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Costs, Earnings, and Employment in the Alaska Saltwater Sport Fishing Charter Sector, 2017

D. K. Lew and J. Lee

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Costs, Earnings, and Employment in the Alaska Saltwater Sport Fishing Charter Sector, 2017

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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, 2014, and 2016 to collect data on the 2011-2013 and 2015 seasons. In 2018, 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 2017 season. This report describes the 2018 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 2017 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 profit 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 two years (2015 and 2017) following the implementation of the Alaska halibut catch sharing plan (CSP), which was implemented in 2014. A comparison of results for 2017 with those from 2015 suggest several notable changes in employment and spending patterns within the charter sector. This includes a shift to using proportionately more part-time guides/operators rather than full-time ones and a decline in the number of full-time and part-time crew employees. There was also a substantial decrease in investments in capital (vessels) in 2017 compared with 2015, which represents a return to levels seen in earlier survey years. In addition, average general overhead costs were higher than has been seen in any other survey year.

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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 being implemented (83 FR 47819).

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 Survey¹ and Saltwater Charter Logbook program², 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, 2014, and 2016 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). Details on the 2016 survey's implementation and data analysis are presented in Lew and Lee (2018).

In 2018, the Alaska Saltwater Sport Fishing Charter Business Survey was administered to collect data for the 2017 fishing season³ 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 2018 survey. To maximize data consistency, the survey administered in 2018 and the methods used in data collection and analysis are nearly identical to those used in the 2016 survey and described in Lew and Lee (2018).

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.

The first three sections of the report present a brief description of the development, design, and implementation of the survey. Since the 2018 survey was nearly identical to the 2016 survey described in Lew and Lee (2018), emphasis in these sections is on differences from the 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 2018 survey respondents and compares them with previous survey years. Then, summaries of the population estimates derived from the 2018 survey sample data are presented and compared with estimates from 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). But by the mid-2000s, harvest of halibut by the sport fishery had 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.

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

⁴ For additional details on these methods, see Lew et al. (2015a, b).

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 wastage⁵ 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).

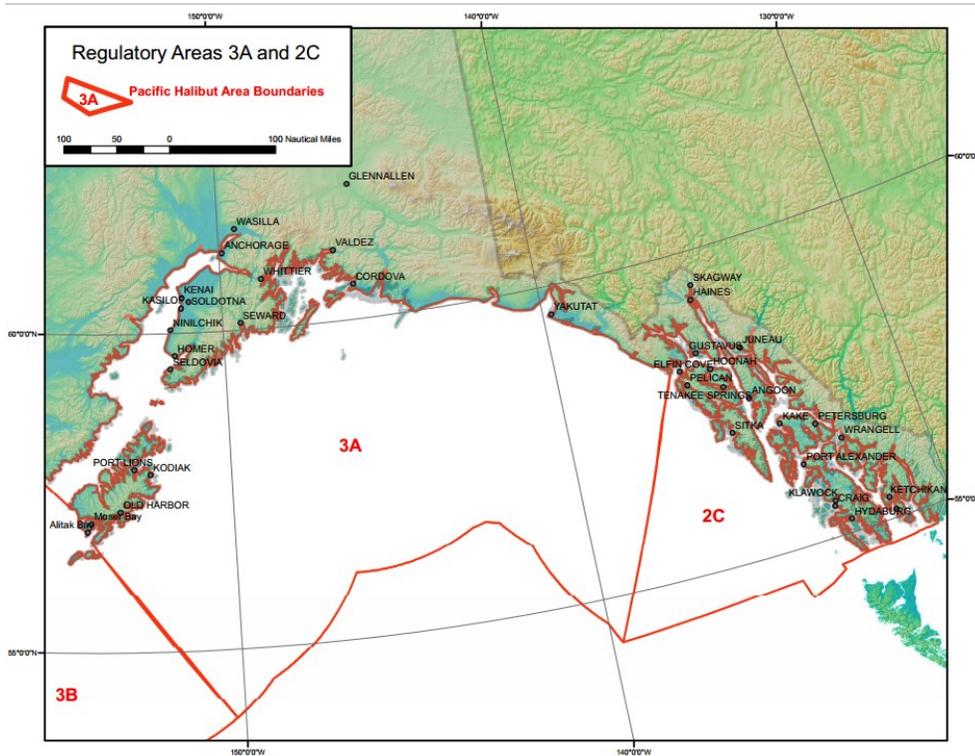


Figure 1. -- Pacific halibut regulation Areas 3A and 2C
(Source: <https://alaskafisheries.noaa.gov/fisheries/sport-halibut>).

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 harvest estimates using statewide harvest survey data. The initial GHLs were set at 1,430,000 pounds net weight⁶ for Area 2C and 3,650,000 pounds net weight in Area 3A.

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.

⁶ IPHC defines net weight for halibut as the weight after the head, guts, ice, and slime are removed.

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 GHGs, the guided charter fishery exceeded the GHG 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 GHG between 2004 and 2007, charter anglers in that area were not subject to additional limitations during the years in which the GHG 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 2C and 3A (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 GHG 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 annually⁷, 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 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

⁷ GAF numbers and conversion from IFQ to GAF for Areas 2C and 3A for each fishing year are posted at <https://www.fisheries.noaa.gov/resource/document/guided-angler-fish-gaf-program-annual-reports>.

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 September 2018, based on NPFMC recommendations, NMFS issued a final 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 (83 FR 47819).

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 closely follows the ones in Lew et al. (2015b) and Lew and Lee (2018) since the questionnaire used in this study was virtually identical to those administered in 2012-2014 and 2016. The primary difference in the 2016 and 2018 relative to the 2012-2014 surveys 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 guides⁸ (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 off-season), 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.

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

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.

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 C6 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 off-season 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 re-entry of valid value formats.

SURVEY IMPLEMENTATION

Implementation of the 2018 Alaska Saltwater Sport Fishing Charter Business Survey followed the 2016 survey implementation. As in all previous survey years, 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. As for the 2016 survey, the 2018 survey was administered to a stratified random sample of eligible charter businesses rather than to all eligible charter businesses as was done in the 2012-2014 survey years. 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 2018 survey, the target population consisted of 550 charter business license holders, compared to 650 in the 2012 survey, 592 in the 2013 survey, 572 in 2014 survey, and 561 in the 2016 survey. The target population was identified from Alaska business guide license data and limited to those with saltwater charter fishing activity in 2017, as indicated by ADF&G’s Saltwater Charter Logbook data (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 parts of Areas 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 count	Percent of population
1	Southeast Alaska charter businesses with one vessel and one guide	128	23.3%
2	Southeast Alaska charter businesses with more than one vessel or guide	180	32.8%
3	Southcentral Alaska charter businesses with one vessel and one guide	116	21.1%
4	Southcentral Alaska charter businesses with more than one vessel or guide	125	22.8%
Total		549*	100.00%

*This is the population count determined using a preliminary dataset available for the sampling process; the final dataset revealed there were 550 active businesses in the population during 2017.

Beginning in March 2018, 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

⁹ The sampling frame was developed based on preliminary (non-final) 2017 ADF&G Saltwater Charter Logbook data available in February 2018, which was 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 used to construct the sampling frame and the population size reported in official reports (e.g., Powers and Sigurdsson 2016).

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 reached, they were asked to participate in the survey (i.e., complete and return the survey or fill it out online) 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 2018 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 2018 survey.

Stage	2018 Date
Advance letter mailed	March 5, 2018
Initial survey mailed	March 19, 2018
Postcard reminder	March 26, 2018
Phone call reminders	April 9-20, 2018
Second survey mailed	April 23, 2018

For the 2018 survey year, there were 963 telephone calls made during survey implementation. Approximately 50% 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 89 completed surveys, which is the same as the 2016 survey’s response rate (Table 3). Figure 2 shows the distribution of returned mail questionnaires by week (with the initial mailing representing week zero). The majority of completed questionnaires were returned within the first 5 weeks after the initial mailing (Fig. 2).

Table 3. -- Summary of survey sample size, responses, and response rates for the 2012-2014 and 2016-2018 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%
2018	550	416	89	21%

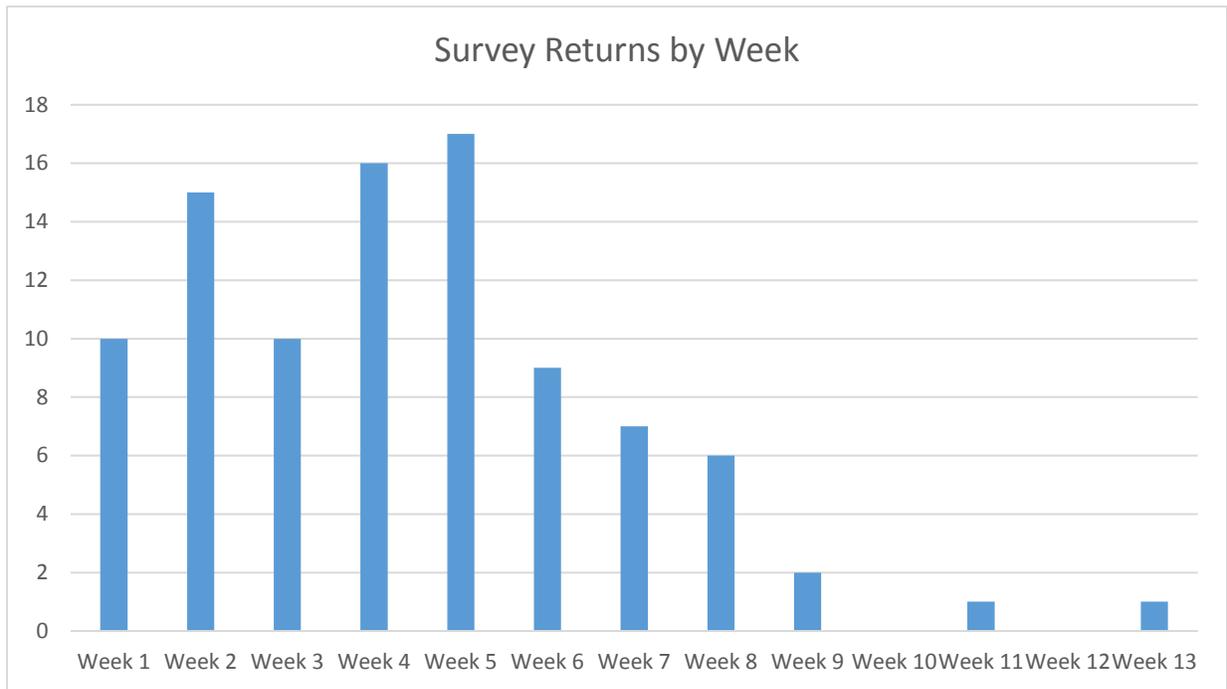


Figure 2. -- Completed 2018 mail surveys returned by week.

For the 2018 survey, 40% of the total respondents completed the mailed paper version of the questionnaire, with the remaining respondents submitting the web version. This represents the first survey year in which the majority of respondents submitted their responses using the web version.

METHODS

In this report, we summarize information on costs, revenues, employment and business characteristics provided by respondents for the 2017 season, then extrapolate results to the population of charter businesses using sample weighting and data imputation methods detailed in Lew et al. (2015a) and Lew

and Lee (2018).¹⁰ 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 respondents. The descriptive statistics and frequency distributions are examined for the 2017 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 2017 U.S. dollars.¹¹ 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 non-response (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 2018 survey achieved a unit response rate of 21% while also experiencing widespread item non-response (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 response rates for 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).¹² These methods involve applying weights to individuals in the sample that adjust for

¹⁰ Note also that the features distinguishing the four sample strata are variables that are accounted for in the sample weighting and data imputation approaches.

¹¹ 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>).

¹² 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).

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 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^{th} 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):

$$w_i = w_{i1} \times w_{i2} \times w_{i3} . \quad (1)$$

The three weights in Equation 1 can be referred to as the base weight (w_1), non-response adjustment weight (w_2), and post-stratification weight (w_3). 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, a term that captures the average utility across respondents of unmodeled components (Train 2003), called an alternative specific constant, was also included in the specification¹³.

¹³ These variables are consistent with those used for previous survey year analyses (see Lew et al. 2015b and Lew and Lee 2018).

Table 4. -- Auxiliary variable descriptions and logit model estimates for the 2018 survey data.

Variable	Estimate	Asymptotic t-value
Alternative specific constant	-0.417	-0.739
Did not fish in Southeast Alaska	-0.133	-0.407
Only used a single vessel	-0.510*	-1.762
Took 50 trips or less	-0.396	-0.555
Fished 50 calendar days or less	0.106	0.146
Did not fish in early shoulder season (April to mid-June)	0.170	0.475
Did not fish in late shoulder season (mid-August through September)	-0.075	-0.194
Did not fish in the off-season (October through March)	-0.046	-0.084
Did not report any crew fishing trips	-0.924**	-2.958
Reported no Alaska resident clients	0.179	0.490
Proportion of clients that are Alaska residents	-1.964	-1.381
250 or fewer clients	0.799	1.452
1,500 or more clients	-0.577	-1.048
Did not report any non-paid trips	-0.076	-0.270
Did not report fishing for salmon	0.708	1.090
Did not report fishing for bottomfish	-1.023	-1.632

Note: Asterisks indicate statistical significance at either the 5% (**) or 10% (*) level. The pseudo-R² (likelihood ratio index) for this model is 0.294.

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.¹⁴ For the 2018 survey year, only two variables exhibited statistical significance between survey respondents and non-respondents, holding all else constant: the dummy variable indicating use of only a single vessel by the charter business and the dummy variable indicating no crew fishing was done on any trips during the season. 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 elements¹⁵ 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 1.35 for respondents that used a single vessel and did not have any crew fishing during the season, 0.85 for single-vessel businesses with crew fishing during the season, 1.05 for businesses with multiple vessels and no crew fishing, and 0.67 for businesses with multiple vessels and crew fishing (Table 5).

¹⁴ 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. A parsimonious model specified only with the two statistically significant variables reported in Table 4 led to similar results.

¹⁵ These include any potential respondent and non-respondent.

