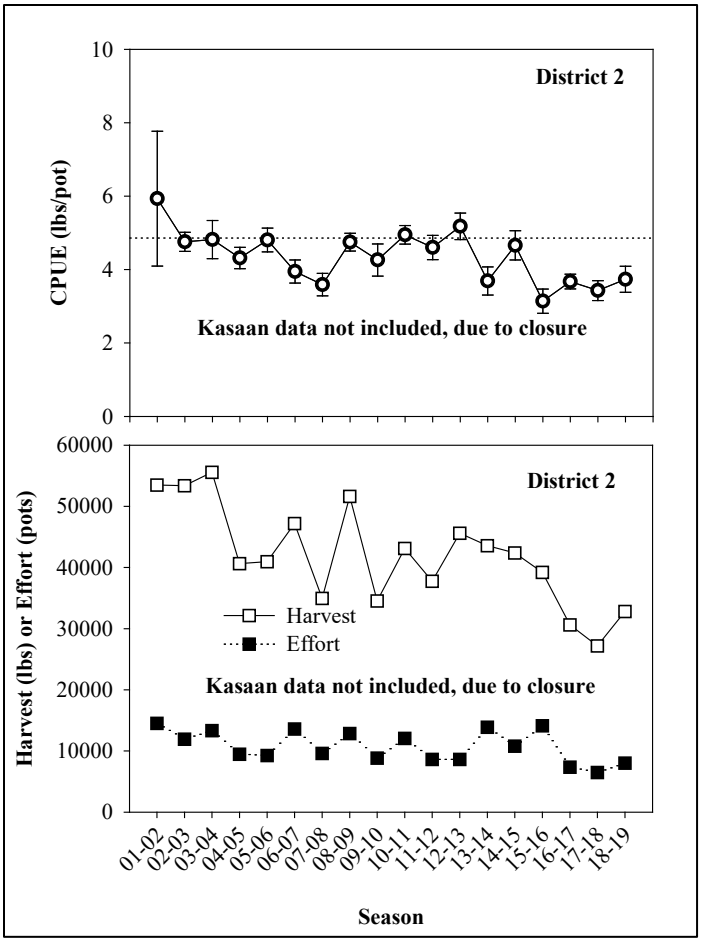


Figure 10.–Districtwide CPUE and effort data for District 2, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

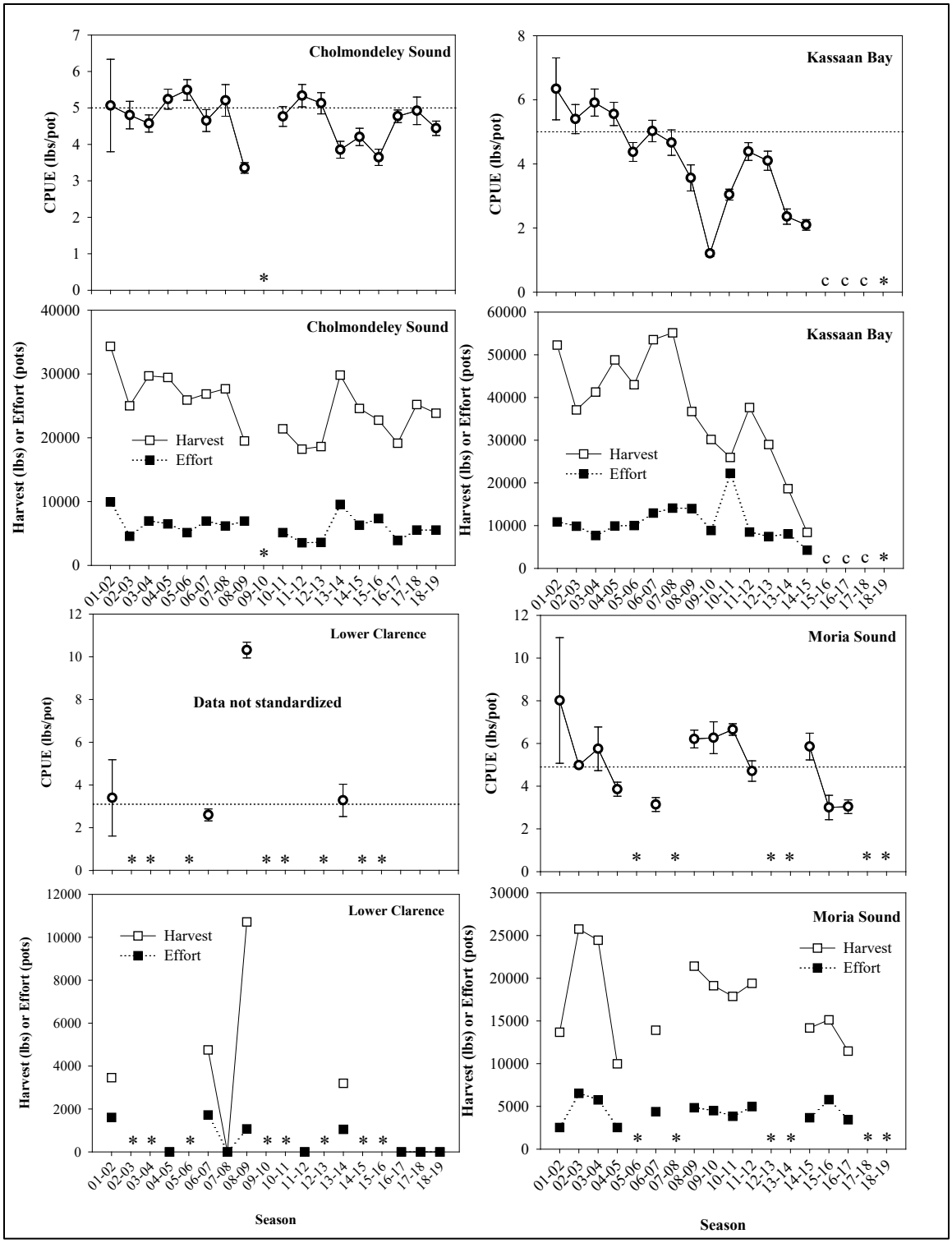


Figure 11.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 2, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

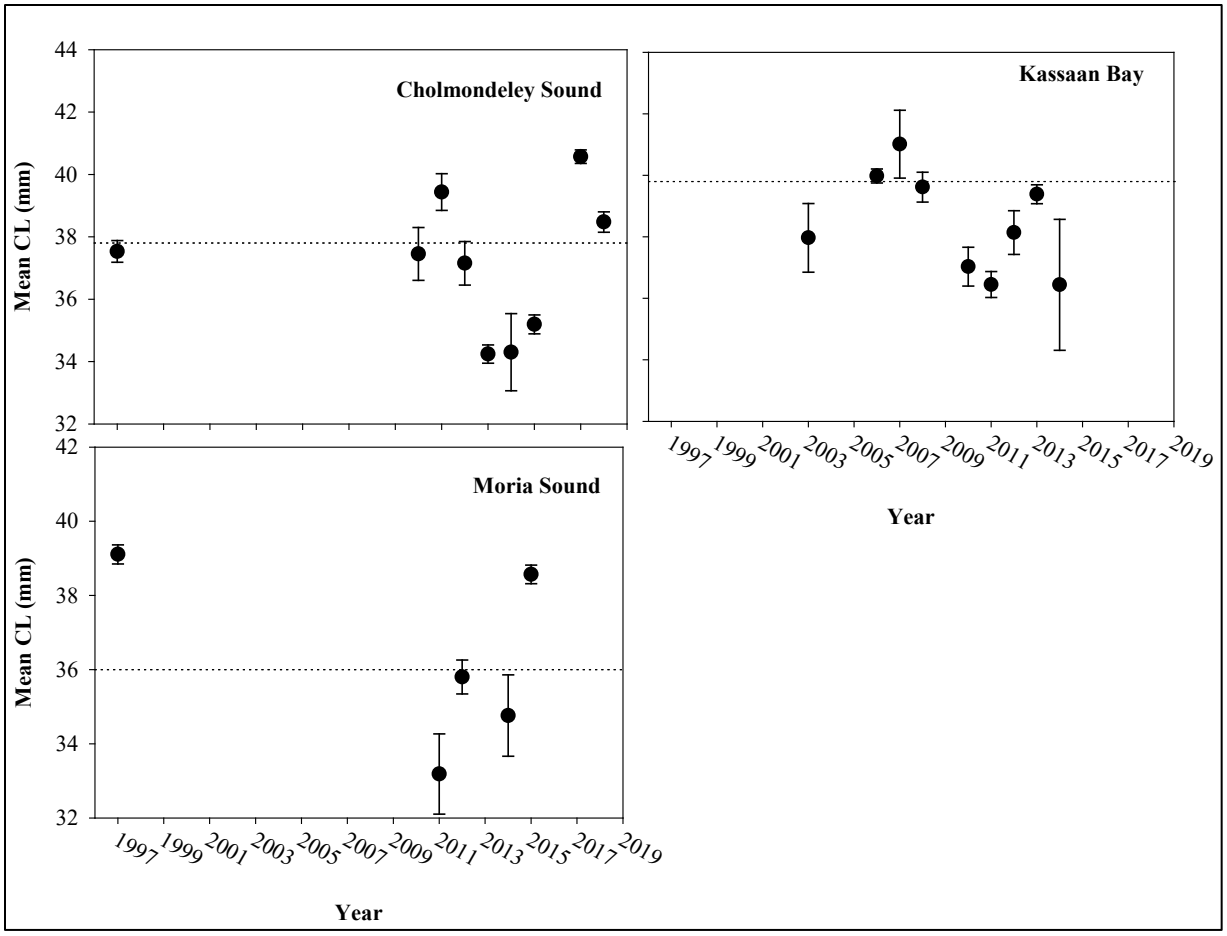


Figure 12.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 2, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

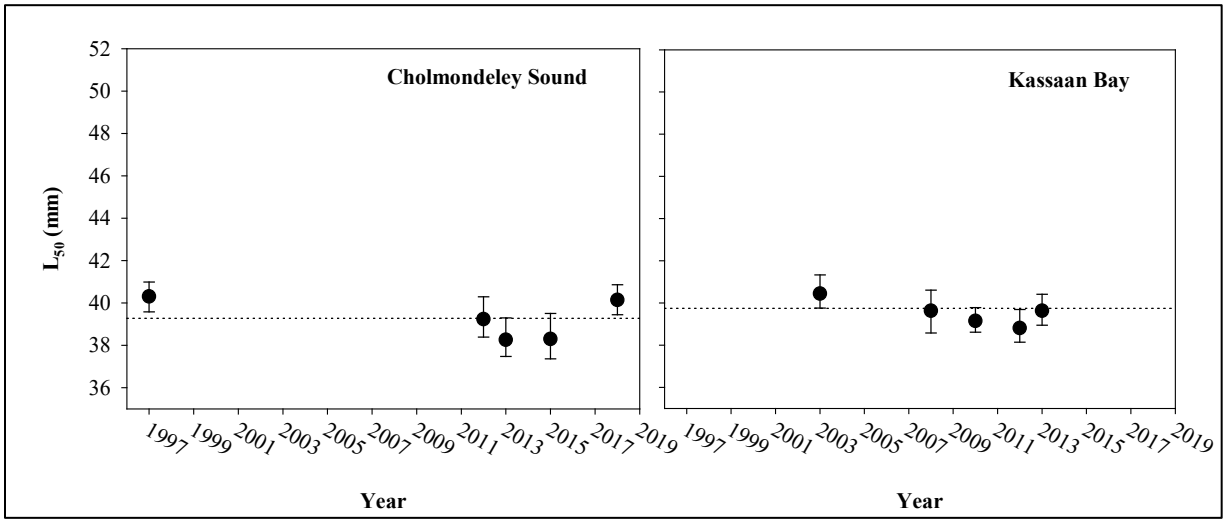


Figure 13.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 2, 1997/98–2018/19 seasons. Only areas with baselines or 2018/19 season data are shown.

## District 3

### *Section 3-A*

The GHL in Section 3-A has changed 4 times since the 1998/99 season. The GHL for this section was increased from 200,000 lb to 264,000 lb beginning with the 2000/01 fishing season, when Section 3-A was split from Sections 3-B and C (Table 8). In response to poor stock status, the Section 3-A GHL was reduced to 198,000 lb (-25%) for the 2004/05 fishing season to 158,400 lb (-20%) for the 2008/09 fishing season, and to 95,000 (-40%) for the 2010/11 season. The GHL was increased prior to the 2015/16 season to 114,000 lb. Over the last 10 years, harvest has averaged 115,300 lb (107% of GHL). This section is divided into 4 analysis areas: Hetta Inlet, Lower Cordova Bay, Mid Cordova Bay, and Upper Cordova Bay (Table 2).

Survey catch rate of large class shrimp dropped to half of its 2016 (and baseline) value in Hetta Inlet in 2017 then decreased again in 2018. It remains below baseline and decreasing in the 4-year analysis (Table 9, Figure 14). Catch rate of large class shrimp increased for the second year in Mid Cordova Bay and is now at the highest level seen in over a decade and is above baseline and increasing in the 4-year analysis. Catch rate of small class shrimp followed the large class trend decreasing in Hetta and increasing in Mid Cordova. Mean survey CL decreased in both areas and is at baseline and showing a decrease in the 4-year analysis in Hetta Inlet. Mean CL remains above baseline and increasing in the 4-year analysis in Mid Cordova Bay (Table 9, Figure 14). The $L_{50}$ increased to baseline in Hetta Inlet and above baseline in Mid Cordova (Table 9, Figure 15).

Sectionwide CPUE remains at baseline (Figure 16). Standardized commercial CPUE for Section 3-A was significantly below the baseline with no 4-year trend in Hetta Inlet, at the baseline and increasing in the 4-year analysis in Mid Cordova Bay and above baseline and increasing in the 4-year analysis in Lower Cordova Bay (Table 9, Figure 17).

No on-the-grounds sampling occurred in Section 3A in the 2017/18 season (Table 9, Figures 18 and 19).

Commercial logbook data showed the harvest rate of large class shrimp at 45% (Normal) in Lower Cordova Bay, and 11% (Low) in Upper Cordova Bay. Catch rate of large class shrimp from logbooks increased in Hetta Inlet and Lower Cordova Bay, and decreased in Upper Cordova Bay (Table 9).

Manager scores were neutral in all areas (Table 9).

The overall matrix score is 0.63 (Moderate) up from -0.71 (Moderate) in the 2017/18 season, with 0.41 (Moderate) confidence.

Table 8.–Section 3-A matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 |
| Actual GHL (lb spot shrimp) | 198,000 | 198,000 | 198,000 | 198,000 | 158,400 | 158,400 | 95,000 | 95,000 |
| Recommended GHL or stock status | Poor | Poor | Poor | Poor | Poor | Poor | Below Average | Below Average |
| Season length (days) | 20 | 15 | 18 | 229 | 120 | 32 | 30 | 19 |
| Landings (number) | 88 | 138 | 355 | 302 | 265 | 293 | 164 | 171 |
| Harvest (lb spot shrimp) | 256,392 | 202,186 | 205,435 | 182,145 | 114,048 | 137,015 | 85,228 | 97,632 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 | 264,000 |
| Actual GHL (lb spot shrimp) | 95,000 | 95,000 | 95,000 | 114,000 | 114,000 | 114,000 | 114,000 |
| Recommended GHL or stock status | Below Average | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate |
| Season length (days) | 16 | 13 | 10 | 14 | 13 | 11 | 10 |
| Landings (number) | 156 | 132 | 135 | 147 | 150 | 160 | 124 |
| Harvest (lb spot shrimp) | 107,643 | 123,238 | 111,098 | 116,235 | 136,240 | 132,536 | 105,958 |

Table 9.–Section 3-A matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Hetta Inlet | | | Lower Cordova Bay | | |
|---|---|---|---|---|---|---|---|
| Area weighting | | 0.2 | | | 0.2 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | 3.2 | 1.2 | -1.00 | – | – | – |
| 4-yr trend in catch rate | survey | – | Sig. dec. | -0.25 | – | – | – |
| Std. Comm. CPUE | fish tickets | 7.3 | 4.9 | -1.00 | 6.2 | * | 1.00 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | Sig. inc. | 0.25 |
| Catch rate ≥XL | logbook | – | Sig. inc. | 1.00 | – | Sig. inc. | 1.00 |
| Harvest rate ≥XL (2016) | logbook | – | 58.0% | – | – | 54.1% | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | 45.0% | 0.00 |
| Mean CL | survey | 34.0 | 34.4 | 0.00 | – | – | – |
| 4-yr trend in CL | survey | – | Sig. dec. | -0.25 | – | – | – |
| Mean CL | OTG | 37.4 | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – |
| $L_{50}$ | survey | 38.5 | 38.2 | 0.00 | – | – | – |
| $L_{50}$ | OTG/DS | 37.2 | – | – | 38.9 | – | – |
| Manager score | | – | – | 0.00 | – | – | 0.00 |
| Score | | – | – | -1.50 | – | – | 2.25 |
| Max. possible score | | – | – | 6.75 | – | – | 4.25 |
| Stock Status | | – | – | – | – | – | – |
| Confidence | | – | – | 0.53 | – | – | 0.29 |

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Table 9.–Page 2 of 2.

| Analysis Area | | Mid Cordova Bay | | | Upper Cordova Bay | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.1 | | | 0.5 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | 0.6 | 1.6 | 1.00 | – | – | – | -0.33 |
| 4-yr trend in catch rate | survey | – | Sig. inc. | 0.25 | – | – | – | -0.08 |
| Std. Comm. CPUE | fish tickets | 5.9 | 7.0 | 0.00 | 5.9 | 6.0 | 0.00 | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | Sig. inc. | 0.25 | – | No trend | 0.00 | 0.05 |
| Catch rate ≥XL | logbook | – | – | – | – | Sig. dec. | -1.00 | -0.11 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | 63.0% | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | 36.4% | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | 11.0% | 1.00 | 0.71 |
| Mean CL | survey | 31.8 | 33.7 | 1.00 | – | – | – | 0.22 |
| 4-yr trend in CL | survey | – | Sig. inc. | 0.25 | – | – | – | -0.06 |
| Mean CL | OTG | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | 36.2 | 38.1 | 1.00 | – | – | – | 0.22 |
| $L_{50}$ | OTG/DS | 38.5 | – | – | 36.6 | – | – | – |
| Manager score | | – | – | 0.00 | – | – | 0.00 | 0.00 |
| Score | | – | – | 3.75 | – | – | 0.00 | 0.63 |
| Max. possible score | | – | – | 5.75 | – | – | 4.25 | 5.92 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.47 | – | – | 0.29 | 0.41 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

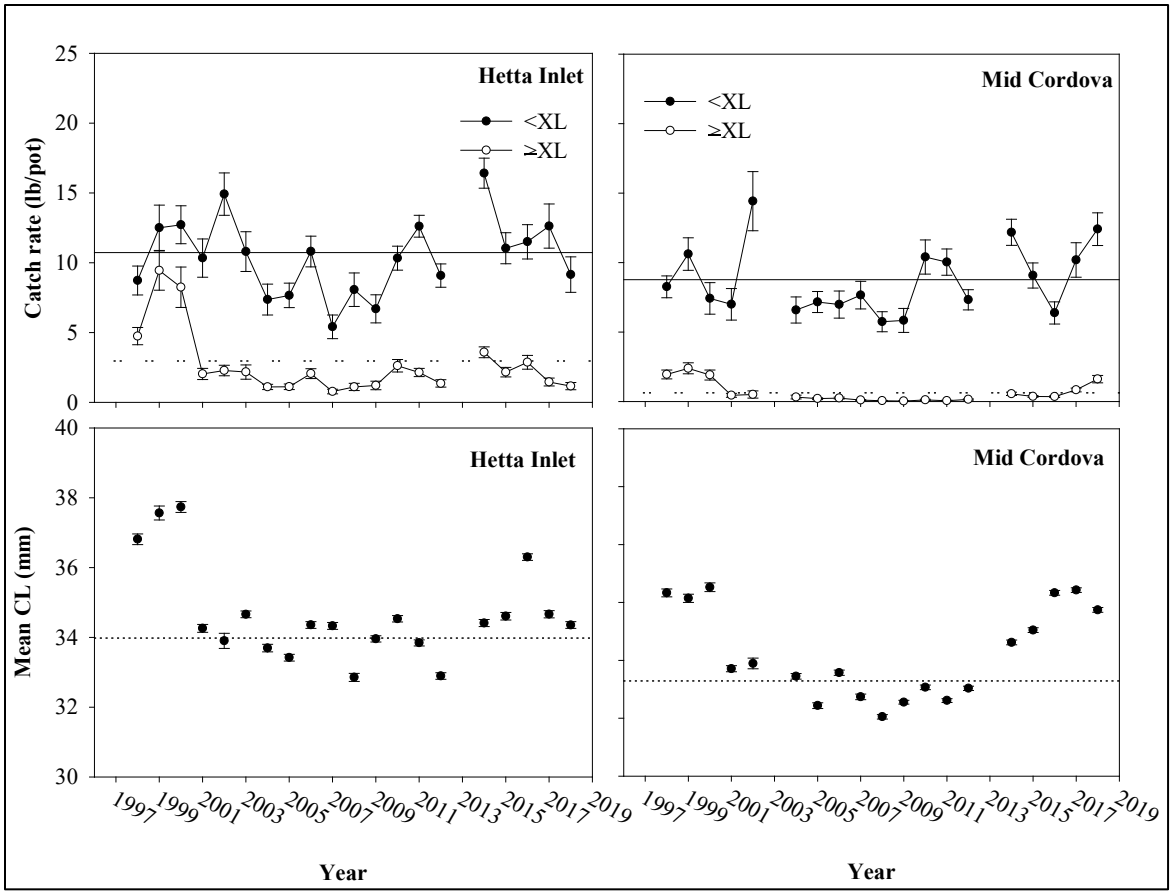


Figure 14.–Mean and standard error of spot shrimp catch rate (upper panels) and carapace length (lower panels) from preseason surveys in Section 3-A, 1998–2018. No survey was conducted in 2013 due to poor weather. Lines represent the long-term baselines.

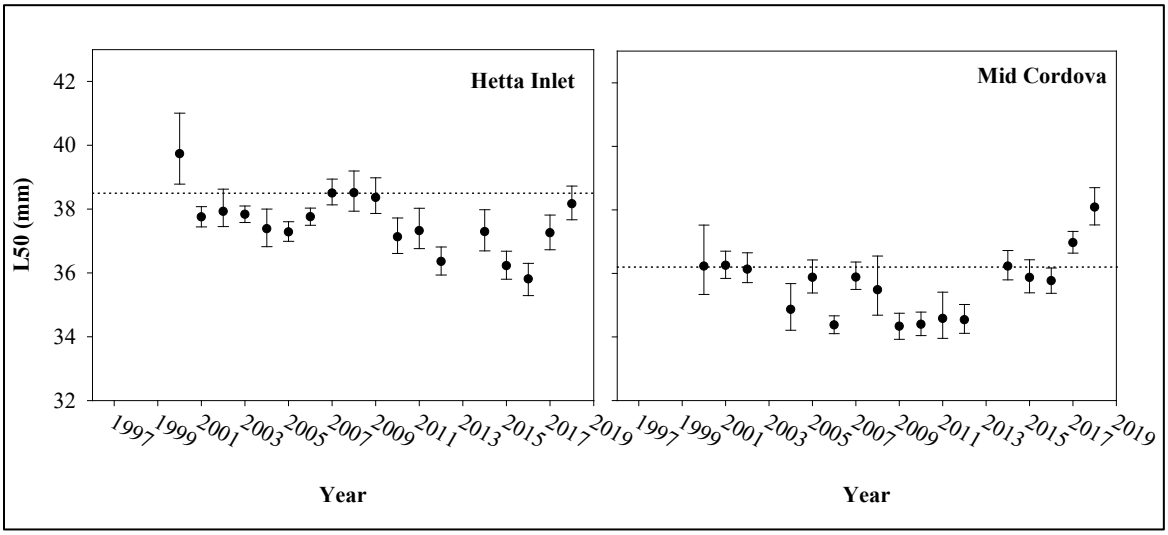


Figure 15.–$L_{50}$ and 95% confidence intervals of spot shrimp from preseason surveys in Section 3-A, 2000–2018. No survey was conducted in 2013 due to poor weather. Dotted line represents the long-term baseline.

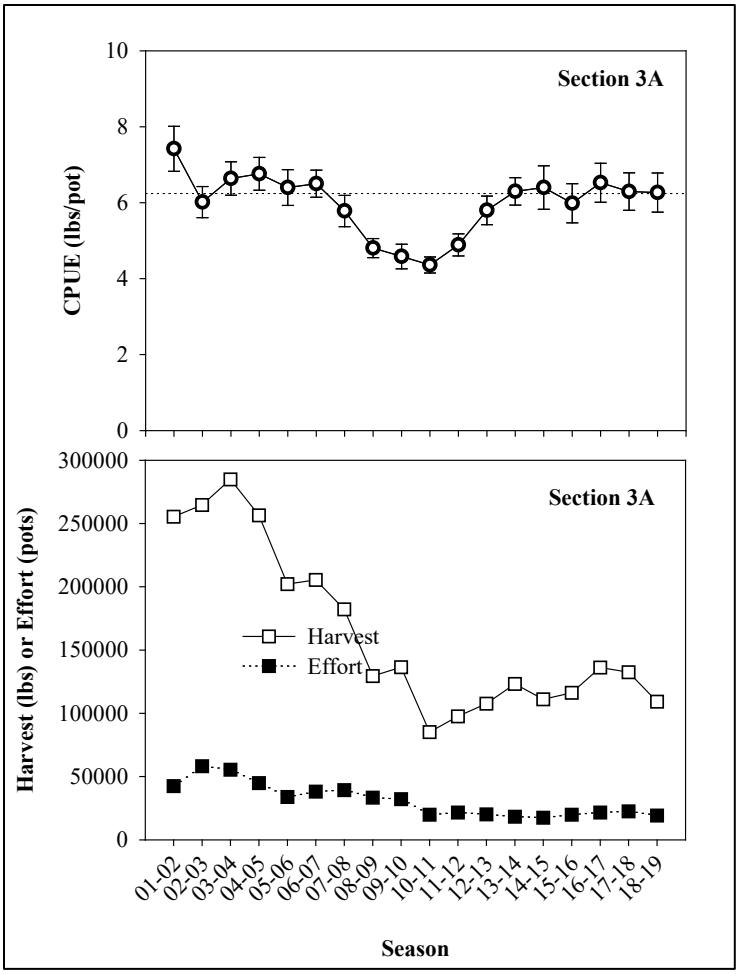


Figure 16.–Sectionwide CPUE and effort data for Section 3-A, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

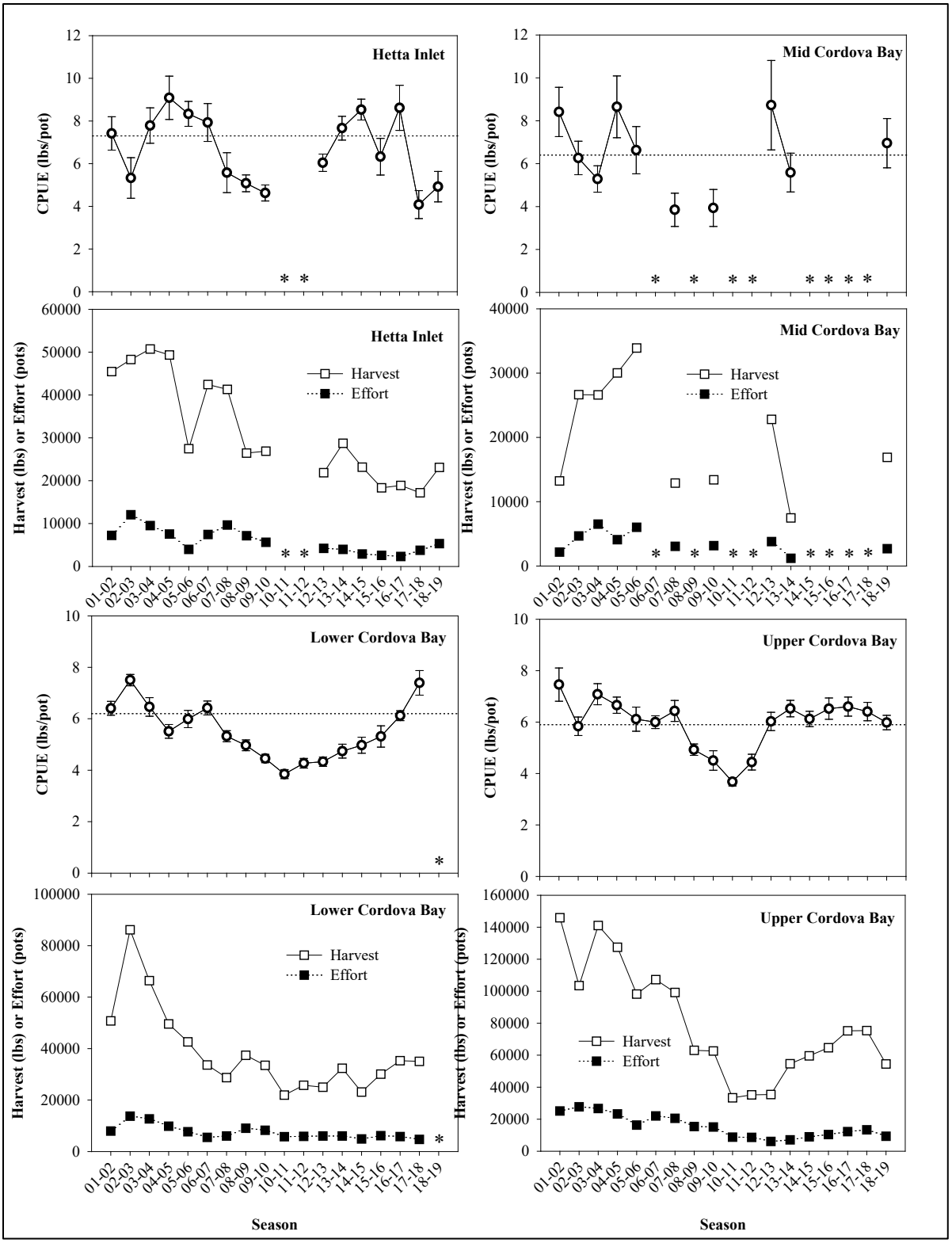


Figure 17.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Section 3-A, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

