# Costs, Earnings, and Employment in the Alaska Saltwater Sport Fishing Charter Sector, 2015 

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U.S. DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration National Marine Fisheries Service Alaska Fisheries Science Center

## NOAA Technical Memorandum NMFS


#### Abstract

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This document should be cited as follows:

Lew, D. K., and J. Lee. 2018. Costs, earnings, and employment in the Alaska saltwater sport fishing charter sector, 2015. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-383, 85 p.

Document available: http://www.afsc.noaa.gov/Publications/AFSC-TM/NOAA-TM-AFSC-383.pdf

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# Costs, Earnings, and Employment in the Alaska Saltwater Sport Fishing Charter Sector, 2015 

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#### Abstract

The Alaska Saltwater Sport Fishing Charter Business Survey, a survey that collects economic information from the saltwater sport fishing charter businesses in Alaska, had previously been administered in 2012, 2013, and 2014 to collect data on the 2011-2013 seasons. In 2016, the survey was administered to a random sample of Alaska saltwater sport fishing charter businesses to collect annual costs, earnings, and employment information for the 2015 season. This report describes the 2016 survey and results. Descriptive statistics of the samples of item respondents are presented, as well as population-level estimates of key variables that are adjusted for missing data using sample weighting and data imputation methods.

The adjusted population-level results suggest that in 2015 the Alaska saltwater sport fishing charter sector as a whole operated at a break-even level, one where total costs and revenues offset one another in aggregate, at least statistically: point estimates suggest a small, but statistically insignificant, net loss was accrued by the charter sector. The analysis includes an examination of sector-level trends and provides a basic understanding of the economic conditions in the charter sector in the year following the implementation of the Alaska halibut catch sharing plan (CSP), which was implemented in 2014. The data for 2015 reveal several changes in employment and spending patterns by the charter businesses in the fishery compared to the 2011-2013 period. This includes a marked increase in the number of fulltime charter operators and decrease in the number of all part-time workers, regardless of type of worker, and increased investment in capital (vessels). At the same time, average revenues decreased to levels similar to those seen in 2012.


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## INTRODUCTION

In recent years Alaska's sport fisheries have undergone substantial changes, particularly in the management of the Pacific halibut (Hippoglossus stenolepis) charter fishery. As a result of these regulatory changes, participation in the charter sector Pacific halibut fishery has been capped with a limited entry program, and charter vessel operators in some areas have been subject to size restrictions and bag limits on the catch of Pacific halibut during guided trips, as well as restrictions in recent years on which days of the week guided halibut fishing trips can occur. Additionally, a halibut catch sharing plan (CSP) formalizing the process of allocating catch between the commercial and charter sectors was implemented in 2014 (78 FR 39121). Most recently, a recreational quota entity that would be allowed to buy (and sell) commercial fishing quota shares as an additional means for cross-sectoral allocation is in the process of being implemented (82 FR 46016).

In spite of regulatory changes in Alaska's sport fisheries over the last decade, information about how changes in fisheries management tools affect sport fishery anglers and charter businesses has generally been somewhat limited to date (Lew and Larson 2012, 2015, 2017; Lew et al. 2016). While some information on the Alaska charter boat sector has been collected through the Statewide Harvest Survey ${ }^{1}$ and Saltwater Charter Logbook program ${ }^{2}$, data collection has generally been limited to information about angler participation and harvest. Information on vessel and crew characteristics, services offered to clients, and information detailing cost and earnings have generally not been available for study or use in policy analyses.

To address this gap in information, the Alaska Fisheries Science Center (AFSC) of the National Marine Fisheries Service (NMFS) developed and implemented the Alaska Saltwater Sport Fishing Charter Business Survey to collect baseline economic information about the charter fisheries sector for use in understanding the economics of the charter sector and evaluating the effects of regulatory changes on the sector. The survey was administered by the Pacific States Marine Fisheries Commission (PSMFC) in 2012, 2013, and 2014 and collected information on the respective preceding year's charter fishing seasons. The 2012-2014 surveys, administration, and data collected are described and summarized in Lew et al. (2015b).

In 2016, the Alaska Saltwater Sport Fishing Charter Business Survey was administered to collect data for the 2015 fishing season ${ }^{3}$ and enable comparisons in economic conditions in the post-CSP period to the pre-CSP period. This report describes the development, implementation, and results from the 2016 survey and provides updated estimates of the 2012-2014 surveys' population-level estimates after applying a minor adjustment to the survey data (described later). To maximize data consistency, the survey administered in 2016 and the methods used in data collection and analysis are nearly identical to those used in the 2012-2014 surveys and described in Lew et al. (2015b).

[^0]The first section of this report presents the regulatory history of saltwater sport fisheries in Alaska, particularly in the Pacific halibut charter sector, with an emphasis on management issues. The three subsequent sections present a brief description of the development, design, and implementation of the survey. Since the 2016 survey was very similar to past surveys described in Lew et al. (2015b), emphasis in these sections is on differences from earlier surveys. Next, the methods used to summarize survey respondent data and calculate population estimates are summarized. ${ }^{4}$ This is followed by a section that summarizes responses from the 2016 survey respondents and compares them with previous survey years. Then, summaries of the population estimates derived from the 2016 survey sample data are presented and compared with estimates from the three previous survey years. The report concludes with a discussion of the survey findings and next steps for this research.

## BACKGROUND

Pacific halibut and Pacific salmon are the most common target sport fish species in Alaska. The Alaska Department of Fish and Game (ADF\&G) manages Pacific salmon in Alaska primarily through a policy that involves maintaining spawning habitats and ensuring escapement levels (Heard 2009). Allocation between the commercial and recreational fishing sectors is set by the Alaska Board of Fish and can have a profound influence on observed trends. In recent years, there has been concern over declining Chinook salmon levels, leading to area closures. Current Pacific salmon sport fishing regulations can be found on ADF\&G's website: http://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.sport.

Pacific halibut in the North Pacific are harvested in commercial, sport, and subsistence fishery sectors. The International Pacific Halibut Commission (IPHC), which was created by a treaty between the United States and Canada in 1923, is responsible for conducting stock assessment research and setting harvest strategies and catch limits for Pacific halibut. In the United States, the North Pacific Fishery Management Council (NPFMC) is responsible for allocating Pacific halibut among harvest sectors off Alaska. NMFS is primarily responsible for enforcing and developing regulations concerning the management of Pacific halibut within U.S. waters per the authority of the Northern Pacific Halibut Act of 1982 (Halibut Act).

Prior to 1973, sport halibut fishing was legal only during the commercial halibut season; however, this regulation was not strictly enforced due to the small size of the fishery (Alaska Department of Fish and Game 2014). For instance, the estimated take of halibut by the sport fishery was only 10,000 pounds in 1975 (Alaska Department of Fish and Game 2014). But by the mid-2000s, harvest of halibut by the sport fishery increased to half a million fish annually (Lew and Seung 2010). With growing participation in the halibut sport fishery, regulations were established specific to the sport fishery.

Along with growth and regulatory change in the sport fishery came changes to the management of the commercial halibut fishery. Beginning in 1995, the commercial halibut fishery experienced a change from open access, derby-style fishing characterized by overcapitalization and short seasons to an individual fishing quota (IFQ) system wherein vessel owners were allocated quota based on catch histories (Fina 2011). The switch to the IFQ program resulted in a larger share of the halibut catch sold to fresh fish markets and reductions in gear losses and the associated mortality (Fina 2011), but did not go so far as to formally establish allocation rules among the three main fishing sectors.

[^1]Each year, the IPHC assesses the abundance and potential yield of Pacific halibut using data from fishery surveys. From this information, harvest levels for each of two main regulatory areas (Areas 2C and 3A; Fig. 1) are determined. A biological target level, called constant exploitation yield (CEY), is then set by multiplying a fixed harvest rate by the estimate of exploitable Pacific halibut biomass. In the early 1990s, estimates of each regulatory area's Pacific halibut guided charter harvest, subsistence harvests, and wastage ${ }^{5}$ was deducted off the top of each year's CEY. The amount of fish remaining after these subtractions constituted the catch quota for each regulatory area's commercial fishing sector. Any growth in the charter sector harvest needed to be offset by a reduction in the allowable commercial sector catch limit (68 FR 47256).


Figure 1. -- Pacific halibut regulation areas (Source: https://alaskafisheries.noaa.gov/fisheries/sporthalibut)

In recognition of the growth of the Alaska sport halibut fishery and a need for a more formalized process of allocation between the guided sport and commercial sectors, a guideline harvest level (GHL) policy for the charter sector was established in the fall of 2003 ( 68 FR 47256). The GHLs were designed to serve as benchmarks for an acceptable level of charter sector harvest of Pacific halibut, per IPHC estimates of abundance. In particular, the GHL established a pre-season estimate of allowable harvests for the guided sport fishery in Areas 2C and 3A (Fig. 1) (68 FR 47256). To accommodate limited future growth in the sector, GHLs were structured to allow for a $25 \%$ growth over the average of 1995-1999 guided charter

[^2]harvest estimates using statewide harvest survey data. The initial GHLs were set at 1,430,000 pounds net weight ${ }^{6}$ for Area 2C and 3,650,000 pounds net weight in Area 3A.

Due in part to growth in the guided charter sector and revisions to IPHC stock assessment methodologies that resulted in lower estimates of Pacific halibut abundances and therefore lower GHLs, the guided charter fishery exceeded the GHL for Area 2C every year between 2004 and 2007 (50 FR 30504) (Meyer 2010). As a consequence, in 2007 charter-specific angler harvest rules in Area 2C were put in place for the first time. These restrictions took the form of size and bag limits that were more restrictive than those applied to unguided anglers. For example, in 2007 unguided anglers were allowed to catch and keep two Pacific halibut of any size, while charter anglers were restricted to one fish of any size and one no longer than 32 inches with its head on. In later years, guided charter anglers in Area 2C were restricted to a one-fish retainable limit. Since harvest by the charter sector in Area 3A only slightly exceeded the GHL between 2004 and 2007, charter anglers in that area were not subject to additional limitations during the years in which the GHL policy was in place.

To control the growth of the guided charter sector, NMFS issued regulations in 2010 creating a limited entry program for charter vessels in the guided sport fishery for Pacific halibut off Alaska ( 75 FR 554). The limited entry program limits the number of charter vessels that may participate in the halibut guided sport fishery and applies to waters of Areas 2 C and 3 A (Fig. 1). The program goals are to increase the value of the halibut fishery and enhance economic stability in rural coastal communities by limiting boats to qualified active participants. Under the limited entry program, NMFS issues Charter Halibut Permits (CHPs) to applicants who are licensed by ADF\&G based on their past participation in the charter halibut fishery per the Saltwater Charter Logbook program. The CHPs are also issued to Community Quota Entities (CQEs) that have been created by some rural Alaska communities (69 FR 23681). As of February 1, 2011, all charter vessel operators in Areas 2C and 3A with charter anglers onboard catching and retaining Pacific halibut were required to have a valid CHP onboard during every charter fishing trip. A CHP limits charter operators to the regulatory area and number of anglers specified in the permit.

To provide more structure to the allocation rules between the commercial and charter fishing sectors, a Pacific halibut Catch Sharing Plan (CSP) in Areas 2C and 3A was adopted by the NPFMC and implemented in 2014 (78 FR 75843). The CSP defines a formal process for allocating Pacific halibut between the commercial and charter fisheries in Areas 2C and 3A, allows for sectoral allocations that vary in proportion to changing annual estimates of halibut abundance, addresses specific needs of the commercial and charter fisheries, and provides a public process through which the NPFMC may develop recommendations to the IPHC for charter fishery harvest restrictions. Allocations under the CSP replace the GHL with an annual combined (commercial and charter) catch limit (CCL) for the Pacific halibut fishery. The annual CSP CCL will be determined by the IPHC and apportioned through a predictable and standardized process to the commercial and charter fisheries in Areas 2C and 3A.

The CSP also authorizes CHP holders to lease limited amounts of commercial halibut IFQ for use in the charter fishery. The annual IFQ, measured in pounds, are converted to guided angler fish (GAF), measured in number of fish, based upon a conversion rate published by NMFS annually ${ }^{7}$, which then can be fished by a CHP holder's client anglers ( 78 FR 39121). GAF leases are area-specific, but the leasing program is intended to provide charter businesses a way to relax harvest restrictions for their angler

[^3]clients. As such, fish caught as GAF by charter client anglers are subject to the less restrictive size and bag limits that are imposed on unguided anglers. For example, since (currently) unguided anglers are allowed to retain two fish of any size, a fish retained as GAF can be of any size regardless of the size limit imposed on charter sector harvests. Additionally, if a bag limit of one fish is imposed on charter anglers, GAF can be used to legally harvest a second fish.

In October 2017, based on NPFMC recommendations, NMFS issued a proposed rule to authorize formation of a recreational quota entity (RQE), which would participate in the Alaska Halibut IFQ program on behalf of the recreational charter (guided) sector and accumulate halibut quota share for use by the charter sector as a whole (82 FR 46016).

## SURVEY DEVELOPMENT AND TESTING

Details about the survey development and qualitative testing of the mail survey instrument (i.e., the questionnaire) are outlined below. The exposition follows the one in Lew et al. (2015b) since the questionnaire used in this study was virtually identical to those administered in 2012-2014. The primary difference in the 2016 survey was the addition of a question asking about expenses associated with leasing GAF. The survey instrument had been developed by NMFS with input from a series of focus groups, cognitive interviews, and discussions with charter business associations and staff within NMFS, the NPFMC, and ADF\&G (see Lew et al. 2015b for details).

## SURVEY DESIGN

## Mail Questionnaire

The 12-page questionnaire was designed to collect information about charter businesses' costs, revenues, employment, and business characteristics. The questionnaire is divided into six sections and includes both open-ended and categorical questions (the full survey is included in Appendix B).

Section A is short and asks for information that identifies the respondent's charter business to enable linking the information collected in the survey to supplemental data on fishing trips (i.e., catch, number of clients, dates of trips) collected in ADF\&G's Saltwater Charter Logbook program (see Methods section).

Section B collects information on employees and employee compensation during the previous season. Respondents are asked to identify the number of people employed as vessel operators and sport fishing guides ${ }^{8}$ (B1), deckhands or other crew (B2), and staff of onshore business operations (B3). Since there are several distinct fishing periods during the year (main season, early and late-shoulder, and offseason), these questions ask respondents to break down employment numbers by time period. Question B4 asks respondents to indicate the total compensation provided to each of the employee classes asked about in questions B1 to B3, and B5 collects information on the terms of compensation for each type of employee.

[^4]Section C asks respondents for information on the business's offerings, including types of fishing trips offered and other services such as lodging, non-fishing trips, etc. Respondents are asked to identify the types of trips they offer in question C1, and then are asked in questions C2 and C3 to identify the specific fishing trip offerings by trip length and number of species targeted. Questions C2 and C3 also collect information on the average price charged per person and per full boat. Question C4 collects information on additional services provided on fishing trips, such as food and beverages, fish cleaning services, lodging services, etc. Question C5 asks respondents to indicate whether lodging services are offered to non-fishing clients. Question C 6 collects information necessary to calculate the annual revenues from the business's activities. Question C6 also asks for information on the number of CHPs sold or leased and the associated revenues from these transactions.

Cost information is collected in Section D. The section begins with a question (D1) on amounts paid by charter businesses toward goods and services required for trip operations (such as fuel, vessel cleaning, supplies, etc.) and general overhead purposes (such as non-wage payroll costs, telephone and internet, insurance, etc.). Expenses related to leasing GAF are also collected in question D1. Question D2 collects information on capital expenditures, including rental and loan servicing on previously financed purchases and total expenditures on new investments toward capitalized assets used by the business.

The next section asks respondents for information about their clients. Questions E1 through E3 ask for the percentage of clients that were returning customers (E1), that booked trips a month or more in advance (E2), and that booked at the last minute (defined as less than 48 hours in advance) (E3). Question E4 asks respondents to identify the percentage of clients that booked fishing trips through different sources.

The final section contains questions aimed at further classifying respondents and their businesses, and at understanding respondents' investment in the businesses. Questions F1 and F2 are used to identify the type of business structure utilized by the charter business. Question F3 asks respondents for the percentage of the business they (and their families) own; question F5 asks for the percentage of their household income earned from the business; and question F4 collects information on the number of people from the respondent's household involved in the business and their role(s) therein. To assess offseason activities undertaken by owners of charter businesses, question F6 asks the respondent to identify what they did in the off-season.

## Web-based Survey

As in previous survey versions, an online web version of the survey was constructed to closely resemble the paper version of the survey to minimize potential mode biases. It was developed using the print version of the questionnaire and formatted for on-screen display, functionality, and ease of use with standard web browsers. As with the mail questionnaire, the web-based survey was divided into six sections. Each section of the web-based survey collected the same information as the mail questionnaire and was organized in a manner consistent with the mail survey. Survey respondents using the web version were allowed to save survey responses in progress and logout to permit completion of the survey over multiple sessions. For a number of questions, logic checks were put in place to alert respondents when invalid values (such as negative costs or revenues) were entered and to prompt reentry of valid value formats.

## SURVEY IMPLEMENTATION

Implementation of the 2016 Alaska Saltwater Sport Fishing Charter Business Survey differed in one important respect from those conducted in 2012, 2013, and 2014. Although the target population-all licensed charter businesses that had conducted Alaska charter fishing in the previous year according to ADF\&G Saltwater Charter Logbook records—remained the same, previous surveys were conducted as population censuses, whereas the 2016 survey was administered to a stratified random sample of eligible charter businesses rather than to all eligible charter businesses. This was done in large part to reduce survey fatigue among the target population, given that the survey had been conducted several times in previous years, with some respondents participating in multiple years. For the 2016 survey, the target population consisted of 561 charter business license holders, compared to 650 in the 2012 survey, 592 in the 2013 survey, and 572 in 2014 survey. The target population was identified from Alaska business guide license data and limited to those with charter fishing activity as indicated by ADF\&G's Saltwater Charter Logbook data for 2015 (Powers and Sigurdsson 2016). ${ }^{9}$

The sample strata were defined based on ADF\&G management area and the number of guide licenses and vessels registered to a business according to license data. ADF\&G's Southeast Alaska region roughly corresponds to IPHC Area 2C and the Southcentral Alaska region roughly corresponds to Area 3A, although it also includes Area 3B and 4A (where only a few small businesses operate). Table 1 lists the sample strata and their proportion of the overall target population. From each stratum, a simple random sample representing 75\% of the stratum's total membership was drawn.