Table 5. -- Non-response adjustment weights (w_2) and corresponding percentage of responding sample to which the weight applied for the 2018 survey using information on a) the number of vessels used by charter businesses and b) whether or not charter businesses reported any crew fishing trips during the 2017 fishing year.

Variable	Weight (w_2)	Percent of responding sample (%)
Single vessel and no crew fishing trips	1.347	33.7
Single vessel and crew fishing trips	0.854	23.6
Multiple vessels and no crew fishing trips	1.049	15.7
Multiple vessels and crew fishing trips	0.666	27.0

The post-stratification weight (w_3) 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., Areas 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., Areas 2C or 3A) and the number of client trips. Table 6 summarizes the post-stratification weights for the 2018 survey year.

Table 6. -- Post-stratification weights for the 2018 survey year using total client trips and regulatory fishing area.

Total client trips	Weight	
	Area 2C	Area 3A
100 or less	0.878	1.335
101-200	0.761	0.728
201-300	1.032	1.416
301-400	1.335	1.241
401-500	1.618	1.214
501-1,000	1.996	1.003
1,001-2,000	0.701	0.324
2,001-10,000	1.295	2.104

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^{th} observation in a regression framework according to

$$y_{mi} = f(z_{mi}) + \epsilon_{mi}, \quad (2)$$

where $f(z_{mi})$ is a general function involving the vector of auxiliary information and ϵ_{mi} 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^{th} item non-respondent, the researcher could specify a function (D_j) that minimizes the algebraic distance over a set of auxiliary variables (x) across all item respondents (N^r) according to

$$D_j = \sum_{i=1}^{N^r} |x_i - x_j|, \quad \text{for all } i \neq j. \quad (3)$$

The “nearest neighbor” is then the i^{th} respondent that best satisfies the objective in Equation 3 for the j^{th} 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) and used in Lew and Lee (2018)—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.

We follow Lew and Lee (2018) and 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. Seven 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 seven variables and the distance function in Equation 3. The seven variables were (i) a dummy variable indicating whether fishing occurred in Area 2C, (ii) the number of distinct calendar days fished, (iii) the total number of client fishing trips, (iv) a dummy variable indicating whether crew fishing trips were taken, (v) a dummy variable indicating whether some unpaid fishing trips were taken, (vi) the number of hours spent fishing for Pacific salmon, and (vii) 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) and Lew and Lee (2018) 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.

RESULTS

This section summarizes data collected from the 2018 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 2018 survey as well as the 4 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 2017 season along with those from the previous survey years that were previously reported in Lew and Lee (2018).

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 2017 U.S. dollars throughout this report.

The total number of active vessels owned or leased across all item respondents during the 2017 charter fishing year was 152. Of this total, all but three vessels were owned by the charter businesses. The median number of vessels owned or leased was 1.0 and the mean was 1.8. The minimum number of vessels owned or leased was also 1 and the maximum was 9. A summary of the total vessels active in 2017 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 \$23.7 million. The mean revenue per respondent was \$422,612 (standard error \$152,721) and the median was \$102,575. Similar to the range reported for previous years (in Lew and Lee 2018), there was a broad range of revenues reported by item respondents. Total costs for the 2017 fishing year, excluding investment payments, amounted to \$26.8 million for the respondent sample. Mean and median costs were \$334,710 (standard error \$105,044) and \$81,875, respectively. Hence, over the responding sample as a whole, the average charter business operated at a statistically break-even level during the 2017 fishing year.¹⁶

The total number of trips of any type (fishing and non-fishing charter trips) and seats sold by item respondents in 2017 were 4,653 and 27,253, respectively. The median number of trips sold per respondent was 56 and the mean was 88. The median number of seats sold per respondent was 203 and the mean was 524.

For 2017 the largest group of employee positions was full-time shore workers, with a reported total of 438 across the sample of item respondents.¹⁷ The mean and median number of full-time shore worker positions per respondent was 12.88 and 5.5, respectively. The second largest employment category was full-time guide/operator positions, with a total of 429 reported. The mean and median number of full-time operator positions per respondent was 8.58 and 4, respectively. Full-time crew worker positions constituted the third largest employment category, with a total of 187 and mean and median of 5.19 and 4 full-time crew worker positions per respondent, respectively. Part-time operator, crew, and shore positions totaled 110, 32, and 65, respectively.

As expected, employment during the 2017 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.

¹⁶ Although the point estimates of the mean and median costs are lower than the corresponding revenue amounts for the item respondents in 2017 (suggesting a net profit on average), the determination of a statistically break-even level in the sector during 2017 is due to a comparison of means reported and the standard errors of the mean estimates, which are large.

¹⁷Note 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 four employee positions.

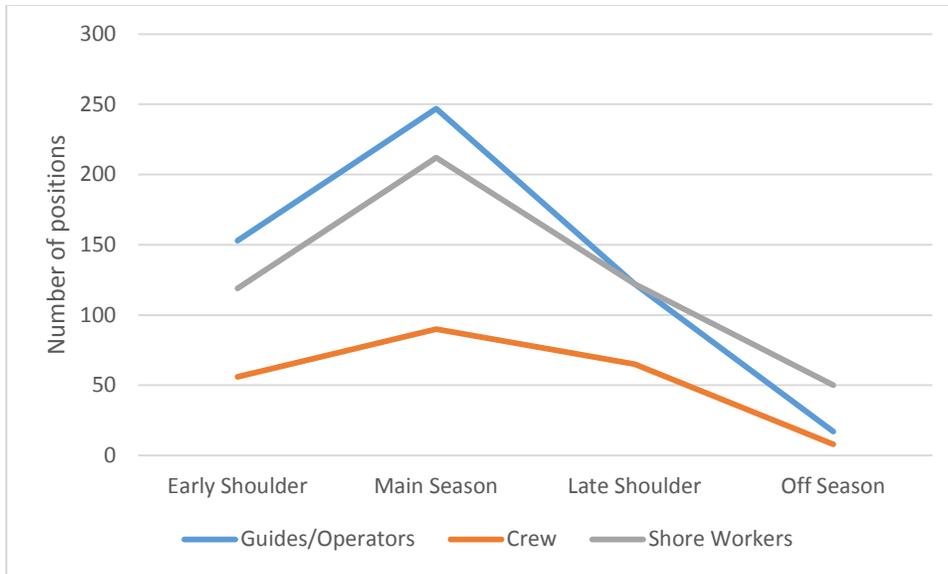


Figure 3. -- 2017 employment by season for both part-time and full-time positions across the sample of item respondents.

Full-time positions represented over three-quarters of respondent sample employment for all fishing seasons, except for guides/operators in the off-season, during the 2017 fishing year (Table 7). The percent of full-time employee positions was generally highest for crew and shore workers.

Table 7. -- 2017 respondent sample percentage of full-time employee positions by season and type.

	Guide/Operator	Crew	Shore worker
Early shoulder	79%	86%	82%
Main season	84%	84%	92%
Late shoulder	74%	88%	86%
Off-season	59%	75%	82%

Respondents from the 2017 fishing year reported that wages were the most common method of compensation for guides/operators and crew workers (Fig. 4). For shore workers, equal numbers of respondents indicated wage and salary systems as the method of compensation. Revenue sharing was not used for shore workers by any respondents and was the least common method of compensation for guides/operators and shore workers.

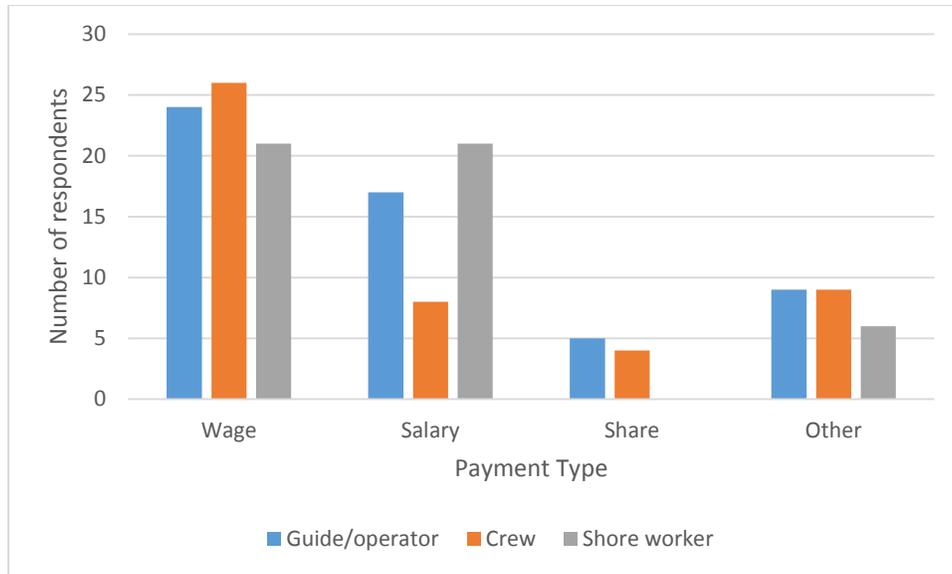


Figure 4. -- Number of charter businesses in the item respondent sample by form of payment and type of employee during the 2017 charter fishing year.

The largest type of expenditure during 2017 for the respondent sample was general overhead expenses, where respondents reported a total of approximately \$12.5 million in expenses (Table 9). The second largest expenditure category was labor payments, which amounted to approximately \$5.6 million. Charter trip-related payments were the third largest expenditure category and accounted for \$4.4 million (Table 8). In addition, respondents reported a total of \$4.2 million as capital expenditures toward vehicles, machinery, and equipment. Note that capital expenditures includes rental/lease payments, purchases, and improvements fully paid for during 2017, as well as loan payments on purchases and improvements financed during or before 2017.

Table 8. -- 2017 respondent sample total and mean labor expenses by type (in 2017 dollars).

Employee type	Mean	Total (in millions)
Guide/Operator	30,257 (7,049)	2.12
Crew	9,787 (2,735)	0.64
Shore worker	44,685 (22,771)	2.82

Note: standard errors are given in parentheses.

Table 9. -- 2017 respondent sample mean, median, and total major cash expenses by type (in 2017 dollars).

Major expense type	Mean	Median	Total (in millions)
Labor payments	96,022 (30,949)	29,500	5.57
Charter trip operating expenses	66,345 (17,733)	21,000	4.45
General overhead expenses	198,915 (97,117)	31,200	12.5
Capital expenditures (equipment & real estate)	86,345 (31,011)	17,500	4.2

Note: standard errors are given in parentheses.

New investments during the 2017 fishing year amounted to approximately \$1.3 million, with the majority consisting of investments toward vehicles, machinery, and equipment (Table 10). Mean new investments were almost \$51,000 per respondent. Note that these investments are total investment costs financed by loans issued during 2017, including loan principal, taxes and fees, and down payment amount.

Table 10. -- 2017 respondent sample mean, median, and total major new investments by type (in 2017 dollars).

	Mean	Median	Total (in millions)
Equipment & real estate	50,614 (12,885)	34,813	1.27

Note: standard errors are given in parentheses.

In terms of the sources of annual household income for item respondents, approximately 94% of item respondents reported some household income was derived from outside the charter business (Fig. 5).

Only four item respondents reported zero household income deriving from their charter business. A little more than one-third of the item respondents (37%) reported that 25% or less of their total annual household income was derived from their charter business.

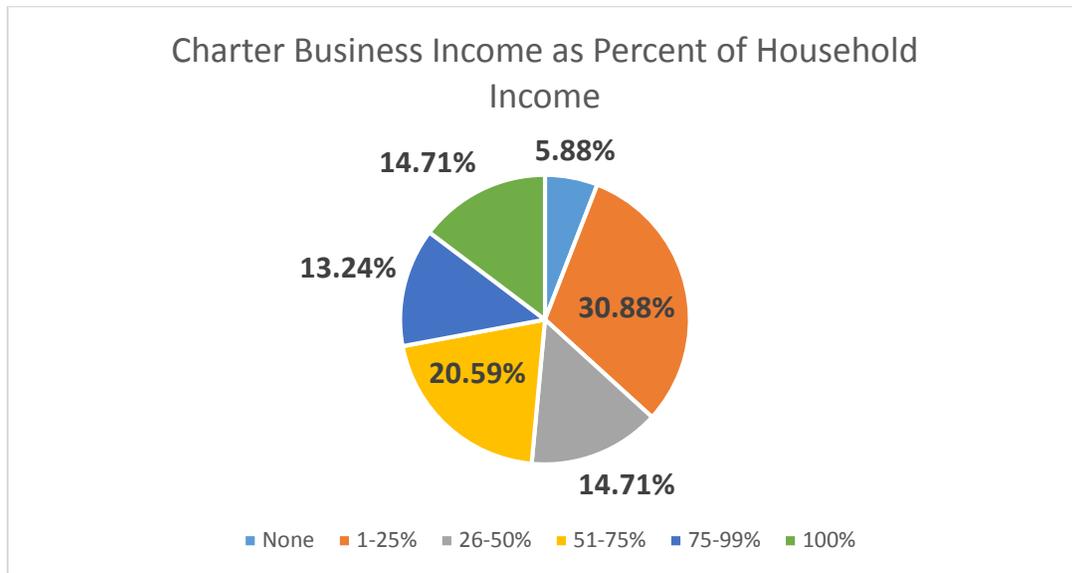


Figure 5. -- Distribution of 2017 respondent sample of percent of annual household income earned from the charter business.

Approximately 40% 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. About 11% of respondents reported working outside Alaska during the off-season. About one-quarter 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 2017 respondent off-season activity.

Off-season activity	Count of respondents	Percentage of respondents
Continued charter business work	36	40%
Worked in AK commercial fishing	9	10%
Worked in AK non-fishing job	25	28%
Live in AK with no job	20	22%
Work outside AK in fishing job unrelated to charter business	1	1%
Work outside AK in non-fishing job	9	10%
Live outside AK with no job	3	3%

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

For the 2017 fishing year, 7 respondents (or about 8%) identified their businesses as being structured as a C corporation. Every item respondent that did not identify their business as a C corporation identified their business as a sole proprietorship.