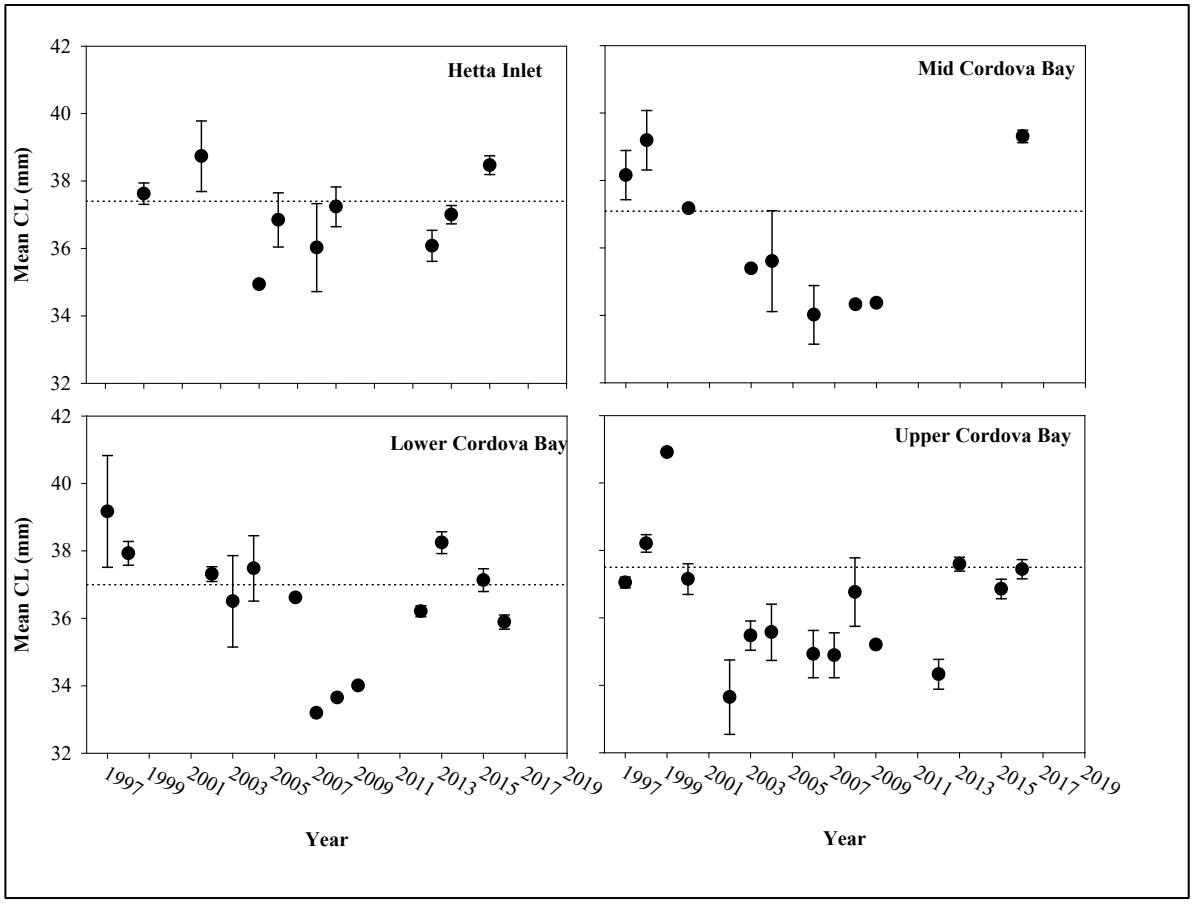


Figure 18.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Section 3-A, 2001/02–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

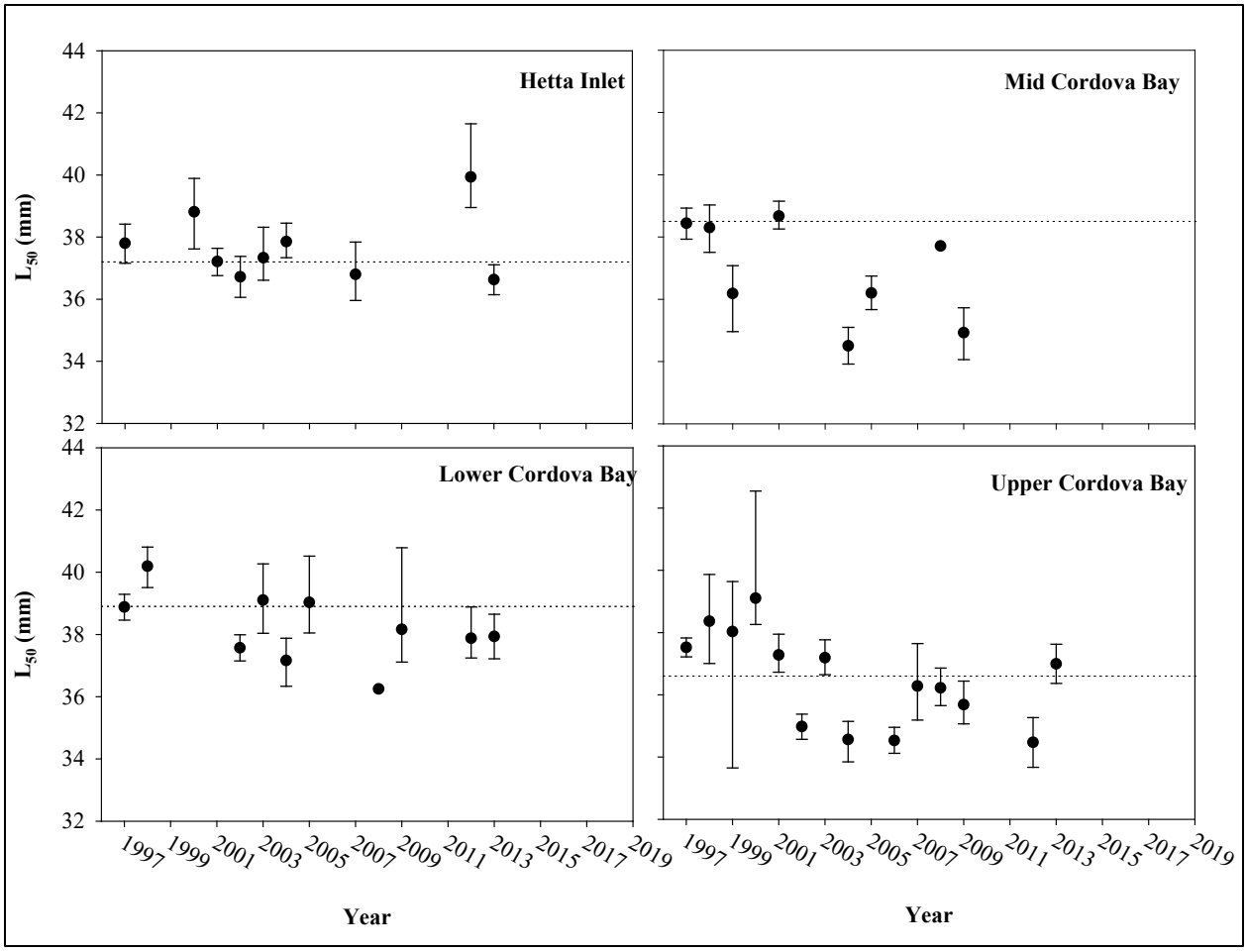


Figure 19.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Section 3-A, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

### *Sections 3-B/C*

The GHL in Sections 3-B/C has changed 3 times since the 1998/99 season. The GHL for these sections was set at 50,000 lb beginning with the 2000/01 fishing season when they were split from Section 3-A (Table 10). Beginning with the 2007/08 season, the GHL was reduced 20% to 40,000 lb in response to poor stock status. It was further reduced 25% to 30,000 lb for the 2010/11 fishing season due to continued stock health concerns. Harvest has averaged 34,000 lb (110% of the GHL) over the last 10 years. This section is divided into 2 analysis areas: Craig and Sea Otter Sound (Table 2).

Section wide CPUE decreased for the second season and is now the lowest since standardization was possible (Figure 20). Standardized analysis area commercial CPUE decreased strongly in both Sea Otter Sound and Craig; it is at or near the lowest levels seen since standardization was possible. The Craig area also shows a significant 4-year decrease (Table 11, Figure 21).

Commercial logbook data showed a 46% (Moderate) harvest rate of large class shrimp in Craig, and 25% (Low) in Sea Otter Sound (Table 11).

No on-the-grounds samples were taken during the 2018/19 fishing season.

Manager scores were neutral Craig and negative for Sea Otter Sound (Table 11).

The overall matrix score is -0.40 (Moderate), up from -0.73 (Below Average) in 2017/18 due to the harvest rate of large shrimp in Sea Otter Sound no longer being excessive. This was tempered by the CPUE if Sea Otter Sound dropping below baseline. Sections 3-B/C have a low (0.24) data confidence.

Table 10.–Sections 3-B/C matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 50,000 | 50,000 | 70,000 | 70,000 | 70,000 | 70,000 | 70,000 | 70,000 |
| Actual GHL (lb spot shrimp) | 50,000 | 50,000 | 50,000 | 40,000 | 40,000 | 40,000 | 30,000 | 30,000 |
| Recommended GHL or stock status | – | – | 30,000 | Poor | Moderate | Below Average | Moderate | Moderate |
| Season length (days) | 14 | 6 | 47 | 132 | 120 | 68 | 22 | 23 |
| Landings (number) | 421 | 312 | 355 | 252 | 62 | 121 | 44 | 50 |
| Harvest (lb spot shrimp) | 46,497 | 56,051 | 47,309 | 44,703 | 29,402 | 47,054 | 33,104 | 40,640 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2016/17 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 70,000 | 70,000 | 70,000 | 70,000 | 70,000 | 70,000 | 70,000 |
| Actual GHL (lb spot shrimp) | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| Recommended GHL or stock status | Below Average | Moderate | Moderate | Moderate | Moderate | Below Average | Moderate |
| Season length (days) | 29 | 19 | 16 | 18 | 14 | 18 | 19 |
| Landings (number) | 68 | 52 | 67 | 47 | 52 | 47 | 50 |
| Harvest (lb spot shrimp) | 33,107 | 26,714 | 36,359 | 30,492 | 37,968 | 33,597 | 31,733 |

*Note*: En dash = not available.

Table 11.–Sections 3-B/C matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Craig | | | Sea Otter Sound | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.4 | | | 0.6 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 4.2 | 2.0 | -1.00 | 5.0 | 3.4 | -1.00 | -0.03 |
| 4-yr trend in CPUE | fish tickets | – | Sig. dec. | -0.25 | | No trend | 0.00 | -0.07 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | 47.0% | – | – | 67.2% | – | – |
| Harvest rate ≥XL (2018) | logbook | – | 46.0% | 0.00 | – | 25.0% | 1.00 | 0.60 |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | 37.9 | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | 42.5 | – | – | – |
| Manager score | | – | – | 0.00 | – | – | -1.00 | -0.60 |
| Score | | – | – | -1.25 | – | – | -1.00 | -0.40 |
| Max. possible score | | – | – | 3.25 | – | – | 3.25 | 2.17 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.24 | – | – | 0.24 | 0.24 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

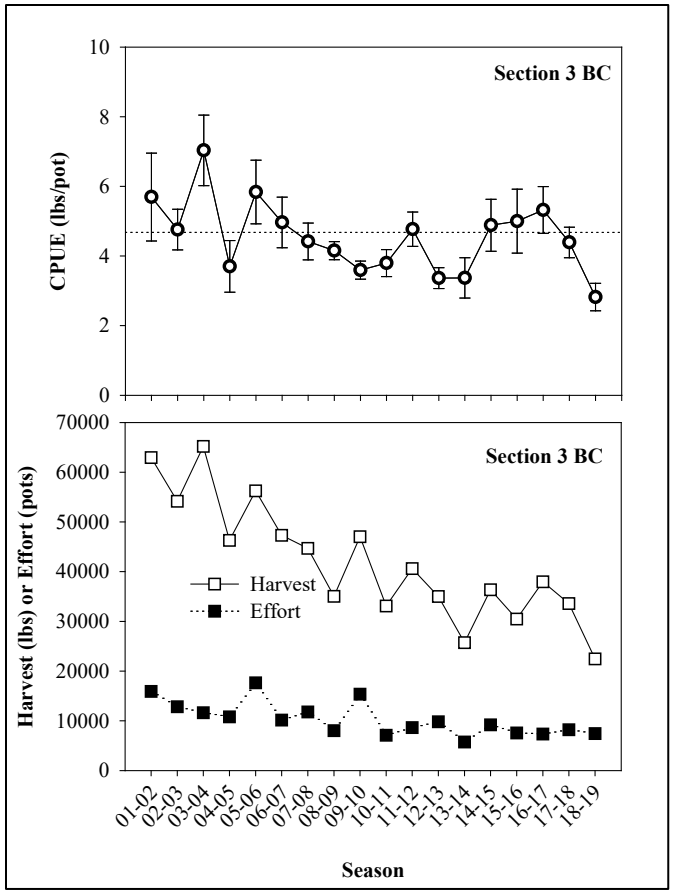


Figure 20.–Sectionwide CPUE and effort data for Sections 3B/C, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

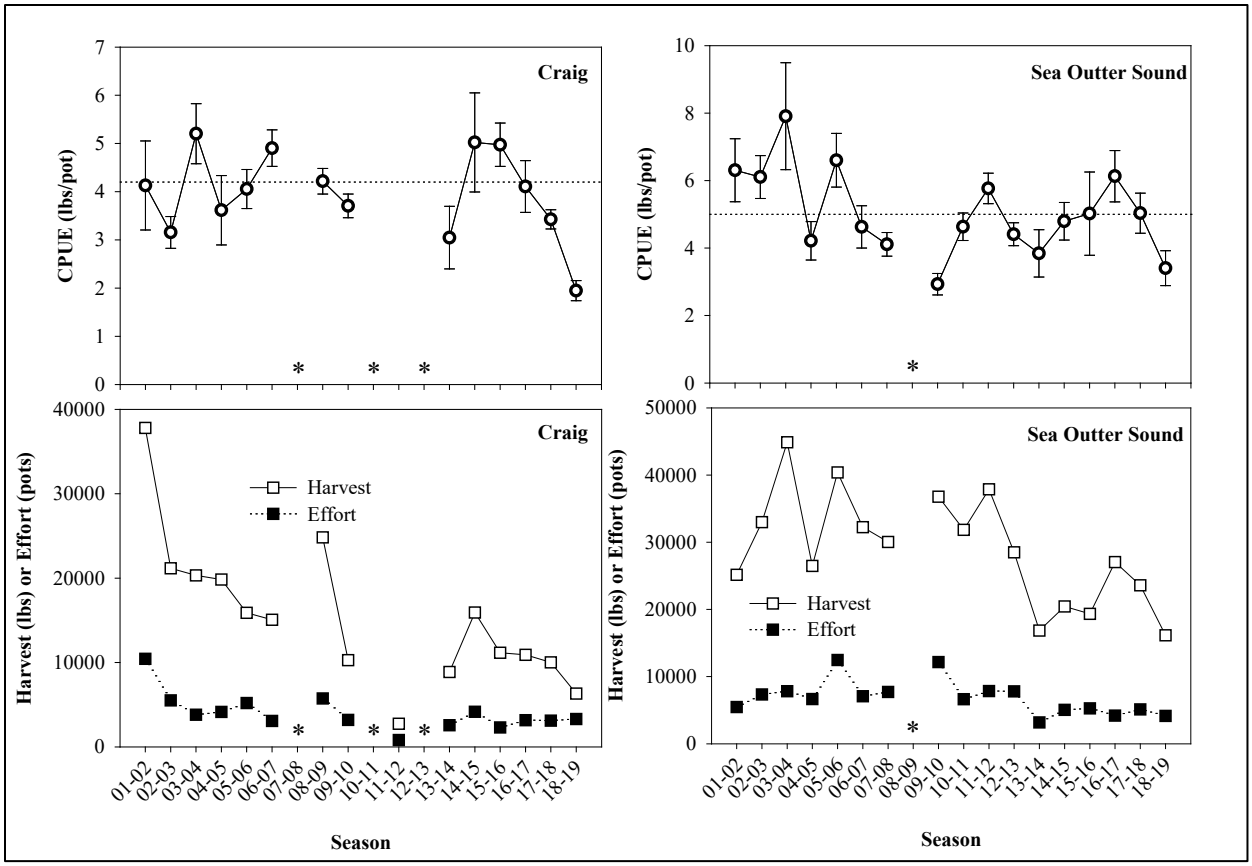


Figure 21.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Sections 3-B/C, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

## District 4

The GHL for District 4 has been 20,000 lb since pot fishery GHLs were first established in the 1995/96 fishing season. Harvest has averaged 17,600 lb (88% of the GHL) over the last 10 years (Table 12). This district is not divided into analysis areas.

Standardized commercial CPUE dropped slightly and is at the baseline with (Table 13, Figure 22).

Commercial logbook data showed the harvest rate of large class shrimp at 55% (Excessive) and a flat catch rate from previous seasons.

Manager scores were neutral for this area (Table 13).

The overall score for this district is 0.00 (Moderate), which was up from -0.83 (Below Average) in the 2017/18 season due to standard commercial CPUE no longer showing an increasing 4-year trend, and the loss of negative logbook data, Data confidence is 0.33 (low).

Table 12.–District 4 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 |
| Actual GHL (lb spot shrimp) | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Recommended GHL or stock status | – | – | 20,000 | Poor | Poor | Above Average | Above Average | Above Average |
| Season length (days) | 150 | 213 | 229 | 229 | 229 | 229 | 125 | 229 |
| Landings (number) | 57 | 75 | 68 | 1 | 0 | 66 | 35 | 31 |
| Harvest (lb spot shrimp) | 19,296 | 18,579 | 15,085 | 174 | 0 | 20,932 | 21,384 | 17,060 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 | 28,000 |
| Actual GHL (lb spot shrimp) | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Recommended GHL or stock status | Above Average | Moderate | Moderate | Below Average | Below Average | Below Average | Moderate |
| Season length (days) | 229 | 151 | 151 | 151 | 229 | 229 | 229 |
| Landings (number) | 29 | 31 | 53 | 20 | 25 | 19 | 36 |
| Harvest (lb spot shrimp) | 19,168 | 9,196 | 18,129 | 19,591 | 12,591 | 11,632 | 14,313 |

*Note*: * indicates confidential data with less than 3 permits participating; en dash = not available.

Table 13.–District 4 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | District 4 | | | |
|---|---|---|---|---|---|
| Area weighting | | | 1.0 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.4 | 2.3 | 0.00 | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | 99.0% | – | – |
| Harvest rate ≥XL (2017) | logbook | – | 55.1% | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – |
| Mean CL | survey | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – |
| Mean CL | OTG | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – |
| Mean CL | DS | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – |
| Manager score | | – | – | 0.00 | 0.00 |
| Score | | – | – | 0.00 | 0.00 |
| Max. possible score | | – | – | 2.25 | 1.17 |
| Stock Status | | – | – | – | Moderate |
| Confidence | | – | – | 0.20 | 0.20 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

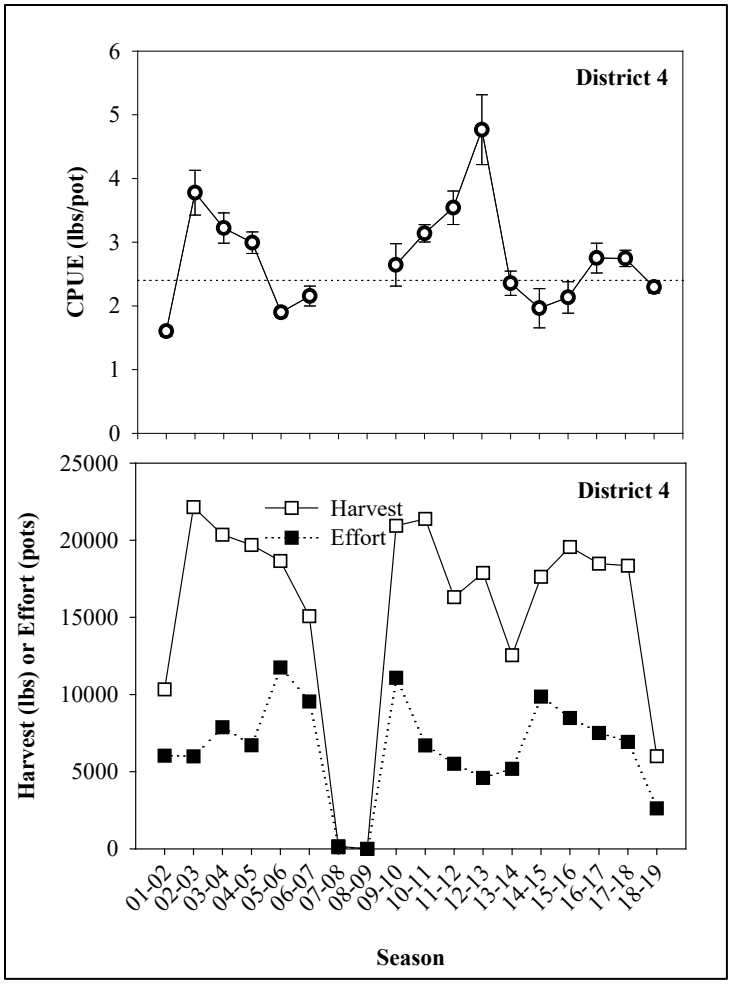


Figure 22.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 4, 2001/02–2018/19 seasons.

## PETERSBURG MANAGEMENT AREA

### District 5

The GHL for District 5 was unchanged at 20,000 lb from the 1995/96 fishing season until the 2015/16 season when it was reduced to 12,000 lb (-40%) due to poor stock health. Harvest has averaged 6,100 lb (36% of the GHL) over the last 10 seasons (Table 14). This district is divided into 3 analysis areas: Affleck/Port Beauclerc, Rocky Pass, and Cape Pole to Point Baker (Table 2). The spatial composition of harvest is highly variable in this small GHL district (Figure 24).

Districtwide CPUE declined strongly from the 2017/18 season and is below the baseline (Figure 23). This was driven by a strong decline in standardized commercial CPUE in Affleck/Port Beauclerc. There was no assessable effort in other analysis areas (Table 15).

Logbook data showed a 27.4% (Low) harvest of large class shrimp in Affleck / Port Beauclerc, down from 49.1% in 2017/18 (Table 15).

The overall matrix score is 0.67 (Above Average), which was up from 0.50 (Above Average) for the 2017/18 season due to the lower logbook harvest rate. This increase was tempered by the decrease in CPUE in the Affleck/Port Beauclerc analysis area. District 5 data has 0.16 (very low) data confidence (Table 15).

Table 14.–District 5 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Actual GHL (lb spot shrimp) | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Recommended GHL or stock status | | | 20,000 | Poor | Moderate | Above Average | Above Average | Moderate |
| Season length (days) | 222 | 151 | 151 | 229 | 229 | 151 | 229 | 229 |
| Landings (number) | 117 | 49 | 41 | 0 | 18 | 47 | 22 | 42 |
| Harvest (lb spot shrimp) | 21,498 | 19,282 | 10,216 | 0 | 3,653 | 16,683 | 10,555 | 8,568 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Actual GHL (lb spot shrimp) | 20,000 | 20,000 | 20,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| Recommended GHL or stock status | Moderate | Below Average | Below Average | Poor | Moderate | Above Average | Above Average |
| Season length (days) | 151 | 229 | 229 | 229 | 229 | 229 | 229 |
| Landings (number) | 17 | 24 | 9 | 23 | 11 | 19 | 11 |
| Harvest (lb spot shrimp) | 5,131 | 2,768 | 2,039 | 4,886 | 1,666 | 7,656 | 1,713 |

Table 15.–District 5 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Affleck/Port Beauclerc | | | Rocky Pass | | | Cape Pole to Point Baker | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.60 | | | 0.35 | | | 0.05 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 1.7 | * | -1.00 | 2.2 | * | – | 1.3 | No effort | – | -0.33 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | – | – | – | – | – | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | 49.1% | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | 27.4% | 1.00 | – | – | – | – | – | – | 1.00 |
| Mean CL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – | – | – | – |
| Manager score | | – | – | 0.00 | – | – | 0 | – | – | 0 | 0.00 |
| Score | | – | – | 0.00 | – | – | 0.00 | – | – | 0.00 | 0.67 |
| Max. possible score | | – | – | 3.25 | – | – | 1.00 | – | – | 1.00 | 2.17 |
| Stock Status | | – | – | – | – | – | – | – | – | – | Above Average |
| Confidence | | – | – | 0.24 | – | – | 0.06 | – | – | 0.06 | 0.16 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

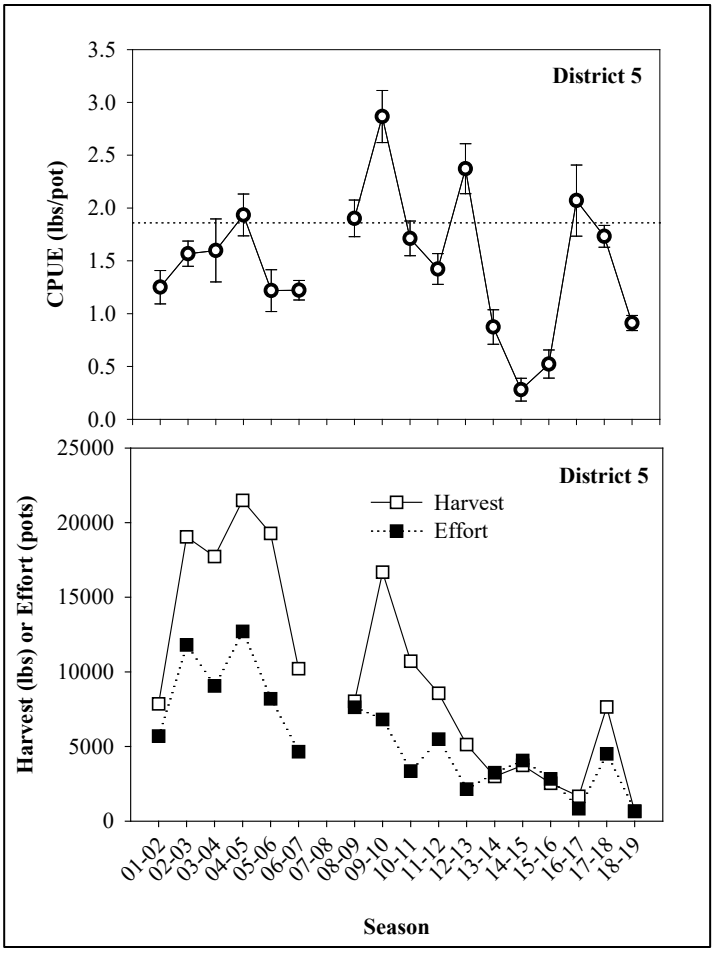


Figure 23.–Districtwide CPUE and effort data for District 5, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

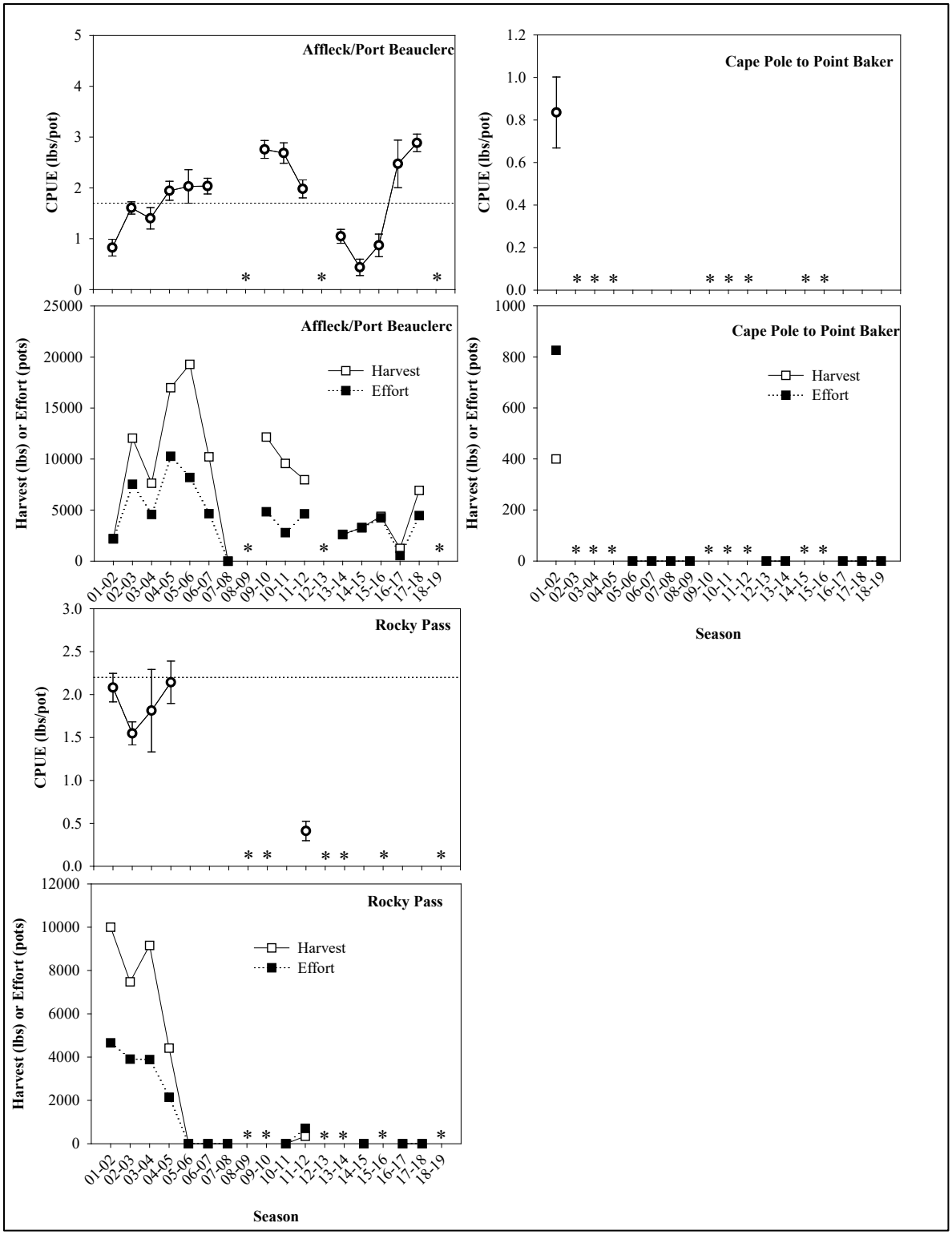


Figure 24.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 5, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

## Northern Clarence Strait

The Northern Clarence Strait management area was created by the Board of Fisheries at the 2018 meeting in Sitka. It is made up of Sections 6B, 6C, and 6D and was established with an upper end GHR of 60,000 lb. Northern Clarence Strait is divided into 2 analysis areas: SW Etolin Island and Upper Clarence Strait (Table 2). Although most of the harvest comes from the Upper Clarence analysis area, the spatial composition of harvest has been fairly stable. Over the past 10 years harvest has averaged 36,000 lb.

Districtwide weighted CPUE dropped from the second highest in the past 12 years last season (Figure 25) and is below baseline. This was driven by declines in standardized commercial CPUE in both analysis areas. Upper Clarence Strait is now below baseline, while the SW Etolin area is at baseline. Neither area shows a significant 4-year trend (Table 17, Figure 26).

Logbook harvest rate data of large size class shrimp showed a 31% (Low) harvest rate of large class shrimp in Upper Clarence. Logbook catch rates of large class shrimp decreased in in Upper Clarence and showed no change in the SW Etolin area (Table 17).

Mean CL from on-the-grounds sampling in Upper Clarence Strait decreased for the second season in a row and is now below average with no 4-year trend (Table 17, Figure 27).

The $L_{50}$ point estimate from on-the-grounds sampling in Upper Clarence increased and remains at baseline (Table 17, Figure 28).

The manager scores were neutral in SW Etolin and negative in Upper Clarence (Table 17).

The overall matrix score is -1.47 (Below Average), down precipitously from 4.03 (Good) in the 2017/18 season due to decreased commercial CPUE, carapace lengths, and logbook indicators.

Table 16.–Northern Clarence Strait matrix Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | NA–former GHR for All of District 6 | | | | | | | |
| Actual GHL (lb spot shrimp) | NA–former GHL for All of District 6 | | | | | | | |
| Recommended GHL or stock status | NA–former Stock Status for All of District 6 | | | | | | | |
| Season length (days) | 21 | 77 | 39 | 151 | 78 | 84 | 92 | 10 |
| Landings (number) | 137 | 207 | 202 | 110 | 82 | 129 | 82 | 36 |
| Harvest (lb spot shrimp) | 64,762 | 78,556 | 71,027 | 30,958 | 29,503 | 49,215 | 32,783 | 30,657 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | NA–former GHR for All of District 6 | | | | | | 60,000 |
| Actual GHL (lb spot shrimp) | NA–former GHL for All of District 6 | | | | | | 34,300 |
| Recommended GHL or stock status | NA–former Stock Status for All of District 6 | | | | | | Below Average |
| Season length (days) | 11 | 21 | 17 | 23 | 18 | 19 | 19 |
| Landings (number) | 60 | 89 | 50 | 57 | 63 | 93 | 81 |
| Harvest (lb spot shrimp) | 35,051 | 35,116 | 22,039 | 26,108 | 39,126 | 52,179 | 38,180 |

*Note*: NA = not applicable.