Table 1. -- Sample strata.

| Stratum | Description | Population <br> count | Percent of <br> population |
| :---: | :--- | :---: | :---: |
| 1 | Southeast Alaska charter businesses with one <br> vessel and one guide | 125 | $22.28 \%$ |
| 2 | Southeast Alaska charter businesses with more <br> than one vessel or guide | 174 | $31.02 \%$ |
| 3 | Southcentral Alaska charter businesses with <br> one vessel and one guide | 121 | $21.57 \%$ |
| 4 | Southcentral Alaska charter businesses with <br> more than one vessel or guide | 141 | $25.13 \%$ |
| Total |  | 561 | $100.00 \%$ |

Beginning in March 2016, PSMFC administered the survey following a modified Dillman tailored design method (Dillman et al. 2009) approach consisting of several mailings and a telephone interview (see Table 2). Every charter business in the stratified random sample received an advance letter, an initial mailing of the questionnaire, and a postcard reminder. This was followed by a telephone contact, whereby charter businesses that had yet to return a completed survey were contacted via telephone. If

[^5]reached, they were asked to participate in the survey (i.e., complete and return the survey) or indicate they did not want to participate in the survey during a brief phone interview. Up to six attempts were made to reach the identified charter business during the telephone phase in the 2016 survey. Once the intended person was contacted, regardless of whether or not they agreed to complete the survey, no further attempts were made.

Upon completion of the telephone reminders/short interviews, a second full mailing of the questionnaire was conducted. In addition, respondents were given the option of completing the survey online. Because numerous charter business operators reside outside Alaska during the off-season, survey materials were mailed to both Alaskan and out of state addresses, if applicable. Note that these survey protocols and the timing of the mailings and reminders followed those of the previous iterations of the survey, and further details are provided in Lew et al. (2015b).

Table 2. -- Dates of survey contacts for the 2016 survey.

|  | Stage | 2016 Date |
| :--- | :---: | :---: |
| Advance letter mailed | March 3, 2016 |  |
| Initial survey mailed | March 10, 2016 |  |
| Postcard reminder | March 17, 2016 |  |
| Phone call reminders | March 30, 2016 |  |
| Second survey mailed | April 14,2016 |  |

For the 2016 survey year, there were 980 telephone calls made during survey implementation. Approximately $46 \%$ of these call attempts resulted in respondents participating in a telephone interview in which they were encouraged to respond to the survey by mail or online and, if they agreed, also answered a few questions to assist in comparing non-respondents with respondents.

Individuals who had yet to complete the web or mail survey, and who had not already refused to participate in the survey in the telephone interview, were sent a second full mailing of the survey. A new cover letter addressing some of the hesitations voiced during phone interviews with the survey population was included with the second full mailing. This second full mailing served as the final contact with potential respondents.

Following the protocols discussed above, the survey achieved an overall response rate of $21 \%$, or 87 completed surveys, ${ }^{10}$ which is slightly lower than previous years' response rates (Table 3). Figure 2 shows the distribution of returned mail questionnaires by week (with the initial mailing representing week zero). Over half of the completed questionnaires were returned within the first 6 weeks after the initial mailing (Fig. 2). Response rates for the four sample strata were $25,21,16$, and $23 \%$, respectively.

[^6]Table 3. -- Summary of survey sample size, responses, and response rates for the 2012-2014 and 2016 survey years.

| Year | Population size | Mail out sample | Unit responses | Response rate |
| :--- | :---: | :---: | :---: | :---: |
| 2012 | 650 | 650 | 174 | $27 \%$ |
| 2013 | 592 | 592 | 141 | $24 \%$ |
| 2014 | 572 | 572 | 125 | $22 \%$ |
| 2016 | 561 | 421 | 87 | $21 \%$ |

## Survey Returns by Week



Figure 2. -- Completed mail surveys returned by week.

For the 2016 survey, 71\% of the total respondents completed the mailed paper version of the questionnaire, with the remaining respondents submitting the web version.

## METHODS

In this report, we summarize information on costs, revenues, employment and business characteristics provided by respondents for the 2015 season, then extrapolate results to the population of charter businesses using sample weighting and data imputation methods detailed in Lew et al. (2015a). ${ }^{11}$ To describe the sample of respondents, descriptive statistics such as sums, means, medians, minimums, and maximums were calculated for each non-categorical survey item where a numerical item response was expected; statistics were calculated for the subset of respondents who provided a valid answer for the item. For categorical survey items, response frequency distributions were produced for item

[^7]respondents. The descriptive statistics and frequency distributions are examined for the 2015 fishing season and also compared to earlier survey data years. For comparative purposes, we used the Consumer Price Index to correct for inflation over time, reporting all monetary figures in 2015 U.S. dollars. ${ }^{12}$ This method applies to both the respondent sample and population estimates.

Information about the population of active charter businesses was inferred from the data provided by the sample of charter businesses responding to the survey. Generally speaking, in order for the sample estimates to be accepted as good estimates of the population parameters, the charter business respondents constituting the sample need to be considered representative of the population of charter businesses and all items in the survey need to be completed by respondents. In the presence of unit non-response (i.e., the failure of a potential respondent to complete and return a survey) and item nonresponse (i.e., the failure of a sample respondent to answer an individual survey item), the representativeness of the sample is less certain and thus the validity of extrapolating unadjusted sample results to estimate the characteristics of the population is brought into question.

Several unit response rate benchmarks have been put forth as a way to determine whether survey response is sufficiently high to assume representativeness of the sample for making inferences about the population. For instance, the results of Dolsen and Machlis (1991) have been used to support ignoring any potential unit non-response bias when unit response rates exceed 65\%. Other results, such as Groves (2006), suggest that the use of response rates as a predictor of non-response bias is uncertain. Hence, it may be generally insufficient to rely on response rate alone when determining the potential presence of non-response bias in survey results.

The 2016 survey achieved a unit response rate of $21 \%$ while also experiencing widespread item nonresponse (see Appendix A tables). Although the relatively low unit response rates are not uncommon among voluntary cost and earnings surveys of commercial fisheries (Holland et al. 2012) and are similar to the past surveys, they are below the benchmark level of Dolsen and Machlis (1991), suggesting that adjustments must be made for missing data in order for the population-level estimates to be calculated with confidence.

## Adjusting for Unit Non-response

We addressed survey unit non-response through sample weighting methods described in more detail in Lew et al. (2015a). ${ }^{13}$ These methods involve applying weights to individuals in the sample that adjust for the missing data associated with unreturned questionnaires. The objective is to give more weight to underrepresented individuals in the sample and less weight to overrepresented individuals in the sample so that the weighted sample better reflects the profile of the population. In this context, representativeness can be determined by sample selection, external data on the sample respondents and non-respondents, follow-up surveys of non-respondents, or some combination thereof. A handful of studies have applied weighting methods to adjust for unit non-response in economic surveys of

[^8]participants in recreational (Fisher 1996, Hunt and Ditton 2002, Tseng et al. 2012) and commercial (Knapp 1996, 1997) fisheries.

To demonstrate the weighting approach, let the individual weight given to the $i^{t h}$ respondent in a given year's survey sample be denoted $w_{i}$. The weight $w_{i}$ may be represented as a product of one or more weights such that (Brick and Kalton 1996):

$$
\begin{equation*}
w_{i}=w_{i 1} \times w_{i 2} \times w_{i 3} \tag{1}
\end{equation*}
$$

The three weights in Equation 1 can be referred to as the base weight $\left(w_{1}\right)$, non-response adjustment weight $\left(w_{2}\right)$, and post-stratification weight $\left(w_{3}\right)$. The base weight is equal to the inverse probability of being selected for the sample from the population (Brick and Kalton 1996). Since the survey was administered to a stratified random sample of active charter businesses where $75 \%$ of each stratum was randomly sampled, the sample is self-weighting, so the base weight $w_{1}$ equals 1.

The non-response adjustment weight is designed to account for any differences between charter businesses that responded and those from the population who did not. In this study we exploited an auxiliary dataset obtained from the ADF\&G's Saltwater Charter Logbook program that contains information for the population of charter businesses concerning when fishing occurred during the year, the amount of fishing effort, the species of fish targeted, and clientele type. Since the auxiliary dataset provides information about both respondents and non-respondents, a logit regression model was used to estimate the likelihood of a charter business responding to the survey as a function of auxiliary variables collected in the logbooks. Table 4 lists the auxiliary variables used in the fully specified logit regression model. In addition, an alternative-specific constant, which captures the average utility across respondents of unmodeled components (Train 2003), was also included in the specification ${ }^{14}$.

[^9]Table 4. -- Auxiliary variable descriptions and logit model estimates for the 2016 survey data.

| Variable | Estimate | Asymptotic <br> t-value |
| :--- | :---: | :---: |
| Alternative specific constant | $-2.3896^{* *}$ | -3.6662 |
| Did not fish in Southeast Alaska | -0.1317 | -0.3870 |
| Only used a single guide | -0.3705 | -1.1615 |
| Only used a single vessel | 0.2222 | 0.5806 |
| Took 50 trips or less | 1.2086 | 1.0266 |
| Fished 50 calendar days or less | -1.1977 | -0.9207 |
| Did not fish in early shoulder season (April to mid-June) | -0.2847 | -0.8065 |
| Did not fish in late shoulder season (mid-August through September) | $-0.6976^{*}$ | -1.8168 |
| Did not fish in the off-season (October through March) | 0.6749 | 1.1696 |
| Did not report any crew fishing trips | -0.0770 | -0.2518 |
| Reported no Alaska resident clients | 0.3914 | 1.1515 |
| Proportion of clients that are Alaska residents | 0.7939 | 0.8011 |
| 250 or fewer clients | 0.5662 | 0.9603 |
| 1000 or more clients | 0.2944 | 0.6447 |
| Did not report any non-paid trips | -0.1165 | -0.4050 |
| Did not report fishing for salmon | 0.0943 | 0.1660 |
| Did not report fishing for bottomfish | -0.5558 | -1.0936 |

Note: Asterisks indicate statistical significance at either the $5 \%\left({ }^{* *}\right)$ or $10 \%\left(^{*}\right)$ level. The pseudo-R2 (likelihood ratio index) for this model is 0.39 .

Results from the fully specified logit regression model are summarized in Table 4. Variables found to be statistically significant in the fully specified model were used in determining sample weighting. ${ }^{15}$ For the 2016 survey year, only two variables exhibited statistical significance between survey respondents and non-respondents, holding all else constant. These variables were the alternative specific constant and the dummy variable indicating no fishing was done in the late shoulder season (mid-August through September). Focusing on the latter variable, which has a parameter of similar sign and magnitude as in two previous survey years' models (2012 and 2014), a cross-tab frequency table for the survey respondents and charter business population was constructed. From this table, weights were constructed from the ratio of the number of charter business population elements ${ }^{16}$ to the number of survey response unit respondents in each cell (Table 5). Larger weights were applied to underrepresented groups in the respondent sample, relative to each group's representation in the population. The non-response adjustment weight was 0.93 for respondents that fished in the late shoulder and 1.45 for respondents that did not fish during the late shoulder season (Table 5).

[^10]Table 5. -- Non-response adjustment weights ( $\mathrm{w}_{2}$ ) and corresponding percentage of responding sample to which the weight applied for the 2016 survey using information on whether or not charter businesses reported late shoulder season fishing during the 2015 fishing year.

| Variable | Weight $\left(w_{2}\right)$ | Percent of responding <br> sample (\%) |
| :--- | :---: | :---: |
| No late shoulder season fishing | 1.4542 | 13.48 |
| Late shoulder season fishing | 0.9292 | 86.52 |

The post-stratification weight $\left(w_{3}\right)$ is designed to address potential non-coverage bias resulting from underrepresentation of certain key variables in the population. The post-stratification weight is therefore intended to reduce potential biases resulting from incomplete coverage of the population of charter businesses (Brick and Kalton 1996). Post-stratification weights were calculated such that the respondents in each class are multiplied by a factor so that the weights for the class respondents sum to the known population total for that class. With respect to this study, and consistent with Lew et al. (2015b), the key dimension to control for is the size of charter businesses, defined as the number of client fishing trips reported during the fishing year. A second dimension to control for is the regulatory region in which charter fishing took place (e.g., Area 2C or 3A).

We used the post-stratification approach advocated for and applied in Lew et al. (2015b) in this study-post-stratification weighting based on both the IPHC regulatory area (i.e., Area 2C or 3A) and the number of client trips. Table 6 summarizes the post-stratification weights for the 2016 survey year.

Table 6. -- Post-stratification weights for the 2016 survey year using total client trips and regulatory fishing area.

|  | Weight |  |
| :--- | :---: | :---: |
| Total client trips | Area 3A | Area 2C |
| 100 or less | 1.392553 | 0.883881 |
| $101-200$ | 0.793226 | 0.740345 |
| $201-300$ | 1.237433 | 0.89238 |
| $301-400$ | 1.586453 | 4.442068 |
| $401-500$ | 0.793226 | 0.793226 |
| $501-1000$ | 1.229501 | 0.89899 |
| $1001-4000$ | 0.60814 | 1.229501 |

## Adjusting for Item Non-response

To address item non-response, we used data imputation methods described in Lew et al. (2015a) in order to fill in missing data (item non-responses) with appropriate responses from other respondents. A number of imputation techniques are available and generally involve either auxiliary information that may include data external to the survey, other variables from within the survey, or other item responses for the variable of interest (Brick and Kalton 1996, Durrant 2009, Lohr 2010). The general imputation method can be conceptualized using a regression framework (e.g., Brick and Kalton 1996). Suppose $y_{r}$ is the value of the variable of interest when reported and $y_{m}$ is the missing value due to item non-
response. Also suppose that $z$ is a vector of auxiliary information available to the researcher. Then, the imputation method can be expressed for the $i^{t h}$ observation in a regression framework according to

$$
\begin{equation*}
y_{m i}=f\left(z_{m i}\right)+\epsilon_{m i} \tag{2}
\end{equation*}
$$

where $f\left(z_{m i}\right)$ is a general function involving the vector of auxiliary information and $\epsilon_{m i}$ is an unobserved error component that is modeled stochastically. Regression-based imputation approaches estimate Equation 2 for the item respondents using the observed auxiliary information ( $z$ ), then use the estimated function to predict the missing values.

Imputation methods differ according to the structure of the auxiliary information and the assumptions made over the stochastic component of Equation 2. For instance, single-value imputation approaches can be used when the auxiliary information is assumed to have no effect on the missing value and the stochastic component is ignored. Often times the mean or median of item responses serve as the single value used to fill in for the missing value. However, single-value imputation approaches are generally less desirable when there is a source of auxiliary information correlated with the reported variable that can be exploited when predicting the missing values.

Methods that involve the use of auxiliary variables are referred to as regression imputation methods. If all the auxiliary information used to impute responses is categorical, then the method is referred to as an imputation class method approach. For imputation class approaches, a small number of auxiliary variables are used as a means to classify respondents. Values from an item respondent (the donor) are then taken and assigned to a non-respondent according to a measure of similarity across the auxiliary information between the donor and non-respondent. Hot deck imputation is one type of imputation class approach where the value from an item respondent (the donor) is assigned to a non-respondent (Andridge and Little 2010). The donor is generally selected from the group of item respondents that are most similar to the respondent with the missing value. As Brick and Kalton (1996) note, the number of imputation classes must be selected carefully since there must be at least one donor in each class. Another hot deck method uses a distance function-based approach (Chen and Shao 2000). In this approach, a distance function is minimized to identify the "nearest neighbor" from the set of item respondents. That is, for the $j^{t h}$ item non-respondent, the researcher could specify a function $\left(D_{j}\right)$ that minimizes the algebraic distance over a set of auxiliary variables $(x)$ across all item respondents $\left(N^{r}\right)$ according to

$$
\begin{equation*}
D_{j}=\sum_{i=1}^{N^{r}}\left|x_{i}-x_{j}\right|, \quad \text { for all } i \neq j \tag{3}
\end{equation*}
$$

The "nearest neighbor" is then the $i^{t h}$ respondent that best satisfies the objective in Equation 3 for the $j^{t h}$ non-respondent and thus provides the donor value for the missing value.

Variations on the imputation class method can be used to obtain donor values in accordance with the nature of the auxiliary information and respondent sample. For instance, the researcher could simply choose a donor value within a class at random and without regard to distance functions, such as the one specified in Equation 3. Alternatively, the researcher could find the single nearest neighbor which best minimizes the objective in Equation 3 when choosing the donor value. Similarly, the researcher can choose a donor at random from amongst the $K$-nearest neighbors that best meets the objective in Equation 3 (herein referred to as $K$-nearest neighbor imputation).

In this study, we followed the approach advocated for in Lew et al. (2015a, b)-the $K$-nearest neighbor ( $K=3$ ) imputation approach, where missing values are replaced with a donor value selected at random from one of the $K$-nearest neighbor item respondents.