Comparisons with the 2011-2013 and 2015 Respondent Samples

To understand changes in the charter sector since 2011, 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 sizes and sampling approach were different in the 2016 and 2018 surveys relative to earlier years. Unlike in Lew et al. (2015b), we do not present comparisons of sample-level totals since comparing totals from samples of such differing sizes 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 2017 dollars.

Across all survey years, mean revenues per item respondent ranged from approximately \$188,000 in 2012 to approximately \$423,000 in 2017, while median revenues ranged from approximately \$73,000 in 2012 to \$122,000 in 2015. Although the mean revenue per respondent in the 2017 fishing year was highest among all surveyed years, the relatively large standard error for 2017 (\$153,000) suggests the mean revenue for this year was not statistically different from those in previous years (Fig. 6).¹⁸ For all years, the mean revenues exceed the median revenues, suggesting some potential positive skewness in the distribution of revenues across item respondents.

¹⁸ 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.

Table 12. -- Summary of revenues and expenditures for the four surveyed fishing years (in 2017 dollars).*

	2011		2012		2013		2015		2017	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Revenues	217,046 (53,536)	80,134	187,575 (37,295)	72,803	297,454 (73,940)	90,694	235,450 (49,325)	121,575	422,612 (152,721)	102,575
Labor expenditures	77,378 (20,734)	21,503	67,736 (15,136)	23,839	96,816 (25,732)	25,574	61,267 (14,207)	27,224	96,022 (30,949)	29,500
Charter trip expenses	60,475 (15,193)	19,865	52,364 (12,149)	22,602	60,293 (11,505)	25,576	65,072 (10,740)	29,828	66,344 (17,733)	21,000
Overhead expenses	78,219 (14,633)	22,054	53,451 (7,325)	28,718	86,254 (20,343)	30,882	55,586 (9,731)	26,497	198,915 (97,117)	31,200
Capital expenses	56,197 (16,945)	10,988	30,725 (4,472)	15,847	48,340 (12,211)	13,644	39,699 (12,860)	12,725	86,345 (31,011)	17,500
Investment payments	51,154 (13,651)	28,119	62,212 (13,835)	28,660	49,898 (11,048)	24,888	80,813 (26,639)	25,062	50,614 (12,885)	34,813

*Standard errors in parentheses.

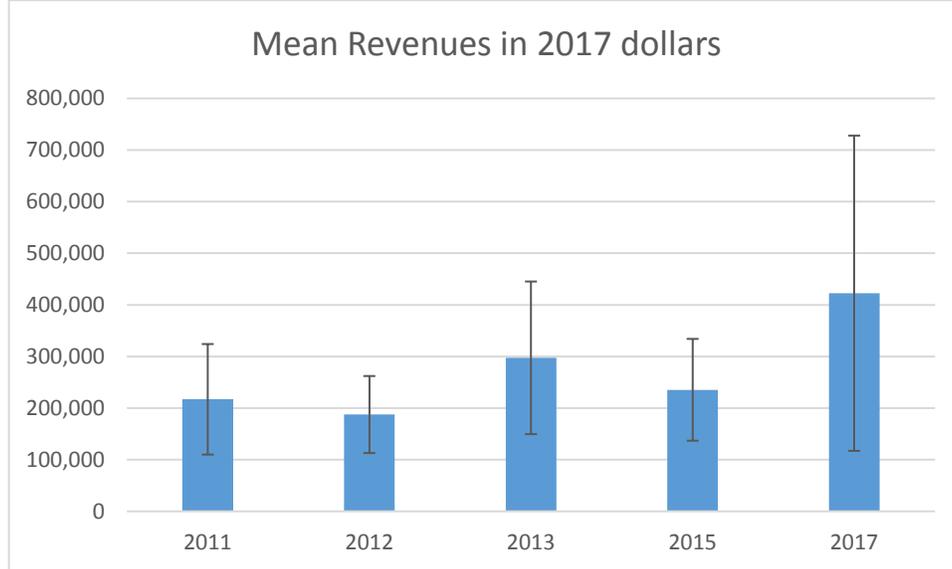


Figure 6. -- Mean revenues for the 2011, 2012, 2013, 2015, and 2017 fishing years. Error bars represent two standard errors of the mean above and below the mean.

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). Across all survey years mean labor expenses per item respondent ranged from approximately \$61,000 to \$97,000. 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 \$52,000 to \$66,000 and from \$20,000 to \$30,000, respectively (Table 12 and Fig. 7). There is no statistically significant difference in mean charter trip expenses across the five fishing years.

The 2017 mean overhead expense per respondent was \$199,000, larger than in any of the previous years. The 2017 median overhead expenses per respondent (\$31,000) is close to the 2013 level (Table 12).

Prior to the 2017 season, the mean capital expenditures per item respondent represented the smallest expense category for each of the four fishing years and ranged from a low of \$31,000 in 2012 to a high of \$56,000 in 2011. In 2017, the mean capital expenditure was above this range (\$86,000) and surpassed mean expenditures for charter trips expenses and investment payments (Table 12). Median capital expenditures per respondent were consistently and considerably lower than the mean capital expenditure in each fishing year.

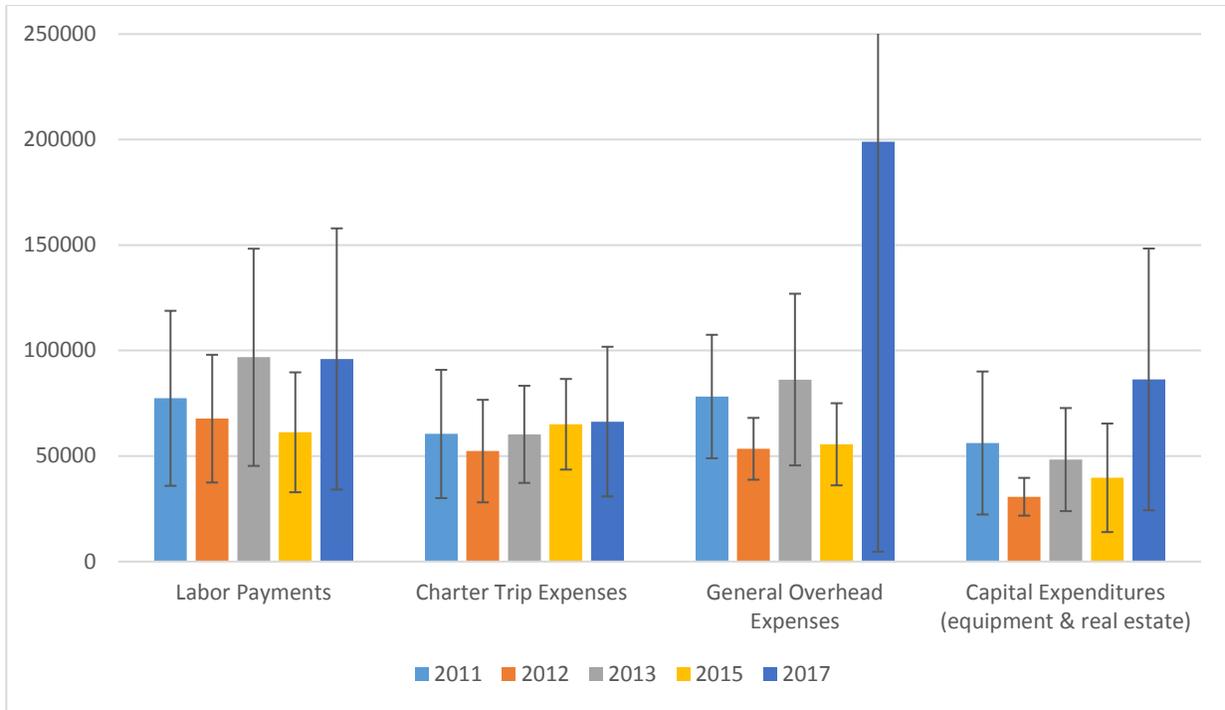


Figure 7. -- Respondent sample mean major expenses (in 2017 dollars) by type over fishing years. Error bars represent two standard errors around the mean.

Charter business part-time and full-time personnel positions are divided into three categories: operators, crew, and shore workers. For each of the five years of survey data, the mean number of season-specific full and part-time positions are presented for each of the three personnel categories. Each count represents one particular position over one particular season (e.g., one full-time operator during the early shoulder season is counted as one position)¹⁹. 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), but decreased in 2017 (to 8.6) (Table 13). These changes were not statistically significant. The mean number of part-time operator positions increased in 2017 from 2015, but the difference is not statistically significant. Median full-time and part-time operator positions were unchanged across the five fishing years.

Neither the mean number of part-time nor full-time crew positions varied significantly across the four fishing years. In 2017, the mean full-time crew positions was tied (with 2012) for the lowest level 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 2015 and 2017, and median full-time crew positions per respondent increased from 3.0 to 4.0.

¹⁹ As noted 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.

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 positions employed over the year.

Year	2011		2012		2013		2015		2017	
	Mean (S.E)	Median								
FT Operators	5.8 (.8)	4	6.2 (.9)	4	7.4 (1.3)	4	9.8 (3.8)	4	8.6 (2.3)	4
PT Operators	2.4 (.2)	2	2.2 (.2)	2	3.1 (.5)	2	2.5 (.5)	2	4.8 (1.7)	2
FT Crew	5.5 (1.)	3	5.2 (.8)	3	6.8 (1.9)	3	5.6 (1.2)	3	5.2 (.9)	4
PT Crew	2.5 (.3)	2	3.3 (.9)	3	2.5 (.4)	2	1.8 (.2)	2	2.7 (.5)	3
FT Shore Workers	11.9 (3.)	6	9.9 (2.1)	6	14.3 (3.8)	5	11.8 (2.6)	9	12.9 (4.1)	6
PT Shore Workers	4.4 (.7)	4	3.8 (.6)	3	4.2 (.6)	3	2.5 (.4)	2	5.4 (1.8)	4

Season-specific shore worker positions constituted the largest personnel category per respondent for the five fishing years (Table 13). Mean full-time and part-time shore worker positions ranged from 9.9 to 14.3 and 2.5 to 5.4, respectively. Mean full-time shore worker positions did not vary significantly across the five fishing years. However, the mean part-time shore worker positions in 2015 was statistically lower than in 2013. The mean part-time worker positions for 2017 are not statistically different from any of the four previous seasons. The median number of full-time shore worker positions decreased from 6.0 in 2011 to 5.0 in 2013, but increased to 9.0 in 2015 and then fell back to 6.0 in 2017. On the other hand, the median part-time shore worker positions per respondent decreased from 4.0 in 2011 to 2.0 in 2015 and increased to 4.0 in 2017.

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 in 2017 were similar to the 2013 level (about \$96,000), though the 2017 mean labor expenses were not statistically different from levels in other survey years. For any given personnel category none of the differences in expenses over time can be considered statistically significant.

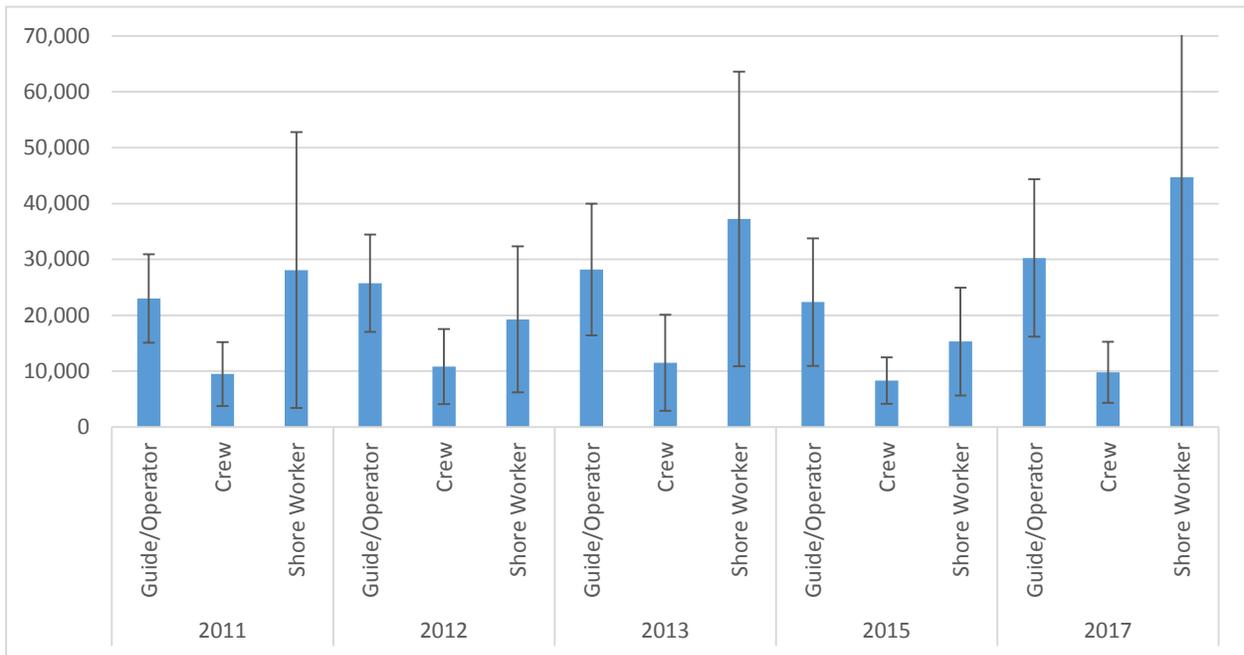


Figure 8. -- Respondent sample mean labor expenses for 2011-2013, 2015, and 2017 by personnel type. Error bars represent two standard errors around the mean.

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; no part-time crew workers were employed in the off-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. In 2017, as in 2011 and 2013, the lowest percentage of full-

time positions occurred during the off-season. Across personnel categories, there is no clear difference in the percentage of full-time employment.