Table 17.–Northern Clarence Strait matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | SW Etolin | | | Upper Clarence | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.1 | | | 0.9 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 4.3 | 3.8 | 0.00 | 4.3 | 4.0 | -1.00 | -0.30 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | No trend | 0.00 | – | Sig. dec. | -1.00 | -0.90 |
| Harvest rate ≥XL (2016) | logbook | – | 44.8% | – | – | 48.1% | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | 28.1% | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | 31.3% | 1.00 | 1.00 |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | 37.2 | 36.7 | -1.00 | -0.67 |
| 4-yr trend in CL | OTG | – | – | – | – | No trend | 0.00 | 0.00 |
| Mean CL | DS | – | – | – | 43.6 | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | 39.4 | 39.0 | 0.00 | 0.00 |
| Manager score | | – | – | 0.00 | – | – | -1.00 | -0.60 |
| Score | | – | – | 0.00 | – | – | -3.00 | -1.47 |
| Max. possible score | | – | – | 3.25 | – | – | 6.50 | 4.42 |
| Stock Status | | – | – | – | – | – | – | Below Average |
| Confidence | | – | – | 0.24 | – | – | 0.47 | 0.45 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

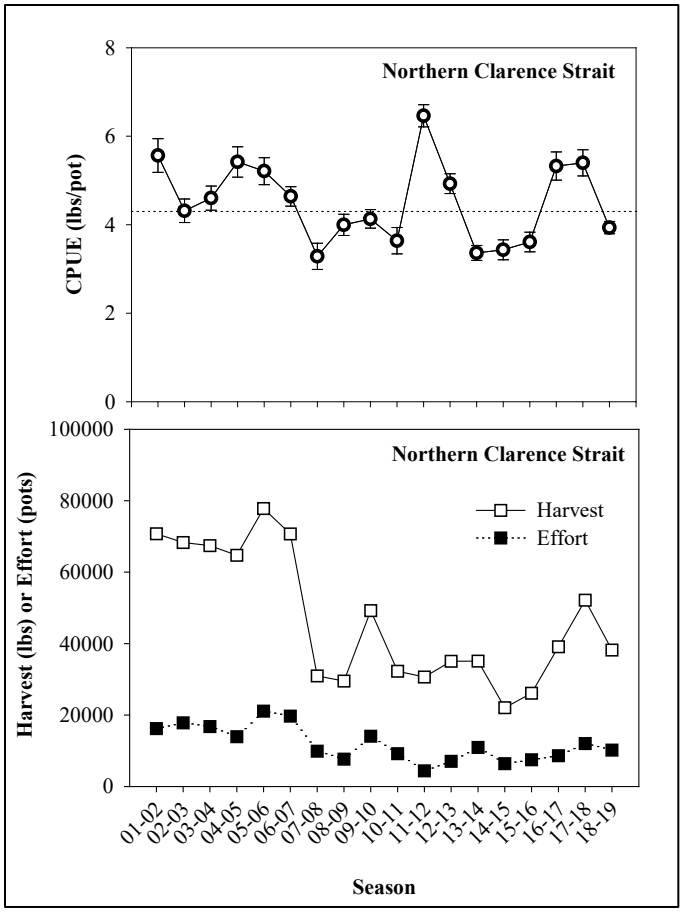


Figure 25.–Areawide CPUE and effort data for Northern Clarence Strait, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

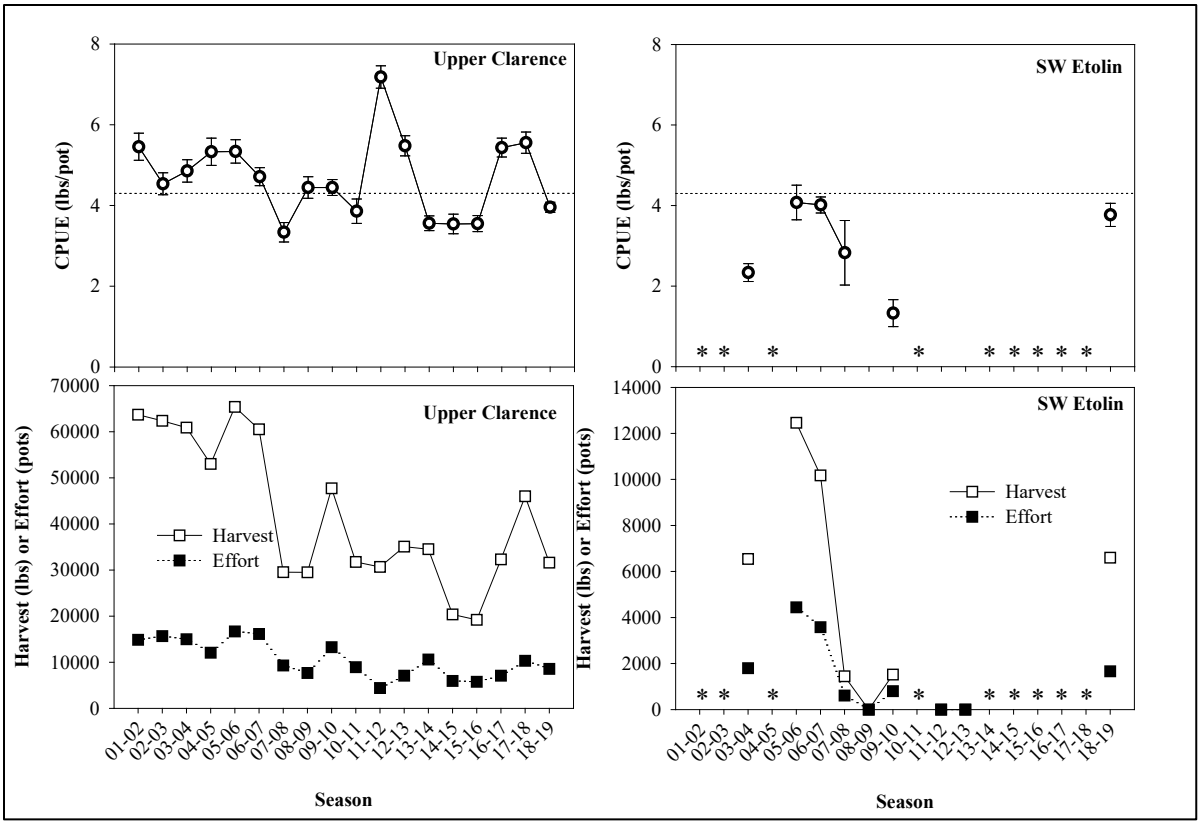


Figure 26.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Northern Clarence Strait, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

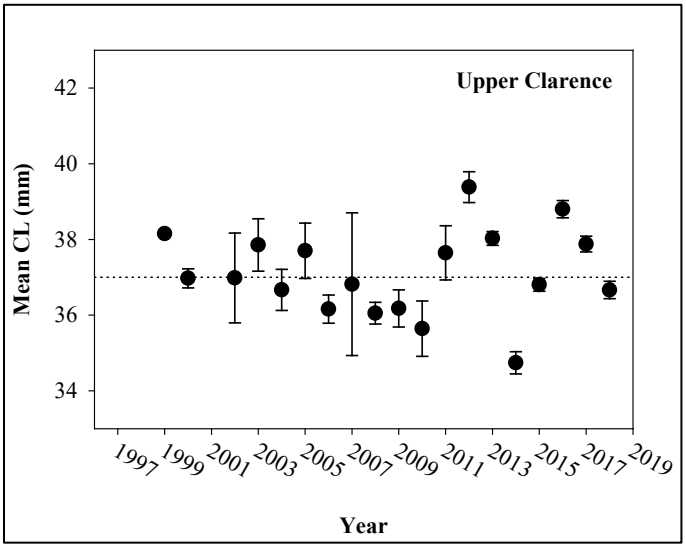


Figure 27.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Northern Clarence Strait, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

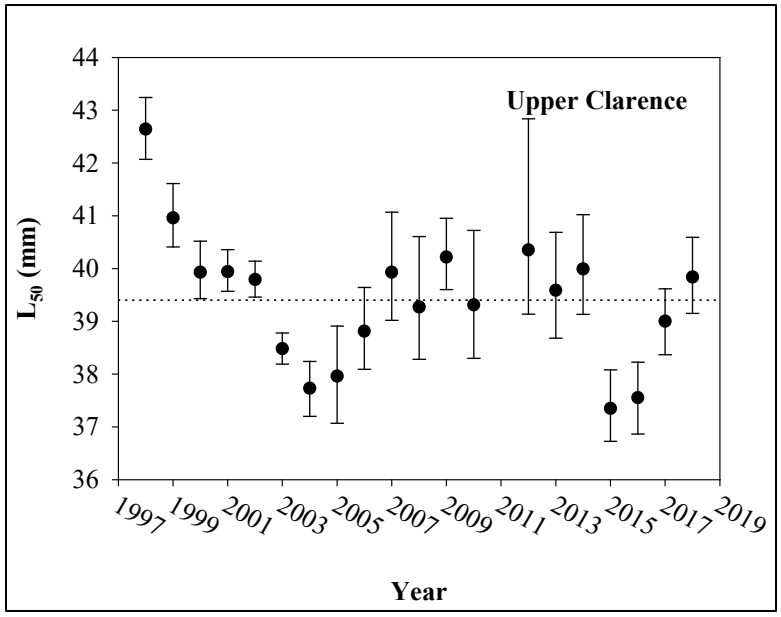


Figure 28.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Northern Clarence Strait, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

## District 7

The GHL in District 7 has changed 4 times since the 1998/99 season. The GHL in District 7 was reduced 25% to 78,000 lb beginning with the 2004/05 season; prior to this it was 104,000 lb for the 2000/01–2003/04 seasons and 100,000 lb for the 1995/96–1999/00 fishing seasons. The district GHL was achieved in 2007/08 after fishing an extra 37 days and was not achieved in 2008/09 after fishing 19 extra days (Table 18). The GHL was met during the 2009/10 fishing season after an 84-day season, the longest in 6 years. The GHL was reduced 30% for the 2010/11 season to 54,600 lb, then increased 17% for the 2012/13 season and an experimental inseason GHL adjustment system was implemented. During a meeting between industry and management in January 2015, it was mutually agreed to increase the preseason GHL from 63,700 lb to 74,300 lb so that the full range of the GHR could be met using inseason adjustments. During the last 10 years, harvest has averaged 78,200 lb (105% of the GHL) (Table 18). District 7 is divided into 4 analysis areas: Bradfield Canal, Lower Ernest Sound, Upper Ernest Sound, and Zimovia Strait (Table 2).

Survey catch rates of large size class shrimp increased in Lower Ernest Sound and increased Upper Ernest Sound. Large class shrimp catch rates above baseline in both areas and show an increasing 4-year trend in Lower Ernest Sound (Table 19, Figure 29). It should also be noted that catch rate of small size class shrimp, though not scored, continues to decrease and is now at baseline in Upper Ernest Sound, and increased to baseline level in Lower Ernest Sound. Mean survey CL increased in Lower Ernest Sound and decreased in Upper Ernest Sound. Mean survey CL is above baseline in Lower Ernest Sound, and at baseline in Upper Ernest Sound. Both areas show increasing 4-year trends (Table 19, Figure 29). Survey $L_{50}$ estimates increased in both areas and are now at baseline in Upper Ernest Sound and above baseline in Lower Ernest Sound (Table 19, Figure 30).

Districtwide weighted CPUE decreased for the second year but remains above the baseline (Figure 31). This decrease was driven by decreases in standardized commercial CPUE in all analysis areas except Zimovia Strait. Standardized commercial CPUEs are significantly above the long-term baseline in all areas except Lower Ernest Sound where it is at baseline, with no area showing a significant 4-year trend (Table 19, Figure 32).

Logbook data showed a 38.5% (Low) harvest of large class shrimp in Upper Ernest Sound, and a 25% (Low) rate in Zimovia Strait (Table 19). Catch rates of large class shrimp were steady in Lower Ernest Sound and Zimovia Strait, and declined in Upper Ernest Sound.

On-the-grounds CL measurements were above baseline in Bradfield Canal and at baseline in Upper Ernest Sound. Neither area showed a significant 4-year trend. Dockside CL was below the baseline in Bradfield Canal with no 4-year trend (Table 19, Figure 33). On-the-grounds and dockside $L_{50}$ samples were above baseline in Upper Ernest Sound, and at baseline in Bradfield Canal (Table 19, Figure 34).

The manager scores were positive in Lower Ernest Sound and neutral in all other areas (Table 19).

The overall matrix score for District 7 is 2.82 (Above Average), which was down from 3.48 (Above Average) for the 2017/18 season. The decrease in score this season was mainly due to decreased commercial CPUE and logbook indicators. District 7 has a 0.59 (Good) level of data confidence (Table 19).

Table 18.–District 7 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 |
| Actual GHL (lb spot shrimp) | 78,000 | 78,000 | 78,000 | 78,000 | 78,000 | 78,000 | 54,600 | 54,600 |
| Recommended GHL or stock status | Poor | Poor | 62,400 | Moderate | Moderate | Poor | Below Average | Moderate |
| Season length (days) | 37 | 30 | 22 | 59 | 78 | 84 | 34 | 12 |
| Landings (number) | 322 | 254 | 192 | 223 | 184 | 240 | 135 | 83 |
| Harvest (lb spot shrimp) | 80,072 | 79,927 | 80,491 | 76,613 | 52,345 | 74,474 | 48,762 | 61,825 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 | 104,000 |
| Actual GHL (lb spot shrimp) | 80,899 | 77,500 | 70,000 | 74,300 | 81,730 | 96,590 | 74,300 |
| Recommended GHL or stock status | Moderate | Moderate | Moderate | Moderate | Moderate | Above Average | Above Average |
| Season length (days) | 17 | 17 | 14 | 12 | 12 | 13 | 12 |
| Landings (number) | 124 | 168 | 132 | 156 | 146 | 176 | 159 |
| Harvest (lb spot shrimp) | 82,552 | 94,922 | 76,890 | 70,091 | 87,752 | 96,234 | 78,775 |

Table 19.–District 7 matrix, Part B. Baselines, current season values, and scores for each parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Bradfield | | | Lower Ernest Sound | | |
|---|---|---|---|---|---|---|---|
| Area weighting | | 0.2 | | | 0.2 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | – | – | – | 0.8 | 1.4 | 1.00 |
| 4-yr trend in catch rate | survey | – | – | – | – | Sig. inc. | 0.25 |
| Std. Comm. CPUE | fish tickets | 2.5 | 3.8 | 1.00 | 3.6 | * | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | No trend | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | No trend | 0.00 |
| Harvest rate ≥XL (2016) | logbook | – | 72.8% | – | – | 22% | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | 31.2 | 34.3 | 1.00 |
| 4-yr trend in CL | survey | – | – | – | – | Sig. inc. | 0.25 |
| Mean CL | OTG | 41.8 | 44.5 | 1.00 | – | – | – |
| 4-yr trend in CL | OTG | – | No trend | 0.00 | – | – | – |
| Mean CL | DS | 45.4 | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | 37.9 | 39.1 | 1.00 |
| $L_{50}$ | OTG/DS | 46.7 | 47.2 | 0.00 | – | – | – |
| Manager score | | – | – | 1.00 | – | – | 1.00 |
| Score | | – | – | 2.00 | – | – | 4.50 |
| Max. possible score | | – | – | 4.50 | – | – | 6.75 |
| Stock Status | | – | – | – | – | – | – |
| Confidence | | – | – | 0.35 | – | – | 0.53 |

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Table 19.–Page 2 of 2.

| Analysis Area | | Upper Ernest Sound | | | Zimovia Strait | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.5 | | | 0.1 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | 1.6 | 2.1 | 1.00 | – | – | – | 1.00 |
| 4-yr trend in catch rate | survey | – | No trend | 0.00 | – | – | – | 0.07 |
| Std. Comm. CPUE | fish tickets | 3.9 | 4.2 | 1.00 | 2.3 | * | 1.00 | 0.27 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | Sig. dec. | -1.00 | – | No trend | 1.00 | -0.63 |
| Harvest rate ≥XL (2016) | logbook | – | 39.0% | – | – | 41.5% | – | – |
| Harvest rate ≥XL (2017) | logbook | – | 41.8% | – | – | 24.6% | – | – |
| Harvest rate ≥XL (2018) | logbook | – | 38.5% | 1.00 | – | 26.8% | 1.00 | 1.00 |
| Mean CL | survey | 35.0 | 36.3 | 0.00 | – | – | – | 0.19 |
| 4-yr trend in CL | survey | – | Sig. inc. | 0.25 | – | – | – | 0.17 |
| Mean CL | OTG | 40.7 | 41.0 | 1.00 | 42.9 | – | – | 0.19 |
| 4-yr trend in CL | OTG | – | No trend | 0.00 | – | – | – | 0.00 |
| Mean CL | DS | 43.2 | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | 42.0 | 42.2 | 0.00 | – | – | – | 0.19 |
| $L_{50}$ | OTG/DS | 43.2 | 45.1 | 1.00 | – | – | – | 0.24 |
| Manager score | | – | – | 0.00 | – | – | 0.00 | 0.13 |
| Score | | – | – | 3.25 | – | – | 4.00 | 2.82 |
| Max. possible score | | – | – | 10.00 | – | – | 4.25 | 7.17 |
| Stock Status | | – | – | – | – | – | – | Above Average |
| Confidence | | – | – | 0.76 | – | – | 0.29 | 0.59 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

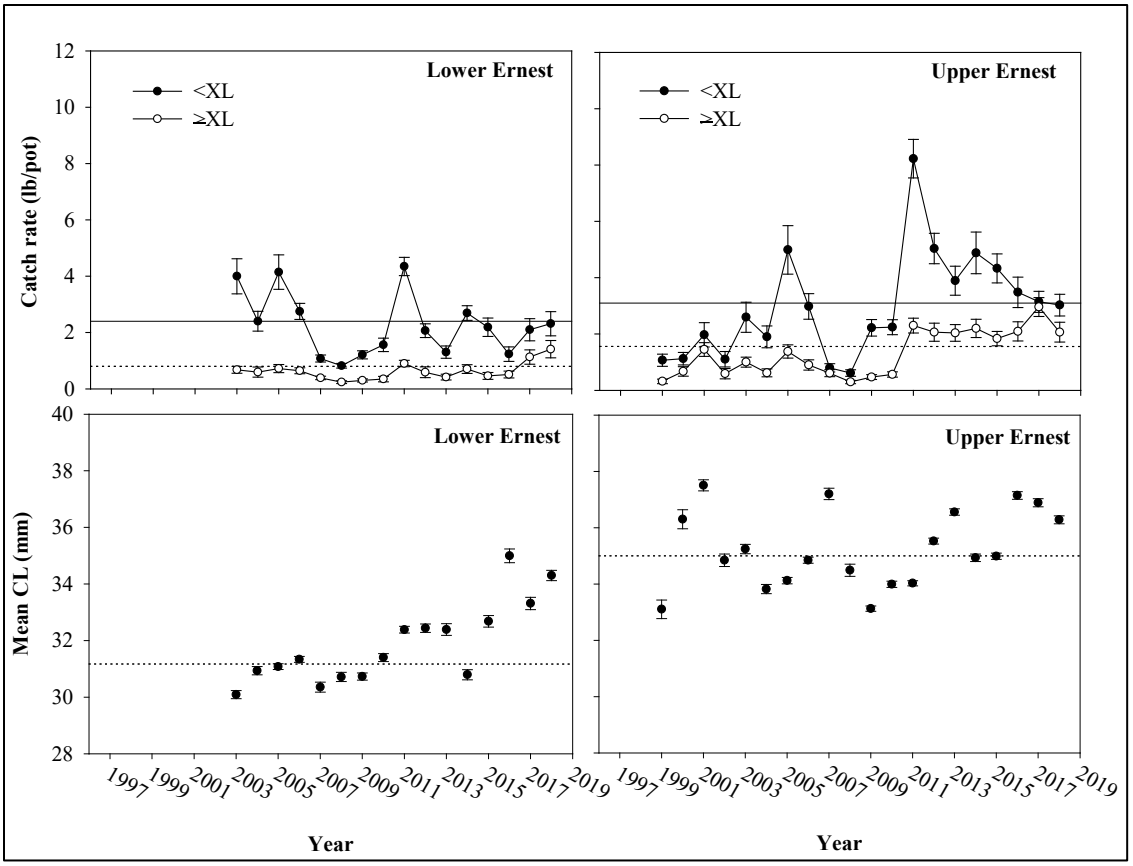


Figure 29.–Mean and standard error of spot shrimp catch rate (upper panels), and carapace length (lower panels) from preseason surveys in District 7, 1998–2018. Lines represent the long-term baselines.

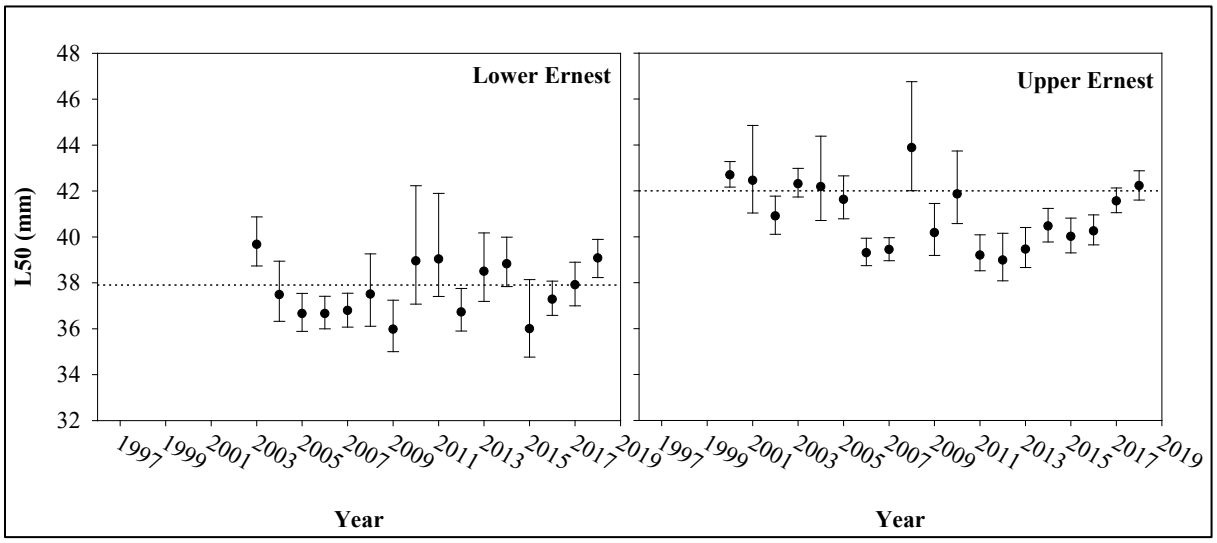


Figure 30.–$L_{50}$ and 95% confidence intervals of spot shrimp from preseason surveys in District 7, 1998–2018. Dotted line represents the long-term baseline.

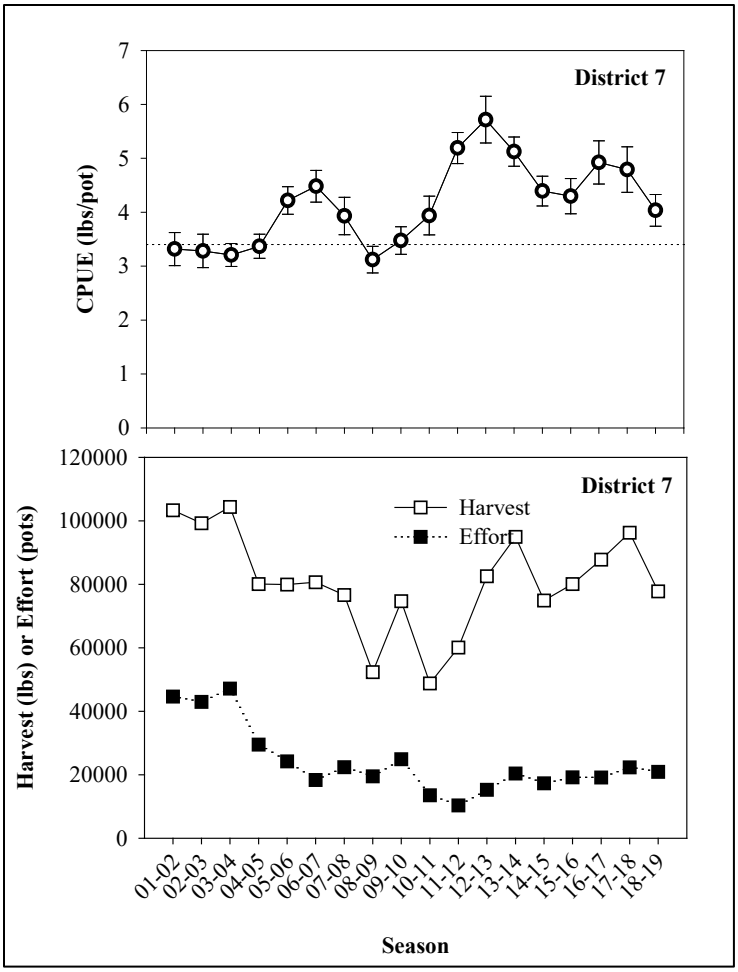


Figure 31.–Districtwide CPUE and effort data for District 7, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

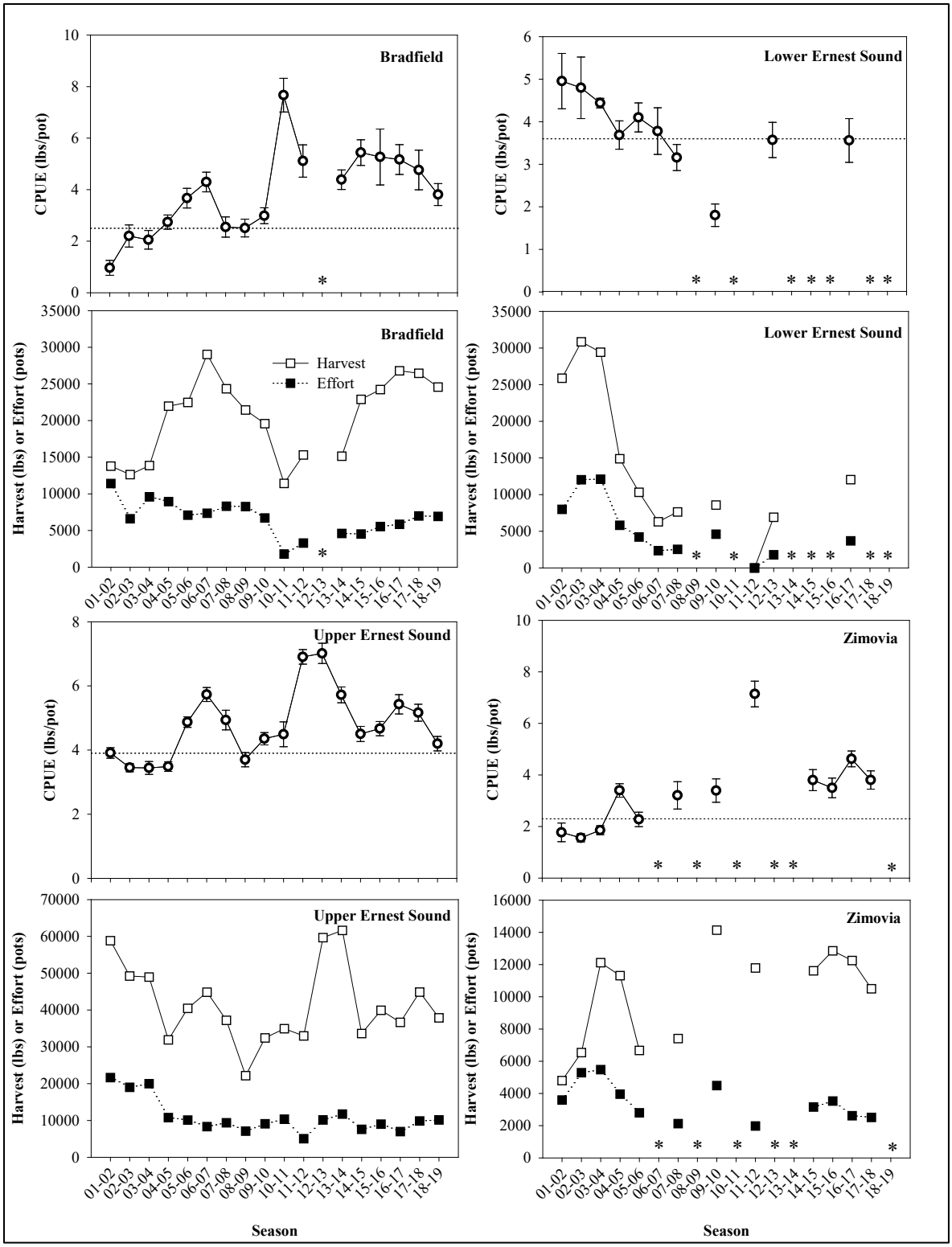


Figure 32.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 7, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

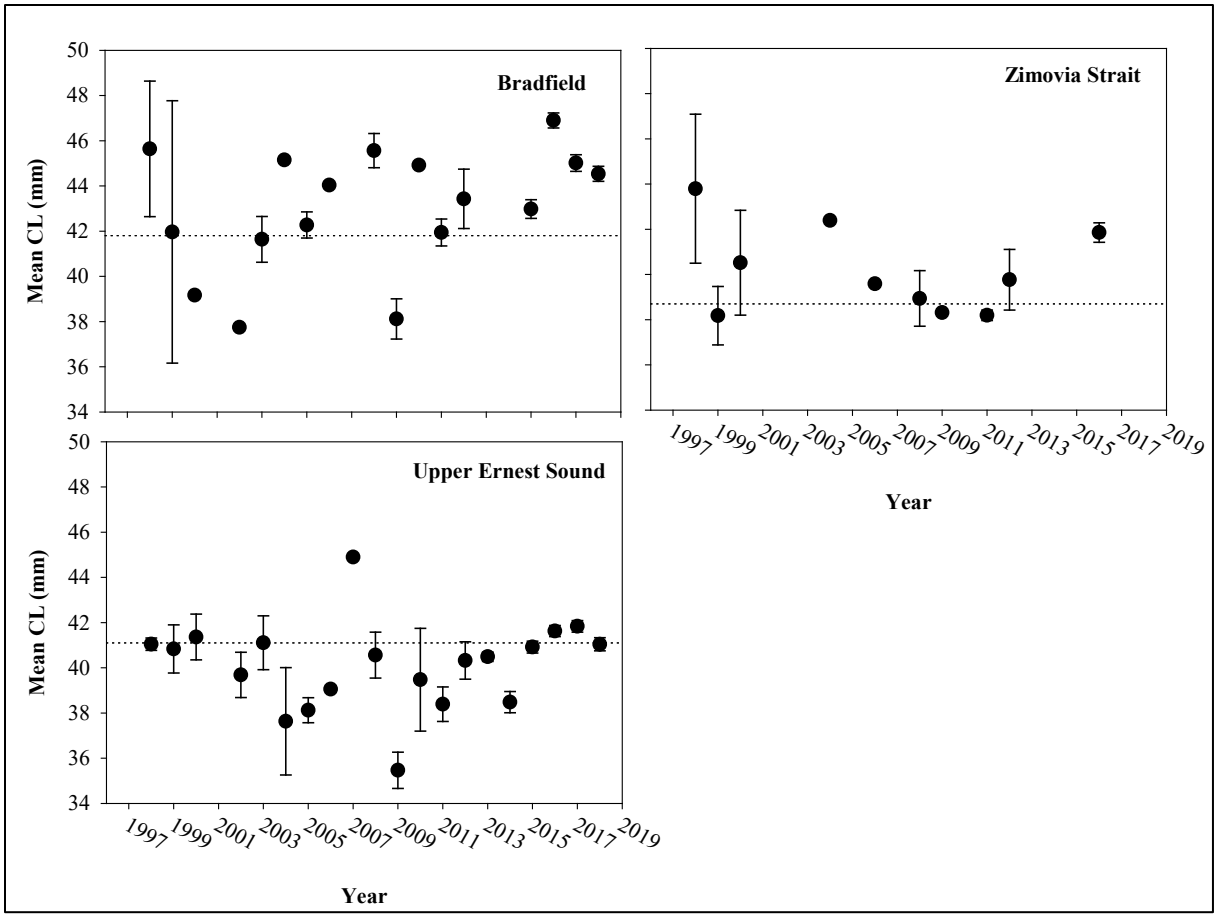


Figure 33.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in District 7, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