For this approach, we set up three respondent classes based on the number of client trips taken during the respective fishing year. The respondent classes were the following: businesses reporting fewer than 200 trips, those reporting between 201 and 400 trips, and those reporting more than 400 trips. Donor values were then selected at random from respondents within the same class as the non-respondent. Eight variables were chosen from logbook data to be used in Equation 3. Similarity between the donor respondent and non-respondent was then evaluated using these eight variables and the distance function in Equation 3. The eight variables were (i) a dummy variable indicating whether fishing occurred in Area 3A, (ii) the number of guides used, (iii) the number of calendar days fished, (iv) the total number of client fishing trips, (v) a dummy variable indicating whether crew fishing trips were taken, (vi) a dummy variable indicating whether some unpaid fishing trips were taken, (vii) the number of hours spent fishing for Pacific salmon, and (viii) the number of hours spent fishing for bottomfish. Note that this approach is identical to the one used by Lew et al. (2015b) to generate the preferred population-level estimates for the 2011-2013 seasons. We also follow the variance estimation approach outlined by Shao (2002) that was also used in Lew et al. (2015b) to estimate the full variance of the imputed estimates so as to account for the variance of the imputation procedure itself, which is ignored in standard variance estimation approaches (Rao and Shao 1992).

## Calculating Population-level Estimates

The population-level costs, revenues, and earnings are calculated as the weighted sum over all the costs, revenues, and earnings categories, respectively. Summation occurred after data imputation was applied to account for item non-response.

## Adjusting 2011-2013 Population-level Estimates

Means and totals associated with costs, revenues, and employment for the 2011-2013 fishing seasons were re-estimated for this report after utilizing (previously unused) information provided by respondents to adjust the data to reduce the number of missing values (item nonresponses). In short, the approach involves replacing missing values that should logically have zero as a response based on responses to one or more related questions. For example, respondents who had not taken any charter trips of a specific type could logically be assumed to have a zero revenue from those trips even though the respondents may have left the revenue field blank. Once these "true zeros" are inserted to replace the blank responses, changes occur to the imputation class membership, which affect the data imputation estimates. As a result, the estimates for both revenues and costs are slightly different from, but more accurate than, the results previously calculated. All reported 2011-2013 estimates are calculated after applying these adjustments to the survey data. Moreover, the 2015 estimates are calculated in the same manner.

## RESULTS

This section summarizes data collected from the 2016 Alaska Saltwater Sport Fishing Charter Business Surveys. The sample results are first presented individually for key variables related to total costs, earnings, and employment. Sample results are presented for the 2016 survey as well as the 3 years that the survey was previously conducted in order to compare results across time and infer any short-term
trends. Across-year sample results include variables related to charter business characteristics as well as total costs, total earnings, and total employment. Population estimates are presented for the 2016 season along with those from the previous survey years, which have been updated.

## Survey Results - Respondent Sample

This section presents results from analyzing data associated with the item respondents only. The statistics presented in this section were calculated directly from the sample data, with no weighting or data imputation methods used to adjust the sample to better reflect the population (presented later in the report). All monetary values are presented in 2015 U.S. dollars.

The total number of active vessels owned or leased across all item respondents during the 2015 charter fishing year was 128 . Of this total, all but one vessel was owned by the charter businesses. The median number of vessels owned or leased was 1.0 and the mean was 1.5. The minimum number of vessels owned or leased was also 1 and the maximum was 12. A summary of the total vessels active in 2015 as well as select attributes for the item respondents are presented in Appendix Table A1.

Total revenues across all charter and non-charter trips and all other income streams totaled $\$ 12$ million. The mean revenue per respondent was $\$ 226,590$ (standard error $\$ 345,579$ ) and the median was $\$ 117,000$. Similar to the range reported for previous years (in Lew et al. 2015b), there was a broad range of revenues reported by item respondents; the minimum reported was under $\$ 2,400$ for the year while the maximum was over $\$ 1.5$ million for the year. Total costs for the 2015 fishing year, excluding investment payments, amounted to $\$ 12.4$ million for the respondent sample. Hence, at least for the responding sample as a whole, the charter fishery operated at a roughly break-even level during the 2015 fishing year. Mean and median costs were $\$ 213,284$ and $\$ 92,652$, respectively. ${ }^{17}$

The total number of trips of any type (fishing and non-fishing charter trips) and seats sold by item respondents in 2015 were 5,132 and 23,181, respectively. The median number of trips sold per respondent was 68 and the mean was 105 . The median number of seats sold per respondent was 315 and the mean was 464.

For 2015 the largest group of employee positions was full-time operators, with a reported total of 430 across the sample of item respondents. ${ }^{18}$ The mean and median number of full-time operator positions per respondent was 9.77 and 4 , respectively. The second largest employment category was full-time shore worker positions, with a total of 248 reported. The mean and median number of full-time shore worker positions per respondent was 11.81 and 9 , respectively. Full-time crew worker positions constituted the third largest employment category, with a total of 179 and mean and median of 5.59 and 3 full-time crew worker positions per respondent, respectively. Part-time operator, crew, and shore positions totaled 35,30 , and 25 , respectively.

[^11]As expected, employment during the 2015 charter fishing year was highest in the main season (Fig. 3). Guides and operators represented the largest personnel category during every season. Crew workers were uniformly the least numerous of any personnel category across all seasons.


Figure 3. -- 2015 employment by season for both part-time and full-time positions across the sample of item respondents.

Full-time positions represented over three-quarters of respondent sample employment for all fishing seasons during the 2015 fishing year (Table 7). The percent of full-time employee positions was generally highest for guides/operators, but the percent of full-time employees of all types was generally higher than in previous survey years (see Lew et al. [2015b]). No part-time crew workers were employed during the off season.

Table 7. -- 2015 respondent sample percentage of full-time employee positions by season and type.

|  | Guide/Operator | Crew | Shore worker |
| :--- | :---: | :---: | :---: |
| Early shoulder | $92 \%$ | $81 \%$ | $92 \%$ |
| Main season | $94 \%$ | $85 \%$ | $92 \%$ |
| Late shoulder | $92 \%$ | $88 \%$ | $92 \%$ |
| Off season | $90 \%$ | $100 \%$ | $76 \%$ |

Respondents from the 2015 fishing year reported that wages were the most common method of compensation for guides/operators and crew workers (Fig. 4). For shore workers, a salary system was predominant, with wages being the second most common method of compensation. Revenue sharing was the least common method of compensation for guides/operators and shore workers and was the second most prevalent amongst the crew personnel category.


Figure 4. -- Number of charter businesses in the item respondent sample by form of payment and type of employee during the 2015 charter fishing year.

The largest type of expenditure during 2015 for the respondent sample was charter trip expenses, where respondents reported a total of approximately $\$ 4.1$ million in expenses (Table 9). The second largest expenditure category was overhead payments, which amounted to approximately $\$ 3.4$ million. Labor payments were the third largest expenditure category and accounted for $\$ 2.95$ million (Table 8). In addition, respondents reported a total of $\$ 1.9$ million as capital expenditures toward vehicles, machinery, and equipment. Note that capital expenditures includes rental/lease payments, purchases, and improvements fully paid for during 2015, as well as loan payments on purchases and improvements financed during or before 2015.

The 2016 survey was the first version to collect information on expenditures made by charter businesses participating in the GAF leasing program established as part of the Catch Sharing Plan. However, there were too few item respondents to enable reporting statistics summarizing those responses.

Table 8. -- 2015 respondent sample total and mean labor expenses by type (in 2015 dollars).

| Employee type | Mean | Total (in millions) |
| :--- | :---: | :---: |
| Guide/Operator | 21,530 | 1.51 |
|  | $(5,488)$ |  |
| Crew | 8,013 | 0.51 |
|  | $(1,994)$ |  |
| Shore worker | 14,732 | 0.93 |
|  | $(4,645)$ |  |

Note: standard errors are given in parentheses.

Table 9. -- 2015 respondent sample mean, median, and total major cash expenses by type (in 2015 dollars).

| Major expense type | Mean | Median | Total <br> (in millions) |
| :--- | :---: | :---: | :---: |
| Labor payments | 58,961 | 26,200 | 2.95 |
|  | $(13,673)$ |  |  |
| Charter trip operating expenses | 62,624 | 28,706 | 4.13 |
|  | $(10,336)$ |  |  |
| General overhead expenses | 53,494 | 25,500 | 3.37 |
|  | $(9,365)$ |  |  |
| Capital expenditures (equipment \& real estate) | 38,205 | 135,654 | 1.95 |
|  | $(12,376)$ |  |  |

Note: standard errors are given in parentheses.
New investments during the 2015 fishing year amounted to approximately $\$ 2.2$ million, with the majority consisting of investments toward vehicles, machinery, and equipment (Table 10). Mean new investments were approximately $\$ 78,000$ per respondent. Note that these investments are total investment costs financed by loans issued during 2015, including loan principal, taxes and fees, and down payment amount.

Table 10. -- 2015 respondent sample mean, median, and total major new investments by type (in 2015 dollars).

|  | Mean | Median | Total (in millions) |
| :--- | :---: | :---: | :---: |
| Equipment \& real estate | 77,772 | 24,119 | 2.18 |
|  | $(25,636)$ |  |  |

Note: standard errors are given in parentheses.

In terms of the sources of annual household income for item respondents, approximately $85 \%$ of item respondents reported some household income was derived from outside the charter business (Fig. 5).

Only one item respondent reported zero household income deriving from their charter business. About one-quarter of the item respondents reported that $25 \%$ or less of their total annual household income was derived from their charter business.

# Charter Business Income as Percent of Household Income 



Figure 5. -- Distribution of 2015 respondent sample of percent of annual household income earned from the charter business.

Approximately half of item respondents reported continuing work related to their charter business during the off season (Table 11). Likewise, many respondents reported working, at least in part, in Alaskan non-fishing related jobs during the off season. Relatively few respondents reported any sort of work outside of Alaska. Approximately 31\% of item respondents reported engaging in two or three activities during the off season. Most frequently, respondents reported continuing charter business work and either working in non-fishing or commercial fishing inside Alaska.

Table 11. -- Counts of 2015 respondent off season activity.

| Off-season activity | Count of respondents | Percentage of <br> respondents |
| :--- | :---: | :---: |
| Continued charter business work | 43 | $49 \%$ |
| Worked in AK commercial fishing | 7 | $8 \%$ |
| Worked in AK non-fishing job | 18 | $21 \%$ |
| Live in AK with no job | 17 | $20 \%$ |
| Work outside AK in fishing job unrelated to business | 1 | $1 \%$ |
| Work outside AK in non-fishing job | 9 | $10 \%$ |
| Live outside AK with no job | 5 | $6 \%$ |

Note: Off season activities are not mutually exclusive and respondents may report more than one activity.

For the 2015 fishing year, 8 respondents (or almost 10\%) identified their businesses as being structured as a C corporation. For those that did not identify as a C corporation, almost all (98\%) identified their business as a sole proprietorship, with only one identifying as a LLP, LLC, or S corporation.

## Comparisons with the 2011-2013 Respondent Samples

To understand changes in the charter sector between 2011 and 2013, we compare sample results across the survey years with respect to average charter business revenues, costs, employment, and certain charter business attributes. The focus is on averages since the sample size and sampling approach were different in the 2016 survey relative to earlier years. Unlike in Lew et al. (2015b), we do not present comparisons of sample level totals since comparing totals of very different-sized samples is less informative for understanding trends. Note also that although we discuss them for completeness the respondent samples are not adjusted for differences in response rates or population sizes and are thus not directly comparable. Instead, trend comparisons are made between measures of central tendency each year only (i.e., means and medians). As noted above, all monetary estimates are in 2015 dollars.

Mean revenues per item respondent ranged from approximately $\$ 181,000$ to approximately $\$ 286,000$, while median revenues ranged from approximately $\$ 70,000$ to $\$ 117,000$. Mean revenues per respondent were highest for the 2013 fishing year and lowest for the 2012 fishing year. The median revenue was highest in 2015 and lowest in 2012. The mean revenue per respondent in the 2015 fishing year was about $\$ 227,000$, which is higher than the mean revenue in all fishing years except 2013. However, the standard error $(\$ 47,000)$ suggests the mean revenue in 2015 was not statistically different from those in previous years (Fig. 6). ${ }^{19}$ For all years, the mean revenues exceed the median revenues, suggesting some potential positive skewness in the distribution of revenues across item respondents.

[^12]Table 12. -- Summary of revenues and expenditures for the four surveyed fishing years (in 2015 dollars).

|  | 2011 |  | 2012 |  | 2013 |  | 2015 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Mean | Median | Mean | Median | Mean | Median | Mean | Median |
| Revenues | $\begin{aligned} & \hline 208,879 \\ & (51,522) \end{aligned}$ | 77,118 | $\begin{aligned} & \hline 180,517 \\ & (35,891) \end{aligned}$ | 70,063 | $\begin{aligned} & 286,261 \\ & (71,158) \end{aligned}$ | 87,281 | $\begin{aligned} & 226,590 \\ & (47,469) \end{aligned}$ | 117,000 |
| Labor expenditures | $\begin{gathered} 74,466 \\ (20,693) \end{gathered}$ | 20,693 | $\begin{gathered} 65,187 \\ (14,566) \end{gathered}$ | 22,942 | $\begin{gathered} 93,173 \\ (24,764) \end{gathered}$ | 24,611 | $\begin{gathered} 58,961 \\ (13,673) \end{gathered}$ | 26,200 |
| Charter trip expenses | $\begin{gathered} 58,200 \\ (14,621) \end{gathered}$ | 19,118 | $\begin{gathered} 50,393 \\ (11,691) \end{gathered}$ | 21,751 | $\begin{gathered} 58,024 \\ (11,073) \end{gathered}$ | 24,613 | $\begin{gathered} 62,624 \\ (10,336) \end{gathered}$ | 28,706 |
| Overhead expenses | $\begin{gathered} 75,275 \\ (14,083) \end{gathered}$ | 21,224 | $\begin{aligned} & 51,440 \\ & (7,050) \end{aligned}$ | 27,638 | $\begin{gathered} 83,009 \\ (19,577) \end{gathered}$ | 29,720 | $\begin{aligned} & 53,494 \\ & (9,365) \end{aligned}$ | 25,500 |
| Capital expenditures | $\begin{gathered} 54,082 \\ (16,308) \end{gathered}$ | 10,575 | $\begin{aligned} & 29,569 \\ & (4,304) \end{aligned}$ | 15,251 | $\begin{gathered} 46,521 \\ (11,752) \end{gathered}$ | 13,131 | $\begin{gathered} 38,205 \\ (12,376) \end{gathered}$ | 12,246 |
| Investment payments | $\begin{gathered} 49,229 \\ (13,138) \end{gathered}$ | 27,061 | $\begin{gathered} 59,871 \\ (13,314) \end{gathered}$ | 27,582 | $\begin{gathered} 48,021 \\ (10,632) \end{gathered}$ | 23,952 | $\begin{gathered} 77,772 \\ (25,636) \\ \hline \end{gathered}$ | 24,119 |

[^13]
## Mean Revenue in 2015 dollars



Figure 6. -- Mean revenues for the 2011, 2012, 2013, and 2015 fishing years. Error bars represent two standard errors of the mean above and below the mean.

Charter business expenses are broken down into four categories: labor expenses (e.g., payments to employees), charter trip operation expenses (e.g., vessel fuel and supplies costs), overhead expenses (e.g., non-wage payroll costs, legal services), and capital expenditures (e.g., purchases and improvements made to equipment and real estate). Mean labor expenses per item respondent ranged from approximately $\$ 59,000$ to $\$ 93,000$. However, there is no significant difference in mean labor expenses across fishing years (Fig. 7). Median labor expenses were uniformly lower than the mean labor expense per respondent (Table 12).

Mean and median charter trip expenses per respondent ranged from roughly $\$ 50,000$ to $\$ 63,000$ and from $\$ 19,000$ to $\$ 29,000$, respectively (Table 12 and Fig. 7). There is no statistically significant difference in mean charter trip expenses across the four fishing years.

The 2015 mean overhead expense per respondent was on the lower end of the range of mean values for previous years-about $\$ 53,000$ (close in magnitude to the 2012 mean). The median overhead expenses per respondent are lower than the mean for each of the three fishing years and exhibit less variation across years (Table 12).

Mean capital expenditures per item respondent represented the smallest expense category for each of the four fishing years and ranged from a low of $\$ 30,000$ in 2012 to a high of $\$ 54,000$ in 2011. The 2015 mean value was on the lower end of this range ( $\$ 38,000$ ). Median capital expenditures per respondent were consistently and considerably lower than the mean capital expenditure in each fishing year.


Figure 7. -- Respondent sample mean major expenses by type over fishing years. Error bars represent two standard errors around the mean.

Charter business part-time and full-time personnel positions are divided into three categories: operators, crew, and shore workers. For each of the 4 years of data, the mean number of season-specific full or part-time positions are presented. That is, each count represents one particular position over one particular season (e.g., one full-time operator during early shoulder is counted as one position) ${ }^{20}$. For the item respondents, the mean number of full-time operator positions increased each surveyed year from 2011 to 2015 (reaching a high of 9.8), though not significantly so (Table 13). The mean number of part-time operator positions experienced a decline in 2015 from the 2013 level, but the difference is not statistically significant. Median full-time and part-time operator positions were unchanged across the three fishing years.

[^14]Neither the mean number of part-time nor full-time crew positions varied significantly across the four fishing years. In 2015, the mean part-time crew positions was the lowest across the survey years, although it was not statistically lower than in other years. Median part-time crew positions per respondent increased from 2.0 to 3.0 between 2011 and 2012 and then decreased back to 2.0 between 2012 and 2013. It remained at 2.0 in 2015. Median full-time crew positions per respondent was unchanged across the four fishing years.