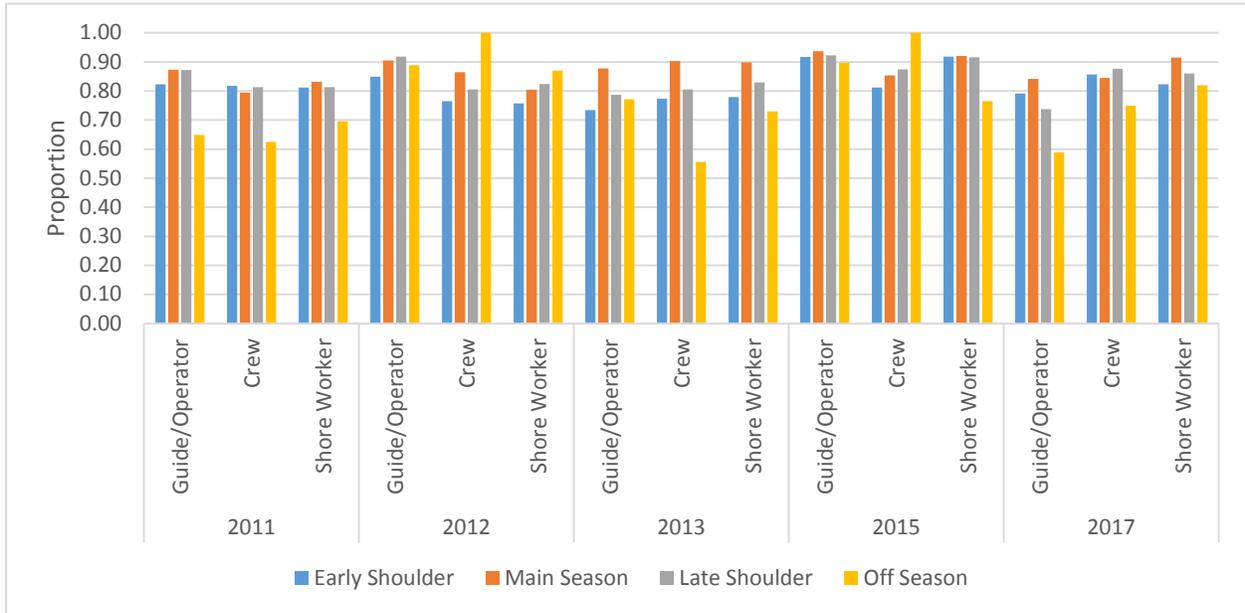
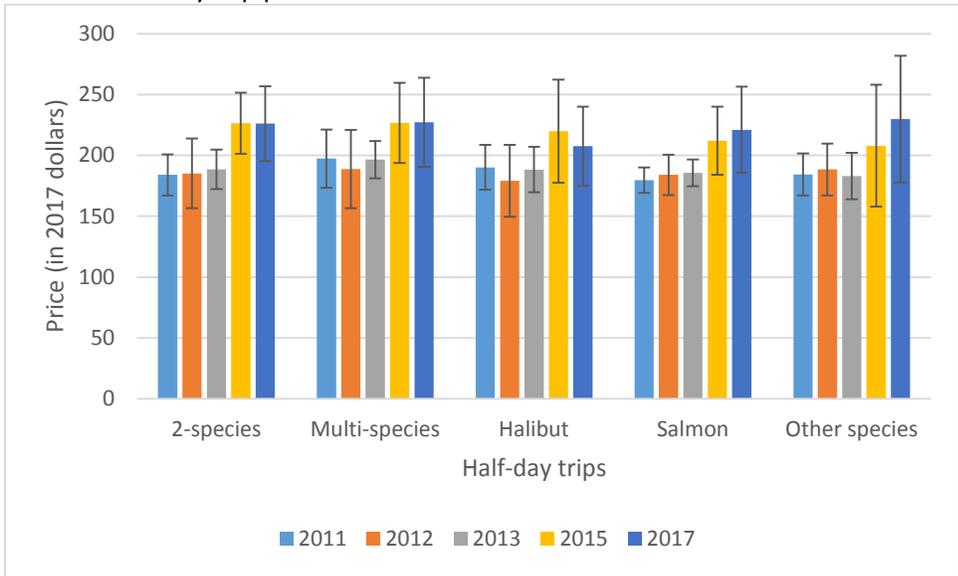


Figure 9. -- Respondent sample percent full-time positions by season and type from 2011-2013, 2015, and 2017.

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), two-species trips, and multi-species trips (more than two species targeted).

Half-day charter trips were offered by approximately 60% of respondents, on average (Fig. 10A). Between 2015 and 2017, the percentage of respondents offering half-day of every type (halibut, salmon, other species, two-species, and multi-species trips) increased slightly. Mean prices charged per person to charter clients for half-day trips were very similar in 2017 compared to 2015, even accounting for inflation. In 2017, the average price of a half-day trip (across types) was approximately \$222 (Fig. 10B).

A. Mean half-day trip prices



B. Proportion of respondents offering half-day trips

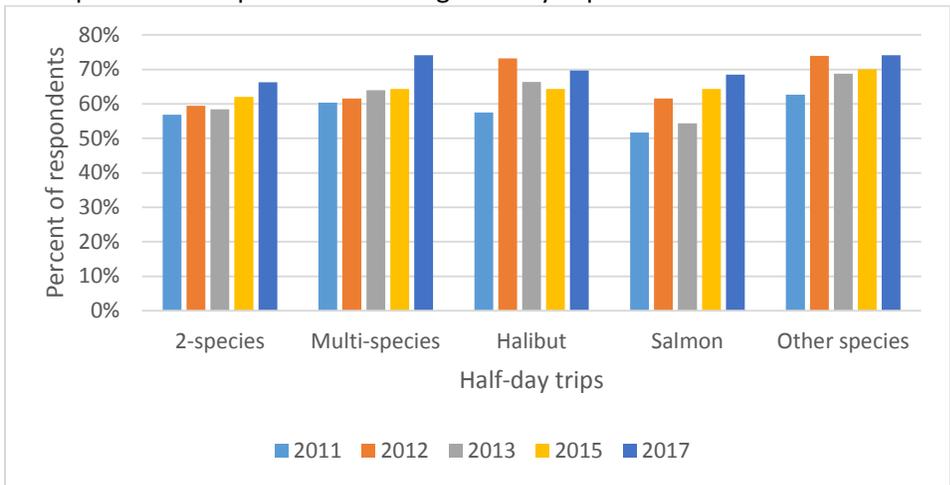
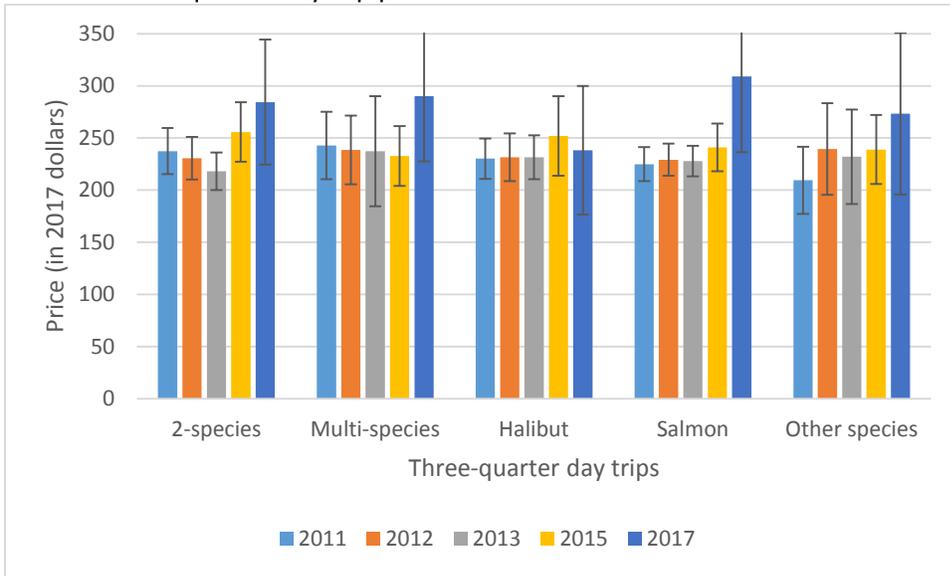


Figure 10. -- Respondent sample of half-day trip offerings. Error bars represent two standard errors around the mean.

Three-quarter day charter trips were offered by at least 63% of the item respondents each year (Fig. 11B). Mean prices charged per client for three-quarter day trips ranged from approximately \$210, for two-species trips in 2013, to \$309, for salmon-only trips in 2017 (Fig. 11A). Similar to the half-day trips, there was minimal variation in the mean prices charged for these trips across target species and over the first four survey years. Although 2017 mean prices were generally larger than in 2015, comparisons of 95% confidence bounds on these mean prices suggest no statistical differences across years.

A. Mean three-quarter day trip prices



B. Proportion of respondents offering three-quarter day trips

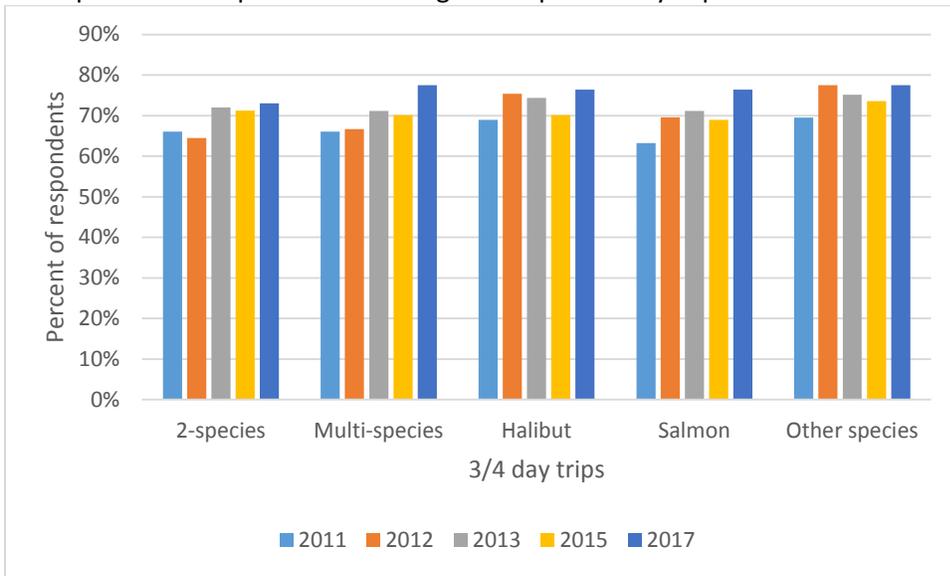
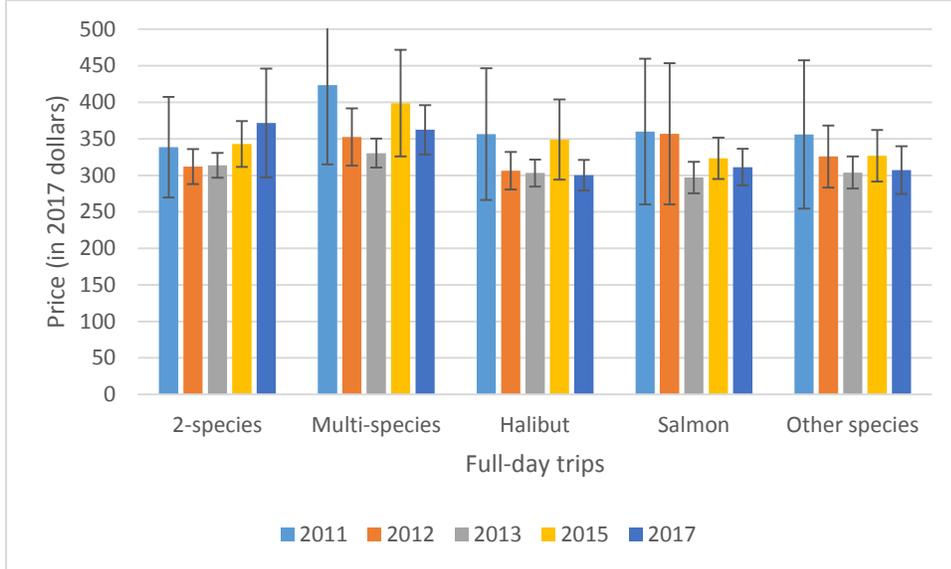


Figure 11. -- Respondent sample of three-quarter day trip offerings. Error bars represent two standard errors around the mean.

During 2017, the percentage of respondents offering full-day charter trips ranged from a low of approximately 34% (for two-species trips) to a high of approximately 61% (other species) (Fig. 12B). The percentage of respondents offering full-day multi-species or other species trips saw a marked increase in 2017 relative to 2015. For full-day trip offerings in 2017, prices charged per client generally ranged from \$300 to \$372 (Fig. 12A), which are slightly lower than the previous years' mean prices. Year-to-year differences in reported prices charged across species offerings were generally not statistically significant.