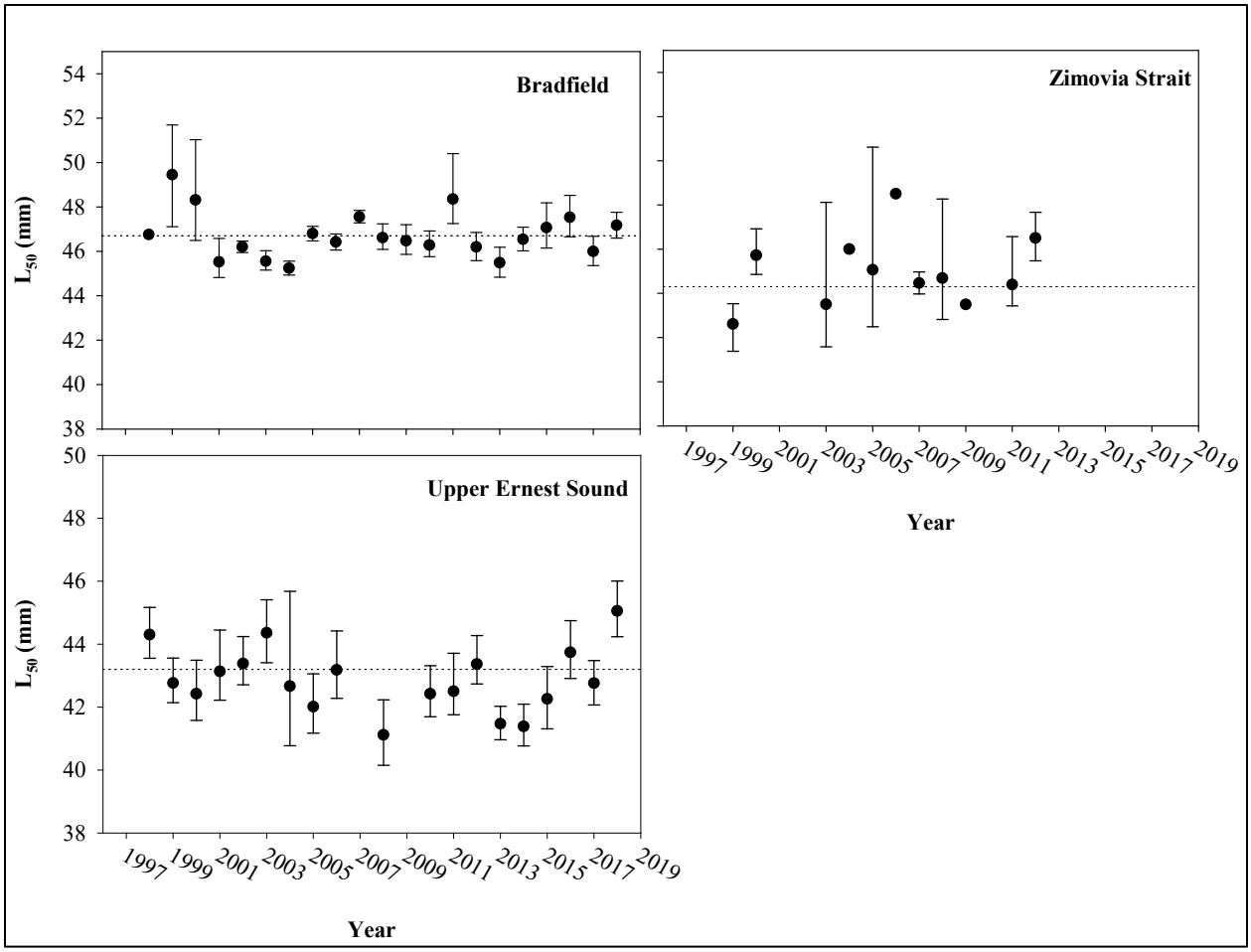


Figure 34.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in District 7, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

## Sumner Strait

The Sumner Strait management area was created by the Board of Fisheries at the 2018 meeting in Sitka. It is made up of Sections 6A and 8B and was established with an upper end GHR of 25,000 lb. Sumner Strait is divided into 3 analysis areas: Eastern Sumner, Western Sumner, and Stikine Strait/Chichagof Pass (Table 2). Over the past 10 years, harvest has averaged 10,600 lb.

Areawide commercial CPUE has decreased slightly but remains among the highest since standardization was possible (Figure 35). Standardized commercial CPUE increased in Eastern Sumner and declined in Western Sumner and Stikine Strait. Eastern Sumner and Stikine Strait remain above the baseline while Western Sumner is at baseline. No areas showed a significant 4-year trend (Table 21, Figure 36).

Logbook data showed a 27.6% (Low) harvest rate of large class shrimp in Stikine Strait (Table 21).

Manager scores were positive in Eastern Sumner and Stikine Strait, and neutral in Western Sumner.

The overall score is 1.80 (Good), which was up from 0.74 (Above Average) in 2017/18 based on increased logbook and manager scores. Sumner Strait has a 0.19 (Low) level of confidence (Table 21).

Table 20.–Sumner Strait matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | NA–Combination of 2 former GHRs | | | | |
| Actual GHL (lb spot shrimp) | | | | NA–Combination of 2 former GHLs | | | | |
| Recommended GHL or stock status | | | | NA–Combination of 2 former Districts | | | | |
| Season length (days) | | | | NA–Combination of 2 former Districts | | | | |
| Landings (number) | 109 | 103 | 133 | 109 | 56 | 81 | 75 | 53 |
| Harvest (lb spot shrimp) | 19,705 | 21,937 | 26,579 | 19,397 | 9,587 | 13,389 | 9,681 | 12,302 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | NA–Combination of 2 former GHRs | | | | 25,000 |
| Actual GHL (lb spot shrimp) | | | NA–Combination of 2 former GHLs | | | | 15,000 |
| Recommended GHL or stock status | | | NA–Combination of 2 former Districts | | | | Good |
| Season length (days) | | | NA–Combination of 2 former Districts | | | | 18 |
| Landings (number) | 43 | 40 | 23 | 35 | 34 | 29 | 49 |
| Harvest (lb spot shrimp) | 9,678 | 6,279 | 3,707 | 9,301 | 12,388 | 12,132 | 17,017 |

*Note*: NA = not applicable.

Table 21.–Sumner Strait matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Eastern Sumner | | | Western Sumner | | | Stikine Strait/ Chichagof Pass | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.49 | | | 0.20 | | | 0.31 | | | Total |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score | Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.7 | 4.0 | 1.00 | 3.0 | * | 0.00 | 2.3 | * | 1.00 | 0.27 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | No trend | 0.00 | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | 43.1% | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | 46.3% | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – | 27.6% | 1.00 | 1.00 |
| Mean CL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – | – | – | – |
| Manager score | | – | – | 1.00 | – | – | 0.00 | – | – | 1.00 | 0.53 |
| Score | | – | – | 2.00 | – | – | 0.00 | – | – | 3.00 | 1.80 |
| Max. possible score | | – | – | 2.25 | – | – | 2.25 | – | – | 3.25 | 2.17 |
| Stock Status | | – | – | – | – | – | – | – | – | – | Good |
| Confidence | | – | – | 0.18 | – | – | 0.18 | – | – | 0.24 | 0.19 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

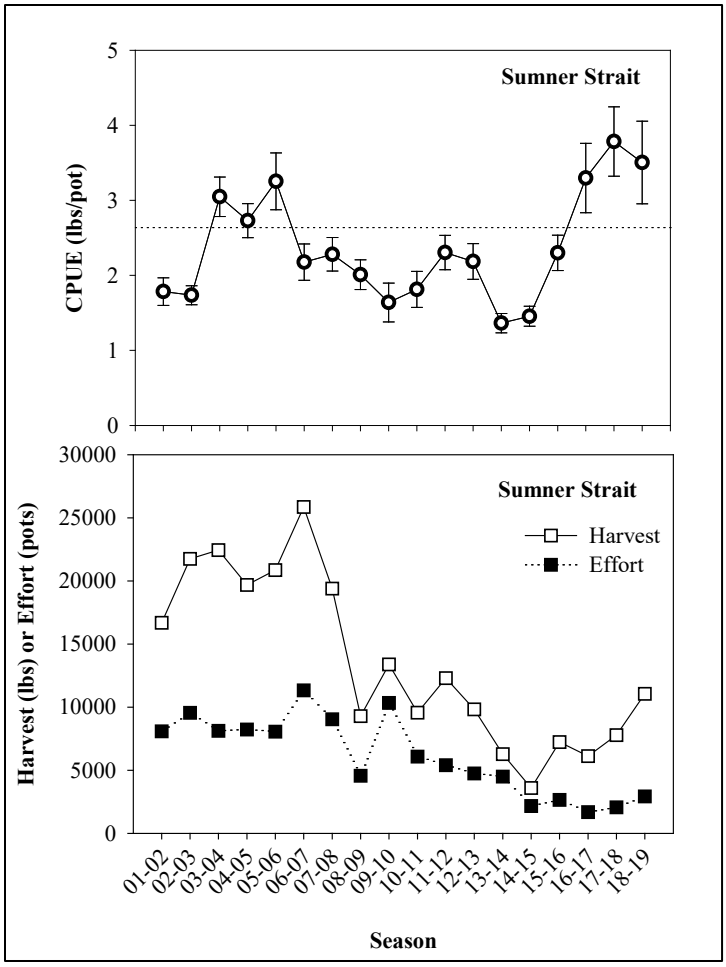


Figure 35.–Areawide CPUE and effort data for Sumner Strait, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

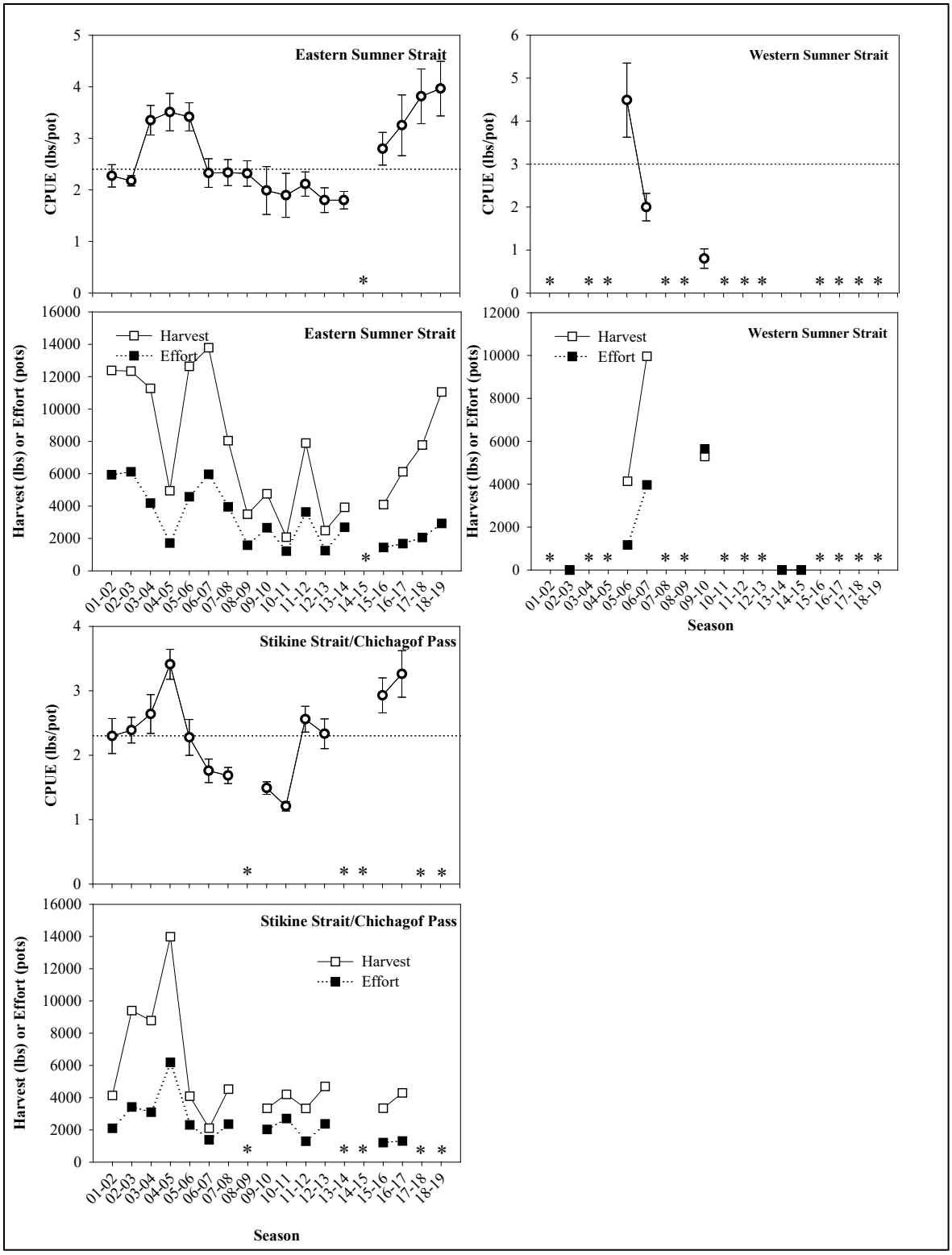


Figure 36.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Sumner Strait, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

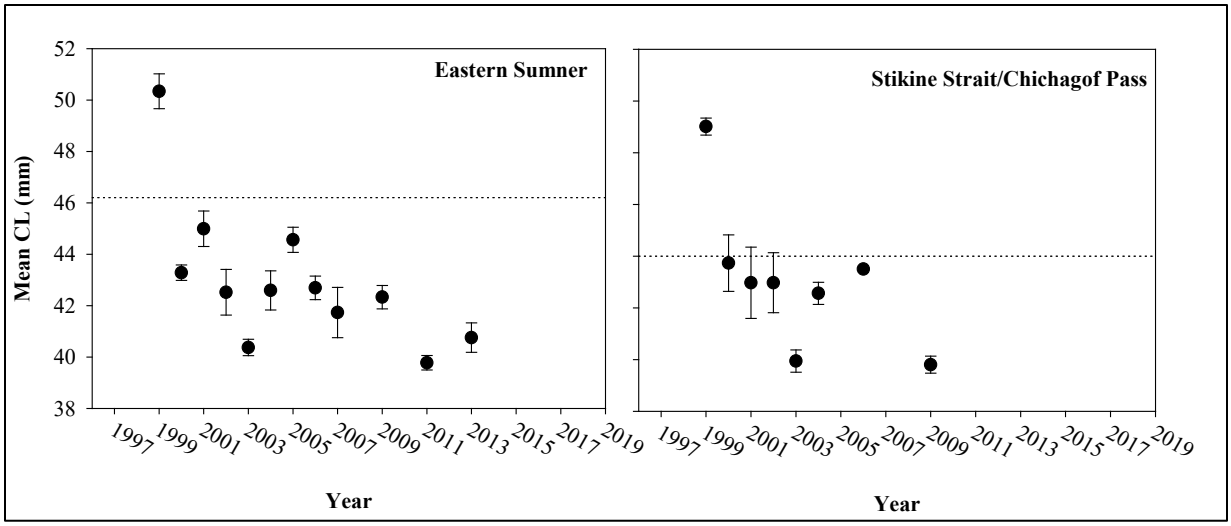


Figure 37.–Mean and standard error of spot shrimp carapace length from dockside and on-the-grounds sampling in Sumner Strait, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

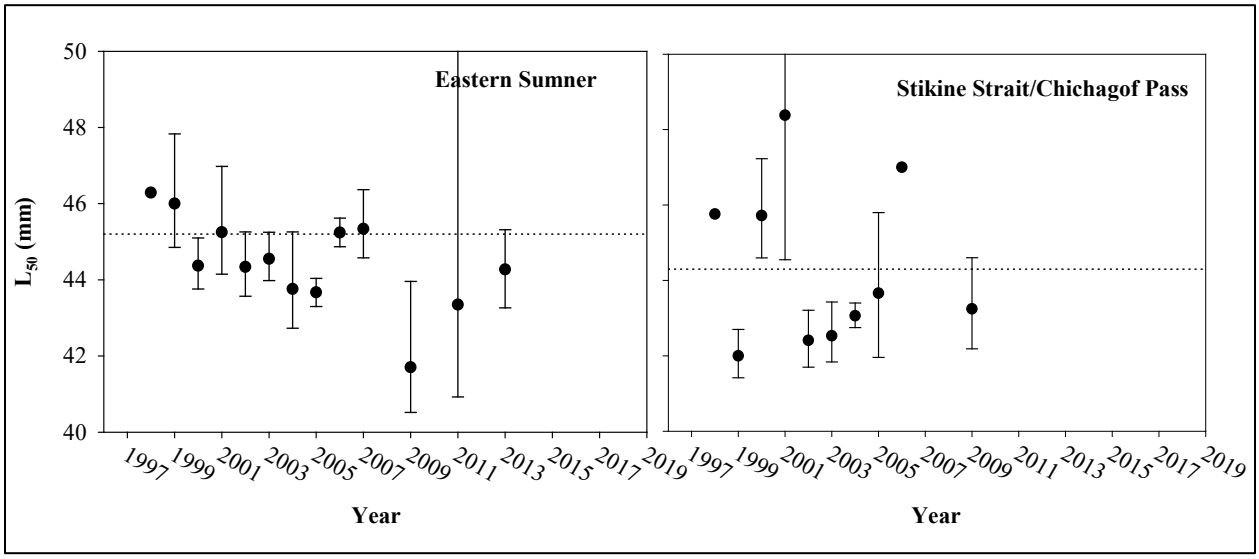


Figure 38.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Sumner Strait, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

## Southern Frederick Sound

The Southern Frederick Sound management area was created by the Board of Fisheries at the 2018 meeting in Sitka. It is made up of Sections 8A and 10C and was established with an upper end GHR of 20,000 lb. Southern Frederick Sound is divided into 2 analysis areas: Frederick Sound and Farragut Bay (Table 2). Over the past 10 years, harvest has averaged 9,950 lb.

Areawide CPUE decreased strongly this season to the second lowest level in 14 seasons (Figure 39). Analysis area level standardized CPUE decreased in both areas. CPUE is now at baseline in Frederick Sound and increasing in the 4-year analysis. Farragut Bay CPUE dropped by more than 50% and is now well below baseline and among the lowest levels since standardization was possible (Table 23, Figure 40).

Logbook-based large class shrimp harvest rates were low in both areas (Table 23).

On-the-grounds carapace lengths were at baseline in Farragut Bay (Table 23).

Manager scores are neutral in both areas (Table 23).

The overall score is 0.88 (Above Average), this was the same score as in the 2017/18 season, with a 0.30 (low) level of data confidence (Table 25).

Table 22.–Southern Frederick Sound matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | NA–Combination of 2 former GHRs | | | | | | | |
| Actual GHL (lb spot shrimp) | NA–Combination of 2 former GHLs | | | | | | | |
| Recommended GHL or stock status | NA–Combination of 2 former Districts | | | | | | | |
| Season length (days) | NA–Combination of 2 former Districts | | | | | | | |
| Landings (number) | 5 | 25 | 20 | 27 | 10 | 59 | 47 | 11 |
| Harvest (lb spot shrimp) | 6,234 | 14,668 | 10,174 | 7,910 | 6,674 | 18,354 | 16,776 | 8,512 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | NA–Combination of 2 former GHRs | | | | | | 20,000 |
| Actual GHL (lb spot shrimp) | NA–Combination of 2 former GHLs | | | | | | 12,000 |
| Recommended GHL or stock status | NA–Combination of 2 former Districts | | | | | | Above Average |
| Season length (days) | NA–Combination of 2 former Districts | | | | | | 26 |
| Landings (number) | 26 | 19 | 30 | 15 | 10 | 10 | 33 |
| Harvest (lb spot shrimp) | 9,311 | 9,351 | 9,434 | 3,740 | 4,172 | 8,924 | 10,846 |

*Note*: NA = not applicable.

Table 23.–Southern Frederick Sound matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Frederick Sound | | | Farragut Bay | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.43 | | | 0.57 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.6 | 3.5 | 0.00 | 4.4 | 2.0 | -1.00 | -0.19 |
| 4-yr trend in CPUE | fish tickets | – | Sig. inc. | 0.25 | – | No trend | 0.00 | 0.07 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | 21.7% | 1.00 | – | 24.1 | 1.00 | 1.00 |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | 39.4 | 38.9 | 0.00 | 0.00 |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | 40.5 | – | – | – |
| Manager score | | – | – | 0.00 | – | – | 0.00 | 0.00 |
| Score | | – | – | 1.25 | – | – | 0.00 | 0.88 |
| Max. possible score | | – | – | 3.25 | – | – | 4.25 | 2.83 |
| Stock Status | | – | – | – | – | – | – | Above Average |
| Confidence | | – | – | 0.24 | – | – | 0.29 | 0.30 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

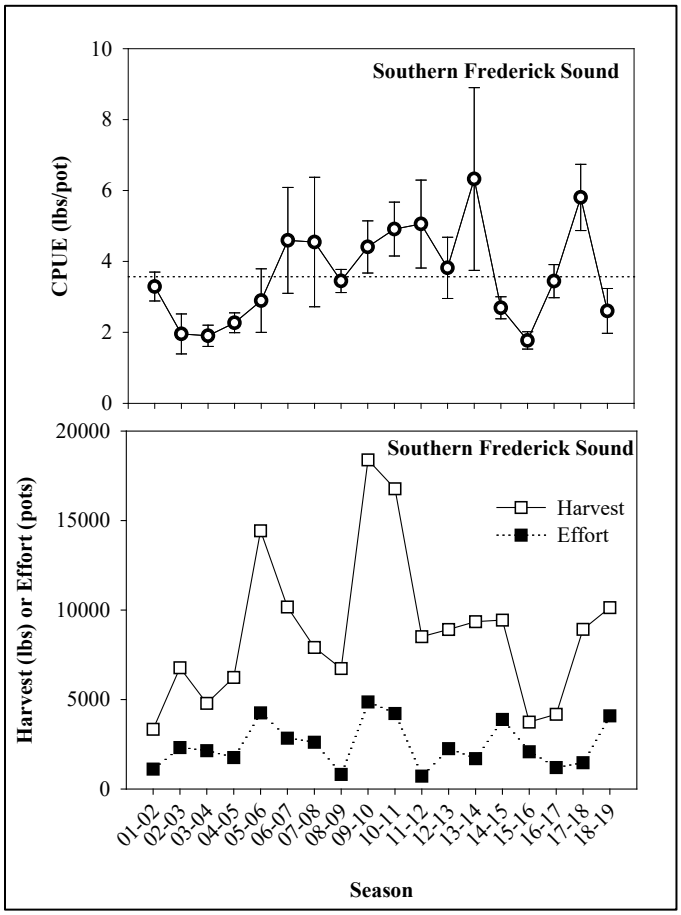


Figure 39.–Areawide CPUE and effort data for Southern Frederick Sound, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

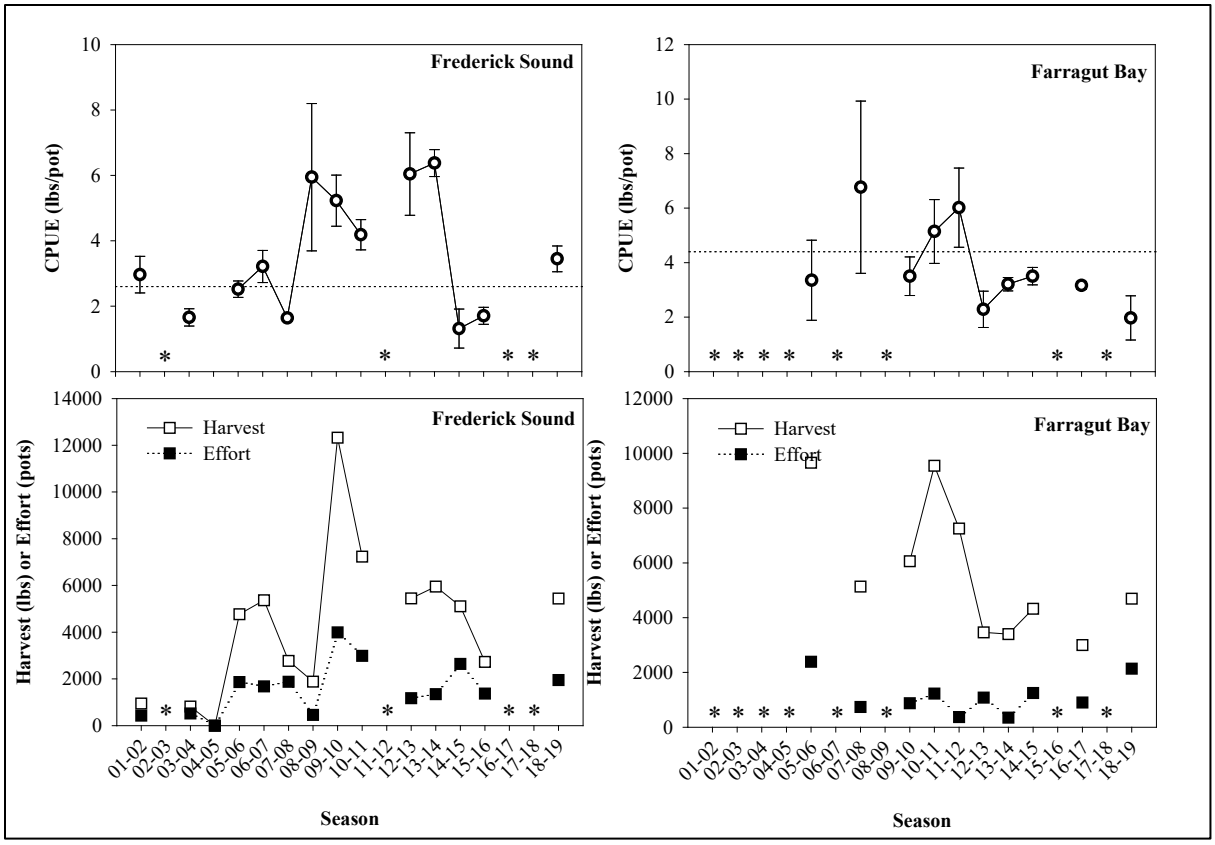


Figure 40.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Southern Frederick Sound, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

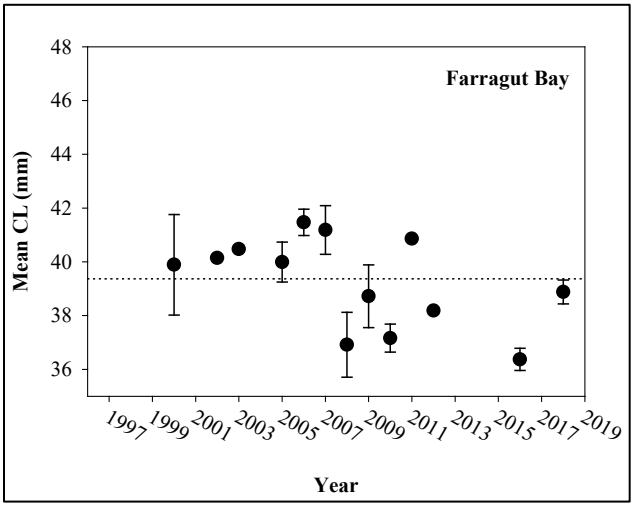


Figure 41.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Southern Frederick Sound, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

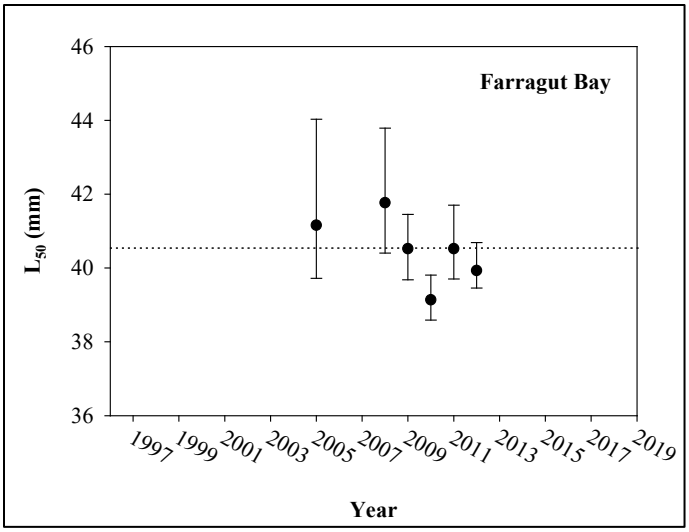


Figure 42.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Southern Frederick Sound, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

## Northern Frederick Sound

The Northern Frederick Sound management area was created by the Board of Fisheries at the 2018 meeting in Sitka. It is made up of Sections 10A and B and was established with an upper end GHR of 50,000 lb. Northern Frederick Sound is divided into 3 analysis areas: Hobart/Windham, Port Houghton, and SE Admiralty (Table 2). Over the past 10 years harvest has averaged 38,800 lb.

Areawide standardized CPUE decreased from last season but remains at baseline and above the recent 7-year average (Figure 4). Analysis area level standardized CPUE decreased in Port Houghton and SE Admiralty, and increased slightly in Hobart/Windham. Standardized CPUE in is at baseline in Port Houghton and Hobart/Windham, while SE Admiralty remains below baseline. Port Houghton and Hobart/Windham also show significant increases in the 4-year analysis (Table 25, Figure 44).

Logbook data showed a 58% (Excessive) harvest rate of large class shrimp in the Port Houghton analysis area, the same as last season. Logbook based catch rate of large class shrimp declined in Port Houghton (Table 25).

On-the-grounds mean CL remains below the long-term baseline in Port Houghton and Hobart/Windham. The Hobart/Windham area shows an increasing 4-year trend (Table 25, Figure 45).

The $L_{50}$ increased in both Port Houghton and Hobart/Windham. It is now at baseline in both areas (Table 25, Figure 46).

Manager scores are positive in Port Houghton and Hobart/Windham, and neutral for SE Admiralty (Table 25).

The overall score is -1.88 (Below Average), which is down from -0.31 (moderate) in the 2017/18 season due to decreasing CPUE and logbook metrics. Northern Frederick sound has a 0.42 (moderate) level of data confidence (Table 25).