Table 13. -- Summary of full-time (FT) and part-time (PT) positions for the four fishing years. The entries represent the number of season-specific

| Year | 2011 |  | 2012 |  | 2013 |  | 2015 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Mean (S.E) | Median | Mean (S.E) | Median | Mean (S.E) | Median | Mean (S.E) | Median |
| FT Operators | 5.8 | 4 | 6.2 | 4 | 7.4 | 4 | 9.8 | 4 |
|  | (0.8) |  | (0.9) |  | (1.3) |  | (3.8) |  |
| PT Operators | 2.4 | 2 | 2.2 | 2 | 3.1 | 2 | 2.5 | 2 |
|  | (0.2) |  | (0.2) |  | (0.5) |  | (0.5) |  |
| FT Crew | 5.5 | 3 | 5.2 | 3 | 6.8 | 3 | 5.6 | 3 |
|  | (1.0) |  | (0.8) |  | (1.9) |  | (1.2) |  |
| PT Crew | $2.5$ | 2 |  | 3 |  | 2 |  | 2 |
|  | (0.3) |  | (0.9) |  | (0.4) |  | (0.2) |  |
| FT Shore |  |  |  |  |  |  |  |  |
| Workers | 11.9 | 6 | 9.9 | 6 | 14.3 | 5 | 11.8 | 9 |
|  | (3.0) |  | (2.1) |  | (3.8) |  | (2.6) |  |
| PT Shore |  |  |  |  |  |  |  |  |
| Workers | 4.4 | 4 | 3.8 | 3 | 4.2 | 3 | 2.5 | 2 |
|  | (0.7) |  | (0.6) |  | (0.6) |  | (0.4) |  |

Season-specific shore worker positions constituted the largest personnel category per respondent for the four fishing years (Table 13). Mean full-time and part-time shore worker positions ranged from 9.9 to 14.3 and 2.5 to 4.4 , respectively. The means of the full-time shore worker positions did not vary significantly across the four fishing years. However, the mean part-time shore worker positions in 2015 was statistically lower than in 2013. The median number of full-time shore worker positions decreased from 6.0 in 2011 to 5.0 in 2013, but increased to 9 in 2015. On the other hand, the median part-time shore worker positions per respondent decreased from 4.0 in 2011 to 2.0 in 2015.

In terms of labor expenses, shore workers and guides tended to be more costly than crew (Fig. 8). In general, mean charter business labor expenses tended to increase from 2011 to 2013, but appear to decrease from 2013 to 2015. However, for a given personnel category none of the differences in expenses over time can be considered statistically significant.


Figure 8. -- Respondent sample mean labor expenses for 2011-2013 and 2015 by personnel type. Error bars represent two standard errors around the mean.

In 2011, the lowest percentage of full-time employee positions occurred in the off season, regardless of personnel category (Fig. 9). In 2012, however, the lowest percentage of full-time positions occurred during the early shoulder season. Similar to 2011, the 2013 fishing year generally exhibited the lowest percentage of full-time employees during the off season. In 2015, the percentage of full-time employees was slightly higher across seasons for guides/operators and for shore workers compared to 2013. As in 2012, in 2015 only full-time crew workers were employed in the off-season. Across personnel categories, there is no clear difference in the percentage of full-time employment.


Figure 9. -- Respondent sample percent full-time positions by season and type from 2011 to 2013.

Alaska charter businesses as a whole offer a variety of charter trip experiences that vary in length and target species. The surveys collected data on whether respondents offered trips that were half-day, three-quarter-day, full day, overnight, or multi-day in duration, as well as prices associated with these offerings. Survey questions on trip offerings were further divided by the types of species targeted: single-species fishing trips (Pacific halibut only, Pacific salmon only, and "other" saltwater species), twospecies trips, and multi-species trips (more than two species targeted).

Half-day charter trips were offered by approximately $60 \%$ of respondents, on average (Fig. 10 B ). Between 2013 and 2015, the percentage of respondents offering half-day salmon, other species, and two-species trips increased slightly, while the percentage of respondents offering half-day halibut trips declined between 2012 and 2015. Mean prices charged per person to charter clients for half-day trips went up in 2015 from 2013 levels, even accounting for inflation, though the increase was not statistically significant except in the case of two-species trips. In 2015, the average price of a half-day trip was approximately $\$ 210$ (Fig. 10 A).

B. Proportion of respondents offering half-day trips


$$
■ 2011 \square 2012 \square 2013 \square 2015
$$

Figure 10. -- Respondent sample of half-day trip offerings. Error bars represent two standard errors around the mean.

Three-quarter day charter trips were offered by at least $63 \%$ of the item respondents each year (Fig. 11 B). Mean prices charged per client for three-quarter day trips ranged from approximately $\$ 220$ to $\$ 235$ (Fig. 11 A). Similar to the half-day trips, there was minimal variation in the mean prices charged for these trips across target species and over the 4 years. Except for multi-species three-quarter day trips, 2015 mean prices were larger than previous years'. However, comparisons of $95 \%$ confidence bounds on these mean prices suggest no statistical differences across years.


Figure 11. -- Respondent sample of three-quarter day trip offerings. Error bars represent two standard errors around the mean.

During 2015, the percentage of respondents offering full-day charter trips ranged from a low of approximately $29 \%$ (for multi-species and 2 -species trips) to a high of approximately $62 \%$ (other species) (Fig. 12 B). The percentage of respondents offering full day multi-species or other species trips decreased slightly in recent years. For full-day trip offerings in 2015, prices charged per client generally ranged from $\$ 311$ to $\$ 384$ (Fig. 12 A), which are comparable to previous years' mean prices. Year-toyear differences in reported prices charged across species offerings were generally not statistically significant.


Figure 12. -- Respondent sample of full day trip offerings. Error bars represent two standard errors around the mean.

Overnight charter trips were offered each year by the majority (over 64\%) of respondents (Fig. 13 B ). Mean prices per client for overnight trips ranged from a low of less than $\$ 430$ (other species in 2011 and 2012 and two-species in 2011) to a high of nearly $\$ 1,200$ (other species in 2013) (Fig. 13 A). Mean prices for overnight charter trips in 2015 were between $\$ 530$ and $\$ 620$; this excludes the mean price for other-species trips, which cannot be reported due to too few charter businesses reporting prices for that type of trip. It should be noted that the low number of item respondents resulted in relatively large standard errors of the means. Hence, none of the mean prices charged are statistically significantly different from one another.


Figure 13. -- Respondent sample of overnight trip offerings. Error bars represent two standard errors around the mean.

The percentage of respondents offering multi-day charter trips ranged from approximately $50 \%$ (twospecies and multi-species) to $70 \%$ (halibut, salmon, and other species (Fig. 14 B ). The percentage of respondents offering multi-day trips generally increased between 2011 and 2015, even though halibut and salmon multi-day trips were offered by slightly fewer businesses in 2015 compared to 2013. With respect to the different multi-day fishing trips offered, multi-species options had the highest price per client on average (Fig. 14 A). Mean price differences across years were not statistically significant.


Figure 14. -- Respondent sample of multi-day trip offerings. Error bars represent two standard errors around the mean.

All 4 years of sample data suggest that relatively few charter businesses rely on charter business revenue for $100 \%$ of their household income. For each of the years of sample data, less than one-fifth of item respondents reported 100\% of their household income deriving from charter business (Fig. 15). The largest proportion of respondents reported that charter business accounted for between 1 and $25 \%$ of their total annual household income. Between 2011 and 2015, the fraction of item respondents reporting at least half of their total household income was earned from charter business increased from 51 to $57 \%$.


Figure 15. -- Distribution of 2011-2013 and 2015 respondent sample of total annual household income earned from the charter business.

During the off-season, charter business operators have a number of different, though not mutually exclusive, options available with respect to employment. For each of the 4 years, continuing charter business work, on its own or as part of an off season portfolio, represented the most common offseason option (Fig. 16), with over 40\% of item respondents in each of the 4 years reporting that they continued charter business work as part of their off-season schedule. In 2015, the proportion continuing charter business work was the highest across the survey years, at 49\%. In 2011-2012, over 30\% of respondents reported working a non-fishing related job in Alaska as part of their off-season schedule, but this dropped to about 20\% in 2015.


Figure 16. -- Proportion of 2011-2013 and 2015 item respondents participating in at least one off-season activity. Charter businesses can engage in multiple opportunities during the off season. The figure shows the distribution of how item respondents, at least in part, spend their offseason time.

Across the 4 years of sample data, the number of off-season activities engaged in remained relatively constant (Fig. 17). In each year, over $60 \%$ of item respondents reported being engaged in one offseason activity. The proportion of respondents engaged in two activities was highest in 2015 (31\%). No respondent reported being engaged in more than three activities during the off-season.


Figure 17. -- Number of off-season opportunities engaged in by 2011-2013 and 2015 item respondents.

With respect to the composition of charter business clients, over half of the item respondents for the 2011-2013 and 2015 fishing years reported that returning customers and personal referrals from previous customers accounted for 51 to 99\% of their client base (Fig. 18). Between 2011 and 2015, the percentage of respondents reporting that $100 \%$ of their clients were returnees or referrals fell from 5 to $2 \%$. Between 2013 and 2015, the percentage of respondents reporting that $76-99 \%$ of clients were returnees or referrals remained fairly constant at close to $20 \%$.


Figure 18. -- Proportion of charter business clients that were either return customers or personal referral from previous customers for 2011-2013 item respondents.

In each year, at least $80 \%$ of item respondents reported that more than $25 \%$ of their clients booked at least one month in advance (Fig. 19). Over the same period, almost $90 \%$ of item respondents indicated that fewer than $25 \%$ of their clients booked trips less than 48 hours in advance (Fig. 20).


Figure 19-- Proportion of charter business clients that booked their trip at least one month in advance for 2011-2013 item respondents.


Figure 20. - Percentage of charter business clients that booked their trip less than 48 hours in advance for 2011-2013 and 2015 item respondents.

Many charter businesses rely on independent bookings (i.e., bookings not done through an intermediary, like a travel agent) for much of their clientele (Fig. 21). In fact, across all 4 years of survey data, approximately half of item respondents each year reported at least $76 \%$ of their clients making independent bookings. Between 18 and $24 \%$ of respondents did not book any independent clients, while between 12 and $22 \%$ of respondents did book at least some clients through cruise ships across the 4 years. The $12 \%$ of respondents booking at least some clients from cruise ships in 2015 was the lowest proportion across the four survey years. About half of charter business respondents booked clients through specialty charter booking services.


Figure 21. -- Distribution of 2011-2013 and 2015 charter business respondents according to the proportion of clients booked by source. Independent denotes an independent booking, cruise ship denotes booking through a cruise ship, charter denotes booking through the charter business itself or a specialty charter booking service, and travel agent denotes booking through a general travel agent.

## POPULATION ESTIMATES

In the previous section, we summarized the descriptive statistics for the 2015 sample item respondents, then compared the totals, means, and medians across all survey years (2011-2013 and 2015). In those comparisons, a limiting factor is that there were different sample sizes each year and unit and item nonresponse were not accounted for, making it difficult to draw conclusions from year-to-year changes. In this section, we estimate corresponding population-level estimates after applying sample weighting and data imputation methods described earlier. These population estimates correct for differences in sample sizes, as well as missing data, which was prevalent in each year's survey data. ${ }^{21}$ As a result, they provide a more complete picture of the costs, earnings, and employment in the charter sector during 2011-2013 and 2015.

## 2015 Population Estimates

The number of active charter businesses during 2015 was 561 . Total revenue to the charter fishing sector for 2015 was estimated to be approximately $\$ 116$ million (S.E. $=\$ 5.5$ million). Total costs were estimated to be just over $\$ 122$ million (S.E. $=\$ 2.9$ million). Hence, it is estimated that the charter fishing sector operated at a slight loss during the 2015 fishing year, although the total cost and revenue estimates are not statistically different and therefore the loss is not statistically significant. Mean revenues per charter business were estimated to be approximately $\$ 207,000(S . E .=\$ 9,743)$ while mean costs were estimated to be $\$ 218,000(S . E .=\$ 5,148)$.

The largest personnel category across the four fishing seasons, full-time and part-time inclusive, was estimated to be guides/operators, followed closely by shore workers. Total full-time and part-time guides/operator and shore worker positions (where each position is season-specific) were estimated to be 3,659 and 2,060, respectively. The largest employment category was full-time operators, estimated at 3,286 (S.E. $=391$ ), followed by full-time shore workers at $1,786($ S.E. $=116)$. The estimated number of mean full-time guides/operators and shore worker positions per business was $5.9(S . E .=0.7)$ and 3.2 (S.E. $=0.2$ ), respectively. Part-time guides/operators and shore worker positions had an estimated mean of 0.7 (S.E. $=0.05$ ) and 0.5 (S.E. $=0.05$ ), respectively. Crew personnel positions were estimated to total 1,769 for the four fishing seasons. Of this total, 1,414 (S.E. $=67$ ) were estimated to be full-time and 354 (S.E. $=30$ ) were estimated to be part-time. Mean full-time and part-time crew positions per business was estimated to be 2.5 (S.E. $=0.1$ ) and $0.6($ S.E. $=0.05)$, respectively.

Total employment during the 2015 fishing year was highest during the main season for guides/operators and shore workers. Total employment across position types was highest during the main season, second highest in the late shoulder season, and lowest in the off-season (Fig. 22). Off season employment for the three personnel categories ranged from $9 \%$ (crew) to $30 \%$ (guides/operators) of their respective totals during the main season.

[^15]

Figure 22. -- 2015 population estimates for full and part-time positions by season and type.

The estimated percentage of full-time positions during the 2015 fishing year ranged from 71 (shore worker, off-season) to 100 (guide/operator, off season) (Table 14). Generally speaking, guides/operators were estimated to have the highest percentage of full-time positions, ranging from approximately $88 \%$ in both shoulder seasons to $100 \%$ in the off season. Crew and shore workers were estimated to have at least 78\% full-time positions through the season (off-season shore workers).

Table 14. -- 2015 population estimates for percent of full-time positions by season and type.

|  | Guide/Operator | Crew | Shore worker |
| :--- | :---: | :---: | :---: |
| Early shoulder | $88 \%$ | $78 \%$ | $91 \%$ |
| Main season | $90 \%$ | $80 \%$ | $86 \%$ |
| Late shoulder | $88 \%$ | $79 \%$ | $88 \%$ |
| Off season | $100 \%$ | $100 \%$ | $71 \%$ |

The largest type of expenditure during the 2015 fishing year for the charter business population was estimated to be general overhead expenses (Table 15). Total and mean general overhead expenses were estimated at approximately $\$ 34.8$ million and $\$ 62,000$, respectively. The second largest expenditure category was charter trip operating expenses, with an estimated total of $\$ 28.1$ million and mean of about $\$ 50,000$. Estimates of expenditures on capital (buildings, land, and real estate) for 2015 were the smallest across major expense types, with population total of $\$ 17.5$ million and mean of $\$ 31,246$. Recall that the capital expenditures category includes rental/lease payments, purchases, and improvements fully paid for during 2015, as well as loan payments on purchases and improvements financed during or before 2015.

Labor expenses were estimated to total $\$ 21.6$ million with a mean of $\$ 38,480$ per business. Within the labor expenditure category, compensation toward guides/operators was estimated to be a little more than half of the total (Table 16). Mean expenditures per business for operators, crew, and shore workers was estimated to be approximately $\$ 19,700, \$ 6,500$, and $\$ 12,300$, respectively.

Table 15. - 2015 population estimates for mean and total major cash expenses by type (in 2015 dollars).

| Major expense type | Population mean | Total <br> (in millions) |
| :--- | :---: | :---: |
| Charter trip operating expenses | 50,110 | 28.11 |
| General overhead expenses | $(1,570)$ | $(0.86)$ |
|  | 62,008 | 34.79 |
| Vehicles, machinery, equipment | $(3,092)$ | $(1.74)$ |
|  | 36,245 | 20.34 |
| Labor expenses | $(3,002)$ | $(1.68)$ |
|  | 38,480 | 21.59 |
| Buildings, land, real estate | $(2,056)$ | $(1.16)$ |
|  | 31,246 | 17.53 |

Note: standard errors are given in parentheses.

Table 16. -- 2015 population estimates for total and mean labor expenses per business in 2015 dollars by personnel type.

|  | Guide/Operator | Crew | Shore worker |
| :--- | :---: | :---: | :---: |
| Population mean | 19,723 | 6,498 | 12,259 |
|  | $(1,354)$ | $(733)$ | $(961)$ |
| Total | 11.07 | 3.65 | 6.88 |
| (in millions) | $(0.76)$ | $(0.41)$ | $(0.54)$ |

Note: standard errors are given in parentheses.

Total new investments (including all investment costs, such as principal, interest, taxes and fees, and down payment) of equipment and real estate made during 2015 was estimated to be $\$ 52$ million (Table 17). Of this total, over half was investments toward vessels and major vessel-related equipment. Mean investments per business were estimated to be just under \$93,000.

Table 17. -- 2015 population estimates for mean and total major new investments by type in 2015 dollars.

| Major investment | Population mean | Total <br> (in millions) |
| :--- | :---: | :---: |
| Equipment and real estate | 92,964 | 52.16 |
|  | $(6,215)$ | $(3.48)$ |

Note: standard errors are given in parentheses.

Total estimated revenues for the population of charter businesses during 2015 was $\$ 116$ million (S.E. $=$ $\$ 5.4$ million), which is about equal to the low of $\$ 116$ million (S.E. $=\$ 4.8$ million) in 2012 (Table 18). It is estimated that the charter fishing sector, as a whole, operated at a loss during the 2011 and 2015 fishing years (based solely on comparing total costs and revenue point estimates). During the 2012 and 2013 fishing years, however, we estimate that the charter fishing sector operated profitably as a whole. Statistically speaking, there is no significant difference between total revenues in 2012 ( $\$ 116$ million, S.E. = \$4.8 million) and 2015 ( $\$ 116$ million, S.E. $=\$ 5.4$ million). However, there was a large and statistically significant increase in total revenues for the 2013 fishing year ( $\$ 171$ million, S.E. $=$ $\$ 9.6$ million) relative to 2011 ( $\$ 143$ million, S.E. $=\$ 4.3$ million) and 2012 and a statistically significant decrease between 2013 and 2015. Mean estimated revenues ranged from a low of \$193,337 (S.E. = $\$ 7,990$ ) in 2012 to a high of $\$ 291,245(S . E .=\$ 16,607)$ in 2013. For 2015, mean estimated revenues $(\$ 206,856$, S.E. $=\$ 9,743)$ were statistically similar to both $2011(\$ 218,638$, S.E. $=\$ 6,856)$ and 2012 ( $\$ 193,337$, S.E. $=\$ 7,990$ ) levels (Fig. 23). Moreover, mean costs per business in 2015 were not statistically different from the 2015 mean revenues, which suggests one cannot reject the notion that charter businesses as a whole were operating at a break-even level (and not at a loss) in 2015. The 2015 and 2013 mean cost estimates are statistically similar.