A. Mean prices of full-day trips



B. Proportion offering full-day trips

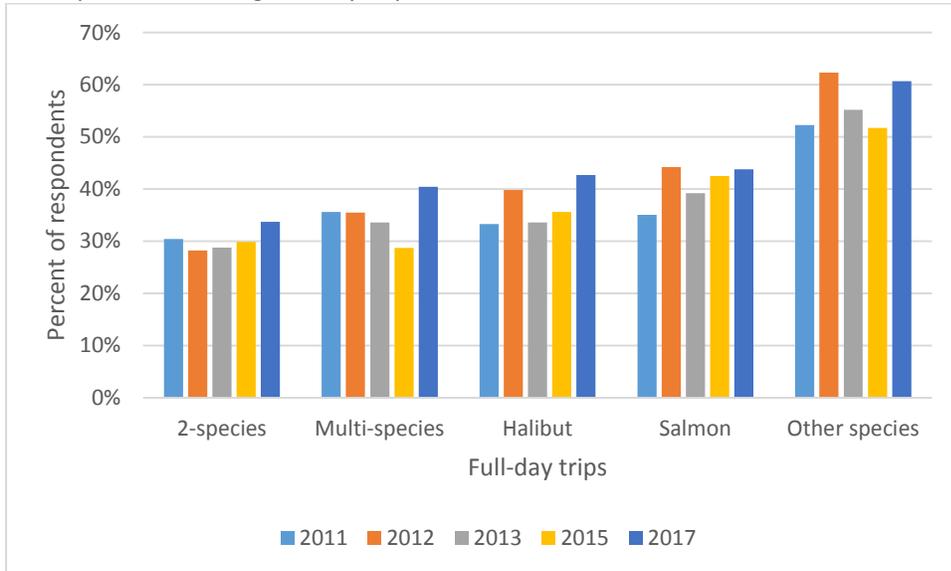
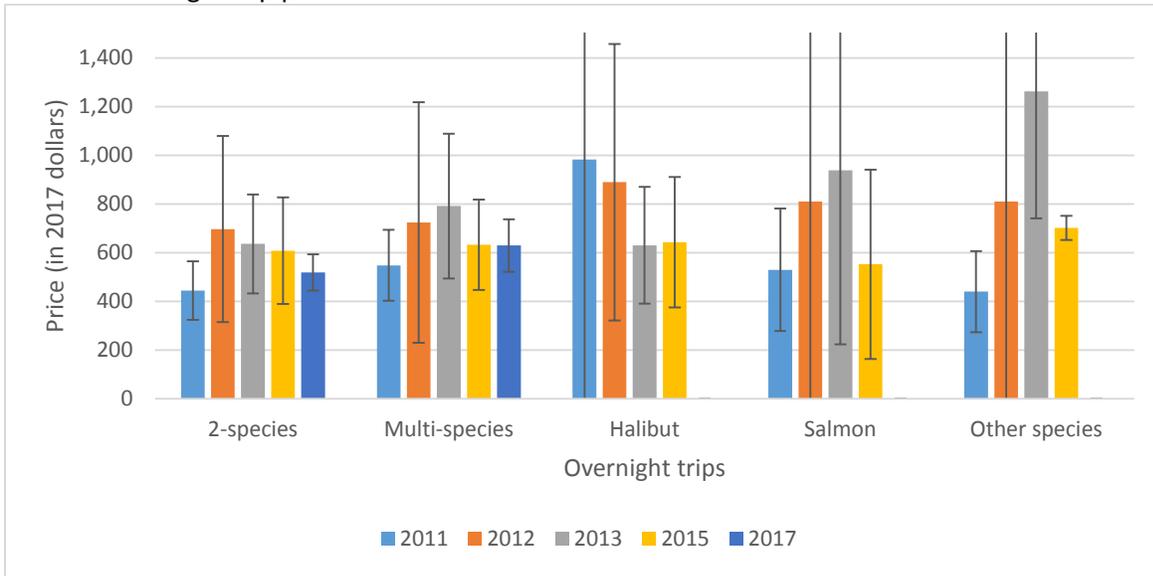


Figure 12. -- Respondent sample of full-day trip offerings. Error bars represent two standard errors around the mean.

Overnight charter trips were offered each year by the majority (74%) of respondents (Fig. 13B). Mean prices per client for overnight trips ranged from a low of about \$440 (other species and two-species trips in 2011) to a high of over \$1,200 (other species in 2013) (Fig. 13A). Mean prices for overnight charter trips in 2017 were \$519 for two-species trips and \$630 for multi-species trips; mean prices for other types of trips cannot be reported due to too few charter businesses reporting prices for those trip types. Neither of the 2017 mean prices presented are statistically significantly different from the corresponding 2015 mean prices.

A. Mean overnight trip prices



B. Proportion offering overnight trips

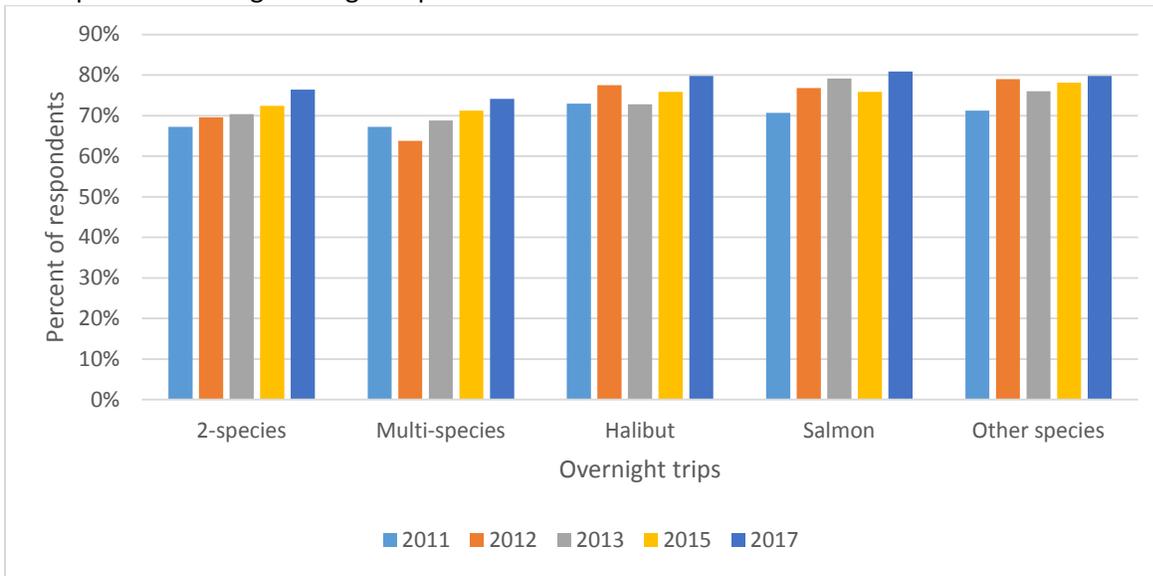
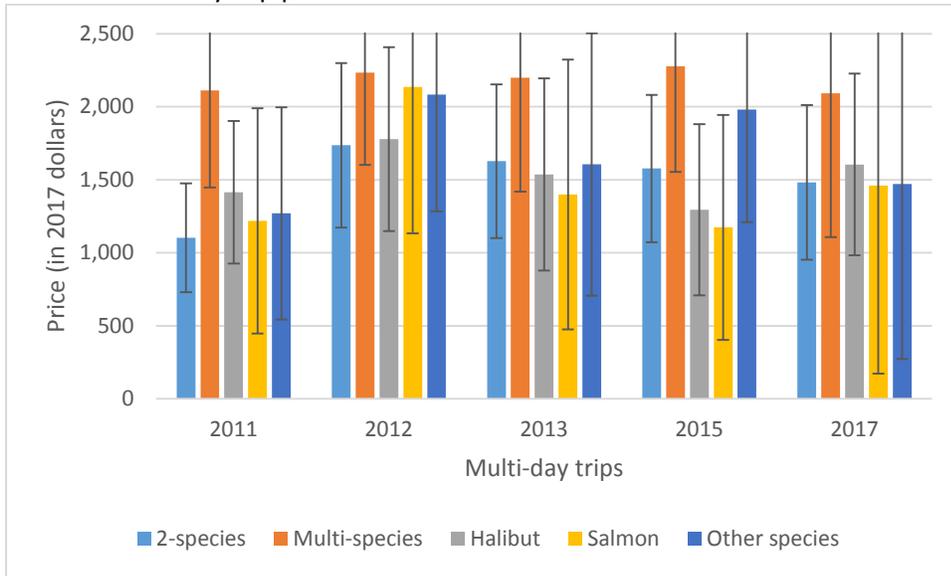


Figure 13. -- Respondent sample of overnight trip offerings. Error bars represent two standard errors around the mean.

The percentage of respondents in 2017 offering multi-day charter trips ranged from approximately 58% (two-species and multi-species) to 70% (halibut, salmon, and other species (Fig. 14B)). The percentage of respondents offering multi-day trips generally increased between 2011 and 2017. With respect to the different multi-day fishing trips offered, multi-species options had the highest price per client on average (Fig. 14A). Mean price differences across years were not statistically significant.

A. Mean multi-day trip prices



B. Proportion offering multi-day trips

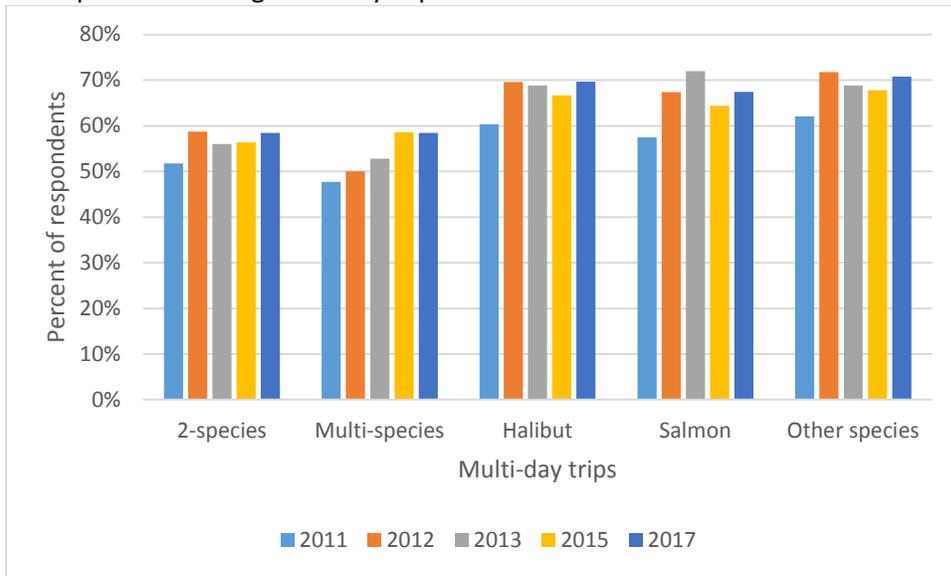


Figure 14. -- Respondent sample of multi-day trip offerings. Error bars represent two standard errors around the mean.

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%. However, that fraction declined between 2015 and 2017 to 49%.

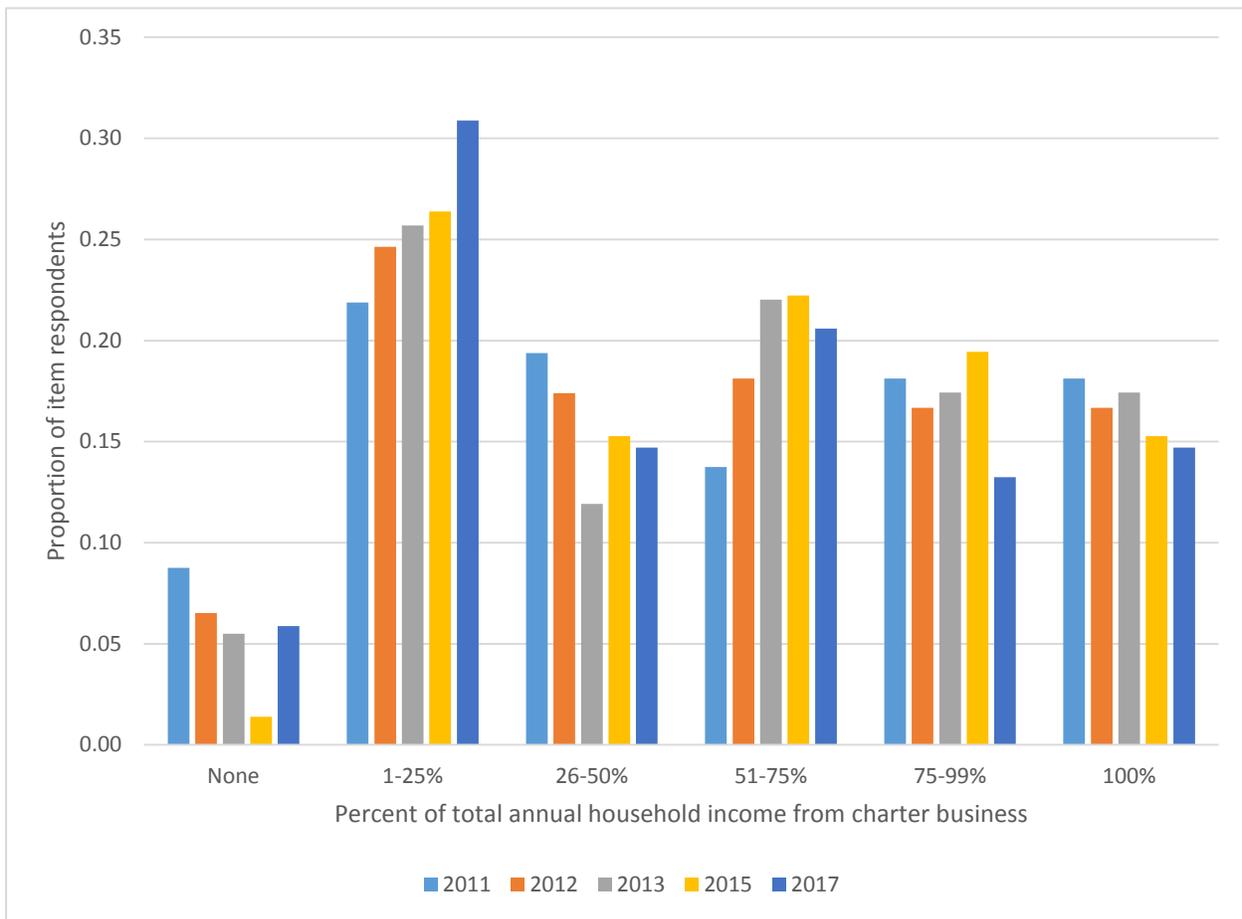


Figure 15. -- Distribution of 2011-2013, 2015, and 2017 respondent sample of total annual household income earned from the charter business.

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 5 years, continuing charter business work, on its own or as part of an off-season portfolio, represented the most common off-season option (Fig. 16), with over 40% of item respondents in each of the 5 years reporting that they continued charter business work as part of their off-season schedule. In 2015, the proportion of operators continuing charter business work was the highest across the survey years, at 49%. This declined to 40% in 2017. 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 and then increased to 28% in 2017.