Table 24.–Northern Frederick Sound matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | NA–former GHR for All of District 10 | | | | | | | |
| Actual GHL (lb spot shrimp) | NA–former GHL for All of District 10 | | | | | | | |
| Recommended GHL or stock status | NA–former Stock Status for All of District 10 | | | | | | | |
| Season length (days) | 11 | 8 | 8 | 9 | 16 | 9 | 8 | 7 |
| Landings (number) | 73 | 59 | 66 | 57 | 79 | 67 | 52 | 69 |
| Harvest (lb spot shrimp) | 45,358 | 43,634 | 46,824 | 39,097 | 50,811 | 47,483 | 47,204 | 45,402 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | | 2018/19 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | NA–former GHR for All of District 10 | | | | | | | 50,000 |
| Actual GHL (lb spot shrimp) | NA–former GHL for All of District 10 | | | | | | | 35,000 |
| Recommended GHL or stock status | NA–former Stock Status for All of District 10 | | | | | | | Below Average |
| Season length (days) | 9 | 10 | 14 | 16 | 14 | 9 | | 8 |
| Landings (number) | 64 | 58 | 60 | 63 | 62 | 56 | | 56 |
| Harvest (lb spot shrimp) | 36,458 | 32,198 | 31,408 | 32,693 | 35,067 | 40,365 | | 39,984 |

Table 25.–Northern Frederick Sound matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Hobart/Windham | | | Port Houghton | | | SE Admiralty | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.44 | | | 0.41 | | | 0.15 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 4.8 | 5.4 | 0.00 | 5.7 | 5.4 | 0.00 | 6.9 | * | -1.00 | -0.05 |
| 4-yr trend in CPUE | fish tickets | – | Sig. inc. | 0.25 | – | Sig. inc. | 0.25 | – | No trend | 0.00 | 0.14 |
| Catch rate ≥XL | logbook | – | – | – | – | Sig. dec. | -1.00 | – | – | – | -1.00 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | 37.5% | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | 57.8% | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | 57.8% | -1.00 | – | – | – | -1.00 |
| Mean CL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – | – | – | – |
| Mean CL | OTG | 40.7 | 39.3 | -1.00 | 40.6 | 37.4 | -1.00 | 37.6 | – | – | -0.67 |
| 4-yr trend in CL | OTG | – | Sig. inc. | 0.25 | – | No trend | 0.00 | – | – | – | 0.13 |
| Mean CL | DS | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | 41.3 | 41.5 | 0.00 | 41.5 | 41.5 | 0.00 | 39.9 | – | – | 0.00 |
| Manager score | | – | – | 1.00 | – | – | 1.00 | – | – | 0.00 | 0.57 |
| Score | | – | – | 0.00 | – | – | -1.75 | – | – | -1.00 | -1.88 |
| Max. possible score | | – | – | 4.50 | – | – | 6.50 | – | – | 2.25 | 4.42 |
| Stock Status | | – | – | – | – | – | – | – | – | – | Below Average |
| Confidence | | – | – | 0.35 | – | – | 0.47 | – | – | 0.18 | 0.42 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

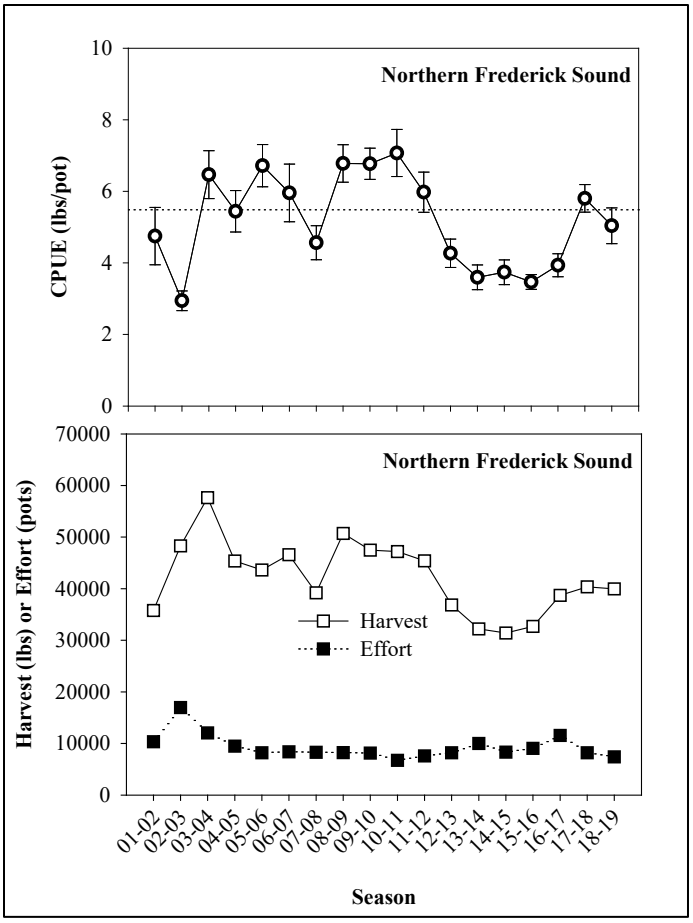


Figure 43.–Areawide CPUE and effort data for Northern Frederick Sound, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

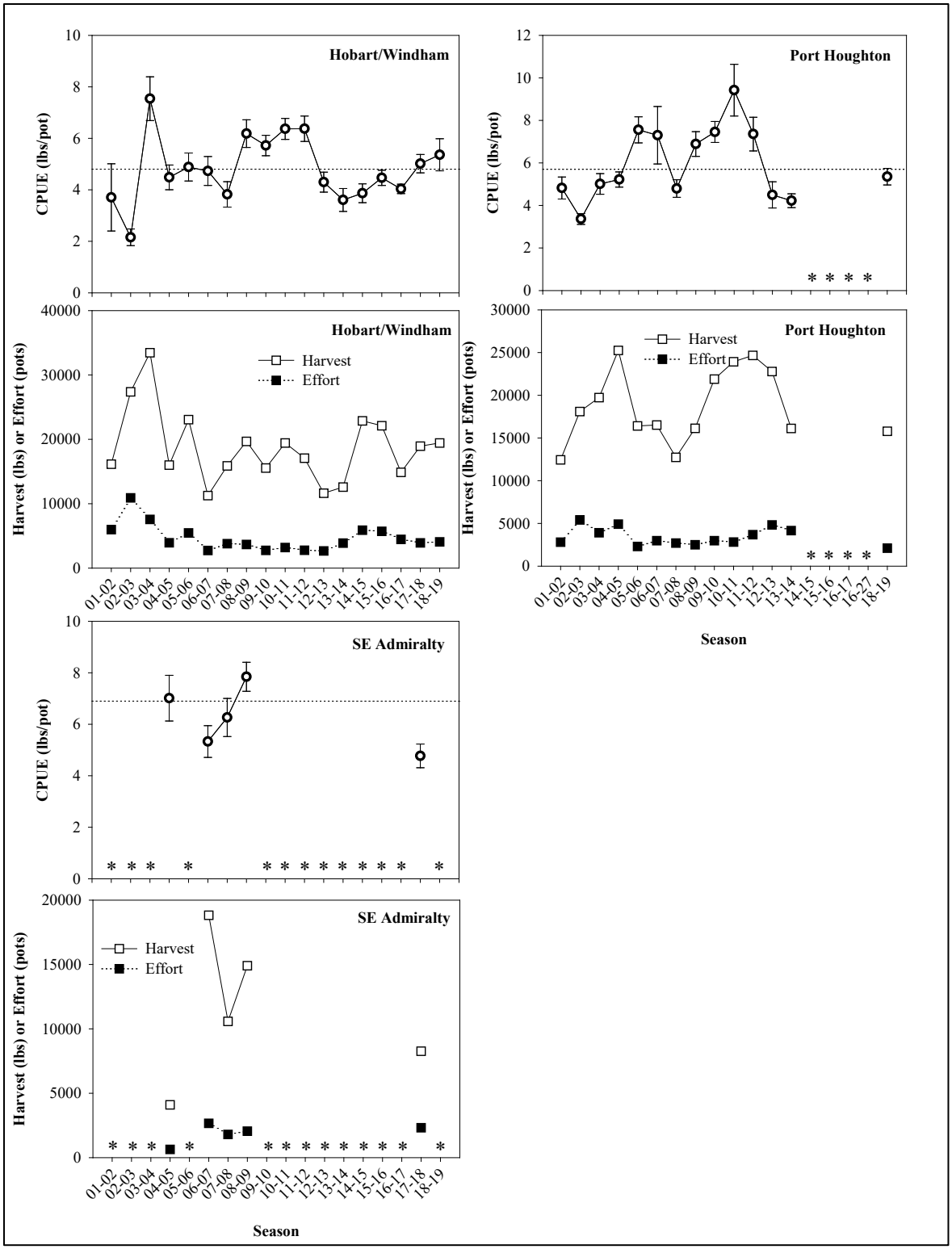


Figure 44.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Northern Frederick Sound, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

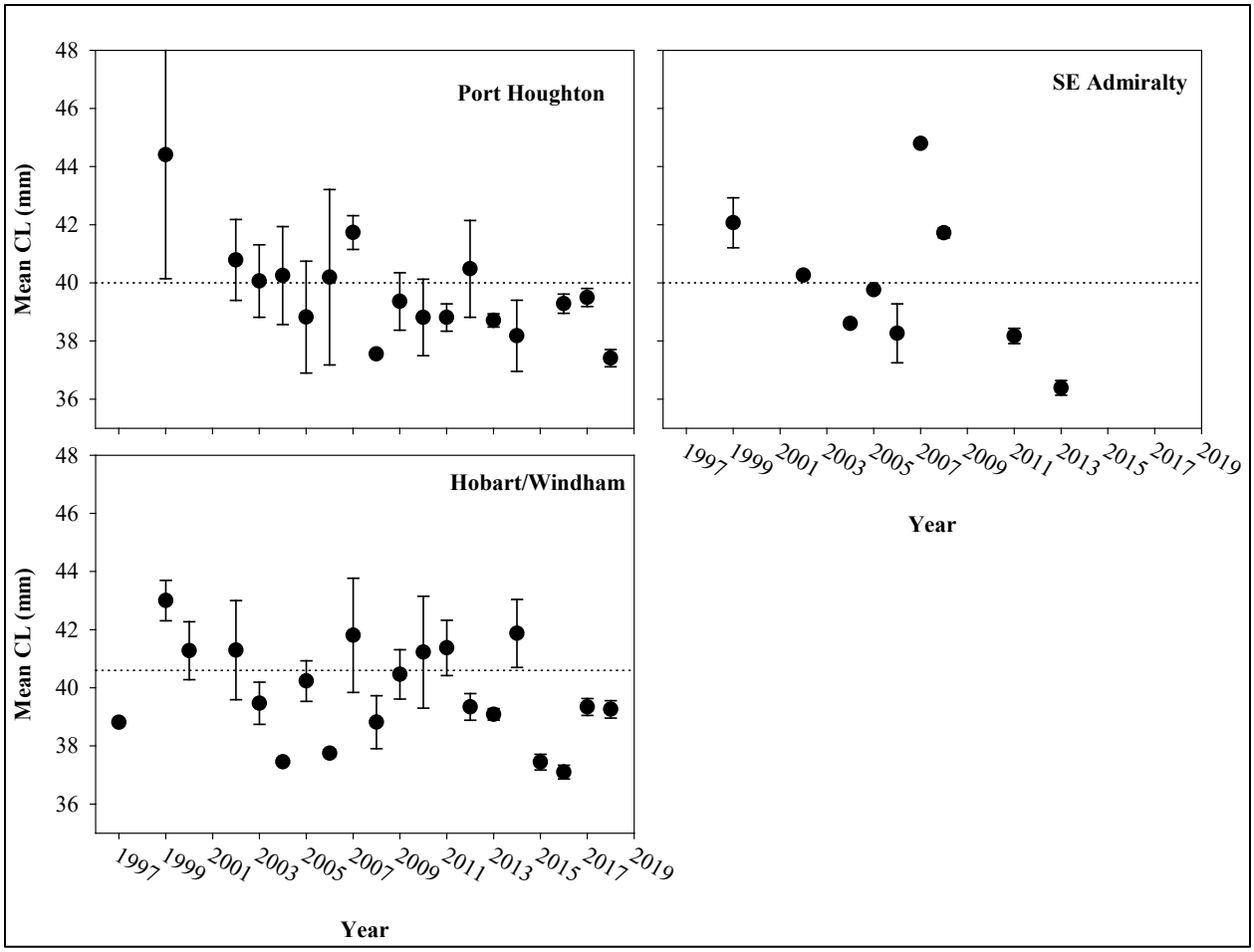


Figure 45.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Northern Frederick Sound, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

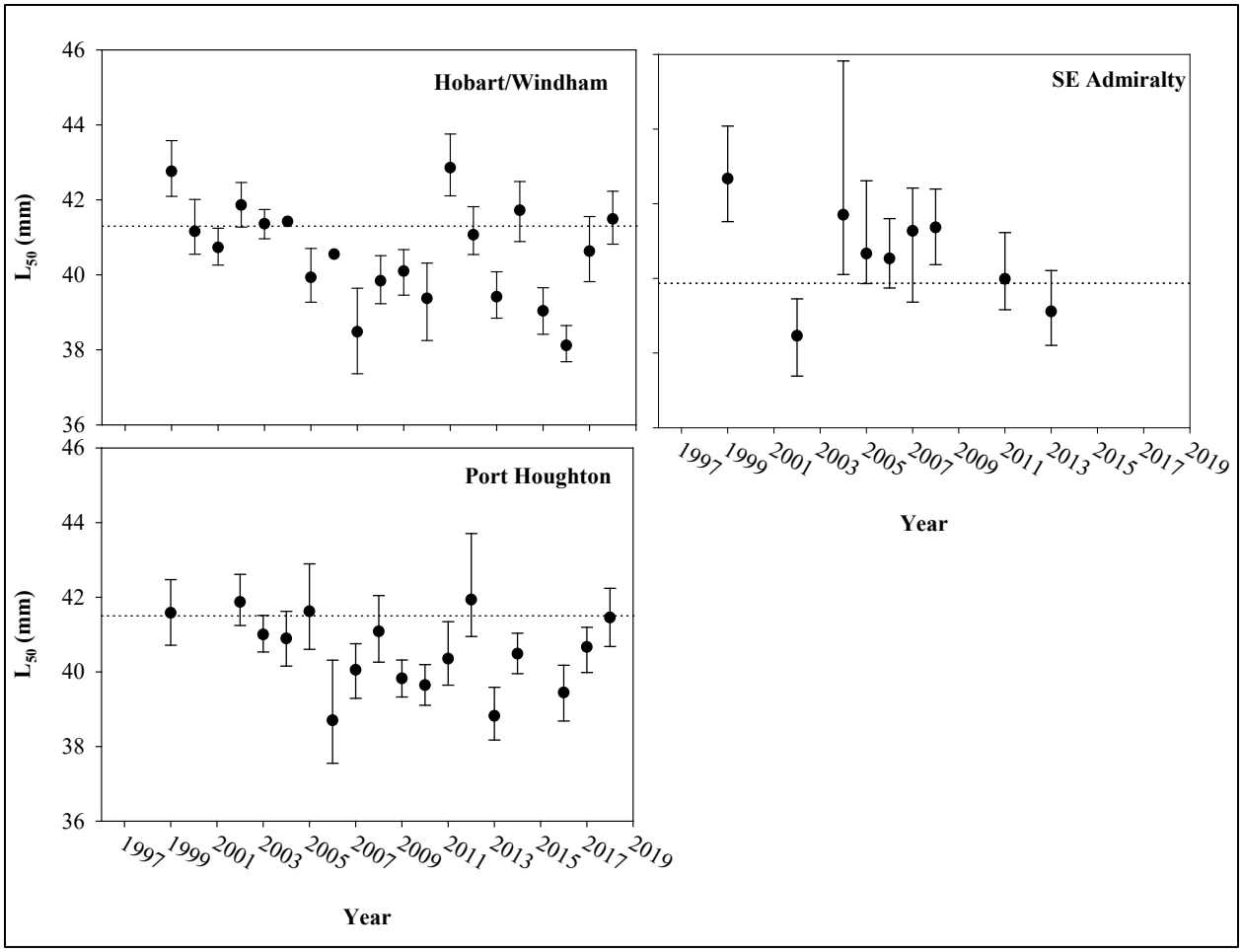


Figure 46.–$L_{50}$ and 95% confidence intervals of spot shrimp from floating processor, on-the-grounds and dockside sampling in Northern Frederick Sound, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

## SITKA MANAGEMENT AREA

### District 9

The GHL in District 9 has changed 4 times since the 1998/99 season. It was increased 20% from 15,000 to 18,000 lb in the 2000/01 fishing season, where it remained until the 2011/12 season when it was reduced to 14,000 lb. It was further reduced by 20% to 11,000 lb prior to the 2015/16 season. A further 40% reduction was implemented prior to the 2018/19 season due to continued declining standardized CPUE. Over the last 10 years, harvest has averaged 14,300 lb (107% of the GHL) (Table 26). District 9 is divided into 4 analysis areas: Eliza Harbor, Keku Strait/Port Camden, SE Baranof Island, and Western Kuiu Island (Table 2). The analysis area composition of the harvest is variable, but most harvest comes from Eliza Harbor and SE Baranof Island. There were no landings from Keku Strait or Western Kuiu Island during the 2011/12 to 2018/19 fishing seasons.

The only data available for this district are standardized commercial CPUE. Overall district CPUE declined severely in the 2018/19. District CPUE has been below baseline for 12 consecutive seasons (Figure 47). This strong decline was driven by a decline in the Eliza Harbor Analysis Area where standardized CPUE is the lowest since standardization was possible and is currently 36% of the baseline with a significant 4-year declining trend (Table 27, Figure 48).

There was no 2018/19 season logbook, dockside, nor OTG data collected in this district.

Manager scores for this district were negative in SE Baranof Island and neutral in all other areas.

The overall matrix score is -0.87 (Poor), which was down from -0.70 (Poor) in 2017/18 due to standardized CPUE in Elisa Harbor showing a significant 4-year decline. District 9 has a 0.12 (very low) level of data confidence.

Table 26.–District 9 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 |
| Actual GHL (lb spot shrimp) | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 14,000 |
| Recommended GHL or stock status | Moderate | – | 18,000 | Moderate | Moderate | Below Average | Below Average | Moderate |
| Season length (days) | 30 | 19 | 16 | 14 | 12 | 24 | 49 | 10 |
| Landings (number) | 45 | 40 | 32 | 27 | 36 | 37 | 45 | 13 |
| Harvest (lb spot shrimp) | 17,911 | 20,252 | 24,113 | 17,336 | 17,139 | 18,960 | 21,893 | 10,799 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 | 18,000 |
| Actual GHL (lb spot shrimp) | 14,000 | 14,000 | 14,000 | 11,000 | 11,000 | 11,000 | 6,500 |
| Recommended GHL or stock status | Below Average | Below Average | Poor | Below Average | Poor | Poor | Poor |
| Season length (days) | 11 | 11 | 10 | 8 | 8 | 9 | 10 |
| Landings (number) | 35 | 38 | 40 | 28 | 19 | 21 | 8 |
| Harvest (lb spot shrimp) | 16,184 | 15,243 | 18,495 | 12,213 | 12,757 | 10,809 | 5,442 |

*Note*: En dash = not available.

Table 27.–District 9 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Eliza Harbor | | | Keku Strait/Port Camden | | |
|---|---|---|---|---|---|---|---|
| Area weighting | | 0.4 | | | 0.025 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 5.7 | 2.1 | -1.00 | – | No effort | – |
| 4-yr trend in CPUE | fish tickets | – | Sig. dec. | -0.25 | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – |
| Manager score | | – | – | 0 | – | – | 0 |
| Score | | – | – | -1.20 | – | – | 0.00 |
| Max. possible score | | – | – | 2.25 | – | – | 1.00 |
| Stock Status | | – | – | – | – | – | – |
| Confidence | | – | – | 0.18 | – | – | 0.06 |

-continued-

Table 27.–Page 2 of 2.

| Analysis Area | | SE Baranof | | | Western Kuiu | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.55 | | | 0.025 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 4.1 | No effort | – | – | No effort | – | -0.33 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | – | – | -0.17 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – |
| Manager score | | – | – | -1.00 | – | – | 0 | -0.37 |
| Score | | – | – | -1.00 | – | – | 0.00 | -0.87 |
| Max. possible score | | – | – | 1.00 | – | – | 1.00 | 1.17 |
| Stock Status | | – | – | – | – | – | – | Poor |
| Confidence | | – | – | 0.06 | – | – | 0.06 | 0.12 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

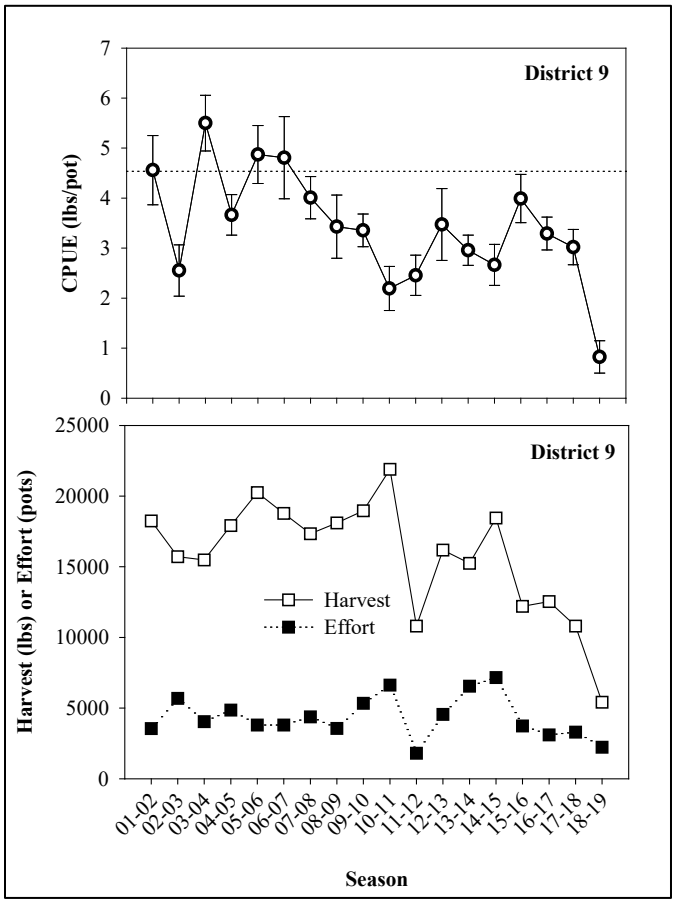


Figure 47.–Districtwide CPUE and effort data for District 9, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

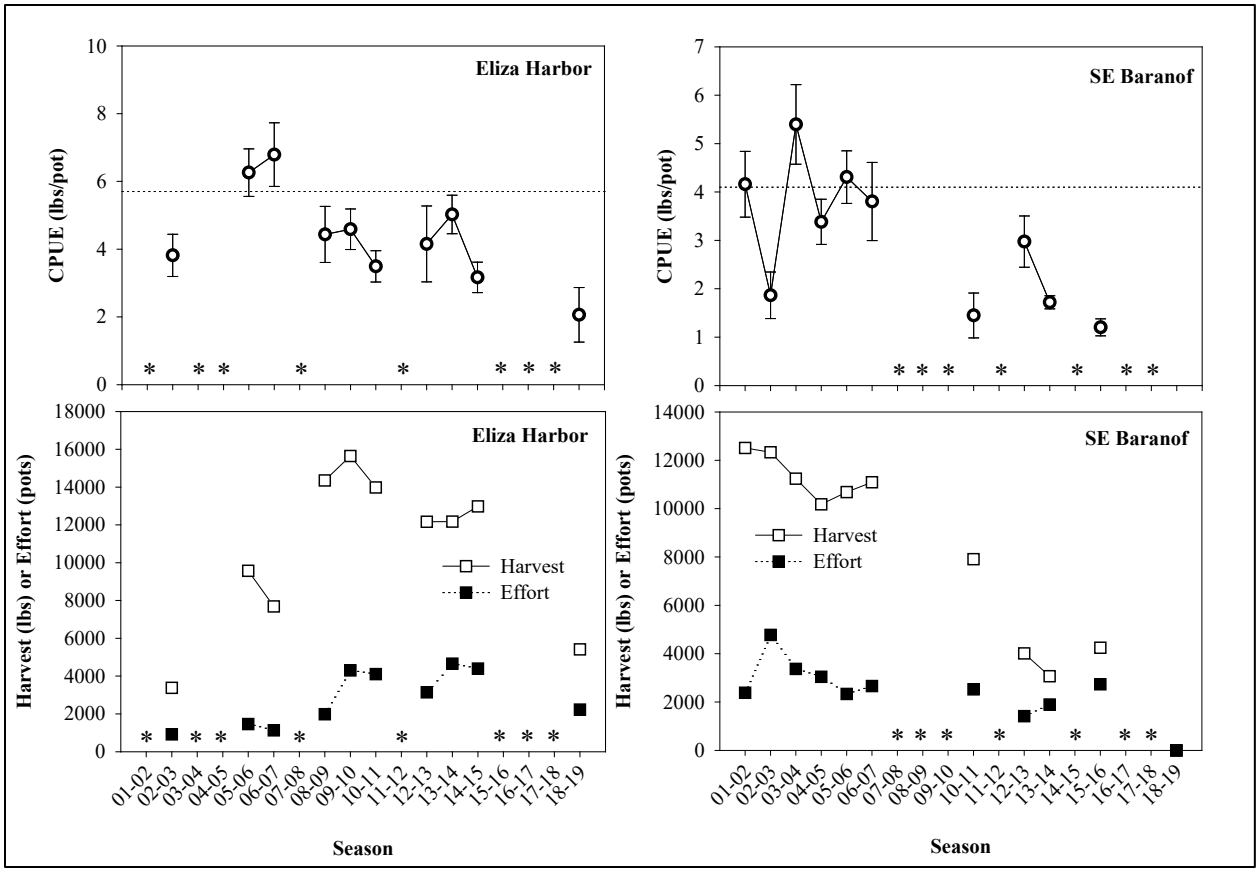


Figure 48.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 9, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

## District 13

### *Sections 13-A/B*

Sections 13-A/B were divided from Section 13-C with a GHL of 15,000 lb beginning with the 2000/01 season; prior to this, the GHL for all of District 13 was 40,000 lb. Over the past 10 seasons, harvest has averaged 15,200 lb (101% of the GHL) (Table 28). This district is divided into 4 analysis areas: Crawfish, Larch/Branch Bays, Necker Bay, and Whale Bay (Table 2).

Sectionwide standardized commercial CPUE decreased strongly from last season and is now at baseline (Figure 49). This decline was driven by large declines in standardized CPUE in the Crawfish (38% of the 2017/18 level) and Whale Bay (42% of the 2017/18 level) analysis areas, which are both now at baseline and showing no 4-year trends. Standardized CPUE in the Necker analysis area remains above baseline (Table 29, Figure 50).

The manager scores are neutral for all areas (Table 29).

The overall matrix score is 0.14 (Moderate) down from 0.25 (Above Average) in the 2017/18 due to the Crawfish and Whale Bay analysis areas no longer being above baseline. Section 13-A/B has a 0.18 (low) data confidence.

Table 28.–Sections 13-A/B matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 | 2012/13 |
|---|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Actual GHL (lb spot shrimp) | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Recommended GHL or stock status | – | Moderate | 15,000 | Moderate | Moderate | Below Average | Moderate | Moderate | Above Average |
| Season length (days) | 152 | 30 | 17 | 14 | 120 | 151 | 151 | 64 | 229 |
| Landings (number) | 54 | 37 | 19 | 17 | 21 | 21 | 21 | 28 | 21 |
| Harvest (lb spot shrimp) | 18,306 | 13,194 | 16,819 | 11,606 | 11,902 | 9,301 | 11,193 | 15,345 | 13,836 |

| Season | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|
| Upper regulatory GHR | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Actual GHL (lb spot shrimp) | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Recommended GHL or stock status | Below Average | Below Average | Below Average | Moderate | Above Average | Moderate |
| Season length (days) | 56 | 32 | 30 | 30 | 3 | 13 |
| Landings (number) | 48 | 49 | 43 | 43 | 15 | 21 |
| Harvest (lb spot shrimp) | 16,681 | 17,572 | 14,615 | 16,692 | 20,702 | 12,913 |

*Note*: En dash = not available.