Table 18. -- Summary of total (in millions) and mean revenues and expenses for the 2011-2013 and 2015 fishing years (in 2015 dollars).

|  | 2011 |  | 2012 |  | 2013 |  | 2015 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Total | Mean | Total | Mean | Total | Mean | Total | Mean |
| Revenues | $\begin{gathered} 143.40 \\ (4.26) \end{gathered}$ | $\begin{gathered} 218,638 \\ (6,856) \end{gathered}$ | $\begin{gathered} 115.92 \\ (4.76) \end{gathered}$ | $\begin{gathered} 193,337 \\ (7,990) \end{gathered}$ | $\begin{aligned} & 170.96 \\ & (9.61) \end{aligned}$ | $\begin{aligned} & 291,245 \\ & (16,607) \end{aligned}$ | $\begin{gathered} 116.06 \\ (5.48) \end{gathered}$ | $\begin{gathered} 206,856 \\ (9,743) \end{gathered}$ |
| Total costs (excluding investment payments*) | $\begin{gathered} 184.10 \\ (7.61) \end{gathered}$ | $\begin{aligned} & 315,784 \\ & (10,371) \end{aligned}$ | $\begin{aligned} & 108.06 \\ & (2.04) \end{aligned}$ | $\begin{gathered} 180,217 \\ (3,059) \end{gathered}$ | $\begin{gathered} 126.94 \\ (2.59) \end{gathered}$ | $\begin{gathered} 216,249 \\ (4,625) \end{gathered}$ | $\begin{aligned} & 122.36 \\ & (2.88) \end{aligned}$ | $\begin{gathered} 218,090 \\ (5,148) \end{gathered}$ |
| Labor expenses | $\begin{aligned} & 33.97 \\ & (1.24) \end{aligned}$ | $\begin{aligned} & 51,801 \\ & (1,981) \end{aligned}$ | $\begin{aligned} & 23.37 \\ & (0.68) \end{aligned}$ | $\begin{aligned} & 38,984 \\ & (1,135) \end{aligned}$ | $\begin{aligned} & 28.10 \\ & (1.06) \end{aligned}$ | $\begin{aligned} & 47,872 \\ & (1,874) \end{aligned}$ | $\begin{aligned} & 21.59 \\ & (1.16) \end{aligned}$ | $\begin{aligned} & 38,480 \\ & (2,056) \end{aligned}$ |
| Charter trip expenses | $\begin{aligned} & 43.34 \\ & (2.89) \end{aligned}$ | $\begin{aligned} & 66,087 \\ & (4,319) \end{aligned}$ | $\begin{aligned} & 28.82 \\ & (1.05) \end{aligned}$ | $\begin{aligned} & 48,058 \\ & (1,783) \end{aligned}$ | $\begin{aligned} & 30.02 \\ & (0.94) \end{aligned}$ | $\begin{aligned} & 51,143 \\ & (1,635) \end{aligned}$ | $\begin{aligned} & 28.11 \\ & (0.86) \end{aligned}$ | $\begin{aligned} & 50,110 \\ & (1,570) \end{aligned}$ |
| Overhead expenses | $\begin{aligned} & 56.00 \\ & (2.47) \end{aligned}$ | $\begin{aligned} & 85,381 \\ & (3,626) \end{aligned}$ | $\begin{aligned} & 34.06 \\ & (0.73) \end{aligned}$ | $\begin{aligned} & 56,805 \\ & (1,207) \end{aligned}$ | $\begin{aligned} & 43.89 \\ & (1.28) \end{aligned}$ | $\begin{aligned} & 74,770 \\ & (2,248) \end{aligned}$ | $\begin{aligned} & 34.79 \\ & (1.74) \end{aligned}$ | $\begin{aligned} & 62,008 \\ & (3,092) \end{aligned}$ |
| Capital expenditures | $\begin{aligned} & 50.78 \\ & (5.61) \end{aligned}$ | $\begin{aligned} & 77,427 \\ & (8,035) \end{aligned}$ | $\begin{aligned} & 21.81 \\ & (1.00) \end{aligned}$ | $\begin{aligned} & 36,370 \\ & (1,688) \end{aligned}$ | $\begin{aligned} & 24.93 \\ & (0.80) \end{aligned}$ | $\begin{aligned} & 42,463 \\ & (1,378) \end{aligned}$ | $\begin{aligned} & 37.87 \\ & (1.72) \end{aligned}$ | $\begin{aligned} & 67,491 \\ & (3,079) \end{aligned}$ |
| Investment payments | $\begin{aligned} & 23.01 \\ & (1.86) \\ & \hline \end{aligned}$ | $\begin{aligned} & 35,088 \\ & (2,880) \end{aligned}$ | $\begin{aligned} & 32.42 \\ & (1.74) \\ & \hline \end{aligned}$ | $\begin{aligned} & 54,071 \\ & (2,890) \\ & \hline \end{aligned}$ | $\begin{aligned} & 23.91 \\ & (2.09) \end{aligned}$ | $\begin{aligned} & 40,728 \\ & (3,584) \end{aligned}$ | $\begin{aligned} & 52.16 \\ & (3.48) \\ & \hline \end{aligned}$ | $\begin{aligned} & 92,964 \\ & (6,215) \\ & \hline \end{aligned}$ |

Note: standard errors are given in parentheses.
*Investment payments include the full investment costs of new investments financed by loans during the year, incl. loan principal, taxes and fees, and down payment amount. Total costs for the year only include actual expenditures made during the year. Capital expenditures refers to new purchases and improvements on equipment and real estate.


Figure 23. -- Mean estimated population-level revenues (in 2015 dollars) for the 2011-2013 and 2015 fishing years. Error bars represent two standard errors around the mean.

Estimated overhead expenses were generally the largest category of expenditures for the charter business population from 2011-2013, ranging from approximately $\$ 34$ million in 2012 to $\$ 56$ million in 2011 (Table 18 and Fig. 24). However, in 2015, the largest expenditure category was investment payments ( $\$ 52$ million, S.E. $=\$ 3.5$ million), which exceeded the $\$ 35$ million (S.E. $=\$ 1.7$ million) spent in overhead expenses. Labor payments were generally the lowest expenditure category in each year. Capital expenditures toward durable goods were relatively low compared to other categories in 2012 and 2013, but were the second largest cost category in terms of expenditures in 2011 and 2015. Between 2012 and 2015, charter trip expenses were fairly similar in magnitude with no statistical differences between estimates. Mean overhead expenses ranged from $\$ 56,805(S . E .=\$ 1,207)$ in 2012 to $\$ 85,381$ (S.E. $=\$ 3,626$ ) in 2011. The 2015 overhead estimate was $\$ 62,008$ (S.E. $=\$ 3,092$ ). The mean investment payments estimate of $\$ 92,964$ (S.E. $=\$ 6,215$ ) in 2015 was larger than in any previous year by at least a $50 \%$ margin.

Between 2011 and 2012, mean expenditures were estimated to have large and statistically significant reductions across all four major expense categories (Fig. 24). The largest estimated reductions were toward capital expenditures to durable goods, with an estimated reduction from \$77,427 (S.E. = \$8,035) in 2011 to $\$ 36,370(S . E .=\$ 1,688)$ in 2012 and $\$ 42,463(S . E .=\$ 1,378)$ in 2013. However, in 2015, the mean capital expenditures per business increased to $\$ 67,491$ (S.E. $=\$ 3,079$ ), which is a statistically significant increase. In 2015, there were significant decreases from 2013 in mean overhead expenses and labor expenses, while mean charter trip expenses appeared to remain statistically level.


Figure 24. -- Mean estimated major expenses (in 2015 dollars) by type for the population of charter businesses for 2011-2013 and 2015. Error bars represent two standard errors above and below the means.

In terms of the number of season-specific positions, 2015 saw a large and statistically significant increase in the total full-time guides/operators. Between 2011 and 2013, the estimated total full-time guide/operator positions remained statistically the same, between 1,938 (S.E. = 3.23) and 1,967 (S.E. = 3.0) (Table 19). However, in 2015 the estimate went up to 3,286 (S.E. = 5.86) full-time guide/operator season-specific positions. Part-time guide/operator positions declined by roughly half between 2013 (734, S.E. $=1.25$ ) and $2015(373$, S.E. $=0.66)$. Shore worker positions generally experienced statistically significant declines compared to 2013. The 2015 shore worker estimates were statistically similar to the 2012 levels for full-time shore workers, but lower for part-time workers. Estimates of full-time crew employment were statistically the same for 2015 compared to 2013, but part-time crew declined over the same period.

Mean full-time guides/operator positions per charter business reached its highest level in 2015 with 5.9 season-positions, which is statistically larger than in previous years. The estimated mean number of part-time guide/operator positions in $2015(0.66$, S.E. $=0.05$ ) declined significantly from 2013 (1.25, S.E. $=0.07)$, returning to a level statistically similar to $2012(0.69$, S.E. $=0.04)$. Mean full-time shore worker positions was $3.18($ S.E. $=0.21)$ in 2015, which is (statistically) lower than the 2013 level (4.52, S.E. $=$ 0.22 ) and similar to the 2012 level ( 2.89, S.E. $=0.11$ ). The mean part-time shore worker positions in 2015 of 0.49 (S.E. $=0.05$ ) is statistically lower than in previous years. The mean number of full-time crew positions was statistically unchanged between 2013 (2.54, S.E. $=0.09$ ) and 2015 ( 2.52 , S.E. $=0.12$ ), though the part-time crew positions were lower in 2015 ( 0.63 , S.E. $=0.05$ ) compared to levels in previous years (approximately 1.00 each year).

Table 19. -- 2011-2013 and 2015 mean and total population estimates for full-time and part-time season-specific positions by type.

|  | 2011 |  |  | 2012 |  |  | 2013 | Meal |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Total | Mean | Total | Mean | Total | Mean | Total |  |
| FT operators | 1,967 | 3.00 | 1,938 | 3.23 | 1,944 | 3.31 | 3,286 |  |
|  | $(42.21)$ | $(0.06)$ | $(45.95)$ | $(0.08)$ | $(50.61)$ | $(0.09)$ | $(391.06)$ | $(0.70)$ |
| PT operators | 584 | 0.89 | 417 | 0.69 | 734 | 1.25 | 373 | 0.66 |
|  | $(26.86)$ | $(0.04)$ | $(26.78)$ | $(0.04)$ | $(40.71)$ | $(0.07)$ | $(26.30)$ | $(0.05)$ |
| FT crew | 1,326 | 2.02 | 1,285 | 2.14 | 1,491 | 2.54 | 1,414 | 2.52 |
|  | $(56.18)$ | $(0.09)$ | $(41.69)$ | $(0.07)$ | $(50.70)$ | $(0.09)$ | $(66.58)$ | $(0.12)$ |
| PT crew | 648 | 0.99 | 606 | 1.01 | 550 | 0.94 | 354 | 0.63 |
|  | $(37.44)$ | $(0.05)$ | $(44.51)$ | $(0.07)$ | $(29.76)$ | $(0.05)$ | $(29.84)$ | $(0.05)$ |
| FT shore workers | 2,711 | 4.13 | 1,733 | 2.89 | 2,655 | 4.52 | 1,786 | 3.18 |
|  | $(83.31)$ | $(0.12)$ | $(64.07)$ | $(0.11)$ | $(127.29)$ | $(0.22)$ | $(115.54)$ | $(0.21)$ |
| PT shore workers | 1,222 | 1.86 | 645 | 1.08 | 820 | 1.40 | 273 | 0.49 |
|  | $(66.04)$ | $(0.10)$ | $(32.48)$ | $(0.05)$ | $(37.93)$ | $(0.07)$ | $(25.86)$ | $(0.05)$ |

Mean labor expenditures per business in 2015 ( $\$ 19,723$, S.E. $=\$ 1,354$ ) spent toward guides/operators were statistically unchanged from the 2013 levels (\$18,492, S.E. = \$630) (Fig. 25). Mean crew expenditures were also statistically unchanged between $2013(\$ 7,710$, S.E. $=\$ 419)$ and $2015(\$ 6,498$, S.E. = \$733). However, mean expenditures on shore workers fell from \$21,670 (S.E. = \$1,478) in 2013 to $\$ 12,259($ S.E. $=\$ 961)$ in 2015, a level similar to $2012(\$ 12,664$, S.E. $=\$ 525)$.


Figure 25. -- Population estimates for mean labor expenses (in 2015 dollars) by type for the years 20112013 and 2015. Error bars represent two standard errors around the mean.

For the 2015 fishing year, the highest percentage of full-time positions tended to occur during the offseason, with $100 \%$ of positions being full-time for both guides/operators and crew (Fig. 26). This is a change from 2013 , when $66 \%$ guide/operator and $46 \%$ of crew positions were full-time during the offseason. The percent of full-time shore workers in the off-season in 2015 (71\%) was higher than in previous seasons (ranged between $47 \%$ and $60 \%$ ). Moreover, the estimated percentage of full-time guides/operators and shore workers throughout the year was larger in 2015 than in previous years. It is worth noting, however, that employment is generally lowest in the off season.


Figure 26. -- Estimated percent of full-time positions for the 2011-2013 charter business population.
For each of the 4 years of data, total (full-time and part-time) employment was estimated to be highest during the main season (Figs. 26-28). Total employment estimates during the early and late shoulder seasons were similar, though late shoulder employment tended to be slightly higher each year across the three personnel categories.

The total estimated number of guides/operator positions (aggregated over seasons) was fairly uniform in 2011-2013 (ranging from 4,366 to 4,691) and tended to follow the same patterns across seasons (Fig. 27). However, in 2015, the total estimated guides/operators (5,674 total for the year) increased in each season compared to prior years. In contrast, the total estimated crew and shore workers decreased in 2015 relative to 2013 for each personnel category except crew in the off-season, which increased from 57 to 71 (Fig. 28-Fig. 29). For crew and shore workers, total estimates for 2015 were mostly lower than corresponding estimates in 2011 and 2012 as well. Note that the population of charter businesses declined from roughly 650 in 2011 to 590 in 2012, and then to 572 in 2013 and 561 in 2015. Thus, the increase in total guide/operator season-positions between 2013 and 2015 occurred over a smaller population of businesses.


Figure 27. -- Charter business population estimates for the total (full- and part-time) number of guides/operator positions by fishing season, 2011-2013 and 2015.


Figure 28. -- Charter business population estimates for the total (full- and part-time) number of crew positions by season, 2011-2013 and 2015.


Figure 29. -- Charter business population estimates for the total (full and part-time) number of shore worker positions by fishing season, 2011-2013 and 2015.

For half day charter fishing trips, we estimated the mean prices charged per individual in 2015 were generally statistically larger than in past years (Fig. 30). Mean half-day charter trip prices in 2015 ranged from approximately $\$ 195$ (S.E. = \$5.47) for a halibut trip to $\$ 219$ (S.E. $=\$ 4.98$ ) for a multi-species trip. For 2011-2013, the mean half-day trip prices ranged from $\$ 160$ (S.E. = \$3.23) for a halibut trip in 2012 to $\$ 191$ for multi-species (S.E. = $\$ 2.95$ ) and halibut (S.E. $=\$ 2.93$ ) in 2011. The mean price for other-species half-day trips in 2015 could not be estimated given insufficient data (the item response rate was too low to apply data imputation methods).


Figure 30. -- Mean estimated prices (in 2015 dollars) charged per individual for half-day trips for the population of charter businesses. Error bars represent two standard errors around the mean.

Mean prices charged for three-quarter day trips could not be estimated for two-species, multi-species, or halibut trips in 2015 due to insufficient data being available to apply our chosen data imputation methods. For salmon, the three-quarter day trip mean price was $\$ 237$ (S.E. $=\$ 3.21$ ), which is statistically larger than the 2013 mean price ( $\$ 218$, S.E. $=\$ 2.26$ ) and 2011 mean price ( $\$ 212$, S.E. $=\$ 4.24$ ), but not statistically different from the 2012 mean price ( $\$ 233$, S.E. $=\$ 2.38$ ) (Fig. 31).


Figure 31. -- Mean estimated prices (in 2015 dollars) charged per individual for three-quarter day trips for the population of charter businesses. Error bars represent two standard errors around the mean.

Mean prices for full-day charter trips in 2015 were estimated to range from approximately $\$ 308$ (S.E. = $\$ 7.81$ ) for salmon to $\$ 328$ (S.E. = $\$ 6.21$ ) for two-species (Fig. 32). For 2015, the mean prices across the trip offerings were not statistically different. However, the mean price for a multi-species trip could not be estimated for 2015 due to insufficient data being available for the data imputation methods to be applied. 2015 mean trip prices were statistically larger than corresponding mean prices in 2013, with the exception of other-species trips, where the difference is not statistically significant. The mean price of halibut full-day trips in 2015 ( $\$ 325$, S.E. $=\$ 8.41$ ) was statistically lower than the 2011 mean price ( $\$ 391$, S.E. = \$23.25).


Figure 32. --Mean estimated prices (in 2015 dollars) charged per individual for full day trips for the population of charter businesses. Error bars represent two standard errors around the mean.

There was insufficient data available to apply the data imputation methods to estimate 2015 mean prices of overnight charter fishing trips (Fig. 33).


Figure 33. --Mean estimated prices (in 2015 dollars) charged per individual for overnight trips for the population of charter businesses. Error bars represent two standard errors around the mean.