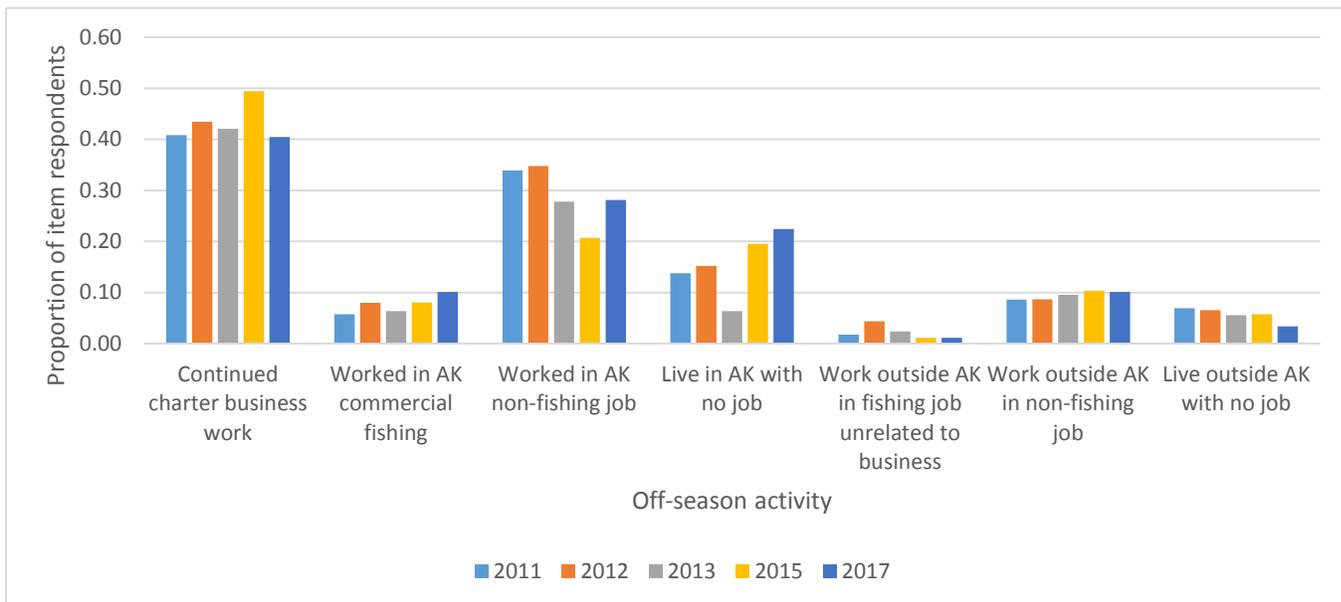


Figure 16. -- Proportion of 2011-2013, 2015, and 2017 item respondents participating in at least one off-season activity. Charter businesses operators can engage in multiple opportunities during the off-season. The figure shows the distribution of how item respondents, at least in part, spend their off-season time.

Across the 5 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 off-season activity. The proportion of respondents engaged in two activities was highest in 2015 (31%). In 2017, for the first time, two respondents reported being engaged in more than three activities during the off-season.

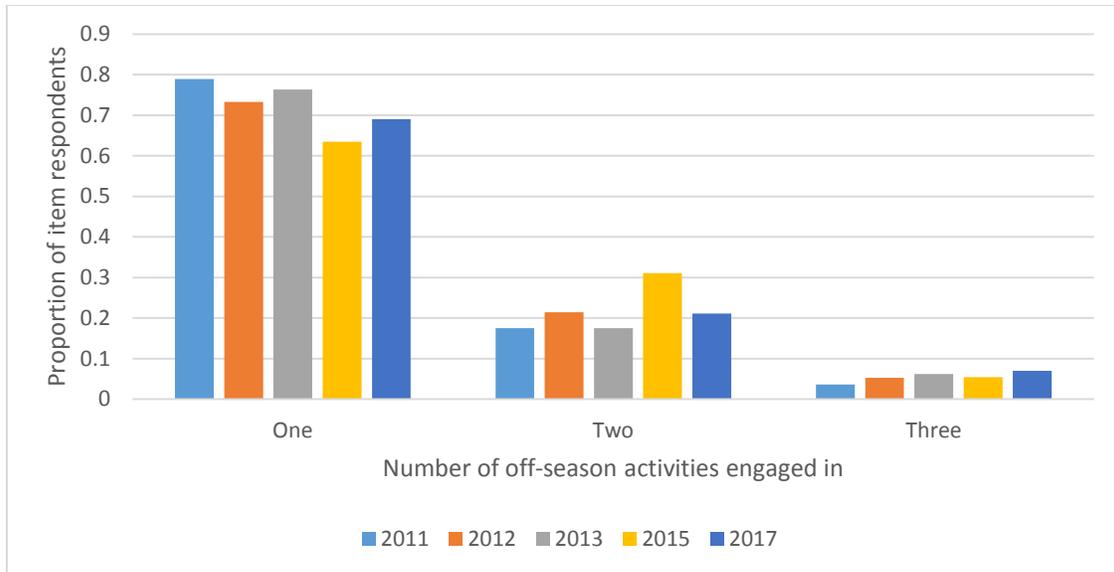


Figure 17. -- Number of off-season opportunities engaged in by 2011-2013, 2015 and 2017 item respondents.

With respect to the composition of charter business clients, over half of the item respondents for each survey year reported that returning customers and personal referrals from previous customers accounted for 51% to 99% of their client base (Fig. 18). Except for 2015 when the percentage fell to 2%, the percentage of respondents reporting that 100% of their clients were returnees or referrals was fairly steady across years at 5%.

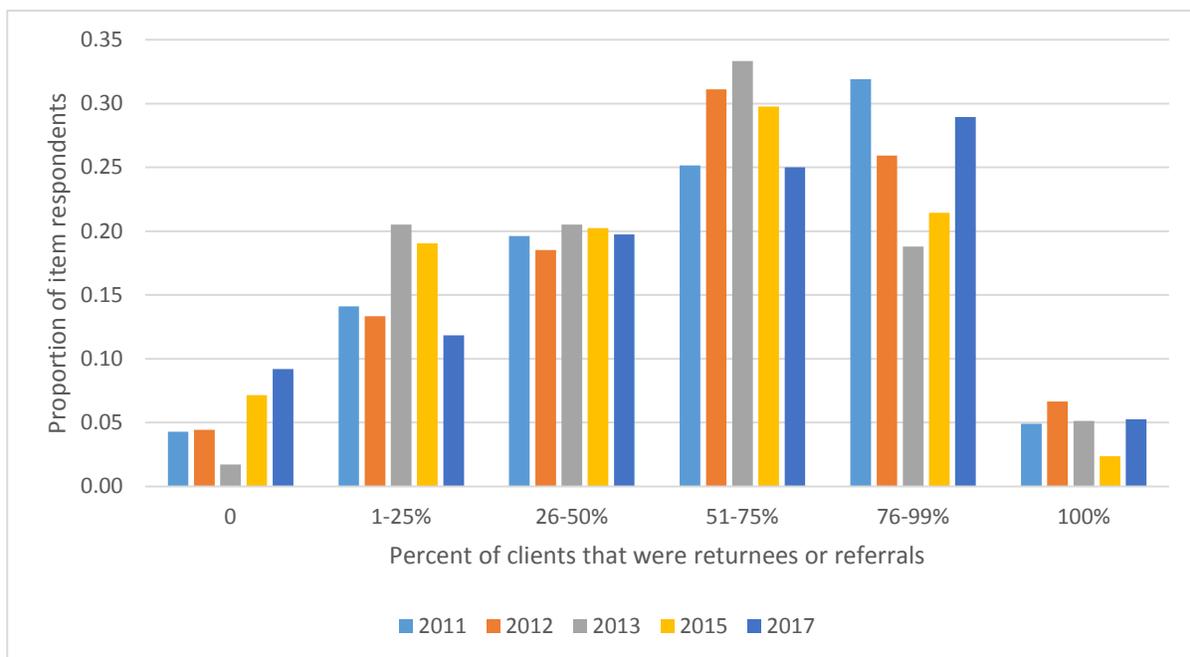


Figure 18. -- Proportion of charter business clients that were either return customers or personal referral from previous customers for 2011-2013, 2015, and 2017 item respondents.

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). Moreover, over 90% of item respondents in each year indicated that fewer than 50% of their clients booked trips less than 48 hours in advance (Fig. 20).

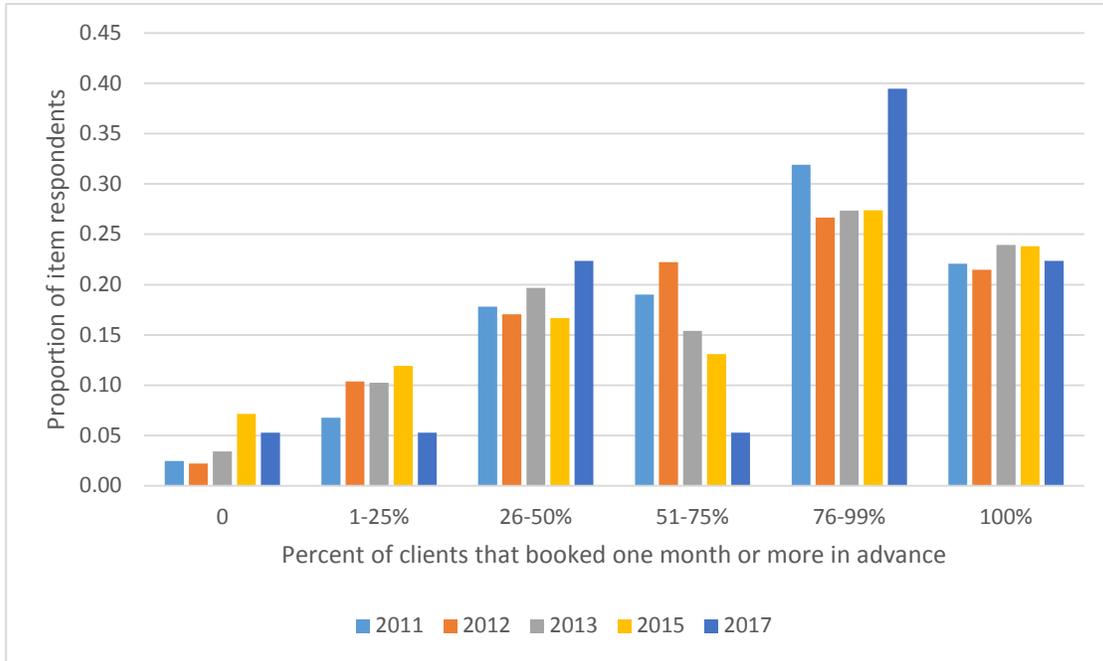


Figure 19. -- Proportion of charter business clients that booked their trip at least one month in advance for 2011-2013, 2015, and 2017 item respondents.



Figure 20. -- Percentage of charter business clients that booked their trip less than 48 hours in advance for 2011-2013, 2015, and 2017 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 5 years of survey data, approximately half of item respondents each year reported at least 76% of their clients making independent bookings; and the percentage of item respondents reporting all of their clients coming from independent bookings ranged from 19% to 28%. Between 18% and 24% of respondents did not book any independent clients, while between 11% and 22% of respondents did book at least some clients through cruise ships across the 5 years. The 11-12% of respondents booking at least some clients from cruise ships in 2015 and 2017 were the lowest proportions across the five survey years. About one-third of charter business respondents in 2017 booked clients through specialty charter booking services, which is lower than in other survey years.

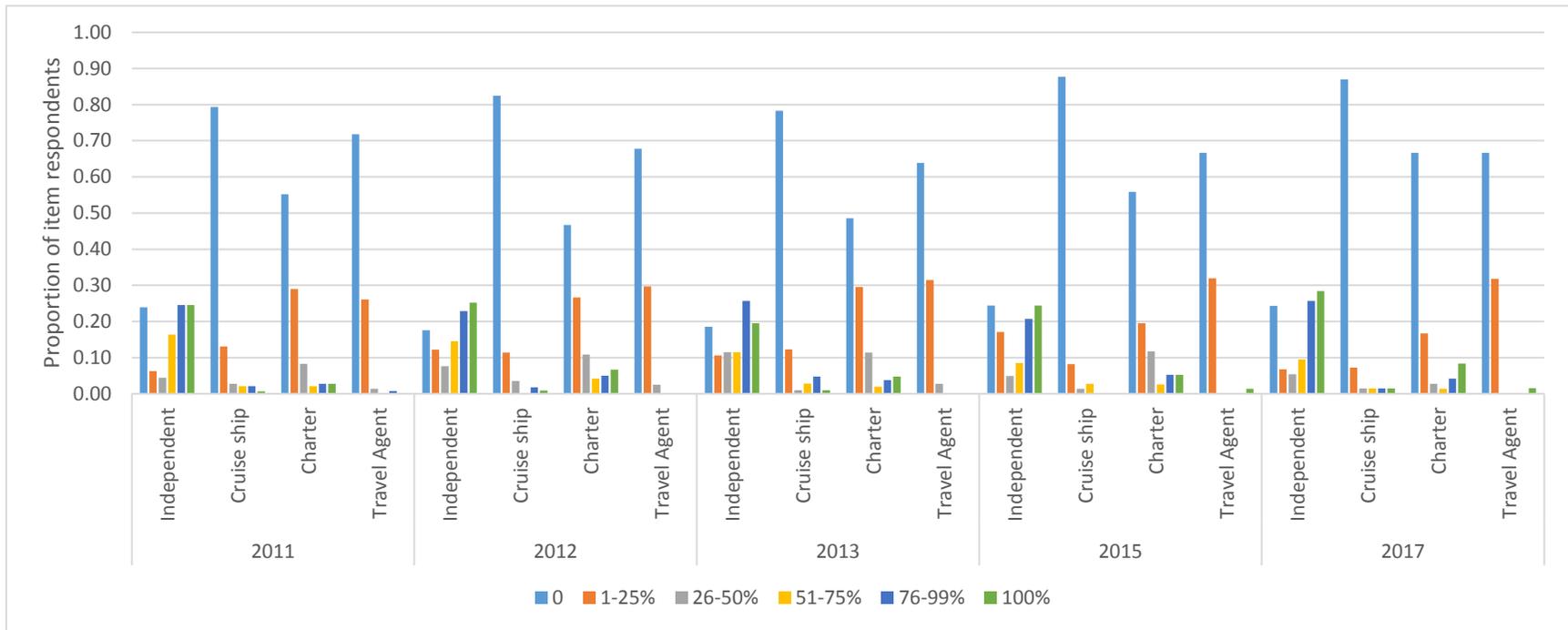


Figure 21. -- Distribution of 2011-2013, 2015, and 2017 charter business respondents according to the proportion of clients booked by source. Independent denotes an independent booking, cruise ship denotes booking through a cruise ship, charter denotes booking through the charter business itself or a 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 2017 sample item respondents, then compared the totals, means, and medians across all survey years (2011-2013, 2015, and 2017). In those comparisons, a limiting factor is that there were different sample sizes each year and unit and item non-response 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.²⁰ As a result, they provide a more complete picture of the costs, earnings, and employment in the charter sector during 2011-2013, 2015, and 2017.