Table 29.–Sections 13-A/B matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Crawfish | | | Larch/Branch Bays | | |
|---|---|---|---|---|---|---|---|
| Area weighting | | 0.3 | | | 0.0 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.1 | 1.2 | 0.00 | – | No effort | – |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – |
| Manager score | | – | – | 0.00 | – | – | 0.00 |
| Score | | – | – | 0.00 | – | – | 0.00 |
| Max. possible score | | – | – | 2.25 | – | – | 1.00 |
| Stock Status | | – | – | – | – | – | – |
| Confidence | | – | – | 0.18 | – | – | 0.06 |

-continued-

Table 29.–Page 2 of 2.

| Analysis Area | | Necker | | | Whale Bay | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.3 | | | 0.4 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.7 | * | -1.00 | 2.4 | 1.7 | 0.00 | 0.14 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – |
| Manager score | | – | – | 0.00 | – | – | 0.00 | 0.00 |
| Score | | – | – | 0.00 | – | – | 0.00 | 0.14 |
| Max. possible score | | – | – | 2.00 | – | – | 2.25 | 1.17 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.12 | – | – | 0.18 | 0.18 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

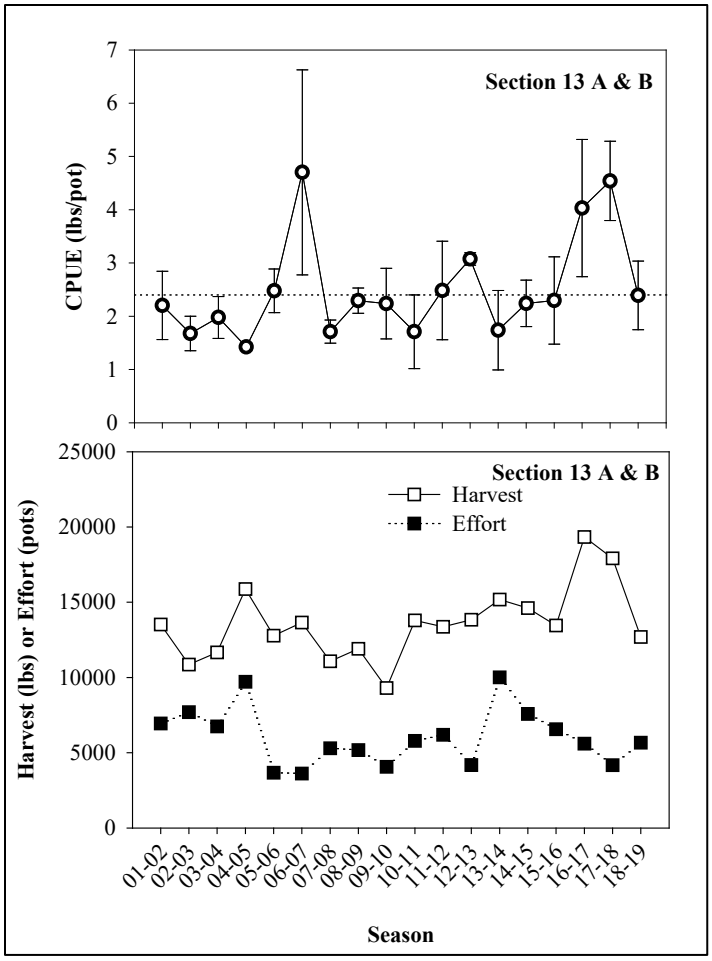


Figure 49.–Sectionwide CPUE and effort data for Sections 13A and B, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

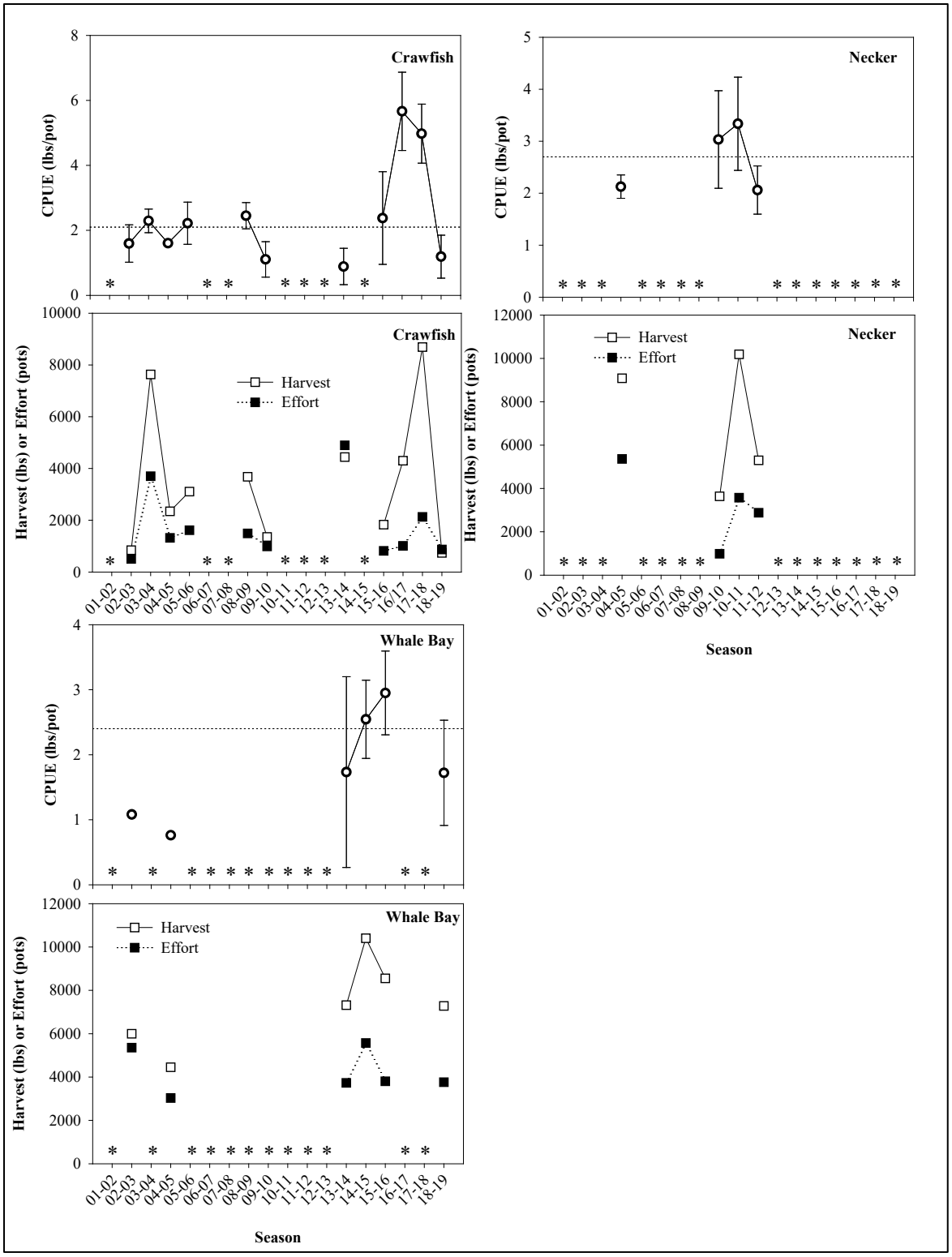


Figure 50.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Sections 13-A/B, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

### *Section 13-C*

Section 13-C was divided from Sections 13-A/B with a GHL of 25,000 lb beginning with the 2000/01 season; prior to this, the GHL for all of District 13 was 40,000 lb. Subsequently, the Section 13-C GHL was increased 40% to 42,000 lb for the 2004/05 fishing season. Due to survey results and poor fishery performance, the GHL was reduced 20% to 34,000 lb for the 2007/08 season, reduced 12% to 30,000 lb for the 2008/09 season, reduced to 26,000 lb prior to the 2013/14 season, and finally reduced to 16,000 lb for the 2017/18 season (Table 30). Over the last 10 seasons, harvest has averaged 25,650 lb (100% of the GHL). This section is divided into 2 analysis areas: Hoonah Sound and Peril Strait (Table 2).

The annual preseason survey in Hoonah Sound was suspended beginning in the fall of 2015 due to budgetary constraints. However, in response to strong declines in commercial CPUE on the 2016/17 season, the area was surveyed again in 2017 and 2018. Catch rate of large class shrimp increased from the 2017 survey and is now at baseline. However, catch rate of small class shrimp was the lowest in the 18-year history of the survey (Figure 51, Table 31). Mean CL increased dramatically to the second highest on record, although this is at least partially due to the decline in the abundance of small shrimp. The $L_{50}$ values were flat from the 2017 survey and remain below baseline.

No on-the-grounds samples were taken in the 2018/19 season.

The sectionwide standardized commercial CPUE increased for the second season from the historic low in the 2016/17 season. Standardized CPUE in the Hoonah Sound analysis area is now at baseline with no 4-year trend (Table 31, Figure 54). There was too little effort in Peril Strait to conduct statistical tests.

Manager scores are neutral in Hoonah Sound and negative in Peril Strait.

The overall matrix score is -0.13 (Moderate), which was up from -2.30 (Poor) in the 2017/18 season. This increase is due to increasing survey catch rates of large class shrimp and increasing commercial CPUE. Section 13-C has 0.33 (Moderate) data confidence (Table 31).

Table 30.–Section 13-C matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 30,000 | 30,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 |
| Actual GHL (lb spot shrimp) | 42,000 | 42,000 | 42,000 | 34,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| Recommended GHL or stock status | Good | Moderate | 42,000 | Poor | Poor | Below Average | Below Average | Below Average |
| Season length (days) | 5 | 6 | 5 | 7 | 5 | 4 | 6 | 4 |
| Landings (number) | 38 | 63 | 41 | 29 | 30 | 31 | 36 | 49 |
| Harvest (lb spot shrimp) | 34,270 | 43,605 | 36,449 | 29,395 | 29,724 | 25,993 | 33,104 | 37,415 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 |
| Actual GHL (lb spot shrimp) | 26,000 | 26,000 | 26,000 | 26,000 | 26,000 | 16,000 | 16,000 |
| Recommended GHL or stock status | Moderate | Moderate | Moderate | Moderate | Poor | Poor | Moderate |
| Season length (days) | 4 | 4 | 4 | 5 | 5 | 3 | 6 |
| Landings (number) | 37 | 32 | 22 | 22 | 32 | 15 | 14 |
| Harvest (lb spot shrimp) | 29,048 | 23,171 | 26,532 | 26,228 | 27,946 | 12,782 | 14,316 |

Table 31.–Section 13-C matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Hoonah Sound | | | Peril Strait | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.8 | | | 0.2 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | 3.0 | 2.9 | 0.00 | – | – | – | 0.00 |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 5.3 | 4.3 | 0.00 | 3.7 | * | – | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | – | – | – | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | 37.8 | 39.5 | 1.00 | – | – | – | 0.67 |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | 36.1 | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | 42.1 | 40.7 | -1.00 | – | – | – | -0.67 |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – |
| Manager score | | – | – | 0.00 | – | – | -1 | -0.13 |
| Score | | – | – | 0.00 | – | – | -1.00 | -2.30 |
| Max. possible score | | – | – | 5.25 | – | – | 1.00 | 3.5 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.35 | – | – | 0.06 | 0.33 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

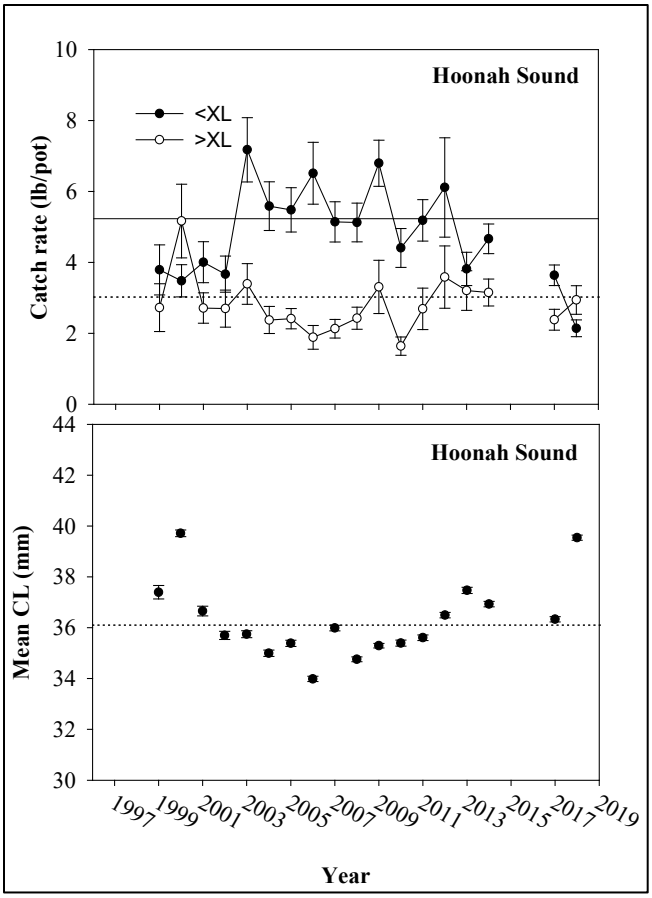


Figure 51.–Mean and standard error of spot shrimp catch rate (upper panels) and carapace length (lower panels) from preseason surveys in Section 13-C, 1999–2018. Lines represent the long-term baselines.

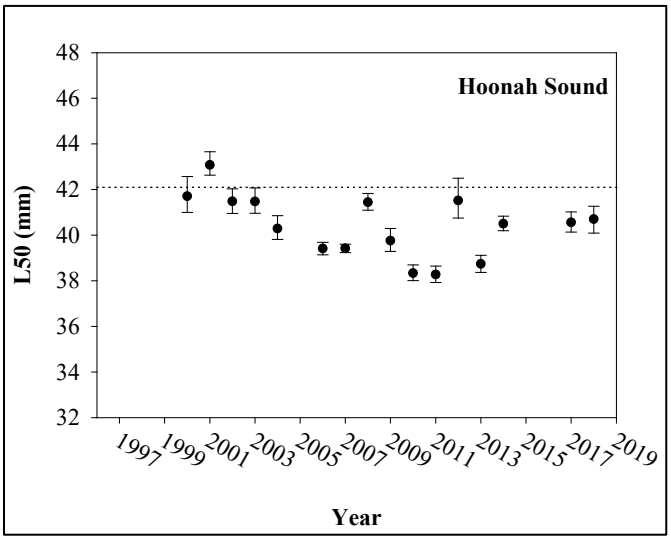


Figure 52.–$L_{50}$ and 95% confidence intervals of spot shrimp from preseason surveys in Section 13-C, 1999–2018 seasons. Dotted line represents the long-term baseline.

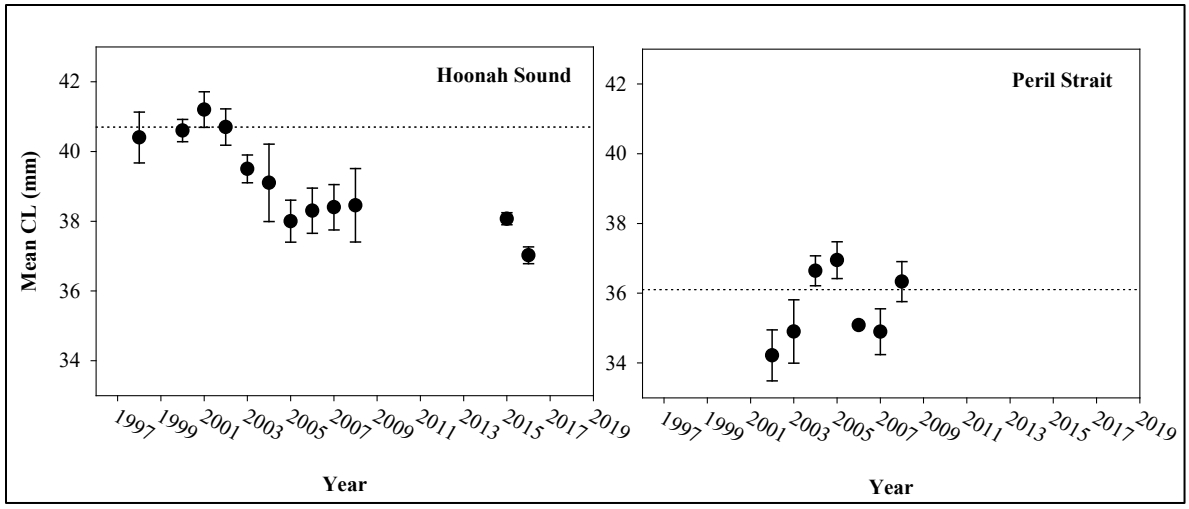


Figure 53.–Mean and standard error of spot shrimp carapace length from floating processor and on-the-grounds sampling in Section 13C, 1998/99–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

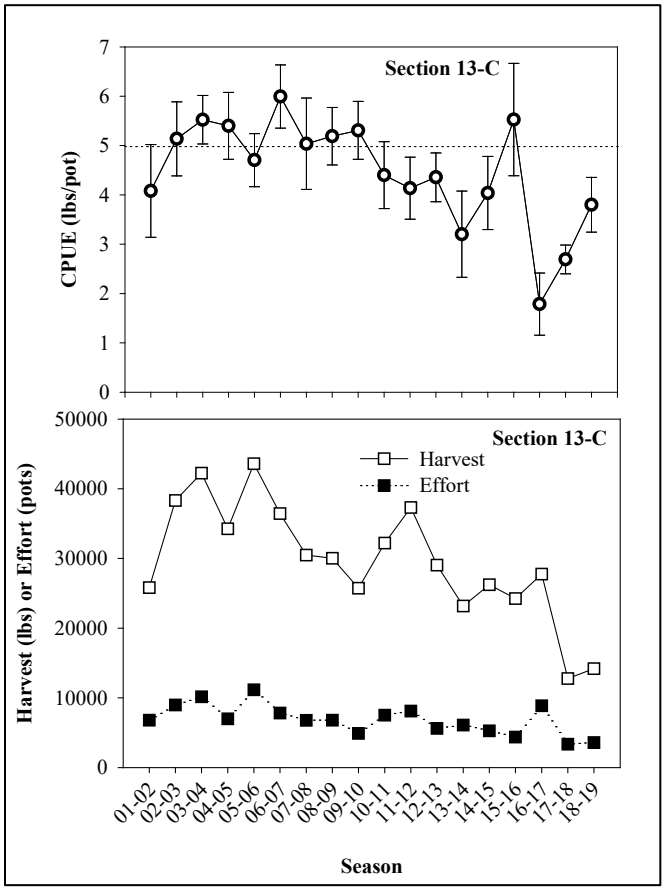


Figure 54.–Sectionwide CPUE and effort data for Section 13C, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

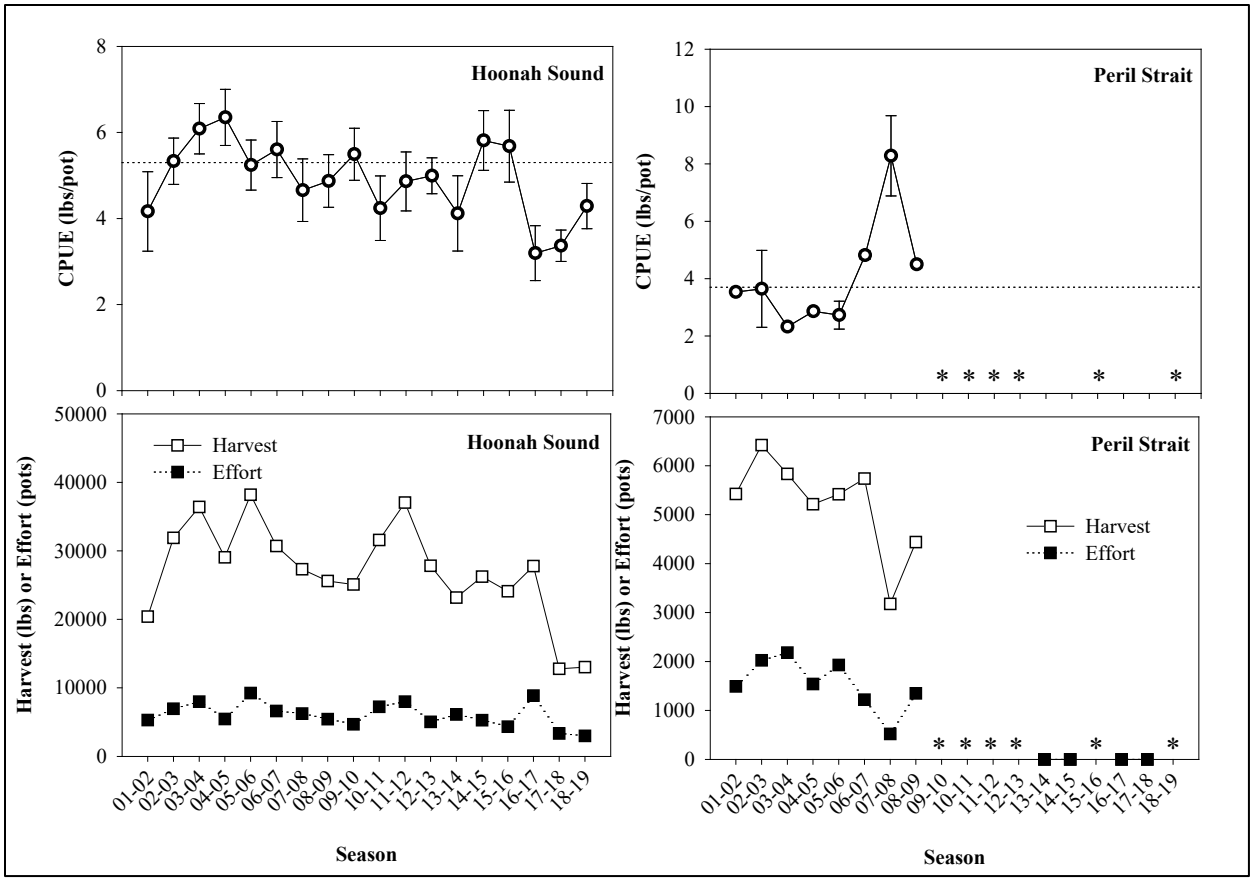


Figure 55.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Section 13-C, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

## JUNEAU MANAGEMENT AREA

### District 11

#### *Seymour Canal*

Seymour Canal was split from the Remainder of District 11 starting with the 2012/13 fishing season. The GHR of spot shrimp is 0–30,000 lb. The 2012/13 GHL was set using an experimental system on the grounds. A traditional GHL of 15,000 lb was implemented for the 2013/14 season and reduced to 12,000 lb prior to the 2014/15 season due to declining catch rates. Over the last 10 years, harvest has averaged 16,200 lb (1.02% of GHL) (Table 32). Seymour Canal contains 1 analysis area (Table 2).

Standardized commercial CPUE decreased strongly from the 2017/18 season and is now at similar levels to the previous 5 seasons. It remains below the long-term baseline and shows no 4-year trend (Table 33, Figure 56).

Logbook based catch rate of large class shrimp showed an increasing trend in the 2017/18 season but showed no trend for the 2018/19 season (Table 33). Logbook based harvest rate of large shrimp showed a 20% (low) harvest.

Manager score for Seymour Canal is negative.

The overall matrix score is 0.33 (Moderate), which is down from 0.83 (Above Average) for the 2017/18 season, based on declining standardized CPUE, logbook catch rates or large class shrimp, and manager score. This decrease was offset by the low harvest rate. Seymour Canal has a 0.33 (Moderate) level of data confidence (Table 33).

Table 32.–Seymour Canal matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | | 20,000 all District 11 | | | |
| Actual GHL (lb spot shrimp) | | | | | 20,000 all District 11 | | | |
| Recommended GHL or stock status | Moderate | | 16,000 | Moderate | Moderate | Above Average | Moderate | Below Average |
| Season length (days) | 43 | 43 | 19 | 15 | 19 | 10 | 10 | 6 |
| Landings (number) | * | 20 | * | * | * | 24 | 26 | 30 |
| Harvest (lb spot shrimp) | * | 15,565 | * | * | * | 25,287 | 23,209 | 20,879 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 | 30,000 |
| Actual GHL (lb spot shrimp) | Experimental | 15,000 | 12,000 | 12,000 | 12,000 | 12,000 | 12,000 |
| Recommended GHL or stock status | Poor | Poor | Below Average | Below Average | Below Average | Above Average | Moderate |
| Season length (days) | 8 | 8 | 12 | 11 | 9 | 9 | 8 |
| Landings (number) | 30 | 21 | * | * | * | * | 22 |
| Harvest (lb spot shrimp) | 21,970 | 13,007 | * | * | * | * | 11,456 |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 33.–Seymour Canal matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Seymour Canal | | | |
|---|---|---|---|---|---|
| Area weighting | | | 1.0 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 7.4 | 4.0 | -1.00 | -0.33 |
| 4-yr trend in CPUE | fish tickets | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | No trend | 0.00 | 1.00 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | 19.6% | 1.00 | 1.00 |
| Mean CL | survey | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – |
| Mean CL | OTG | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – |
| Mean CL | DS | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – |
| $L_{50}$ | OTG/DS | 40.6 | – | – | – |
| Manager score | | – | – | -0.50 | -0.33 |
| Score | | – | – | -0.50 | 0.33 |
| Max. possible score | | – | – | 4.25 | 3.17 |
| Stock Status | | – | – | – | Moderate |
| Confidence | | – | – | 0.33 | 0.33 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

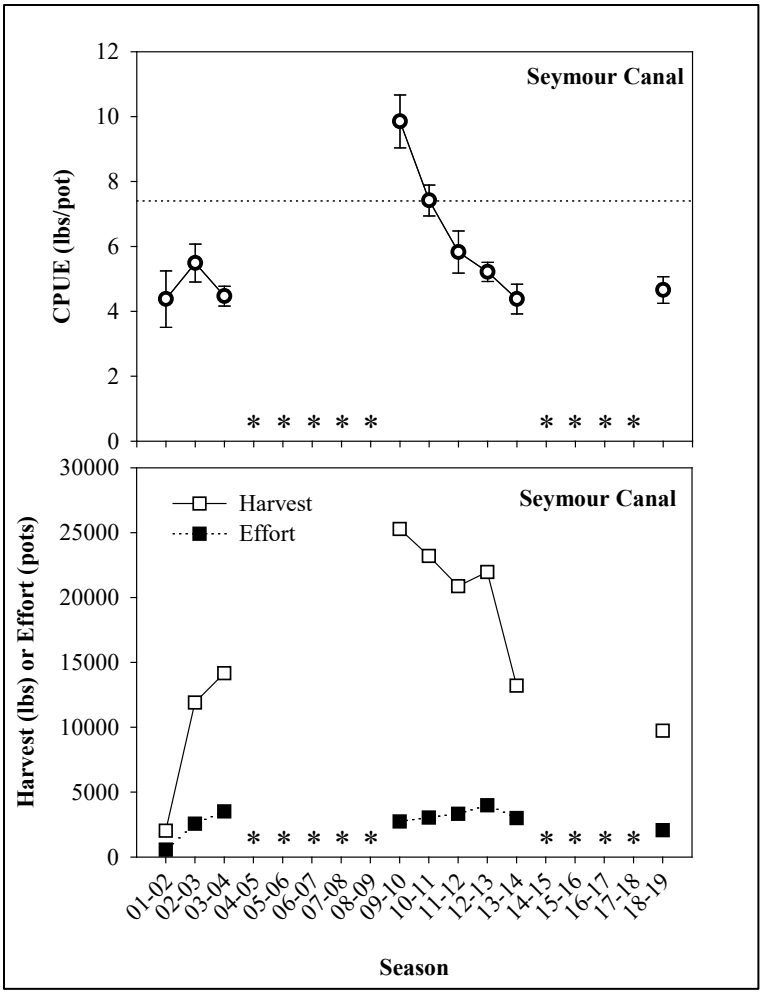


Figure 56.–Mean and standard error of spot and coonstripe shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by in Seymour Canal, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating.

### *Remainder of District 11*

The GHL for spot and coonstripe shrimp in District 11 had been 20,000 lb since the 1995/96 fishing season. Beginning with the 2012/13 fishing season, Seymour Canal was divided from the remainder of the district and the remainder was given an exploratory GHL of 7,500 lb. Due to stock declines, a 4,000 lb GHL was implemented prior to the 2017/18 season. There has been a steady decline in the coonstripe and a corresponding increase in the spot shrimp harvest in this fishing area. Over the last 10 years, harvest has averaged 4,800 lb (72% of GHL) (Table 34). The Remainder of District 11 is divided into 2 analysis areas: 11-A and Glacier-fed Bays (Table 2).

Overall weighted CPUE for the Remainder of District 11 decreased slightly and is once again at the lowest levels since standardization was possible (Figure 57). This is driven by the standardized CPUE in the Glacier-fed Bays analysis area decreasing to a historically low-level (Table 35, Figure 58). The 11-A analysis area was closed beginning with the 2013/14 season due to poor stock health.

Logbook catch rates of ≥XL shrimp increased from previous seasons (Table 35).

Manager score is negative for the Glacier-fed Bays analysis area (Table 35).

The overall matrix score is 0.67 (Above Average), which is down from 1.00 (Above Average) in the 2017/18 season due to decreased CPUE. The Remainder of District 11 management area has a 0.07 (Very Low) level of data confidence (Table 35).

Table 34.–District 11 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | 20,000 all District 11 | | | | |
| Actual GHL (lb shrimp) | | | | 20,000 all District 11 | | | | |
| Recommended GHL or stock status | Moderate | | 16,000 | Moderate | Moderate | Moderate | Moderate | Moderate |
| Season length (days) | 43 | 43 | 19 | 15 | 19 | 10 | 10 | 6 |
| Landings (number) | 52 | 44 | * | 30 | * | * | * | * |
| Harvest (lb shrimp) | 5,500 | 7,816 | * | 4,226 | * | * | * | * |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Actual GHL (lb shrimp) | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 4,000 | 4,000 |
| Recommended GHL or stock status | Below Average | Above Average | Moderate | Moderate | Poor | Above Average | Above Average |
| Season length (days) | 143 | 19 | 21 | 35 | 151 | 19 | 30 |
| Landings (number) | 20 | 21 | 24 | 28 | 34 | 15 | * |
| Harvest (lb shrimp) | 6,466 | 7,818 | 5,774 | 5,600 | 4,583 | 4,399 | * |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 35.–District 11 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | 11-A | | | Glacier-fed Bays | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.75 | | | 0.25 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | – | Closed | – | 1.9 | * | -1.00 | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | Sig. inc. | 1.00 | 1.00 |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | 70.7% | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – |
| Manager score | | – | – | – | – | – | 0.00 | 0.00 |
| Score | | – | – | 0.00 | – | – | 0.00 | 0.67 |
| Max. possible score | | – | – | 0.00 | – | – | 3.25 | 2.17 |
| Stock Status | | – | – | – | – | – | – | Above Average |
| Confidence | | – | – | 0.00 | – | – | 0.24 | 0.07 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

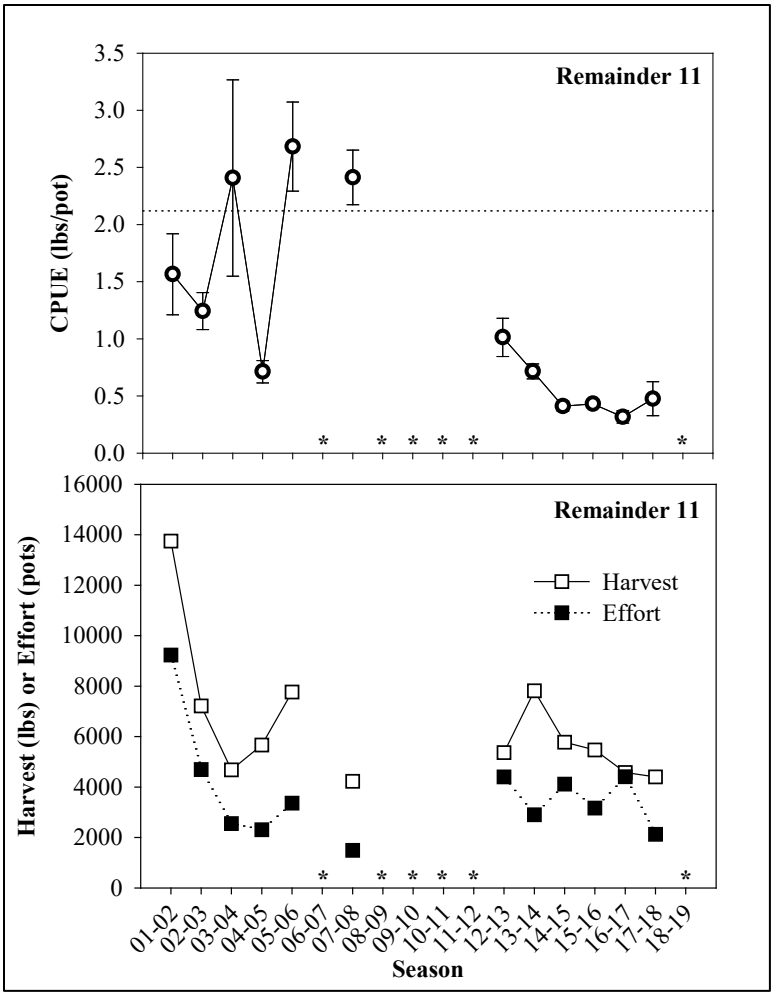


Figure 57.–Areawide CPUE and effort data for the Remainder of District 11, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

*Note*: * indicates confidential data with less than 3 permits participating.