In 2015, estimated mean prices charged per individual for multi-day trips were generally lowest for trips targeting only salmon (\$1,083, S.E. = \$98.12), followed by halibut (\$1,315, S.E. = \$114.20) (Fig. 34).

Multi-species trips had the highest estimated mean price ( $\$ 1,959$, S.E. $=\$ 155.03$ ). The mean price of halibut multi-day trips in 2015 was statistically lower than in $2013(\$ 1,871$, S.E. $=\$ 92.12)$. Mean prices for multi-species, salmon, and other species multi-day trips were lower in 2015 than 2013, but the differences were not statistically significant.


Figure 34. -- Mean estimated prices (in 2015 dollars) charged per individual for multi-day trips for the population of charter businesses by species targeted. Error bars represent two standard errors around the mean.

## DISCUSSION

In this report, we have described the Alaska Saltwater Sport Fishing Charter Business Survey that was fielded in 2016 and collected data on 2015 costs, earnings, employment, and other information from the population of Alaska saltwater charter fishing businesses. We present descriptive statistics of the sample of item respondents and population-level estimates of key variables after applying sample weighting and data imputation to adjust the sample for population representativeness. The results suggest that in 2015 the Alaska saltwater sport fishing charter sector as a whole operated at a roughly break-even level. This is a change from 2013, when the charter sector as a whole was estimated to have operated at a profitable level. In between, there was major change in the management landscape for the charter sector with the implementation of the Catch Sharing Plan, which ushered in the Guided Angler Fish program and a more formalized commercial-recreational sector allocation scheme, among other changes. During this period, there was not much exit from the fishery (the active charter business population decreased from 572 to 561 ), particularly compared to earlier survey years. However, determining the exact causes for the shift in profitability remains a question for further research involving a more structural analytic approach than was taken here.

The 4-year period highlighted here, and particularly the comparison of 2015 with 2013, saw slight changes in employment and spending patterns within the charter sector. This includes a shift to using proportionately more full-time employees, notably for guides/operators, and reducing the number of
crew and onshore worker positions. There was also an increased investment in capital (vessels) compared to previous years. At the same time, average revenues decreased to levels similar to those seen in 2012. There was also some evidence that average prices charged for half-day charter trips increased relative to earlier years, and halibut full day inflation-adjusted trip prices may have gone up as well.

The 2011-2013 population-level estimates were re-estimated and reported here as well. The new results were qualitatively the same as the estimates presented in Lew et al. (2015b). As in the previous report, the population-level estimates relied upon sample weighting and data imputation methods, and we repeat some of the limitations outlined in Lew et al. (2015b) to highlight their continued importance. The data imputation method used in this report relies upon there being a sufficient number of donor values ( $K>3$ ). Due to the high item non-response rate for some variables, we were unable to apply this approach in some cases. Due to the smaller sample size available from the 2016 survey, there were more variables for which we could not generate population-level estimates than in other years. This was most conspicuous with the charter trip price variables. Note that switching our imputation approach to another less data-demanding method, such as assuming a mean or median value, would likely introduce significant bias due to the already small item response rate.

This points to a broader issue with respect to adjusting for missing data. As discussed earlier, the low unit and item response rates suggest adjustments are necessary to provide information about the population. To our knowledge, there is also no agreed-upon threshold on the maximum amount of unit or item non-response to which data imputation methods can be applied without compromising the integrity of the results. In this study, the data requirements imposed by our adjustment methods were primarily dictated by the availability and quality of auxiliary data describing the population. Fortunately, the auxiliary dataset contained a rich set of variables that provided considerable information about the population, allowing us to apply a rigorous data imputation approach. Still, the population-level estimates generated in this study should be viewed with caution due to the low response rates, and future iterations of the survey should endeavor to increase the unit and item response rates to increase the confidence in results that are generated.

Another cautionary note should be made regarding the employment estimates. Our discussion of employment trends relied upon data about employment numbers by season and type of position (vessel operators/guides, crew, and onshore workers). As a result, individuals occupying more than one type of position and/or working in multiple seasons during the same year would appear as multiple positions in the data. As a result, our employment estimates cannot be used to reveal an estimate of the number of individual workers hired by season or in total over the year. Instead, they represent the number of positions filled that are specific to the season and position type.

This report presents baseline economic information about the Alaska saltwater sport fishing charter sector one year after the implementation of the Alaska Halibut Catch Sharing Plan and compares it to information from the period immediately before implementation. A survey to collect data from this sector for the 2017 fishing year is being implemented in 2018, which will add to the information available about the charter sector in the post-CSP implementation era. The survey data will improve our ability to evaluate economic effects of the CSP on the sector. Moreover, structural economic models are being planned that will enable modeling the behavioral responses at the individual business level. These analyses will better explain the factors that influence charter business decisions and their likely response to management actions.

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## APPENDIX A

Appendix Table A1. -- Summary of 2015 active vessels, employment, trips, services, expenditures, and revenues across the sample of item respondents.

| Description | Mean | Med. | Min | Max | Sum | Std Dev |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: |
| Total number of vessels of any type <br> OPERATOR Full-time season workers | 1.47 | 1 | 0 | 12 | 128 | 1.74 |
| for the year | 9.77 | 4.00 | 1.00 | 170.00 | 430.00 | 25.39 |
| OPERATOR Part-time season workers <br> for the year | 2.50 | 2.00 | 1.00 | 8.00 | 35.00 | 1.83 |
| CREW Full-time season workers for <br> the year <br> CREW Part-time season workers for | 5.59 | 3.00 | 1.00 | 30.00 | 179.00 | 6.92 |
| the year | 1.76 | 2.00 | 1.00 | 3.00 | 30.00 | 0.66 |
| SHORE Full-time season workers for <br> the year | 11.81 | 9.00 | 1.00 | 42.00 | 248.00 | 12.05 |
| SHORE Part-time season workers for <br> the year | 2.50 | 2.00 | 1.00 | 4.00 | 25.00 | 1.35 |
| Total sold trips any type | 104.73 | 68.00 | 3.00 | 900.00 | $5,132.00$ | 140.19 |
| Total seats sold any type <br> No. of trips of this type not offered, <br> halibut | 463.62 | 315.00 | 20.00 | $3,441.00$ | $23,181.00$ | 582.65 |
| No. of trips of this type not offered, <br> salmon | 2.55 | 2.00 | 1 | 5 | 181.00 | 1.57 |
| No. of trips of this type not offered, | 2.54 | 2.00 | 1 | 500 | 180.00 | 1.69 |
| two species |  |  |  |  |  |  |

## Appendix Table A2. -- 2015 survey variable descriptions, number of blank or not applicable

 cases, and item non-response rate (raw data, $\mathrm{N}=87$ ).| Variable | Description | Blanks and N/A | $\begin{gathered} \text { Item } \\ \text { response } \\ \text { rate } \\ \hline \end{gathered}$ |
| :---: | :---: | :---: | :---: |
| A2 | Respondent identification: vessels owned | 0 | 1.00 |
| A2 | Respondent identification: vessels leased | 0 | 1.00 |
| B1 | No. of employees: guides/full-time/early shoulder | 13 | 0.80 |
| B1 | No. of employees: guides/full-time/main season | 8 | 0.87 |
| B1 | No. of employees: guides/full-time/late shoulder | 13 | 0.82 |
| B1 | No. of employees: guides/full-time/off season | 21 | 0.70 |
| B1 | No. of employees: guides/part-time/early shoulder | 37 | 0.53 |
| B1 | No. of employees: guides/part-time/main season | 41 | 0.48 |
| B1 | No. of employees: guides/part-time/late shoulder | 39 | 0.49 |
| B1 | No. of employees: guides/part-time/off season | 43 | 0.45 |
| B2 | No. of employees: other crew/full-time/early shoulder | 19 | 0.74 |
| B2 | No. of employees: other crew/full-time/main season | 13 | 0.80 |
| B2 | No. of employees: other crew/full-time/late shoulder | 19 | 0.72 |
| B2 | No. of employees: other crew/full-time/off season | 22 | 0.69 |
| B2 | No. of employees: other crew/part-time/early shoulder | 39 | 0.53 |
| B2 | No. of employees: other crew/part-time/main season | 39 | 0.53 |
| B2 | No. of employees: other crew/part-time/late shoulder | 40 | 0.52 |
| B2 | No. of employees: other crew/part-time/off season | 42 | 0.49 |
| B3 | No. of employees: shore/full-time/early shoulder | 17 | 0.78 |
| B3 | No. of employees: shore/full-time/main season | 16 | 0.79 |
| B3 | No. of employees: shore/full-time/late shoulder | 17 | 0.78 |
| B3 | No. of employees: shore/full-time/off season | 24 | 0.69 |
| B3 | No. of employees: shore/part-time/early shoulder | 41 | 0.52 |
| B3 | No. of employees: shore/part-time/main season | 41 | 0.52 |
| B3 | No. of employees: shore/part-time/late shoulder | 42 | 0.51 |
| B3 | No. of employees: shore/part-time/off season | 43 | 0.48 |


| B4 | Employee pay: guides | 13 | 0.82 |
| :--- | :--- | :---: | :--- |
| B4 | Employee pay: other crew | 19 | 0.74 |
| B4 | Employee pay: shore employees | 18 | 0.74 |
| B5 | Employee pay, wage option: guide | 0 | 1.00 |
| B5 | Employee pay, salary option: guide | 0 | 1.00 |
| B5 | Employee pay, share option: guide | 0 | 1.00 |
| B5 | Employee pay, other option: guide | 0 | 1.00 |
| B5 | Employee pay, wage option: other crew | 0 | 1.00 |
| B5 | Employee pay, salary option: other crew | 0 | 1.00 |
| B5 | Employee pay, share option: other crew | 0 | 1.00 |
| B5 | Employee pay, other option: other crew | 0 | 1.00 |
| B5 | Employee pay, wage option: shore employee | 0 | 1.00 |
| B5 | Employee pay, salary option: shore employee | 0 | 1.00 |
| B5 | Employee pay, share option: shore employee | 0 | 1.00 |
| B5 | Employee pay, other option: shore employee | 84 | 1.00 |
| C1 | Trip offerings, fishing only option | 19 | 1.00 |
| C1 | Trip offerings, combination fishing and hunting option | 75 | 1.00 |
| C1 | Trip offerings, combination fishing and tour option | 45 | 1.00 |
| C1 | Trip offerings, tour only option | 58 | 1.00 |
| C1 | Trip offerings, outfitting option | 84 | 1.00 |
| C1 | Trip offerings, game transport option | 79 | 1.00 |
| C1 | Trip offerings, general transportation option | 60 | 1.00 |
| C1 | Trip offerings, event hosting option | 85 | 1.00 |
| C1 | Trip offerings, research or oil spill services option | 82 | 1.00 |
| C1 | Trip offerings, other services option | 4 | 0.05 |
| C2 | Trip offerings: 2-species/half-day: not offered option | 0 | 1.00 |
| C2 | Trip offerings: 2-species/half-day: individual price | 0.18 |  |
| C2 | Trip offerings: 2-species/half-day: boat price | 0.17 |  |
| C2 | Trip offerings: 2-species/three-quarter day: not offered option | 1.00 |  |
| C2 | Trip offerings: 2-species/three-quarter day: individual price | 0 | 0.10 |
| C2 | Trip offerings: 2-species/three-quarter day: boat price | 0.09 |  |
|  |  | 0 |  |


| C2 | Trip offerings: 2-species/full day: not offered option | 26 | 1.00 |
| :---: | :---: | :---: | :---: |
| C2 | Trip offerings: 2-species/full day: individual price | 1 | 0.54 |
| C2 | Trip offerings: 2-species/full day: boat price | 2 | 0.49 |
| C2 | Trip offerings: 2-species/overnight: not offered option | 63 | 1.00 |
| C2 | Trip offerings: 2-species/overnight: individual price | 0 | 0.06 |
| C2 | Trip offerings: 2-species/overnight: boat price | 0 | 0.06 |
| C2 | Trip offerings: 2-species/multi-day: not offered option | 49 | 1.00 |
| C2 | Trip offerings: 2-species/multi-day: individual price | 0 | 0.22 |
| C2 | Trip offerings: 2-species/multi-day: boat price | 0 | 0.18 |
| C2 | Trip offerings: multi-species/half-day: not offered option | 56 | 1.00 |
| C2 | Trip offerings: multi-species/half-day: individual price | 0 | 0.11 |
| C2 | Trip offerings: multi-species/half-day: boat price | 0 | 0.11 |
| C2 | Trip offerings: multi-species/three-quarter day: not offered option | 61 | 1.00 |
| C2 | Trip offerings: multi-species/three-quarter day: individual price | 0 | 0.06 |
| C2 | Trip offerings: multi-species/three-quarter day: boat price | 0 | 0.05 |
| C2 | Trip offerings: multi-species/full day: not offered option | 25 | 1.00 |
| C2 | Trip offerings: multi-species/full day: individual price | 1 | 0.51 |
| C2 | Trip offerings: multi-species/full day: boat price | 1 | 0.44 |
| C2 | Trip offerings: multi-species/overnight: not offered option | 62 | 1.00 |
| C2 | Trip offerings: multi-species/overnight: individual price | 0 | 0.06 |
| C2 | Trip offerings: multi-species/overnight: boat price | 0 | 0.05 |
| C2 | Trip offerings: multi-species/multi-day: not offered option | 51 | 1.00 |
| C2 | Trip offerings: multi-species/multi-day: individual price | 0 | 0.21 |
| C2 | Trip offerings: multi-species/multi-day: boat price | 0 | 0.17 |
| C3 | Trip offerings: halibut/half-day: not offered option | 56 | 1.00 |
| C3 | Trip offerings: halibut/half-day: individual price | 0 | 0.15 |
| C3 | Trip offerings: halibut/half-day: boat price | 1 | 0.16 |
| C3 | Trip offerings: halibut/three-quarter day: not offered option | 61 | 1.00 |
| C3 | Trip offerings: halibut/three-quarter day: individual price | 0 | 0.11 |
| C3 | Trip offerings: halibut/three-quarter day: boat price | 1 | 0.11 |


| C3 | Trip offerings: halibut/full day: not offered option | 31 | 1.00 |
| :---: | :---: | :---: | :---: |
| C3 | Trip offerings: halibut/full day: individual price | 0 | 0.47 |
| C3 | Trip offerings: halibut/full day: boat price | 2 | 0.43 |
| C3 | Trip offerings: halibut/overnight: not offered option | 66 | 1.00 |
| C3 | Trip offerings: halibut/overnight: individual price | 0 | 0.05 |
| C3 | Trip offerings: halibut/overnight: boat price | 1 | 0.05 |
| C3 | Trip offerings: halibut/multi-day: not offered option | 58 | 1.00 |
| C3 | Trip offerings: halibut/multi-day: individual price | 0 | 0.15 |
| C3 | Trip offerings: halibut/multi-day: boat price | 1 | 0.11 |
| C3 | Trip offerings: salmon/half-day: not offered option | 56 | 1.00 |
| C3 | Trip offerings: salmon/half-day: individual price | 0 | 0.17 |
| C3 | Trip offerings: salmon/half-day: boat price | 0 | 0.18 |
| C3 | Trip offerings: salmon/three-quarter day: not offered option | 60 | 1.00 |
| C3 | Trip offerings: salmon/three-quarter day: individual price | 0 | 0.11 |
| C3 | Trip offerings: salmon/three-quarter day: boat price | 0 | 0.11 |
| C3 | Trip offerings: salmon/full day: not offered option | 37 | 1.00 |
| C3 | Trip offerings: salmon/full day: individual price | 0 | 0.38 |
| C3 | Trip offerings: salmon/full day: boat price | 0 | 0.36 |
| C3 | Trip offerings: salmon/overnight: not offered option | 66 | 1.00 |
| C3 | Trip offerings: salmon/overnight: individual price | 1 | 0.05 |
| C3 | Trip offerings: salmon/overnight: boat price | 0 | 0.05 |
| C3 | Trip offerings: salmon/multi-day: not offered option | 56 | 1.00 |
| C3 | Trip offerings: salmon/multi-day: individual price | 1 | 0.18 |
| C3 | Trip offerings: salmon/multi-day: boat price | 0 | 0.13 |
| C3 | Trip offerings: other species/half-day: not offered option | 61 | 1.00 |
| C3 | Trip offerings: other species/half-day: individual price | 0 | 0.07 |
| C3 | Trip offerings: other species/half-day: boat price | 1 | 0.09 |
| C3 | Trip offerings: other species/three-quarter day: not offered option | 64 | 1.00 |
| C3 | Trip offerings: other species/three-quarter day: individual price | 0 | 0.05 |
| C3 | Trip offerings: other species/three-quarter day: boat price | 1 | 0.06 |