2017 Population Estimates

The number of active charter businesses during 2017 was 550. Total revenue to the charter fishing sector for 2017 was estimated to be approximately \$112 million (S.E. = \$21.5 million). Total costs were estimated to be just over \$89 million (S.E. = \$4.7 million). Hence, it is estimated that the charter fishing sector operated at a slight profit during the 2017 fishing year, although the total cost and revenue estimates are not statistically different and therefore the profit is not statistically significant. Mean revenues per charter business were estimated to be \$349,000 (S.E. = \$65,981) while mean costs were estimated to be \$279,000 (S.E. = \$13,907).

The largest personnel category across the five fishing seasons, full-time and part-time inclusive, was estimated to be guides/operators, followed by shore workers. Total full-time and part-time guides/operator, shore workers, and crew positions (where each position is season-specific) were estimated to be 2,874, 1,605, and 832, respectively, over the four seasons. The largest single employment category was full-time operators, estimated at 1,649 (S.E. = 173), followed by part-time operators at 1,225 (S.E. = 147). The estimated number of mean full-time and part-time guides/operators positions per business was 5.2 (S.E. = 0.5) and 3.8 (S.E. = 0.5), respectively. Full-time and part-time shore worker positions had an estimated mean of 3.6 (S.E. = 0.2) and 1.5 (S.E. = 0.2), respectively. There were an estimated 537 (S.E. = 50) full-time and 296 (S.E. = 41) part-time crew positions. Mean full-time and part-time crew positions per business was estimated to be 1.7 (S.E. = 0.2) and 0.9 (S.E. = 0.1), respectively.

Total employment during the 2017 fishing year was highest during the main season for all position types -- guides/operators, crew, 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 7% (crew) to 27% (shore workers) of their respective totals during the main season.

²⁰ See Appendix A for the number of blank responses (item non-responses) per question.

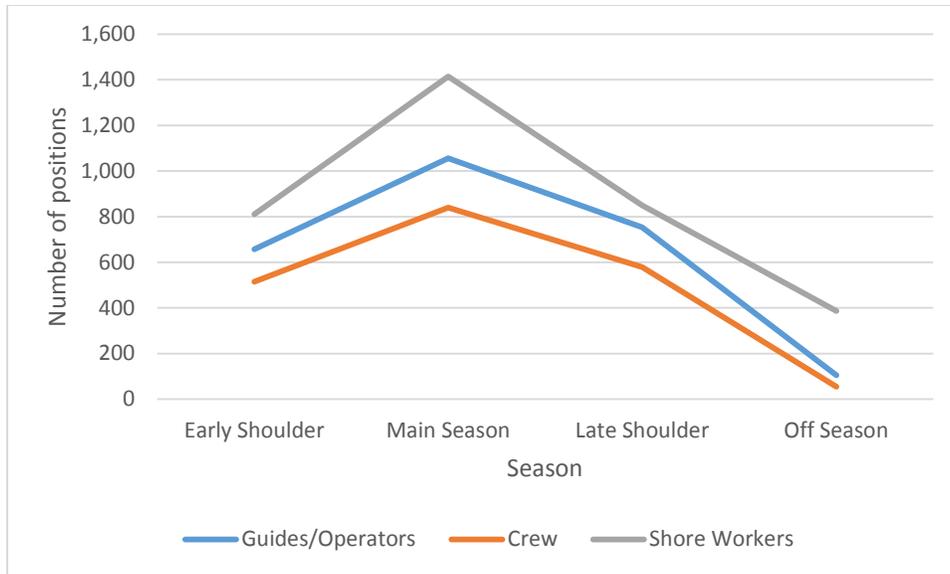


Figure 22. -- 2017 population estimates for full and part-time positions by season and type.

The estimated percentage of full-time positions during the 2017 fishing year ranged from 51 (shore worker, off-season) to 100 (guide/operator, off-season) (Table 14). Generally speaking, shore workers were estimated to have the highest average percentage of full-time positions across the year, ranging from approximately 63% in the off-season to 82% in the main season. Crew and guide/operator workers were estimated to have an average of about 73% full-time positions through the year.

Table 14. -- 2017 population estimates for percent of full-time positions by season and type.

	Guide/Operator	Crew	Shore worker
Early shoulder	64%	69%	73%
Main season	79%	84%	82%
Late shoulder	71%	67%	76%
Off-season	100%	51%	63%

The largest type of expenditure during the 2017 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 \$32.3 million and \$101,000, respectively. The second largest expenditure category was charter trip operating expenses, with an estimated total of \$19.5 million and mean of about \$61,000. Estimates of expenditures on capital (buildings, land, and real estate) for 2017 were the smallest across major expense types, with a population total of \$5.2 million and mean of \$16,295. The capital expenditures category includes rental/lease payments, purchases, and improvements fully paid for during 2017, as well as loan payments on purchases and improvements financed during or before 2017.

Labor expenses were estimated to total \$15.7 million with a mean of \$49,216 per business. Within the labor expenditure category, total compensation for shore workers was estimated to be slightly less than half of the total (Table 16). Mean expenditures per business for operators, crew, and shore workers was estimated to be approximately \$18,600, \$7,700, and \$23,000, respectively.

Table 15. -- 2017 population estimates for mean and total major cash expenses by type (in 2017 dollars).

Major expense type	Population mean	Total (in millions)
Charter trip operating expenses	61,094 (2,710)	19.5 (0.88)
General overhead expenses	100,843 (6,827)	32.3 (2.27)
Vehicles, machinery, equipment	51,172 (6,217)	16.4 (2.06)
Labor expenses	49,216 (4,983)	15.7 (1.62)
Buildings, land, real estate	16,295 (2,441)	5.2 (0.80)

Note: standard errors are given in parentheses.

Table 16. -- 2017 population estimates for total and mean labor expenses per business in 2017 dollars by personnel type.

	Guide/Operator	Crew	Shore worker
Population mean	18,581 (3,349)	7,699 (1,707)	22,936 (3,369)
Total (in millions)	5.95 (1.08)	2.26 (0.55)	7.34 (1.11)

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 2017 was estimated to be \$17 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 \$54,000.

Table 17. -- 2017 population estimates for mean and total major new investments by type in 2017 dollars.

Major investment	Population mean	Total (in millions)
Equipment and real estate	53,608 (7,734)	17.15 (2.51)

Note: standard errors are given in parentheses.

Comparisons with 2011-2013 and 2015 Population Estimates

Total estimated revenues for the population of charter businesses during 2017 was \$111 million (S.E. = \$21.5 million), which is lower than the \$120 million in 2012 and 2015 (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 and 2017 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 (\$120 million, S.E. = \$4.9 million) and 2015 (\$120 million, S.E. = \$5.7 million). However, there was a large and statistically significant increase in total revenues for the 2013 fishing year (\$178 million, S.E. = \$10.0 million) relative to 2011 (\$149 million, S.E. = \$4.4 million) and 2012 and a statistically significant decrease between 2013 and 2015. The decrease in total revenues between 2015 and 2017 is not statistically significant. In fact, the 2017 total revenue is not statistically different from the total revenues in any year except 2013. Mean estimated revenues ranged from a low of \$200,894 (S.E. = \$8,302) in 2012 to a high of \$348,597 (S.E. = \$65,981) in 2017. For 2017, mean estimated revenues were statistically indistinguishable from every other year's mean revenue estimate except 2012 (Fig. 23). Moreover, mean costs per business in 2017 were not statistically different from the 2017 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 profit) in 2017.

Table 18. -- Summary of total (in millions) and mean revenues and expenses for the 2011-2013, 2015, and 2017 fishing years (in 2017 dollars).

	2011		2012		2013		2015		2017	
	Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
Revenues	149.00 (4.42)	227,188 7,124	120.45 (4.95)	200,894 8,302	177.63 (9.99)	302,609 17,254	120.59 (5.70)	214,944 10,123	111.54 (21.46)	348,597 (65,981)
Total costs (excluding investment payments*)	191.30 (7.91)	328,133 10,776	112.28 (2.12)	187,261 3,179	131.89 (2.69)	224,687 4,805	127.14 (2.99)	226,617 5,349	89.15 (4.71)	278,619 (13,907)
Labor expenses	35.30 (1.28)	53,827 2,058	24.29 (0.71)	40,508 1,179	29.20 (1.11)	49,740 1,947	22.43 (1.20)	39,985 2,136	15.75 (1.62)	49,216 (4,983)
Charter trip expenses	45.04 (3.00)	68,671 4,488	29.94 (1.09)	49,936 1,853	31.19 (0.98)	53,139 1,699	29.21 (0.89)	52,069 1,631	19.55 (0.88)	61,094 (2,710)
Overhead expenses	58.19 (2.57)	88,720 3,768	35.39 (0.76)	59,025 1,254	45.60 (1.33)	77,688 2,335	36.15 (1.81)	64,433 3,213	32.27 (2.27)	100,843 (6,827)
Capital expenditures	52.77 (5.83)	80,455 8,349	22.66 (1.05)	37,792 1,754	25.90 (0.83)	44,120 1,431	39.35 (1.79)	70,130 3,199	21.59 (2.07)	67,467 (6,214)
Investment payments	23.91 (1.94)	36,460 2,993	33.69 (1.80)	56,184 3,003	24.84 (2.17)	42,317 3,724	54.20 (3.72)	96,599 6,458	17.15 (2.51)	53,608 (7,734)

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.

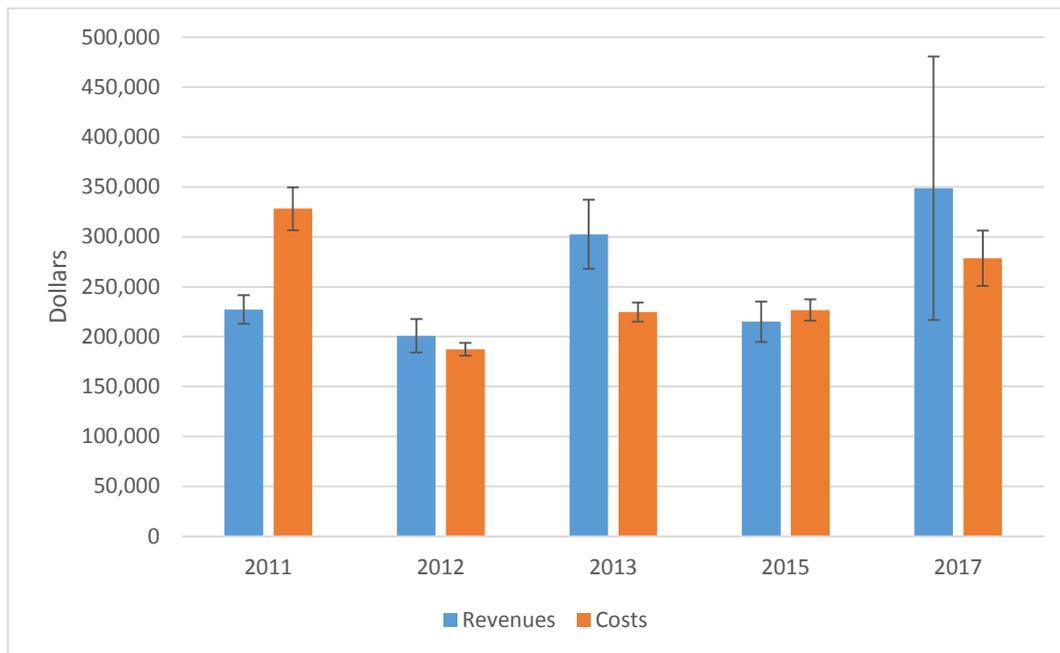


Figure 23. -- Mean estimated population-level revenues (in 2017 dollars) for the 2011-2013, 2015, and 2017 fishing years. Error bars represent two standard errors around the mean.

Estimated overhead expenses were generally the largest category of expenditures for the charter business population from 2011-2013, ranging from approximately \$35 million in 2012 to \$58 million in 2011 (Table 18 and Fig. 24). However, in 2015, the largest expenditure category was investment payments (\$54 million, S.E. = \$3.6 million), which exceeded the \$36 million (S.E. = \$1.8 million) spent in overhead expenses. In 2017, overhead expenses was again the largest category of expenditures, with approximately \$32 million (S.E. = \$2.27 million) being spent. Also in 2017, the total charter trip expenses estimate (\$19.5 million, S.E. = 0.9 million) was statistically lower than for previous years. 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, 2015, and 2017. Between 2012 and 2015, charter trip expenses were fairly similar in magnitude with no statistical differences between estimates.