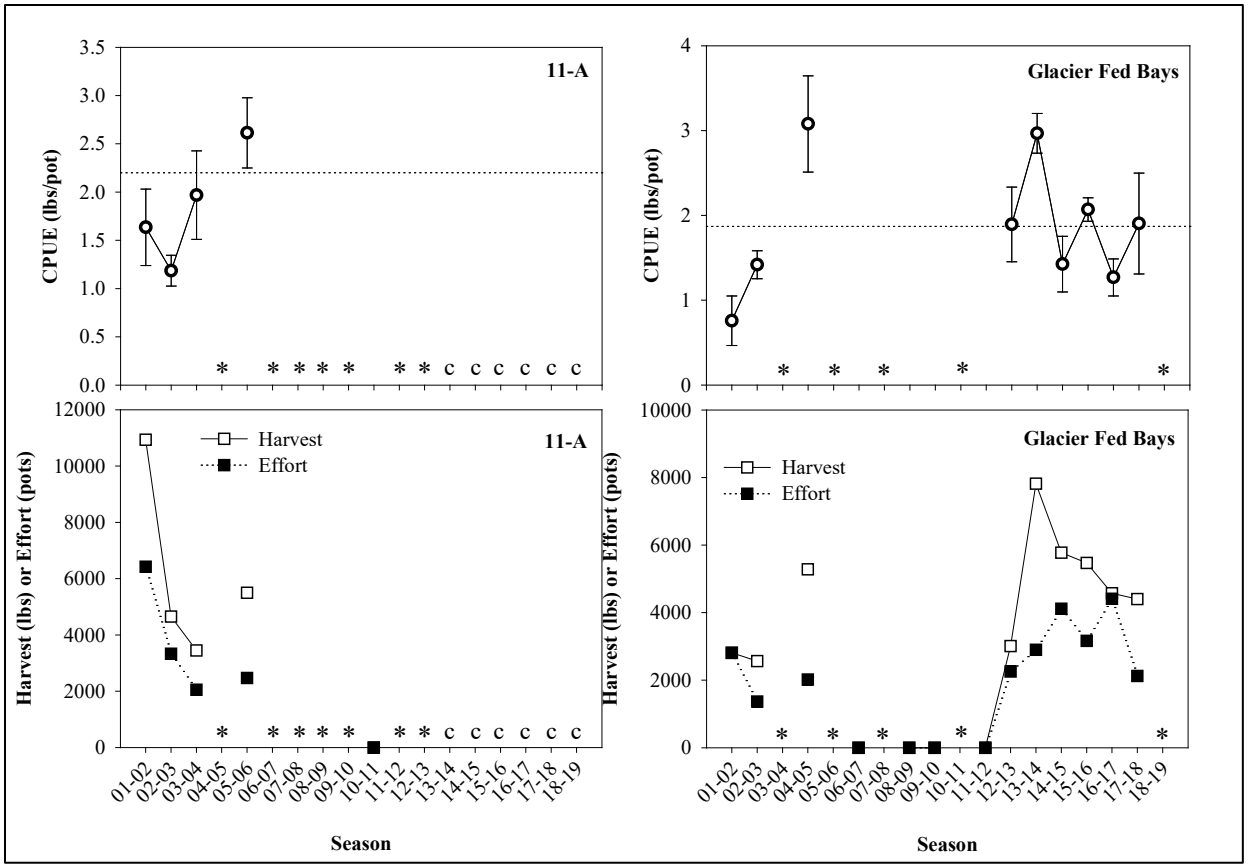


Figure 58.–Mean and standard error of spot and coonstripe shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in the remainder of District 11, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

## District 12

### *Tenakee Inlet*

Tenakee Inlet was divided from the rest of District 12 beginning with the 2001/02 fishing season with a GHR of 0–20,000 lb and a GHL of 20,000 lb. The upper end of the GHR was increased to 34,000 lb prior to the 2005/06 fishing season and the GHL was increased 30% to 28,000 lb. In response to declines in survey and fishery CPUE, the GHL was reduced 40% to 17,000 lb for the 2008/09 fishing season. Due to continued declines in stock status, the GHL was further lowered by 40% to 10,000 lb for the 2010/11 season and was closed to commercial fishing prior to the 2011/12 season. In 2012, Tenakee Inlet was closed to sport and personal use harvests. It was reopened with an exploratory GHL of 7,500 lb for the 2018/19 season. Over the last 10 years when the commercial fishery was open, harvest averaged 20,050 lb (99% of the GHL) (Table 36). This district is divided into 2 analysis areas: East Tenakee Inlet and West Tenakee Inlet (Table 2).

The preseason survey was discontinued in East Tenakee Inlet in 2015.

Survey CPUE of shrimp in West Tenakee Inlet dropped precipitously during the 2011 survey to the lowest level in the history of the survey, and then dropped further in 2012. There was a very slight increase in 2013, then strong increases were seen from 2014 to 2016. The 2017 survey showed a very slight decline, but 2018 showed another increase. The survey catch rate of large class shrimp in West Tenakee is now at baseline and shows an increasing 4-year trend. The 2018 survey also showed a strong increase catch rate of small class shrimp, which is now at the highest level in 14 years (Table 37, Figure 59). Mean CL from the survey remained at baseline and continues to show a decline in the 4-year analysis; this is likely partially due to the increased presence of small class shrimp (Table 37, Figure 59). Survey $L_{50}$ declined slightly and is now below baseline (Table 37, Figure 60).

There was insufficient commercial effort for statistical tests (Table 37, Figures 60 and 61).

Manager scores were neutral.

The overall matrix score is -0.58 (Moderate), which is down from 0.08 (Moderate) in the 2017/18 season due to decreased survey $L_{50}$ values. Tenakee Inlet has a 0.36 (Moderate) level of confidence.

Table 36.–Tenakee Inlet matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 34,000 | 34,000 | 34,000 | 34,000 | 34,000 | 34,000 | 34,000 |
| Actual GHL (lb spot shrimp) | 20,000 | 28,000 | 28,000 | 28,000 | 17,000 | 17,000 | 10,000 | Closed |
| Recommended GHL or stock status | Moderate | Good | 28,000 | Moderate | Poor | Below Average | Above Average | Closed |
| Season length (days) | 3 | 5 | 4 | 3 | 4 | 3 | 2 | Closed |
| Landings (number) | 23 | 45 | 34 | 26 | 11 | 15 | 15 | Closed |
| Harvest (lb spot shrimp) | 23,729 | 36,435 | 30,032 | 18,086 | 12,270 | 10,981 | 14,152 | Closed |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 34,000 | 34,000 | 34,000 | 34,000 | 34,000 | 34,000 | 34,000 |
| Actual GHL (lb spot shrimp) | Closed | Closed | Closed | Closed | Closed | Closed | 7,500 |
| Recommended GHL or stock status | Closed | Closed | Closed | Closed | Closed | Closed | Moderate |
| Season length (days) | Closed | Closed | Closed | Closed | Closed | Closed | 2 |
| Landings (number) | Closed | Closed | Closed | Closed | Closed | Closed | * |
| Harvest (lb spot shrimp) | Closed | Closed | Closed | Closed | Closed | Closed | * |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 37.–Tenakee Inlet matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | East Tenakee | | | West Tenakee | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.1 | | | 0.9 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | 3.7 | – | – | 7.1 | 7.51 | 0.00 | 0.00 |
| 4-yr trend in catch rate | survey | – | – | – | – | Sig. inc. | 0.25 | 0.25 |
| Std. Comm. CPUE | fish tickets | 4.5 | Closed | – | 7.0 | * | – | – |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | 35.4 | – | – | 38.9 | 38.2 | 0.00 | 0.00 |
| 4-yr trend in CL | survey | – | – | – | – | Sig. dec. | -0.25 | -0.17 |
| Mean CL | OTG | – | – | – | 41.1 | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | 40.4 | – | – | 43 | 42.9 | -1.00 | -0.67 |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – |
| Manager score | | – | – | – | – | – | 0.00 | 0.00 |
| Score | | – | – | – | – | – | -1.00 | -0.58 |
| Max. possible score | | – | – | 0.00 | – | – | 4.50 | 3.42 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.00 | – | – | 0.40 | 0.36 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

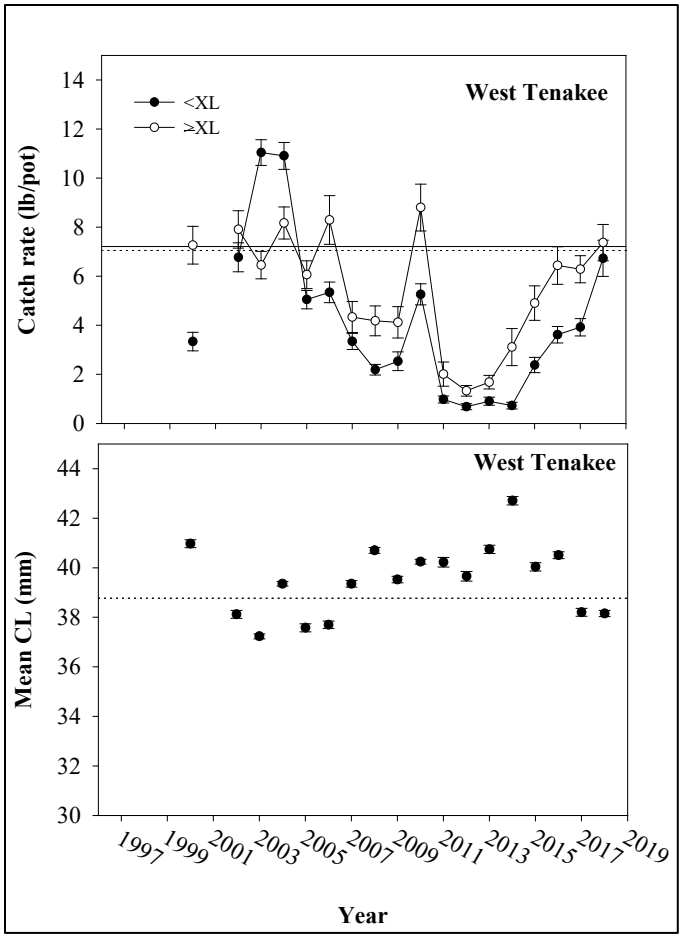


Figure 59.–Mean and standard error of spot shrimp catch rate (upper panels), and carapace length (lower panels) from preseason surveys in West Tenakee Inlet, 2000–2018. Lines represent the long-term baselines.

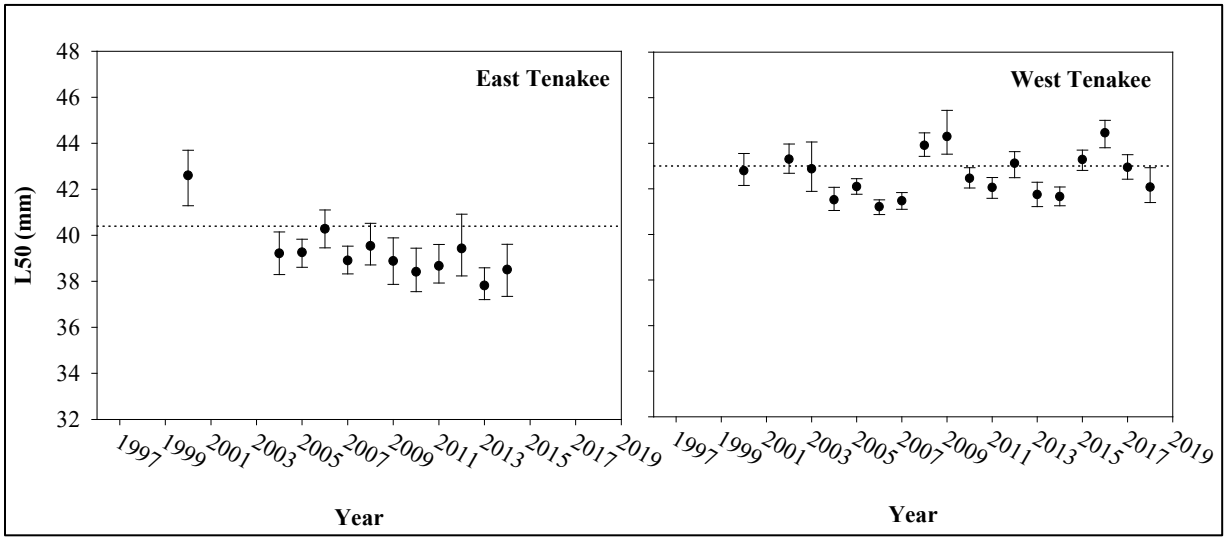


Figure 60.–$L_{50}$ and 95% confidence intervals of spot shrimp from preseason surveys in West Tenakee Inlet, 2000–2018. Dotted line represents the long-term baseline.

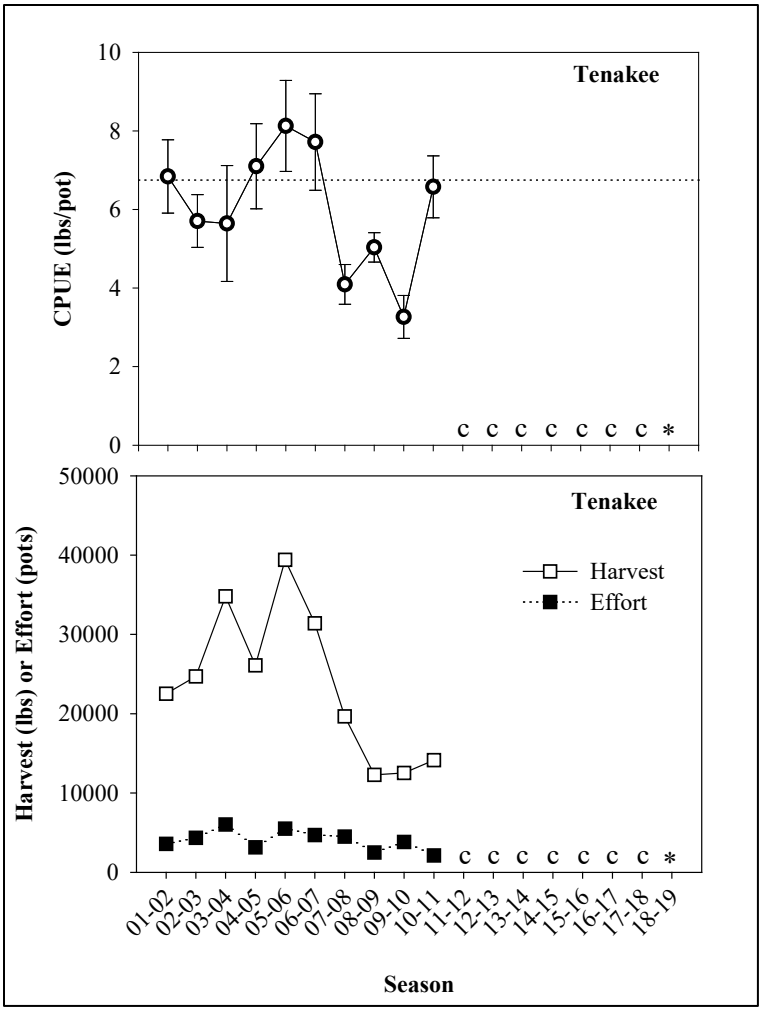


Figure 61.–Areawide CPUE and effort data for Tenakee Inlet, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

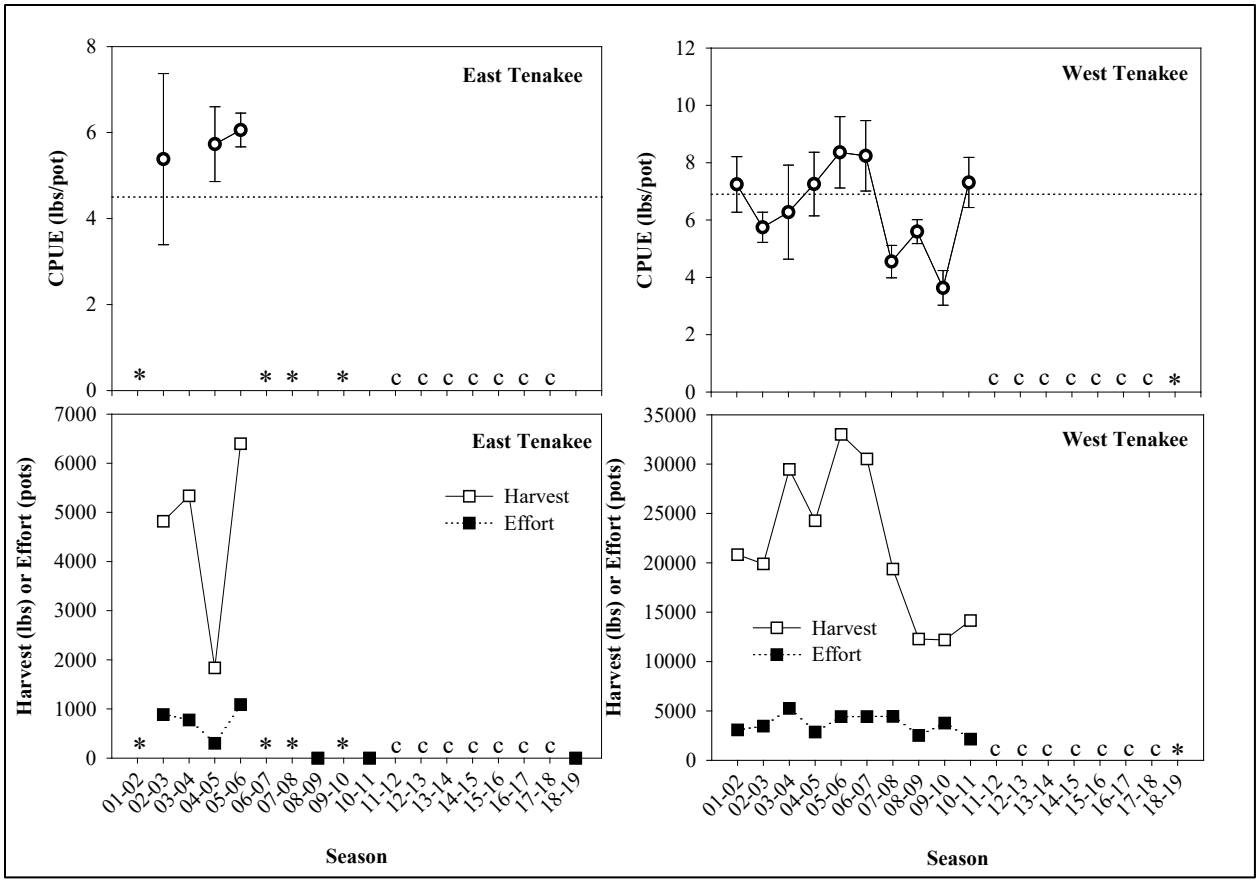


Figure 62.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in Tenakee Inlet, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

### *Remainder of District 12*

Remainder of District 12 was established prior to the 2001/02 season with a GHR of 0–15,000 lb, and the GHL was set at the upper end of the GHR. The GHL was reduced 33% to 10,000 lb for the 2008/09 fishing season. Due to declining CPUE, the Remainder of District 12 was closed prior to the 2012/13 fishing season. It was reopened at a reduced GHL of 7,500 lb for the 2015/16 season and closed for the 2016/17 season (Table 38). Over the last 10 years that the fishery was open, harvest has averaged 10,800 lb (94% of the GHL). This district is divided into 3 analysis areas: Freshwater Bay, Kelp Bay, and Pt. Couverden (Table 2). The proportion of harvest which had come from Kelp Bay relative to the Freshwater Bay analysis area had increased prior to the closure.

Due to the lack of stock recovery in the 2015/16 season after a 3-year closure, the Remainder of District 12 was closed for another 3-year period beginning with the 2016/17 season. This decision was based on the surveyed stock recovery in nearby West Tenakee Inlet where a measurable increase in survey CPUE was not seen until 4 years after the closure of the commercial, sport, and personal use fisheries. Sport and personal use fishing remain open in the Remainder of District 12.

Table 38.–Remainder of District 12 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Actual GHL (lb spot shrimp) | 15,000 | 15,000 | 15,000 | 15,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| Recommended GHL or stock status | – | – | 15,000 | Moderate | Poor | Below Average | Poor | Poor |
| Season length (days) | 23 | 16 | 12 | 10 | 9 | 10 | 19 | 42 |
| Landings (number) | 51 | 34 | 39 | 28 | 24 | 27 | 26 | 38 |
| Harvest (lb spot shrimp) | 17,627 | 13,521 | 18,552 | 15,958 | 12,383 | 7,908 | 8,953 | 6,336 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Actual GHL (lb spot shrimp) | Closed | Closed | Closed | 7,500 | Closed | Closed | Closed |
| Recommended GHL or stock status | Closed | Closed | Closed | Poor | Closed | Closed | Closed |
| Season length (days) | Closed | Closed | Closed | 9 | Closed | Closed | Closed |
| Landings (number) | Closed | Closed | Closed | 23 | Closed | Closed | Closed |
| Harvest (lb spot shrimp) | Closed | Closed | Closed | 5,238 | Closed | Closed | Closed |

*Note*: En dash = not available.

Table 39.–Remainder of District 12 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Freshwater Bay | | | Kelp Bay | | | Pt. Couverden | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.2 | | | 0.7 | | | 0.1 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.5 | Closed | – | 3.2 | Closed | – | 2.3 | Closed | – | – |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | – | – | – | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – | – | – | – |
| Manager score | | – | – | – | – | – | – | – | – | – | – |
| Score | | – | – | 0.00 | – | – | 0.00 | – | – | 0.00 | – |
| Max. possible score | | – | – | 0.00 | – | – | 0.00 | – | – | 0.00 | – |
| Stock Status | | – | – | – | – | – | – | – | – | – | Closed |
| Confidence | | – | – | 0.00 | – | – | 0.00 | – | – | 0.00 | – |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

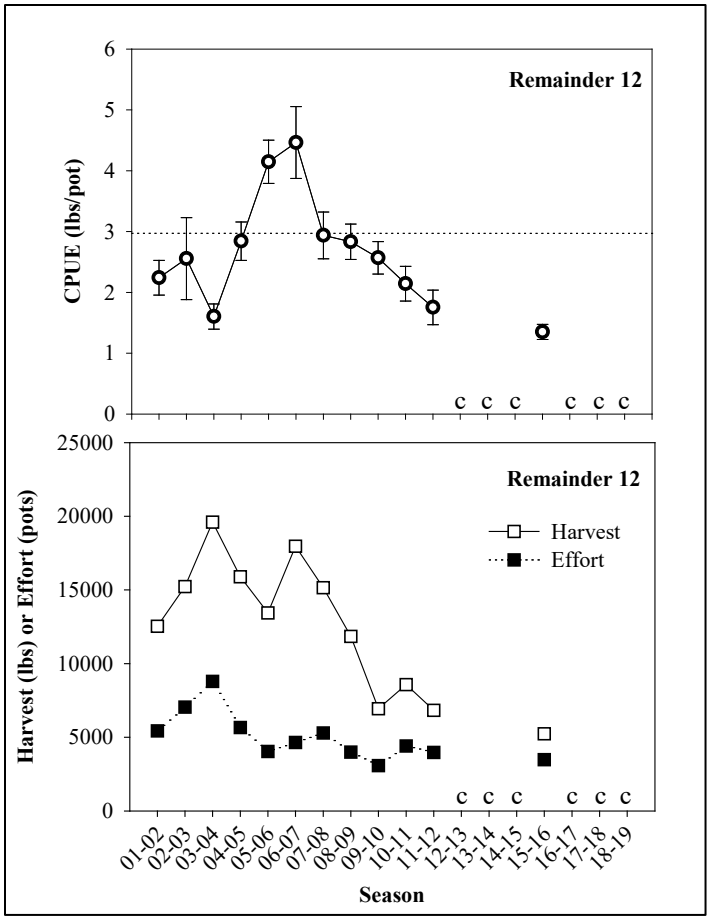


Figure 63.–Areawide CPUE and effort data for the Remainder of District 12, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance. “c” indicates fishery closure.

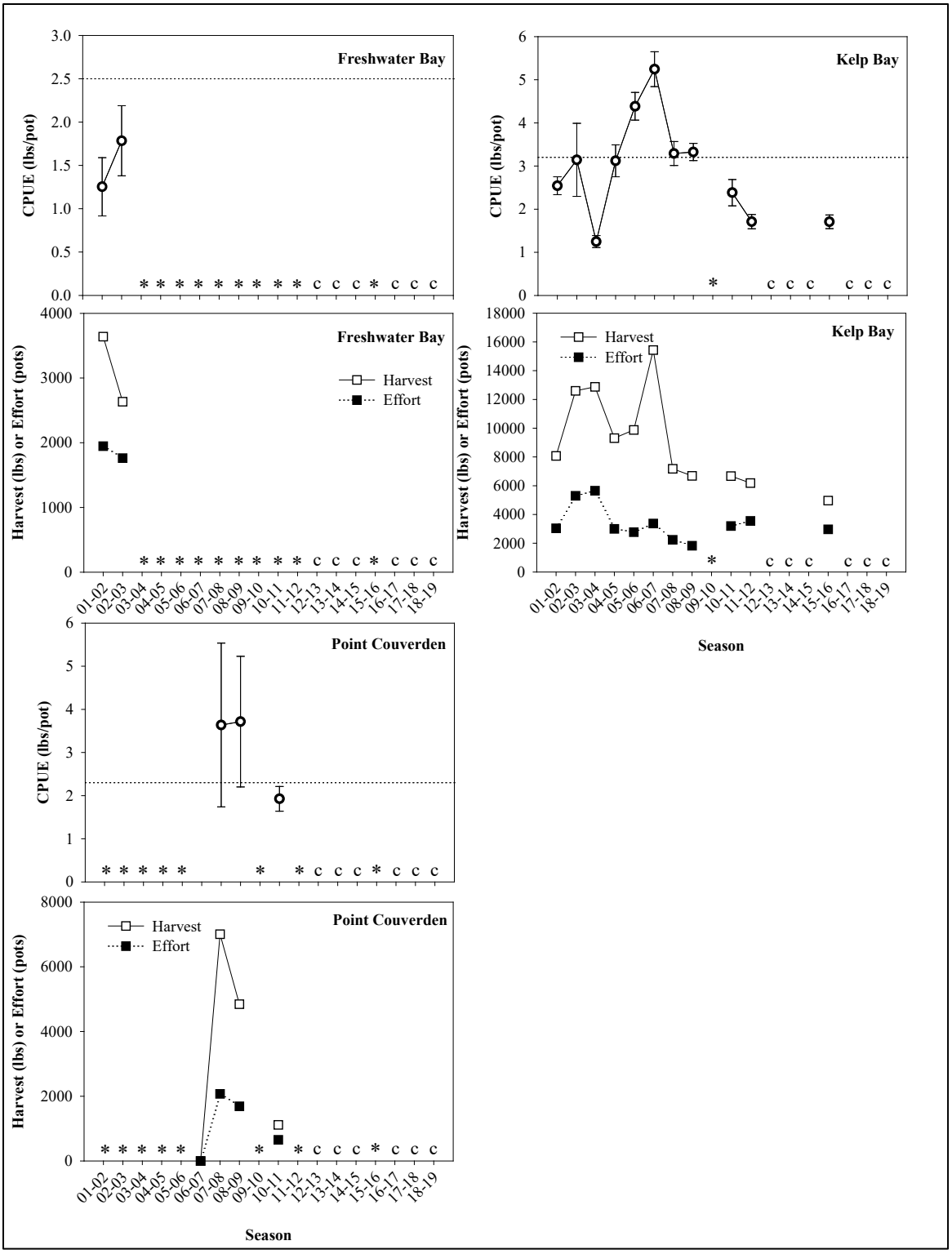


Figure 64.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in the remainder of District 12, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

## District 14

In response to concerns over fishery performance, the GHL for spot shrimp in District 14 was reduced from 20,000 lb to 15,000 lb (-25%) beginning with the 2006/07 fishing season, and then to 10,000 lb (-33%) for the 2008/09 season. The district was subsequently closed for the 2009/10–2011/12 seasons and reopened for the 2012/13 season. Due to continued poor performance, the fishery was closed for the 2013/14–2015/16 seasons (Table 40). The District reopened for the 2016/17 season with a 7,500 lb GHL and is currently on a 2-year fishing rotation. Over the past 10 open fishing seasons, harvest averaged 13,100 lb (88% of the GHL). This district is divided into 2 analysis areas: Eastern Icy Strait and Port Frederick (Table 2).

Standardized commercial CPUE increased from the 2016/17 season in the Eastern Icy Strait analysis area, where all the fishing occurred, and is now above baseline (Figure 66). No 4-year analyses were possible due to the 2013/14–2015/16, and 2017/18 closures.

Manager scores were neutral for Eastern Icy Strait.

The overall matrix score was 0.33 (Moderate), which was up from 0.00 (Moderate) in the 2016/17 season due to increases in commercial CPUE. District 14 has a 0.09 (very low) level of data confidence (Table 41).

Table 40.–District 14 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 15,000 | 20,000 | 20,000 |
| Actual GHL (lb spot shrimp) | 20,000 | 20,000 | 15,000 | 15,000 | 10,000 | Closed | Closed | Closed |
| Recommended GHL or stock status | Moderate | – | 10,000 | Poor | Poor | Closed | Closed | Closed |
| Season length (days) | 68 | 151 | 151 | 151 | 120 | Closed | Closed | Closed |
| Landings (number) | 114 | 76 | 74 | 45 | 44 | Closed | Closed | Closed |
| Harvest (lb spot shrimp) | 21,282 | 15,845 | 13,259 | 13,054 | 7,796 | Closed | Closed | Closed |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Actual GHL (lb spot shrimp) | 10,000 | Closed | Closed | Closed | 7,500 | Closed | 7,500 |
| Recommended GHL or stock status | Poor | Closed | Closed | Closed | Moderate | Closed | Moderate |
| Season length (days) | 54 | Closed | Closed | Closed | 11 | Closed | 151 |
| Landings (number) | 53 | Closed | Closed | Closed | 22 | Closed | 27 |
| Harvest (lb spot shrimp) | 8,833 | Closed | Closed | Closed | 6,806 | Closed | 5,039 |

*Note*: En dash = not available.

Table 41.–District 14 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Eastern Icy Strait | | | Port Frederick | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.1 | | | 0.9 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 1.7 | 2.1 | 1.00 | 1.6 | No effort | – | 0.33 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | 40.4 | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | 40.5 | – | – | – | – | – | – |
| Manager score | | – | – | 0.00 | – | – | – | 0.00 |
| Score | | – | – | 1.00 | – | – | 0.00 | 0.33 |
| Max. possible score | | – | – | 0.00 | – | – | 0.00 | 1.00 |
| Stock Status | | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.12 | – | – | 0.00 | 0.09 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

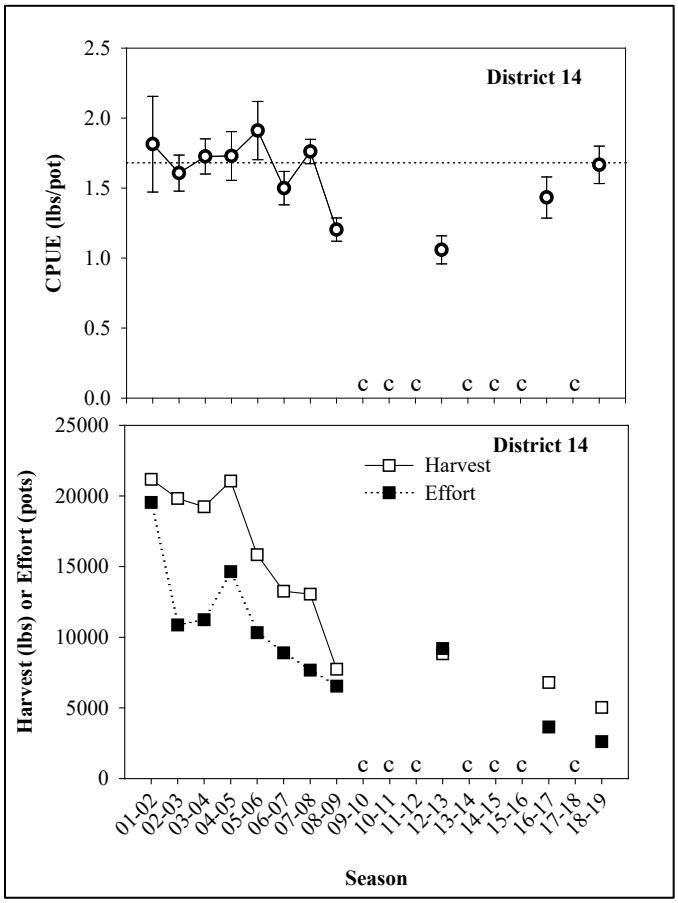


Figure 65.–Districtwide CPUE and effort data for District 14, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance. “c” indicates fishery closure.