| C3 | Trip offerings: other species/full day: not offered option | 45 | 1.00 |
| :---: | :---: | :---: | :---: |
| C3 | Trip offerings: other species/full day: individual price | 0 | 0.25 |
| C3 | Trip offerings: other species/full day: boat price | 1 | 0.25 |
| C3 | Trip offerings: other species/overnight: not offered option | 68 | 1.00 |
| C3 | Trip offerings: other species/overnight: individual price |  | 0.02 |
| C3 | Trip offerings: other species/overnight: boat price |  | 0.03 |
| C3 | Trip offerings: other species/multi-day: not offered option | 59 | 1.00 |
| C3 | Trip offerings: other species/multi-day: individual price | 0 | 0.13 |
| C3 | Trip offerings: other species/multi-day: boat price | 1 | 0.09 |
| C4 | Fishing-related services: long-distance fishing: not offered option | 39 | 1.00 |
| C4 | Fishing-related services: long-distance fishing: included in trip package option | 58 | 1.00 |
| C4 | Fishing-related services: long-distance fishing: added fee option | 84 | 1.00 |
| C4 | Fishing-related services: long-distance fishing: added fee amount | 1 | 0.05 |
| C4 | Fishing-related services: fish cleaning ( $\mathrm{h} / \mathrm{g}$ ): not offered option | 69 | 1.00 |
| C4 | Fishing-related services: fish cleaning ( $\mathrm{h} / \mathrm{g}$ ): included in trip package option | 28 | 1.00 |
| C4 | Fishing-related services: fish cleaning ( $\mathrm{h} / \mathrm{g}$ ): added fee option | 86 | 1.00 |
| C4 | Fishing-related services: fish cleaning ( $\mathrm{h} / \mathrm{g}$ ): added fee amount | 5 | 0.09 |
| C4 | Fishing-related services: fish cleaning (skinning, etc.): not offered option | 70 | 1.00 |
| C4 | Fishing-related services: fish cleaning (skinning, etc.): included in trip package option | 26 | 1.00 |
| C4 | Fishing-related services: fish cleaning (skinning, etc.): added fee option | 87 | 1.00 |
| C4 | Fishing-related services: fish cleaning (skinning, etc.): added fee amount | 5 | 0.10 |
| C4 | Fishing-related services: packing and shipping: not offered option | 38 | 1.00 |
| C4 | Fishing-related services: packing and shipping: included in trip package option | 68 | 1.00 |
| C4 | Fishing-related services: packing and shipping: added fee option | 79 | 1.00 |
| C4 | Fishing-related services: packing and shipping: added fee amount | 3 | 0.09 |
| C4 | Fishing-related services: transport to/from vessel: not offered option | 38 | 1.00 |
| C4 | Fishing-related services: transport to/from vessel: included in trip package option | 61 | 1.00 |


| C4 | Fishing-related services: transport to/from vessel: added fee option | 86 | 1.00 |
| :---: | :---: | :---: | :---: |
| C4 | Fishing-related services: transport to/from vessel: added fee amount |  | 0.02 |
| C4 | Fishing-related services: onshore lodging: not offered option | 40 | 1.00 |
| C4 | Fishing-related services: onshore lodging: included in trip package option | 59 | 1.00 |
| C4 | Fishing-related services: onshore lodging: added fee option | 79 | 1.00 |
| C4 | Fishing-related services: onshore lodging: added fee amount | 2 | 0.09 |
| C4 | Fishing-related services: on-vessel lodging: not offered option | 26 | 1.00 |
| C4 | Fishing-related services: on-vessel lodging: included in trip package option | 71 | 1.00 |
| C4 | Fishing-related services: on-vessel lodging: added fee option | 87 | 1.00 |
| C4 | Fishing-related services: on-vessel lodging: added fee amount |  | 0.01 |
| C4 | Fishing-related services: cooked meals: not offered option | 43 | 1.00 |
| C4 | Fishing-related services: cooked meals: included in trip package option | 53 | 1.00 |
| C4 | Fishing-related services: cooked meals: added fee option | 86 | 1.00 |
| C4 | Fishing-related services: cooked meals: added fee amount |  | 0.00 |
| C4 | Fishing-related services: beverages/snacks: not offered option | 61 | 1.00 |
| C4 | Fishing-related services: beverages/snacks: included in trip package option | 37 | 1.00 |
| C4 | Fishing-related services: beverages/snacks: added fee option | 85 | 1.00 |
| C4 | Fishing-related services: beverages/snacks: added fee amount |  | 0.03 |
| C4 | Fishing-related services: bait: not offered option | 79 | 1.00 |
| C4 | Fishing-related services: bait: included in trip package option | 20 | 1.00 |
| C4 | Fishing-related services: bait: added fee option | 87 | 1.00 |
| C4 | Fishing-related services: bait: added fee amount | 3 | 0.07 |
| C4 | Fishing-related services: ice: not offered option | 67 | 1.00 |
| C4 | Fishing-related services: ice: included in trip package option | 33 | 1.00 |
| C4 | Fishing-related services: ice: added fee option | 85 | 1.00 |
| C4 | Fishing-related services: ice: added fee amount | 3 | 0.05 |
| C4 | Fishing-related services: fishing gear: not offered option | 80 | 1.00 |


| C4 | Fishing-related services: fishing gear: included in trip package |  |  |
| :--- | :--- | :---: | :--- |
| C4 | option | Fishing-related services: fishing gear: added fee option | 20 |
| C4 | Fishing-related services: fishing gear: added fee amount | 87 | 1.00 |
| C4 | Fishing-related services: other gear: not offered option | 5 | 0.08 |
| C4 | Fishing-related services: other gear: included in trip package | 57 | 1.00 |
| option |  | 46 | 1.00 |
| C4 | Fishing-related services: other gear: added fee option | 86 | 1.00 |
| C4 | Fishing-related services: other gear: added fee amount |  | 0.03 |
| C4 | Fishing-related services: souvenirs: not offered option | 32 | 1.00 |
| C4 | Fishing-related services: souvenirs: included in trip package |  |  |
| C4 | option | Fishing-related services: souvenirs: added fee option | 80 |
| C4 | Fishing-related services: souvenirs: added fee amount | 77 | 1.00 |
| C4 | Fishing-related services: other: not offered option | 1 | 0.07 |
| C4 | Fishing-related services: other: included in trip package option |  | 0.00 |
| C4 | Fishing-related services: other: added fee option |  | 0.00 |
| C4 | Fishing-related services: other: added fee amount | 0.00 |  |
| C5 | Fishing-related services: paid lodging offered option |  | 0.00 |
| C6 | Revenue: charter trips, direct client payment: seats sold | 69 | 1.00 |
| C6 | Revenue: charter trips, direct client payment: total trips | 2 | 0.52 |
| C6 | Revenue: charter trips, direct client payment: revenue | 2 | 0.48 |
| C6 | Revenue: charter trips, agent payment: seats sold | 4 | 0.59 |
| C6 | Revenue: charter trips, agent payment: total trips | 14 | 0.41 |
| C6 | Revenue: charter trips, agent payment: revenue | 7 | 0.33 |
| C6 | Revenue: non-fishing charter trips: seats sold | 19 | 0.51 |
| C6 | Revenue: non-fishing charter trips: total trips | 18 | 0.43 |
| C6 | Revenue: non-fishing charter trips: revenue | 13 | 0.39 |
| C6 | Revenue: referrals: total referrals | 26 | 0.52 |
| C6 | Revenue: referrals: revenue | 0.36 |  |
| C6 | Revenue: CHP sales: endorsements sold | 0.43 |  |
| C6 | Revenue: CHP sales: revenue | 22 | 0.39 |
|  |  |  | 0.30 |


| C6 | Revenue: CHP leases: endorsements leased | 30 | 0.40 |
| :---: | :---: | :---: | :---: |
| C6 | Revenue: CHP leases: revenue | 24 | 0.34 |
| D1 | Costs: vessel fuel | 3 | 0.79 |
| D1 | Costs: fish handling, processing, packaging, shipping | 28 | 0.75 |
| D1 | Costs: broker or agent referral/commission fees | 28 | 0.69 |
| D1 | Costs: vessel cleaning | 24 | 0.71 |
| D1 | Costs: supplies | 3 | 0.75 |
| D1 | Costs: other vessel or trip operating expenses | 14 | 0.71 |
| D1 | Costs: non-wage payroll costs | 17 | 0.69 |
| D1 | Costs: utilities | 1 | 0.71 |
| D1 | Costs: repair and maintenance | 3 | 0.70 |
| D1 | Costs: insurance | 2 | 0.70 |
| D1 | Costs: travel, meals, entertainment | 8 | 0.63 |
| D1 | Costs: office and general supplies | 4 | 0.57 |
| D1 | Costs: legal and professional services | 9 | 0.54 |
| D1 | Costs: financial services | 5 | 0.49 |
| D1 | Costs: taxes and licensing fees | 4 | 0.43 |
| D1 | Costs: vehicle fuel costs | 4 | 0.36 |
| D1 | Costs: other general overhead expenses | 12 | 0.30 |
| D1 | Costs: Guided Angler Fish (GAF) leasing expenditures | 14 | 0.18 |
| D2 | Capital expenses: vessels and related equipment: cash payment | 10 | 0.54 |
| D2 | Capital expenses: vessels and related equipment: new investment | 10 | 0.34 |
| D2 | Capital expenses: vehicles: cash payment | 10 | 0.47 |
| D2 | Capital expenses: vehicles: new investment | 11 | 0.29 |
| D2 | Capital expenses: fishing gear, tackle, safety equipment: cash payment | 5 | 0.43 |
| D2 | Capital expenses: fishing gear, tackle, safety equipment: new investment | 7 | 0.26 |
| D2 | Capital expenses: other machinery and equipment: cash payment | 11 | 0.38 |
| D2 | Capital expenses: other machinery and equipment: new investment | 9 | 0.15 |
| D2 | Capital expenses: moorage/slip, boatyard and storage space: cash payment | 3 | 0.31 |


| D2 | Capital expenses: moorage/slip, boatyard and storage space: new investment | 10 | 0.17 |
| :---: | :---: | :---: | :---: |
| D2 | Capital expenses: office space, lodging, shore-side facilities: cash payment | 14 | 0.25 |
| D2 | Capital expenses: office space, lodging, shore-side facilities: new investment | 12 | 0.15 |
| D2 | Capital expenses: transferable fishing permits and licenses: cash payment | 15 | 0.22 |
| D2 | Capital expenses: transferable fishing permits and licenses: new investment | 10 | 0.14 |
| D2 | Capital expenses: other business-related property and assets: cash payment | 12 | 0.17 |
| D2 | Capital expenses: other business-related property and assets: new investment | 10 | 0.13 |
| E1 | Clients: percentage of clients that were return customers or referrals from previous customers | 0 | 0.97 |
| E2 | Clients: percentage of clients booking 1 month of more in advance | 0 | 0.97 |
| E3 | Clients: percentage of clients booking less than 48 hours in advance | 0 | 0.95 |
| E4 | Clients: percentage of clients booked independent | 0 | 0.94 |
| E4 | Clients: percentage of clients booked through cruise ship | 0 | 0.84 |
| E4 | Clients: percentage of clients booked through charter booking service | 0 | 0.89 |
| E4 | Clients: percentage of clients booked through general travel agent | 0 | 0.83 |
| E4 | Business and household: C corporation option | 76 | 0.97 |
| F2 | Business and household: business structure type | 0 | 0.47 |
| F3 | Business and household: percentage share of business by household | 0 | 0.86 |
| F4 | Business and household: household members working as guides | 6 | 0.83 |
| F4 | Business and household: household members working as other crew | 16 | 0.47 |
| F4 | Business and household: household members working on shore | 15 | 0.61 |
| F5 | Business and household: percentage of income from business | 0 | 0.83 |
| F6 | Business and household: work related to charter business option | 44 | 1.00 |
| F6 | Business and household: worked in AK, fishing not related to charter business | 80 | 1.00 |
| F6 | Business and household: worked in AK, non-fishing job | 69 | 1.00 |


| F6 | Business and household: lived in AK, did not work | 70 | 1.00 |
| :--- | :--- | :--- | :--- |
| F6 | Business and household: worked outside AK, fishing not related |  |  |
|  | to charter business | 86 | 1.00 |
| F6 | Business and household: worked outside AK, non-fishing job | 78 | 1.00 |
| F6 | Business and household: lived outside AK, did not work | 82 | 1.00 |

## APPENDIX B

## Alaska Saltwater Sport Fishing Charter Business Survey

## 2015 Season



Photo credit: R. Yamada


This survey is funded by the National Oceanic and Atmospheric Administration, a U.S. government agency charged with making decisions about halibut management.

Public reporting burden for this collection of information is estimated at 90 minutes, including time for reviewing instructions, reviewing existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the Paperwork Reduction Act, unless that collection of information displays a currently valid OMB Control Number.

## SURVEY INSTRUCTIONS

This is a voluntary survey.
$\diamond$ Your responses to the survey questions should reflect information about your saltwater sport fishing charter business.
$\diamond$ If you have questions or anything is unclear, please contact Geana Tyler at the Pacific States Marine Fisheries Commission, (888) 421-4251.
$\diamond$ If you are unable to answer the question, please write why you are unable to answer in the margin (for example, information is unavailable).

## All questions relate to you and the sport fishing charter business you licensed during 2015.

A1 What are the business name and license number of your business as listed on the ADF\&G Sport Fish Business Owner license?

Sport fish business name
$\overline{A D F \& G \text { sport fish business owner license number }}$

A2 Please list the DMV-issued Alaska Vessel Number or U.S. Coast Guard Vessel Documentation Number for all (or up to 10) active vessels that this business operated during the 2015 season and indicate if the vessel was owned by the business or if it was leased from another person or business. Include only saltwater vessels for which your business incurred expenses and/or received revenue.

|  | Vessel license number | Owned <br> $\square$ | Leased <br> $\nabla$ |
| :--- | :---: | :---: | :---: |
| Vessel 1: | $\square$ | $\square$ |  |
| Vessel 2: | $\square$ | $\square$ |  |
| Vessel 3: | $\square$ | $\square$ |  |
| Vessel 4: | $\square$ | $\square$ | $\square$ |
| Vessel 5: | $\square$ | $\square$ |  |
| Vessel 6: | $\square$ | $\square$ |  |
| Vessel 7: | $\square$ | $\square$ |  |
| Vessel 8: | $\square$ | $\square$ |  |
| Vessel 9: | $\square$ | $\square$ | $\square$ |
| Vessel 10: | $\square$ | $\square$ |  |

## EMPLOYMENT IN 2015

The next few questions are about employment and compensation of vessel operators and licensed guides, deckhands and other crew members, and other individuals employed by this business in 2015.

## For these questions:

- The early shoulder season refers to the period from April 1 to mid-June.
- The main season refers to the period from mid-June to mid-August.
- The late shoulder season is from mid-August to the end of September.
- The off-season is the period from October through March.

B1 How many individuals worked for the business primarily as hired vessel operators and/or licensed sport fishing guides during each period in 2015, not including owners of this business? For each period, please report the number of individuals who worked full-time and part-time separately.

|  | Early <br> shoulder | Main <br> season | Late <br> shoulder | Off-season |
| :--- | :---: | :---: | :---: | :---: |
| Full-time (at least 35 hours per week <br> during most of the period)............. |  |  |  |  |
| Part-time (less than 35 hours per week <br> during most of the period)....... |  |  |  |  |

B2 How many individuals worked for the business primarily as hired deckhands or other on-board crew during each period in 2015, not including owners of this business? For each period, please report the number of individuals who worked full-time and part-time separately.

|  | Early <br> shoulder | Main <br> season | Late <br> shoulder | Off-season |
| :--- | :--- | :---: | :---: | :---: |
| Full-time (at least 35 hours per week <br> during most of the period)............ |  |  |  |  |
| Part-time (less than 35 hours per week <br> during most of the period)...... |  |  |  |  |

B3 How many individuals were hired and worked for the business primarily on-shore during each period in 2015 (examples: business manager, guest services, administrative employees, etc)? Do not include independent contractors that provide the same service to multiple businesses, or owners of this business. For each period, please report the number of individuals who worked full-time and part-time separately.

|  | Early <br> shoulder | Main <br> season | Late <br> shoulder | Off-season |
| :--- | :--- | :---: | :---: | :---: |
| Full-time (at least 35 hours per week <br> during most of the period)............. |  |  |  |  |
| Part-time (less than 35 hours per week <br> during most of the period)....... |  |  |  |  |

B4 For work performed in 2015, how much did you pay in total to hired vessel operators and guides, deckhands and other crew, and on-shore employees? Include only payment of wages and other monetary compensation; do not include non-wage benefits (for example, health insurance), other payroll expenses (for example, unemployment insurance), or any payments to owners of this business.

| Worker type | Total payments |
| :---: | :---: |
| Vessel operators/guides................... | \$ |
| Deckhands and other on-board crew...... | \$ |
| On-shore employees..................... | \$ |

B5 What forms of compensation were used for hired vessel operators and guides, deckhands and other crew, and on-shore employees in 2015? For each worker type, please check the box for each form of compensation that was used to pay one or more individuals, not including owners of this business. Check all that apply.

| Worker type | Daily/ <br> hourly <br> wage <br> $\nabla$ | Salary <br> $\square$ | Revenue <br> share <br> $\nabla$ | Other <br> $\square$ | (please describe) |
| :--- | :---: | :---: | :---: | :---: | :---: |

C1 During 2015, which of the following trip types did you offer? Check all that apply.