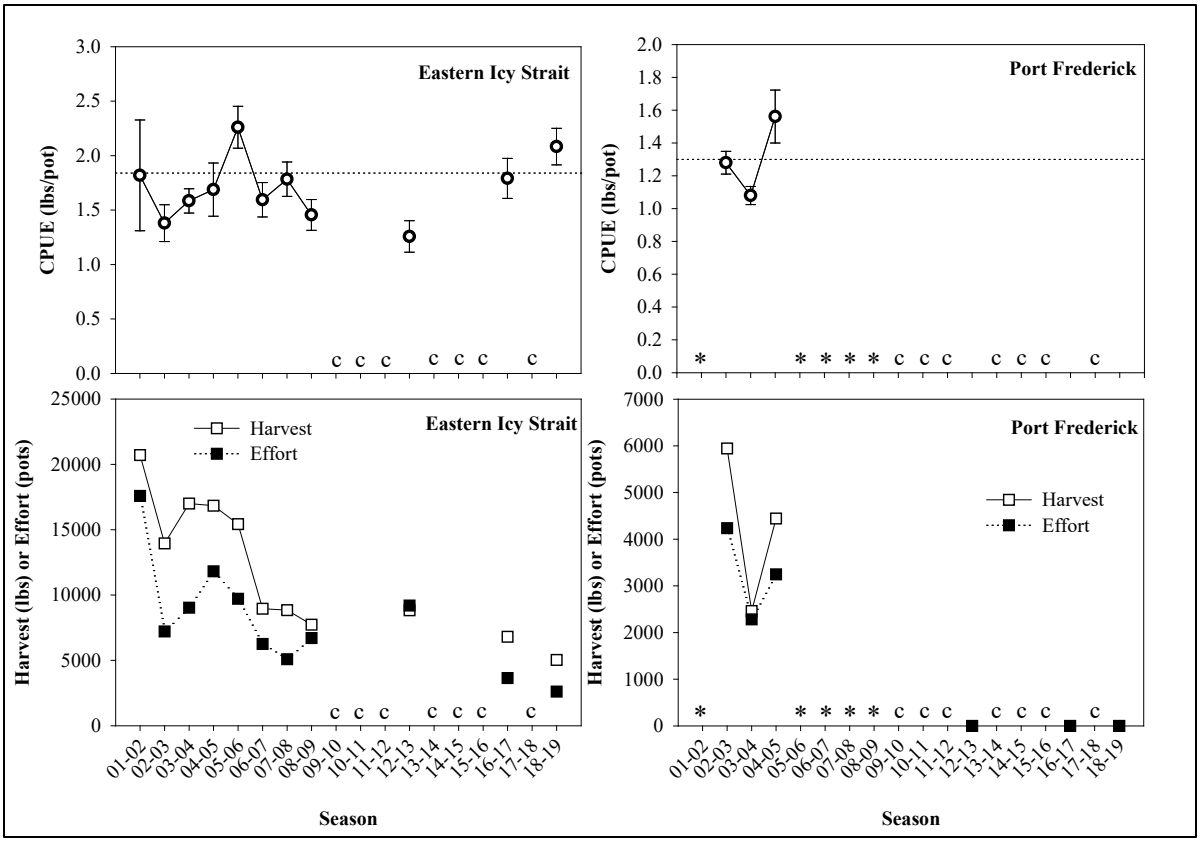


Figure 66.–Mean and standard error of spot shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 14 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

## District 16

The initial GHL in District 16, established for the 1995/96 fishing season, was 20,000 lb of coonstripe shrimp. The GHL was reduced 25% to 15,000 lb for the 2004/05 fishing season. Continuing declines in fishery performance resulted in a 3-year closure from 2005/06 through 2007/08. Following the closure, an every-other-year rotational fishery with a 15,000 lb GHL of combined spot and coonstripe shrimp was implemented beginning with the 2008/09 season. Since 2008/09, harvest has averaged 12,200 lb (81% of the GHL) (Table 42). This district is divided into 2 analysis areas: Lituya Bay and Rest of 16 (Table 2). In recent years, all harvest in the district has come from Lituya Bay.

Standardized commercial CPUE has consistently declined since District 16 was reopened in for the 2008/09 season (Figure 67). Standardized CPUE in Lituya Bay is below baseline (Table 43, Figure 67).

Manager scores were negative for Lituya Bay (Table 43).

The overall matrix score was -1.00 (Poor), which was down from 0.31 (Moderate) in 2016/17. The decrease is due to the loss of logbook data and decreased standardized CPUE. District 16 has a 0.12 (Low) level of data confidence.

Table 42.–District 16 matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Actual GHL (lb) | 15,000 | Closed | Closed | Closed | 15,000 | Closed | 15,000 | Closed |
| Recommended GHL or stock status | Poor | Closed | Closed | Closed | Above Average | Closed | Good | Closed |
| Season length (days) | 151 | Closed | Closed | Closed | 127 | Closed | 54 | Closed |
| Landings (number) | 25 | Closed | Closed | Closed | 22 | Closed | 25 | Closed |
| Harvest (lb shrimp) | 8,347 | Closed | Closed | Closed | 14,381 | Closed | 15,050 | Closed |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 | 20,000 |
| Actual GHL (lb) | 15,000 | Closed | 15,000 | Closed | 15,000 | Closed | 15,000 |
| Recommended GHL or stock status | Above Average | Closed | Above Average | Closed | Moderate | Closed | Poor |
| Season length (days) | 72 | Closed | 72 | Closed | 151 | Closed | 151 |
| Landings (number) | 27 | Closed | 28 | Closed | 21 | Closed | * |
| Harvest (lb) | 14,552 | Closed | 14,118 | Closed | 6,482 | Closed | * |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 43.–District 16 matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Lituya Bay | | | Rest of 16 | | | |
|---|---|---|---|---|---|---|---|---|
| Area weighting | | 1.00 | | | 0.00 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 3.5 | * | -1.00 | – | Closed | – | -0.33 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | 23.4% | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – |
| Mean CL | OTG | – | – | – | – | – | – | – |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – |
| Mean CL | DS | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – | – | – | – |
| Manager score | | – | – | -1.00 | – | – | – | -0.67 |
| Score | | – | – | -2.00 | – | – | 0.00 | -1.00 |
| Max. possible score | | – | – | 2.00 | – | – | 0.00 | 1.00 |
| Stock Status | | – | – | – | – | – | – | Poor |
| Confidence | | – | – | 0.12 | – | – | 0.00 | 0.12 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

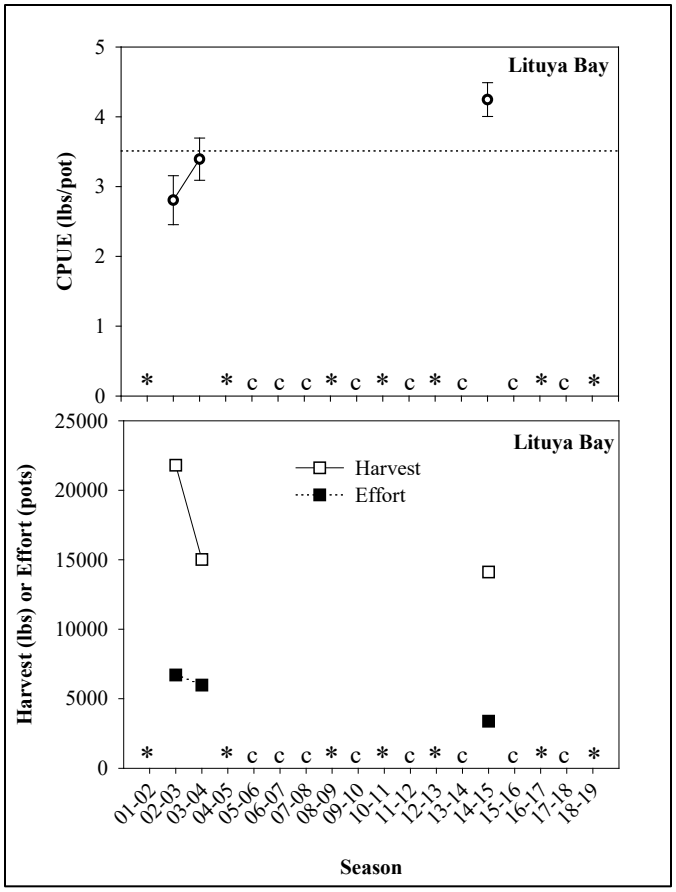


Figure 67.–Mean and standard error of spot and coonstripe shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 16, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

## HAINES MANAGEMENT AREA

### District 15

Historically, the District 15 GHL for coonstripe shrimp was 20,000 lb through the 2004/05 season; it was reduced 25% to 15,000 lb for the 2005/06 season in response to conservation concerns. The district was closed for 3 years from 2006/07 to 2008/09. The District reopened in the 2009/10 season under a new spatial management strategy. Functionally, the District 15 GHL is now managed as 2 separate areas, each with a specific GHL. One GHL of 7,500 lb is specific to "District 15-East," an area comprised by Chilkoot, Lutak, and Taiya Inlets (Table 2). A second 7,500 lb GHL is specified for "District 15-Remainder," which includes only Chilkat Inlet, although if other areas in District 15 are fished in the future, additional analysis areas may be added. These area descriptions and GHLs are used as a management tool only and are not in regulation.

#### *District 15-East*

This area was managed for a 7,500 lb GHL since reopening in 2009/10 until the 2018/19 season when the GHL was reduced to 3,500 lb and all areas but Taiya Inlet were closed due to stock health concerns. During this time, harvest has averaged 6,400 (92% of the GHL) (Table 44).

Standardized CPUE increased slightly in Taiya Inlet and remains at baseline with no 4-year trend (Table 45, Figure 68).

On-the-grounds based carapace length is at baseline with an increasing 4-year trend (Table 45, Figure 69).

Manager scores were neutral in Taiya Inlet (Table 45).

The overall matrix score is 0.25 (Moderate), which is up from -0.32 (Below Average) in the 2017/18 season. This increase is due to the loss of poor fishery indicators with the closure of Chilkoot and Lutak Inlets. District 15-East has a 0.16 (low) data confidence (Table 45).

#### *District 15-Remainder*

This area has been managed for a 7,500 lb GHL since reopening in 2009/10. During this time harvest has averaged 3,300 lb (44% of the GHL) (Table 46).

Standardized CPUE dropped precipitously in the 2015/16 season to the lowest on record in the Southeast pot shrimp fishery. There was no harvest in the District 15-Remainder during the 2016/17season. The 2017/18 and 2018/19 seasons have shown standardized CPUE at baseline (Table 47, Figure 72).

On-the-grounds based carapace length is below baseline (Table 47, Figure 73).

Manager scores were neutral (Table 47).

The overall matrix score is -0.67 (Below Average), down from 0.00 (Moderate) in the 2017/18 season. This decrease is due to the addition of negative On-the-grounds carapace length data. District 15-Remainder has a 0.18 (low) data confidence (Table 45).

Table 44.–District 15-East matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | | 20,000 all District 15 | | | |
| Actual GHL (lb coonstripe shrimp) | | 15,000 | Closed | Closed | Closed | 7,500 | 7,500 | 7,500 |
| Recommended GHL or stock status | Poor | Poor | Closed | Closed | Closed | Good | Above Average | Moderate |
| Season length (days) | 229 | 151 | Closed | Closed | Closed | 151 | 151 | 28 |
| Landings (number) | 14 | 3 | Closed | Closed | Closed | 29 | 31 | 27 |
| Harvest (lb coonstripe shrimp) | 1,248 | 680 | Closed | Closed | Closed | 6,588 | 7,164 | 7,936 |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | 20,000 all District 15 | | | |
| Actual GHL (lb coonstripe shrimp) | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 3,500 |
| Recommended GHL or stock status | Above Average | Moderate | Moderate | Moderate | Moderate | Below Average | Moderate |
| Season length (days) | 99 | 39 | 34 | 151 | 229 | 229 | 64 |
| Landings (number) | 36 | 43 | 41 | * | 20 | 19 | 17 |
| Harvest (lb coonstripe shrimp) | 7,386 | 7,868 | 8,689 | * | 3,666 | 3,614 | 3,882 |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 45.–District 15-East matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Chilkoot Inlet | | | Lutak Inlet | | | Tayia Inlet | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Area weighting | | 0.25 | | | 0.20 | | | 0.55 | | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Baseline | Value | Score | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – | – | – | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 2.0 | Closed | – | 1.6 | Closed | – | 1.9 | 2.0 | 0.00 | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – | – | – | – | No trend | 0.00 | 0.00 |
| Catch rate ≥XL | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – | – | – | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – | – | – | – | – | – | – |
| Mean CL | survey | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – | – | – | – | – | – | – |
| Mean CL | OTG | 34.8 | – | – | 33.4 | – | – | 34.5 | 34.3 | 0 | 0.00 |
| 4-yr trend in CL | OTG | – | – | – | – | – | – | – | Sig. inc. | 0.25 | 0.25 |
| Mean CL | DS | – | – | – | – | – | – | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – | – | – | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | 30.5 | – | – | 31.3 | – | – | – |
| Manager score | | – | – | – | – | – | – | – | – | 0 | 0.00 |
| Score | | – | – | 0.00 | – | – | 0.00 | – | – | 0.25 | 0.25 |
| Max. possible score | | – | – | 0.00 | – | – | 0.00 | – | – | 3.50 | 2.08 |
| Stock Status | | – | – | – | – | – | – | – | – | – | Moderate |
| Confidence | | – | – | 0.00 | – | – | 0.00 | – | – | 0.18 | 0.16 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

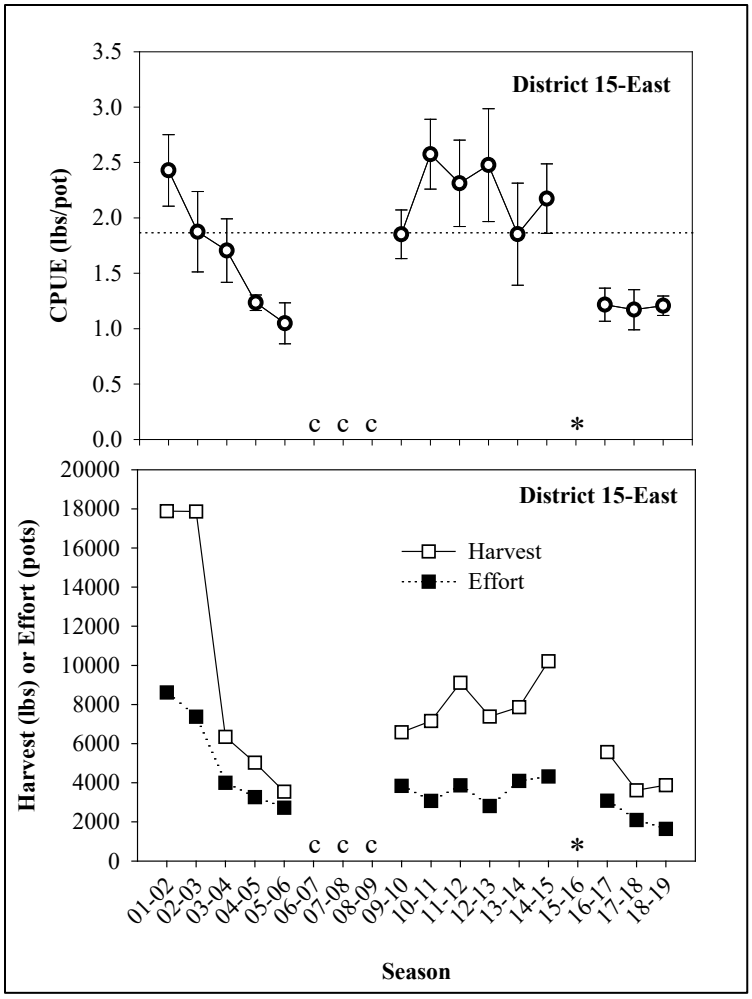


Figure 68.–Areawide CPUE and effort data for District 15-East, 2001/02–2018/19 seasons. CPUE is weighted by analysis area weights to allow for an overall impression of fishery performance.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

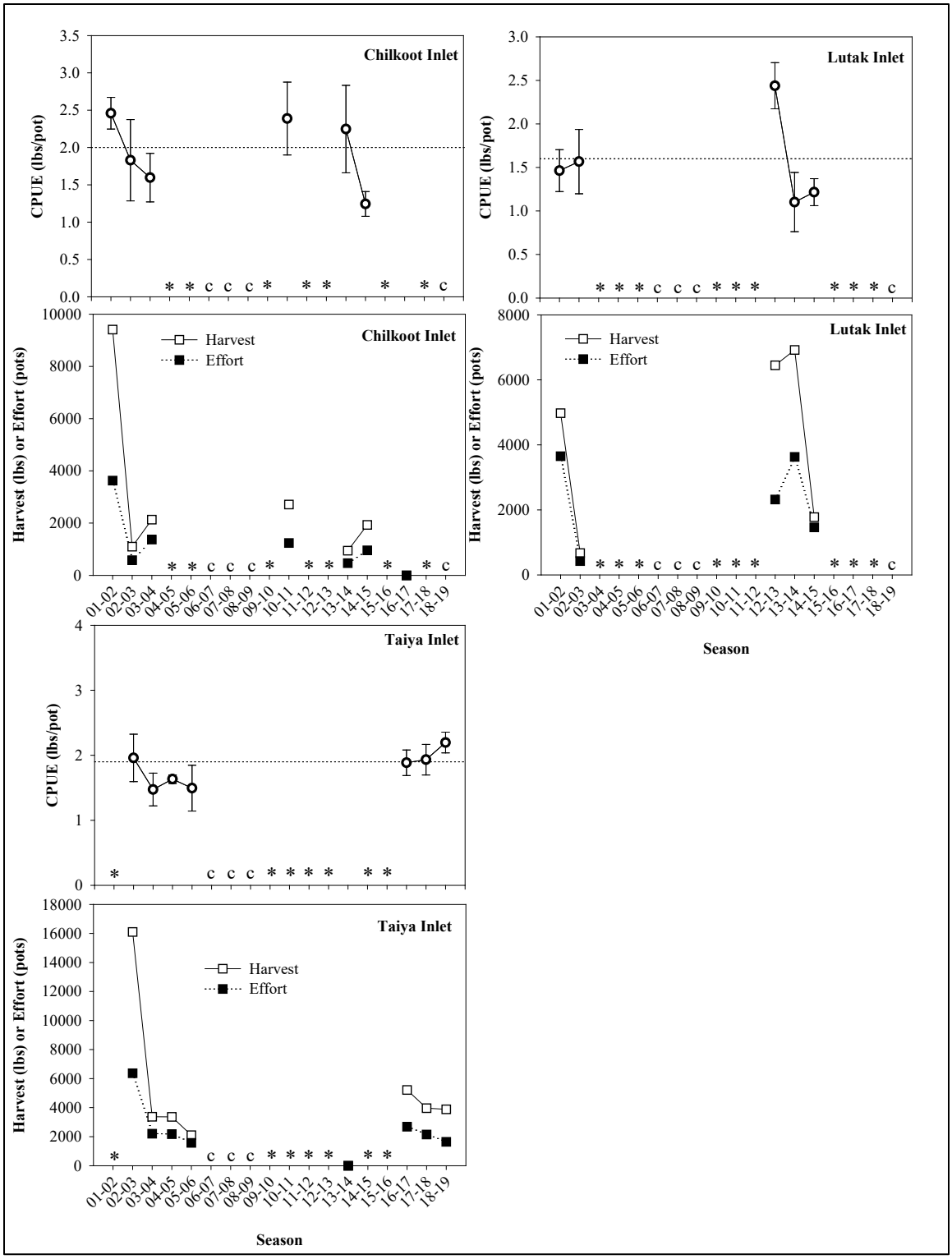


Figure 69.–Mean and standard error of coonstripe shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 15-East, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

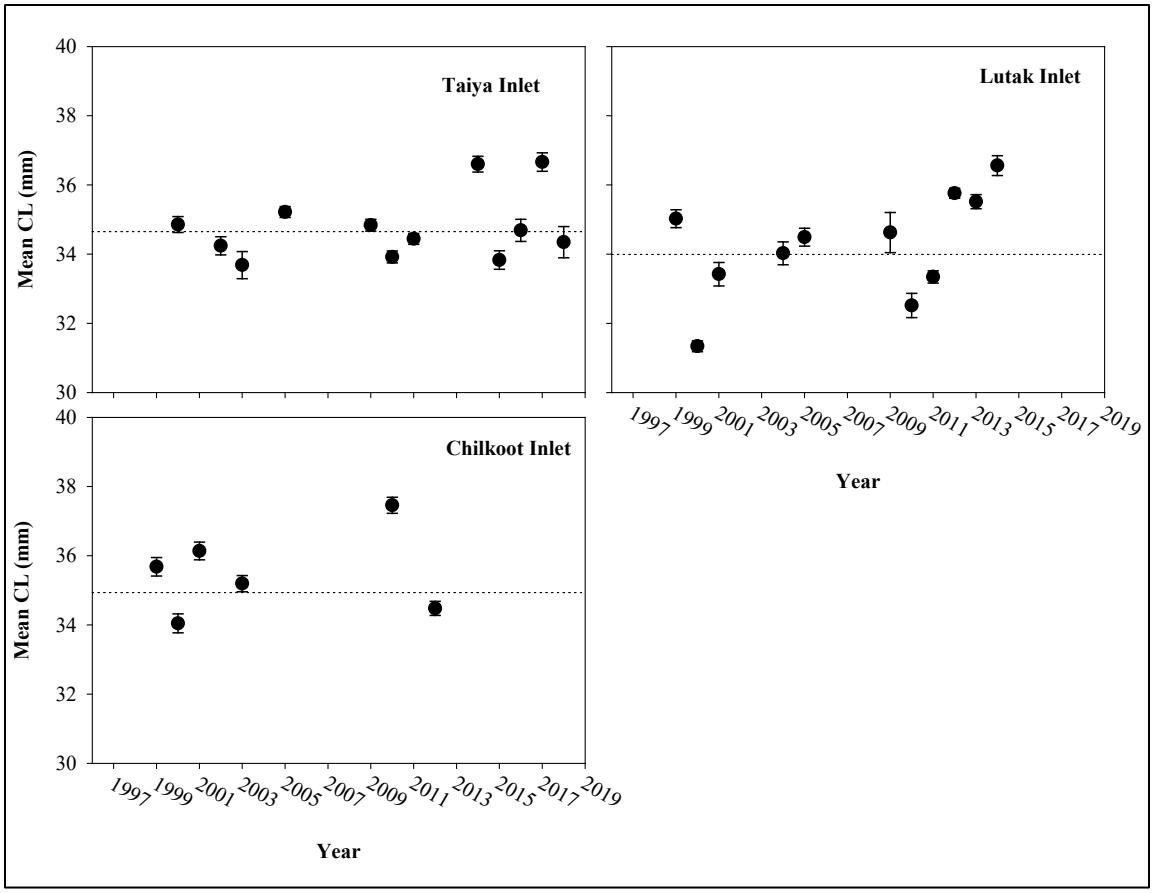


Figure 70.–Mean and standard error of coonstripe shrimp carapace length from floating processor and on-the-grounds sampling in District 15-East, 1999/00–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

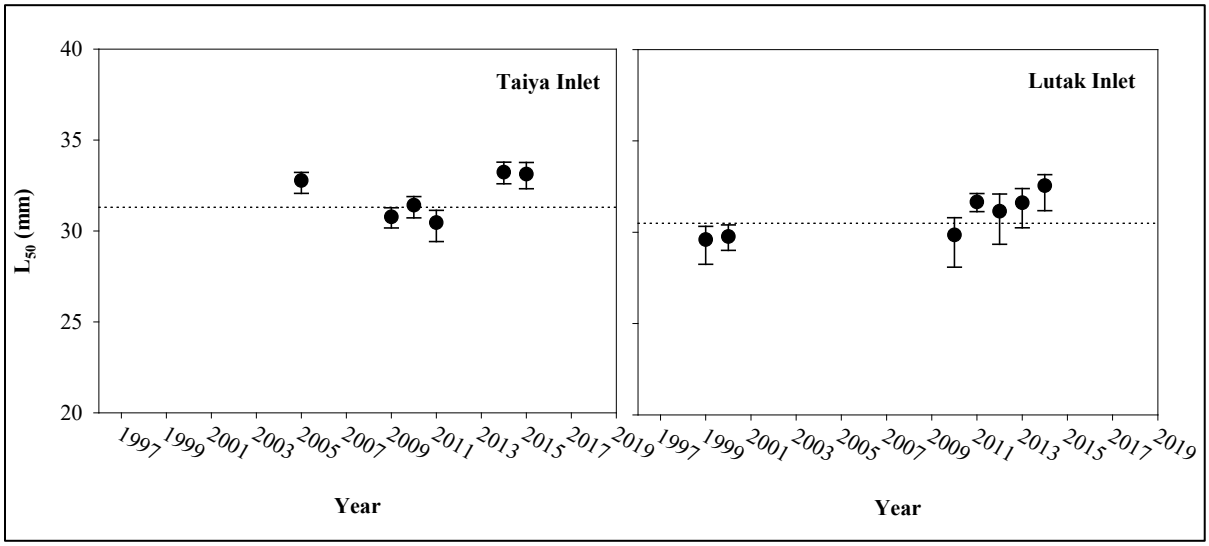


Figure 71.–$L_{50}$ and 95% confidence intervals of coonstripe shrimp from floating processor, on-the-grounds and dockside sampling in District 15-East, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

Table 46.–District 15-Remainder matrix, Part A. A 15-season history, including stock assessment recommendations, for the pot shrimp fishery in Southeast Alaska.

| Season | 2004/05 | 2005/06 | 2006/07 | 2007/08 | 2008/09 | 2009/10 | 2010/11 | 2011/12 |
|---|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | | 20,000 all District 15 | | | |
| Actual GHL (lb coonstripe shrimp) | | 15,000 | Closed | Closed | Closed | 7,500 | 7,500 | 7,500 |
| Recommended GHL or stock status | Poor | Poor | Closed | Closed | Closed | Good | Above Average | Above Average |
| Season length (days) | 229 | 151 | Closed | Closed | Closed | 151 | 151 | 28 |
| Landings (number) | * | * | Closed | Closed | Closed | * | * | * |
| Harvest (lb Coonstripe shrimp) | * | * | Closed | Closed | Closed | * | * | * |

| Season | 2012/13 | 2013/14 | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
|---|---|---|---|---|---|---|---|
| Upper regulatory GHR | | | | 20,000 all District 15 | | | |
| Actual GHL (lb coonstripe shrimp) | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| Recommended GHL or stock status | Above Average | Below Average | Above Average | Moderate | No effort | | Below Average |
| Season length (days) | 192 | 151 | 180 | 151 | 229 | 229 | 229 |
| Landings (number) | 73 | * | 40 | * | 0 | * | * |
| Harvest (lb coonstripe shrimp) | 8,389 | * | 4,192 | * | 0 | * | * |

*Note*: * indicates confidential data with less than 3 permits participating.

Table 47.–District 15-Remainder matrix, Part B. Baselines, current season values, and scores for each stock status parameter and analysis area for the pot shrimp fishery in Southeast Alaska. Data sources are from ADF&G shrimp surveys, fish tickets, logbooks, and on-the-grounds (OTG) and dockside sampling (DS) of commercial catch. Data are divided by type: CPUE, harvest rate, mean carapace length (CL), and $L_{50}$. Score for each analysis area is the sum of all individual scores.

| Analysis Area | | Chilkat Inlet (coonstripe shrimp) | | | |
|---|---|---|---|---|---|
| Area weighting | | | 1.0 | | |
| Stock Status Parameters | Source | Baseline | Value | Score | Total Score |
| Catch rate ≥XL | survey | – | – | – | – |
| 4-yr trend in catch rate | survey | – | – | – | – |
| Std. Comm. CPUE | fish tickets | 1.3 | * | 0.00 | 0.00 |
| 4-yr trend in CPUE | fish tickets | – | – | – | – |
| Catch rate ≥XL | logbook | – | – | – | – |
| Harvest rate ≥XL (2016) | logbook | – | – | – | – |
| Harvest rate ≥XL (2017) | logbook | – | – | – | – |
| Harvest rate ≥XL (2018) | logbook | – | – | – | – |
| Mean CL | survey | – | – | – | – |
| 4-yr trend in CL | survey | – | – | – | – |
| Mean CL | OTG | 33.8 | 31.4 | -1.00 | -0.67 |
| 4-yr trend in CL | OTG | – | – | – | – |
| Mean CL | DS | – | – | – | – |
| 4-yr trend in CL | DS | – | – | – | – |
| $L_{50}$ | survey | – | – | – | – |
| $L_{50}$ | OTG/DS | – | – | – | – |
| Manager score | | – | – | 0.00 | 0.00 |
| Score | | – | – | -1.00 | -0.67 |
| Max. possible score | | – | – | 3.00 | 1.67 |
| Stock Status | | – | – | – | Below Average |
| Confidence | | – | – | 0.18 | 0.18 |

*Note*: * indicates confidential data with less than 3 permits participating. En dashes = not available, NA = not applicable, *Sig. inc.* = significant increase, *Sig. dec.* = significant decrease, ≥XL = ≥40 mm CL.

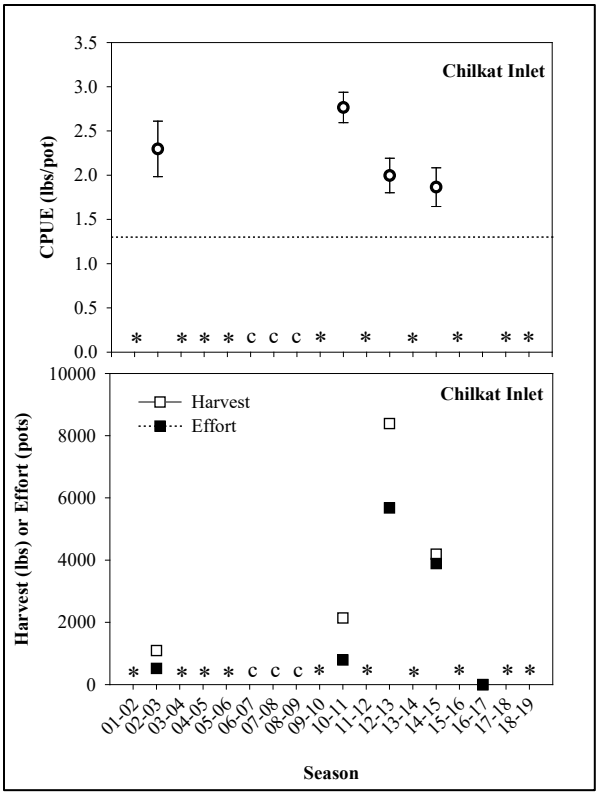


Figure 72.–Mean and standard error of coonstripe shrimp catch rate from commercial harvest (dotted line represents the long-term baseline) and the commercial harvest and effort by analysis area in District 15-Remainder, 2001/02–2018/19 seasons.

*Note*: * indicates confidential data with less than 3 permits participating; "c" indicates fishery closure.

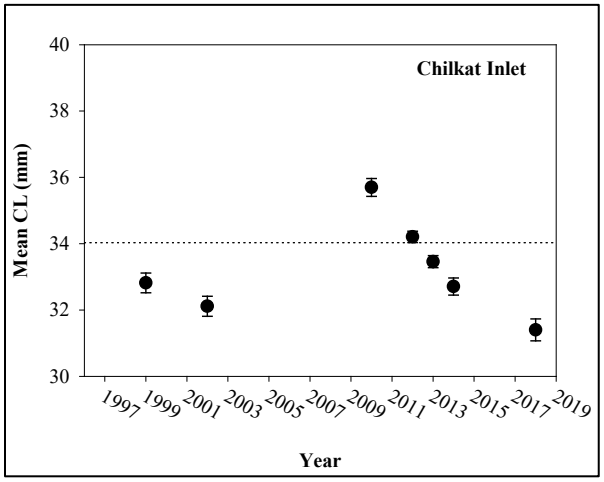


Figure 73.–Mean and standard error of coonstripe shrimp carapace length from floating processor and on-the-grounds sampling in District 15-Remainder, 1997/98–2018/19 seasons. Dotted line represents the long-term baseline. Only areas with baselines or 2018/19 season data are shown.

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