- Fishing only

Combination fishing and hunting
Combination fishing and dedicated eco-tour/wildlife-viewing
Eco-tour/wildlife viewing only (no fishing)
Outfitting (example: saltwater fishing gear rental)

- Game transport

General transportation/water taxi (no outfitting/game transport)
[ Event-hosting services

- Research or oil spill monitoring and response
$\square$ Other, please describe: $\qquad$

C2 Many businesses offer saltwater fishing trips targeting multiple species ("combination fishing trips"). During 2015, what was the average price per person and the full boat price (chartering the whole boat independent of the number of clients) that you charged clients for the following types of combination fishing trips you may have advertised offering? If you did not advertise or offer, please check the "Not offered" box.

| Type of combination fishing trip | Not offered $\nabla$ | Average price per person | Full boat price |
| :---: | :---: | :---: | :---: |
| Two-species combination fishing trips |  |  |  |
| "Half day" trip.................................... | $\square$ | \$ | \$ |
| "Three-quarter day" trip......................... | $\square$ | \$ | \$ |
| "Full day" trip...................................... | $\square$ | \$ | \$ |
| "Overnight" trip....................................... | $\square$ | \$ | \$ |
| "Multi-day" trip.................................. | $\square$ | \$ | \$ |
| Multiple-species combination fishing trip (more than two species) |  |  |  |
| "Half day" trip................................... | $\square$ | \$ | \$ |
| "Three-quarter day" trip.......................... | $\square$ | \$ | \$ |
| "Full day" trip....................................... | $\square$ | \$ | \$ |
| "Overnight" trip....................................... | $\square$ | \$ | \$ |
| "Multi-day" trip................................... | $\square$ | \$ | \$ |

C3 During 2015, what was the average price per person and the full boat price (chartering the whole boat independent of the number of clients) that you charged clients for halibut, king salmon, silver salmon, or other saltwater species fishing trips targeting a single species that you may have advertised offering? If you did not advertise or offer, please check the "Not offered" box.

| Type of fishing trip | Not offered V | Average price per person | Full boat price |
| :---: | :---: | :---: | :---: |
| Halibut fishing trips |  |  |  |
| "Half day" trip................................... | $\square$ | \$ | \$ |
| "Three-quarter day" trip.......................... | $\square$ | \$ | \$ |
| "Full day" trip...................................... | $\square$ | \$ | \$ |
| "Overnight" trip....................................... | $\square$ | \$ | \$ |
| "Multi-day" trip.................................. | $\square$ | \$ | \$ |
| King or silver salmon fishing trips |  |  |  |
| "Half day" trip................................... | $\square$ | \$ | \$ |
| "Three-quarter day" trip......................... | $\square$ | \$ | \$ |
| "Full day" trip..................................... | $\square$ | \$ | \$ |
| "Overnight" trip....................................... | $\square$ | \$ | \$ |
| "Multi-day" trip................................. | $\square$ | \$ | \$ |
| Other saltwater species fishing trips |  |  |  |
| "Half day" trip.................................. | $\square$ | \$ | \$ |
| "Three-quarter day" trip.......................... | $\square$ | \$ | \$ |
| "Full day" trip.................................... | $\square$ | \$ | \$ |
| "Overnight" trip....................................... | $\square$ | \$ | \$ |
| "Multi-day" trip.................................. | $\square$ | \$ | \$ |

C4 Of the following fishing－related services，which did you typically include as part of each saltwater fishing package you offered in 2015，which were offered for an added fee，and which were not offered？For services offered for an additional fee，please indicate how much the fee is per person．If a fee is not charged on a per person basis，please write in the basis for the fee（examples：$\$ 10 /$ trip，$\$ 10 /$ pound）in the margin．

| Fishing－related services | Not offered マ | Included in one or more trip package？『 | Charge an added fee？ マ | Amount of added fee per person（indicate if fee is charged on other basis） |
| :---: | :---: | :---: | :---: | :---: |
| Long－distance fishing locations（including fuel surcharge）． | $\square$ | $\square$ | $\square$ | \＄ |
| Fish cleaning（head／gut）．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Fish cleaning（skinning，scaling，filleting， etc）． | $\square$ | $\square$ | $\square$ | \＄ |
| Packing and shipping．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Transport to／from charter vessel．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| On－shore lodging．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| On－vessel lodging．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Cooked meals（breakfast／lunch／dinner） | $\square$ | $\square$ | $\square$ | \＄ |
| Beverages／snacks．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Bait．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Ice．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Fishing gear．．．．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Other gear．．．．．．．．．．．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Souvenirs／keepsakes．．．．．．．．．．．．．．．．．．．．． | $\square$ | $\square$ | $\square$ | \＄ |
| Other（please describe）： | $\square$ | $\square$ | $\square$ | \＄ |

C5 During 2015，did you offer paid lodging to visitors that were not customers of the charter business？
$\square$ Yes
－No

C6 What sales and revenue were generated from your charter business in 2015? For each source of revenue, please indicate the number of units sold and total revenue received.

| Revenue source | Number of units sold | Total revenue |
| :---: | :---: | :---: |
| Charter trips reported in charter logbook - payment received directly from client... | total clients (seats sold) total trips | \$ |
| Charter trips reported in charter logbook - payment received from booking agent or other service. | total clients (seats sold) total trips | \$ |
| Non-fishing charter trips - not reported in charter logbook (examples: transport, huntingonly, eco-tours).. | total clients total trips | \$ |
| Client referrals/booking commission revenue. | total client referrals/bookings | \$ |
| Federal Charter Halibut Permit (CHP) sales. | total endorsements sold | \$ |
| Federal Charter Halibut Permit (CHP) leases. | total endorsements leased | \$ |

Note: If you have a printed rate sheet, brochure, or other promotional material for your business that describes saltwater charter services offered and prices, please enclose a copy with your completed survey in the return envelope.

## YOUR COSTS IN 2015

The next questions ask about your business' operating costs, excluding the wages paid to employees reported in Section B. The questions are organized to make it easy to use federal tax return information and other common financial records to answer them.

- Question D1 requests information on business expenses that are generally deductible for federal tax purposes and are likely calculated with information from your federal tax return. Expenses typically based on individual charter trips are listed separately from those for other goods and services that contribute to general business overhead.
- Question D2 requests estimated costs related to major assets used by your business. These may include payments you make that are not deductible for federal tax purposes, so it may be necessary to use mortgage or checking account statements, in addition to your federal tax return, to help you estimate these costs.

D1 How much did your business pay during 2015 for goods and services listed in the table below?

| Expense type | Amount paid |
| :---: | :---: |
| Charter trip operating expenses |  |
| Vessel fuel.................................................................... | \$ |
| Fish handling, processing, packaging, and shipping........................... | \$ |
| Broker or agent referral/commission fees....................................... | \$ |
| Vessel cleaning........................................................ | \$ |
| Supplies (examples: ice, bait, food and beverage)............................. | \$ |
| Other vessel or trip operating expenses........................................ | \$ |
| Guided angler fish (GAF) leases......................................... | \$ |
| General overhead expenses |  |
| Non-wage payroll costs, including health insurance and other employee benefits..... | \$ |
| Utilities, including telephone and internet service............................. | \$ |
| Repair and maintenance expenses........................................... | \$ |
| Insurance(vessel, hull, property \& indemnity, liability, etc., excluding health insurance). . . . . . . | \$ |
| Travel, meals, and entertainment (include transportation and per diem costs for employee or crew if paid by business, and trade show/marketing-related travel)... | \$ |
| Office and general supplies..................................................... | \$ |
| Legal and professional services, accounting, and advertising.................. | \$ |
| Financial services (merchant and bank fees) and mortgage interest payments. | \$ |
| Taxes and licensing fees.................................................. | \$ |
| Vehicle fuel costs............................................................... | \$ |
| Other general overhead expenses.............................................. | \$ |

D2 How much did you pay to purchase, improve, or use the items listed below? To help us distinguish annual expenditures from new long-term investments, please estimate separate amounts paid in 2015 for:

- Cash payments in 2015: total rental/lease payments, purchases and improvements fully paid for during 2015, and loan payments on purchases and improvements financed during or before 2015
- New investments in 2015: total investment costs financed by loans issued during 2015, including loan principal, taxes and fees, and down payment amount

| Item | Cash payments | New investments |
| :---: | :---: | :---: |
| Vehicles, machinery, and equipment |  |  |
| Vessel(s) and major vessel-related equipment........... | \$ | \$ |
| Vehicles (car/truck)...................................... | \$ | \$ |
| Fishing gear, tackle, personal safety equipment.......... | \$ | \$ |
| Other machinery and equipment......................... | \$ | \$ |
| Buildings, land and other real estate |  |  |
| Moorage/slip, boatyard and equipment storage space..... | \$ | \$ |
| Office space, lodging, and other shore-side facilities...... | \$ | \$ |
| Transferable fishing permits and licenses............... | \$ | \$ |
| Other business-related property and assets.............. | \$ | \$ |

## YOUR CLIENTS IN 2015

E1 During 2015, about what percentage of your clients were return customers or personal referrals from previous customers? Check the box of the best answer.
$\square$ None $\square 1-25 \% \quad \square 26-50 \% \quad \square 51-75 \% \quad \square 75-99 \% \quad \square 100 \%$
E2 During 2015, about what percentage of your clients booked their trips one month or more in advance? Check the box of the best answer.
$\square$ None

- 1-25\%
- 26-50\%
$\square 51-75 \%$75-99\%$100 \%$

E3 During 2015, about what percentage of your clients booked their trips less than 48 hours in advance? Check the box of the best answer.
$\square$ None

- 1-25\%
26-50\%51-75\%
$\square 75-99 \%$
- 100\%

E4 During 2015, about what percentage of your clients were booked independently, through a cruise ship, through a specialty charter booking service, or through a general travel agent? For each type of booking, check the box of the best answer.

Independent bookings
$\square$ None

- 1-25\%
$\square 26-50 \%$
- 51-75\%
- 75-99\%
- 100\%

Cruise ship-based booking
$\square$ None 1-25\%

- 26-50\%
$\square 51-75 \%$
$\square 75-99 \%$
- 100\%

Specialty charter booking service (or charter business)
$\square$ None $\square 1-25 \% \quad \square 26-50 \% \quad \square 51-75 \% \quad \square 75-99 \% \quad \square 100 \%$

General travel agent (or other booking service)
$\square$ None $\square 1-25 \% \quad \square 26-50 \% \quad \square 51-75 \% \quad \square 75-99 \% \quad \square 100 \%$

F1 Is your business structured as a C corporation? A C corporation is taxed separately from its owners.
$\square$ Yes $\rightarrow$ skip to the end of the survey
$\square \mathrm{No} \rightarrow$ continue to F2
F2 Which of the following business structures best describes your business? Check the best answer.
$\square$ Sole proprietorship
$\square$ Limited liability partnership (LLP), Limited liability company (LLC), or S Corporation
$\square$ Other:
F3 Please indicate the total percentage ownership share of this business held by you and other members of your household during 2015. Your household includes family members and others who share your residence. Do not include family members that have their own residence outside of yours.

My household's ownership share: $\qquad$ \%

F4 During 2015, how many members of your household, including yourself, worked for the business as vessel operators and guides, deckhands and other crew, and in work based primarily on-shore? If an individual did more than one job, include them in the count for the job they did the most.
$\qquad$ Vessel operators/guides
$\qquad$ Deckhands and other on-board crew
$\qquad$ On-shore work

F5 During 2015, about what percentage of your total annual household income was earned from this business? Check the best answer.
$\square$ None

- 1-25\%
- 26-50\%51-75\%75-99\%$100 \%$

F6 Which of the following best describes what you did during the 2014-15 off-season? Check all that apply.

Continued work related to your charter business, including travel outside of Alaska
Worked in Alaska in a commercial fishing-related job not related to your charter business
Worked in Alaska in a non-fishing related job
Lived in Alaska, but did not work

- Worked outside of Alaska in a recreational or commercial fishing-related job not related to your charter business
- Worked outside of Alaska in a non-fishing related job

Lived outside of Alaska, but did not work

Do you have any comments in general or about how your charter business has been affected in the last 5 years or will likely be impacted in the next five years, either positively or negatively? Please use the space below or attach separate sheets to provide us your comments.

## RECENT TECHNICAL MEMORANDUMS

Copies of this and other NOAA Technical Memorandums are available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22167 (web site: www.ntis.gov). Paper and electronic (.pdf) copies vary in price.

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MCKELVEY, D., and K. WILLIAMS. 2018. Abundance and distribution of age-0 walleye pollock in the eastern Bering Sea shelf during the Bering Arctic Subarctic Integrated Survey (BASIS) in 2014, 48 p. NTIS No.PB2018-101437.

381 BRYAN, D. R., M. LEVINE, and S. MCDERMOTT. 2018. Results of the 2016 and 2017 Central and Western Aleutian Islands underwater camera survey of Steller sea lion prey fields, 87 p. NTIS No. PB2018-101436.

SEUNG, C. K., and S. MILLER. 2018. Regional economic analysis for North Pacific fisheries, 86 p. NTIS No. PB2018-101435.

379 GANZ, P., S. BARBEAUX, J. CAHALAN, J. GASPER, S. LOWE, R. WEBSTER, and C. FAUNCE. 2017. Deployment performance review of the 2016 North Pacific Groundfish and Halibut Observer Program, 68 p. NTIS No. PB2018-101537.
M. M. MUTO, V. T. HELKER, R. P. ANGLISS, B. A. ALLEN, P. L. BOVENG, J. M. BREIWICK, M. F. CAMERON, P. J. CLAPHAM, S. P. DAHLE, M. E. DAHLHEIM, B. S. FADELY, M. C. FERGUSON, L. W. FRITZ, R. C. HOBBS, Y. V. IVASHCHENKO, A. S. KENNEDY, J. M. LONDON, S. A. MIZROCH, R. R. REAM, E. L. RICHMOND, K. E. W. SHELDEN, R. G. TOWELL, P. R. WADE, J. M. WAITE, and A. N. ZERBINI. 2018. Alaska marine mammal stock assessments, 2017, 272 p. NTIS No. PB2018-101535.

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TESTA, J. W. (editor). 2018. Fur seal investigations, 2015-2016, 107 p. NTIS No. PB2018100966.

VON SZALAY, P. G., and N. W. RARING. 2018. Data Report: 2017 Gulf of Alaska bottom trawl survey, 266 p. NTIS No. PB2018-100892

ROONEY, S., C. N. ROOPER, E. LAMAN, K. TURNER, D. COOPER, and M. ZIMMERMANN. 2018. Model-based essential fish habitat definitions for Gulf of Alaska groundfish species, 370 p. NTIS No. PB2018-100826.

LANG, C. A., J. I. RICHAR, and R. J. FOY. 2018. The 2017 eastern Bering Sea continental shelf and northern Bering Sea bottom trawl surveys: Results for commercial crab species, 233 p. NTIS No. PB2018-100825.


[^0]:    ${ }^{1}$ The Statewide Harvest Survey has been conducted as a survey of anglers by the State of Alaska annually beginning in 1977.
    ${ }^{2}$ Regulations (5 AAC 75.076) requiring logbooks for saltwater charter vessels in Alaska were adopted in February 1998 by the Alaska Board of Fisheries (for more, see Powers and Sigurdsson 2016).
    ${ }^{3}$ Fishing seasons correspond to the calendar year. In a given year, the recreational charter fishing season in Alaska is generally considered to run from April through September, with most fishing occurring in what is considered the main season, from Memorial Day weekend through Labor Day weekend. Since very little recreational fishing occurs between October and March, this period is generally considered the off-season.

[^1]:    ${ }^{4}$ For additional details on these methods, see Lew et al. (2015a, b).

[^2]:    ${ }^{5}$ Commercial wastage is defined by the IPHC to include (1) fish not meeting the minimum size requirement that are released and subsequently die, (2) fish captured by fishing gear that has been lost or abandoned, and (3) fish discarded for regulatory reasons.

[^3]:    ${ }^{6}$ IPHC defines net weight for halibut as the weight after the head, guts, ice, and slime are removed.
    ${ }^{7}$ GAF numbers and conversion from IFQ to GAF for Areas 2C and 3A for each fishing year are posted at http://alaskafisheries.noaa.gov

[^4]:    ${ }^{8}$ Sport guides in the state of Alaska must have a current ADF\&G sport fishing guide license, U.S. Coast Guard Operator's license (if operating a motorized vessel), and American Red Cross first aid certification.

[^5]:    ${ }^{9}$ The sampling frame was developed based on preliminary (non-final) ADF\&G Saltwater Charter Logbook data available in February, which is necessary in order to field the survey before the start of the main season and ensure optimal response rates. As a result, there are small discrepancies between the active population sizes in Powers and Sigurdsson (2016) and the population sizes in the sampling frames each year used in this report.

[^6]:    ${ }^{10}$ This excludes two completed surveys that consisted of responses that were determined to be outliers. As a result, these two surveys are not included in the sample used for analysis.

[^7]:    ${ }^{11}$ We apply sample weighting and data imputation at the full sample, rather than the strata, level. This was to ensure there were sufficient unit and item responses to utilize these data-intensive approaches and to maintain consistency with previous year estimates. Note also that the features distinguishing the four sample strata are variables that are accounted for in the sample weighting and data imputation approaches.

[^8]:    ${ }^{12}$ We used the inflation calculator based on the yearly Consumer Price Index provided by the U.S. Bureau of Labor Statistics (http://data.bls.gov/cgi-bin/cpicalc.pl).
    ${ }^{13}$ Lew et al. (2015a) apply survey statistical methods commonly employed in the survey literature to adjust for unit non-response in the 2012 survey data described in Lew et al. (2015b). For more information about dealing with unit and item non-response in the survey statistics literature, see Brick and Kalton (1996), Groves et al. (2002), Little and Vartivarian (2003), Lohr (2010), and Graham (2012).

[^9]:    ${ }^{14}$ These variables are consistent with those used for previous survey year analyses (see Lew et al. 2015b).

[^10]:    ${ }^{15}$ These models identify variables that are different between respondents and non-respondents and thus may need to be accounted for in sample weights to adjust for potential non-response bias during a specific year. As a result, the focus is on the statistically significant (i.e., statistically different from zero) parameters.
    ${ }^{16}$ These include any potential respondent and non-respondent.

[^11]:    ${ }^{17}$ Although the mean and median costs are lower than the corresponding revenue amounts for the item respondents in 2015, the determination of a roughly break-even level in the sector during 2015 is due to a comparison of totals reported. Note the discrepancy arises due to missing data resulting in different numbers of item respondents reporting costs and revenues. This illustrates a difficulty with making comparisons using only item respondent data (and not adjusting for missing data, which is done in the "Population Estimates" section). ${ }^{18}$ Note that by "employee position" we are treating reported employees in each season as separate positions even though they may be the same person being employed in different seasons. For instance, one person employed full-time in each of the four seasons would be represented in the data as 4 employee positions.

[^12]:    ${ }^{19}$ Values outside of two standard errors around the mean are outside the $95 \%$ confidence interval. In this report, we consider means with non-overlapping $95 \%$ confidence intervals statistically different.

[^13]:    Note: standard errors are given in parentheses.

[^14]:    ${ }^{20}$ As before, "position" refers to any one individual being employed for one season. Thus, two positions can refer to either one individual being employed for two seasons or two individuals being employed in the same personnel category in one season.

[^15]:    ${ }^{21}$ See Appendix A for the number of blank responses (item non-responses) per question.