The mean charter trip expenses in 2017 (\$61,094, S.E. = \$2,710) was statistically similar to the 2011 level (\$68,671, S.E. = \$4,488). Mean overhead expenses ranged from \$59,025 (S.E. = \$1,254) in 2012 to \$100,843 (S.E. = \$6,827) in 2017. The 2017 overhead estimate was statistically larger than in every year except 2011. The mean investment payments estimate of \$96,599 (S.E. = \$6,458) 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 \$80,455 (S.E. = \$8,349) in 2011 to \$37,792 (S.E. = \$1,754) in 2012 and \$44,120 (S.E. = \$1,431) in 2013. However, in 2015, the mean capital expenditures per business increased to \$70,130 (S.E. = \$3,199), which is a statistically

significant increase. In 2017, the mean capital expenditures per business remained at a statistically similar level (\$67,467, S.E. = \$6,214) compared to 2015. In 2017, there were significant increases from 2015 in mean overhead expenses and charter trip expenses, while the increase in mean labor expenses was not statistically significant.

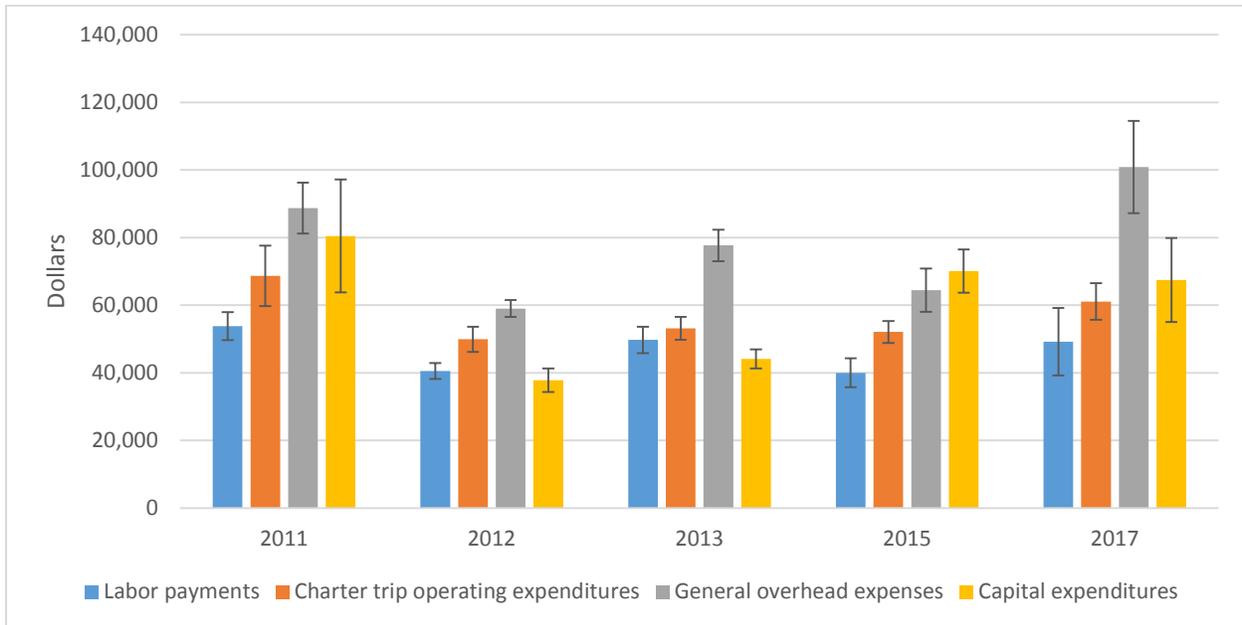


Figure 24. -- Mean estimated major expenses (in 2017 dollars) by type for the population of charter businesses for 2011-2013, 2015, and 2017. Error bars represent two standard errors above and below the means.

In terms of the number of season-specific positions, 2017 saw a statistically significant decrease in the total full-time guides/operators and statistically significant increase in the total part-time guides/operators. Between 2011 and 2013, the estimated total full-time guide/operator positions remained statistically the same, between 1,938 (S.E. = 45.95) and 1,967 (S.E. = 42.21) (Table 19). However, in 2015 the estimate went up to 3,286 (S.E. = 391.06) full-time guide/operator season-specific positions. The 2017 estimate was much lower, at 1,649 (S.E. = 173.15) guides/operators. Part-time guide/operator positions declined by roughly half between 2013 (734, S.E. = 40.71) and 2015 (373, S.E. = 26.30), but then increased in 2017 (1,225, S.E. = 146.53). Shore worker positions generally experienced statistically significant declines compared to earlier years. The 2017 full-time shore worker estimate of 1,143 (S.E. = 77.28) was statistically lower than previous years, and the 2017 part-time shore worker estimate of 463 (S.E. = 62.18) was statistically larger than 2015, but lower than those in 2011-2013. Estimates of full-time crew employment were statistically lower for 2017 compared to all previous years, but part-time crew appears to have declined over the 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 and statistically equivalent to the 2017 estimate of 5.2 season-positions. The estimated mean number of part-time guide/operator positions in 2017 (3.83, S.E. = 0.45) increased significantly from previous years' estimates. Mean full-time shore worker positions was 3.57 (S.E. = 0.24) in 2017, which is (statistically) lower than the 2013 level (4.52, S.E. = 0.22) and similar to the 2011 level (4.13, S.E. = 0.12) and 2015 level (3.18, S.E. = 0.21).

The mean part-time shore worker positions in 2017 of 1.45 (S.E. = 0.19) is statistically greater than in 2015 and statistically similar to the 2011-2013 estimates. The mean number of full-time crew positions was statistically lower in 2017 (1.68, S.E. = 0.15) compared to every year except 2011 (2.02, S.E. = 0.09). The part-time crew positions were higher (though not statistically) in 2017 (0.92, S.E. = 0.13) compared to 2015 (0.63, S.E. = 0.05).

Table 19. -- 2011-2013, 2015, and 2017 mean and total population estimates for full-time and part-time season-specific positions by type.

	2011		2012		2013		2015		2017	
	Total	Mean	Total	Mean	Total	Mean	Total	Mean	Total	Mean
FT operators	1,967	3.00	1,938	3.23	1,944	3.31	3,286	5.86	1,649	5.15
	(42.21)	0.06	(45.95)	0.08	(50.61)	0.09	(391.06)	(0.70)	(173.15)	(0.52)
PT operators	584	0.89	417	0.69	734	1.25	373	0.66	1,225	3.83
	(26.86)	0.04	(26.78)	0.04	(40.71)	0.07	(26.30)	(0.05)	(146.53)	(0.45)
FT crew	1,326	2.02	1,285	2.14	1,491	2.54	1,414	2.52	537	1.68
	(56.18)	0.09	(41.69)	0.07	(50.70)	0.09	(66.58)	(0.12)	(50.11)	(0.15)
PT crew	648	0.99	606	1.01	550	0.94	354	0.63	296	0.92
	(37.44)	0.05	(44.51)	0.07	(29.76)	0.05	(29.84)	(0.05)	(41.25)	(0.13)
FT shore workers	2,711	4.13	1,733	2.89	2,655	4.52	1,786	3.18	1,143	3.57
	(83.31)	0.12	(64.07)	0.11	(127.29)	0.22	(115.54)	(0.21)	(77.28)	(0.24)
PT shore workers	1,222	1.86	645	1.08	820	1.40	273	0.49	463	1.45
	(66.04)	0.10	(32.48)	0.05	(37.93)	0.07	(25.86)	(0.05)	(62.18)	(0.19)

Note: standard errors are given in parentheses.

Mean labor expenditures per business in 2017 (\$18,581, S.E. = \$3,349) spent toward guides/operators were statistically similar to previous years (Fig. 25). Mean crew expenditures were also statistically similar between 2017 (\$7,699, S.E. = \$1,707) and 2015 (\$6,752, S.E. = \$762). However, mean expenditures on shore workers increased from \$12,738 (S.E. = \$999) in 2015 to \$22,936 (S.E. = \$3,369) in 2017, a level similar to 2011 (\$23,935, S.E. = \$886) and 2013 (\$22,516, S.E. = \$1,535).

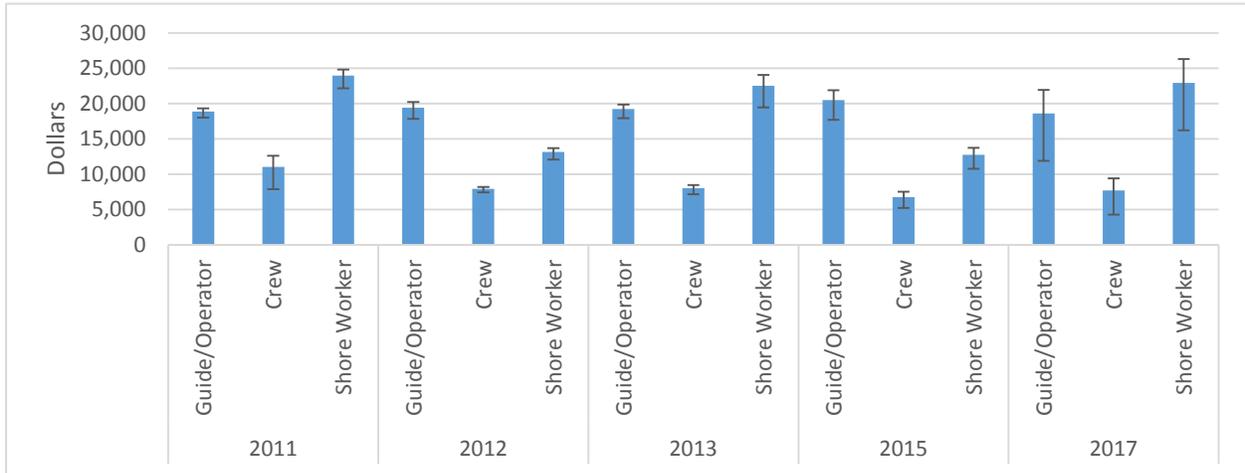


Figure 25. -- Population estimates for mean labor expenses (in 2015 dollars) by type for the years 2011-2013 and 2015. Error bars represent two standard errors around the mean.

For the 2017 fishing year, 100% of crew positions were full-time in the off-season. In contrast, only 59% of crew positions were full-time during the main season (Fig. 26). This is a change from recent years, when over 80% of crew positions in the main season were full-time. The percent of full-time workers in most position types generally fell between 2015 and 2017, with the percent of full-time guides/operators falling the most. For example, the 70% full-time guide/operator positions during the main season in 2017 was 20 percentage points lower than in 2015.

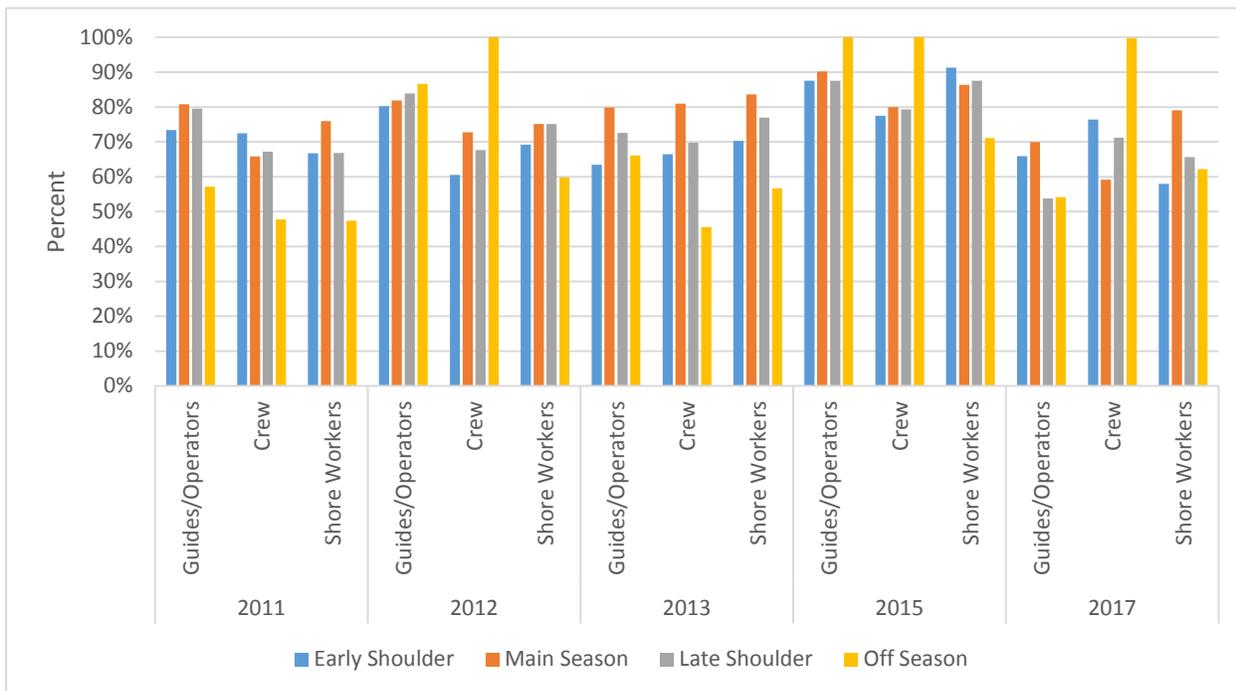


Figure 26. -- Estimated percent of full-time positions for the 2011-2013, 2015, and 2017 charter business population.

For each of the 5 years of data, total (full-time and part-time) employment was estimated to be highest during the main season (Figs. 27-29). Except for 2017, total employment estimates during the early and late shoulder seasons were generally similar, though late shoulder employment tended to be slightly higher each year across the three personnel categories. In 2017, the early shoulder season saw larger employment estimates than the late shoulder season across all personnel categories.

The total estimated number of guides/operator positions (aggregated over seasons) was fairly uniform in 2011-2013 (ranging from 2,354 to 2,678) and tended to follow the same patterns across seasons (Fig. 27). However, in 2015, the total estimated guides/operators (3,659 total for the year) increased in each season compared to prior years. This changed in 2017, with the total estimated guides/operators declining to 2,963 total for the year, reflecting decreases in guides/operators in all seasons except the early shoulder season where there was a slight increase (from 941 to 977). 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 (Figs. 28-29). In 2017, the decrease seen in 2015 continued for crew and shore workers in each season except for shore workers in the off-season, which increased from 142 in 2015 to 204 in 2017. For crew and shore workers, total estimates for 2017 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, 561 in 2015, and 550 in 2017.

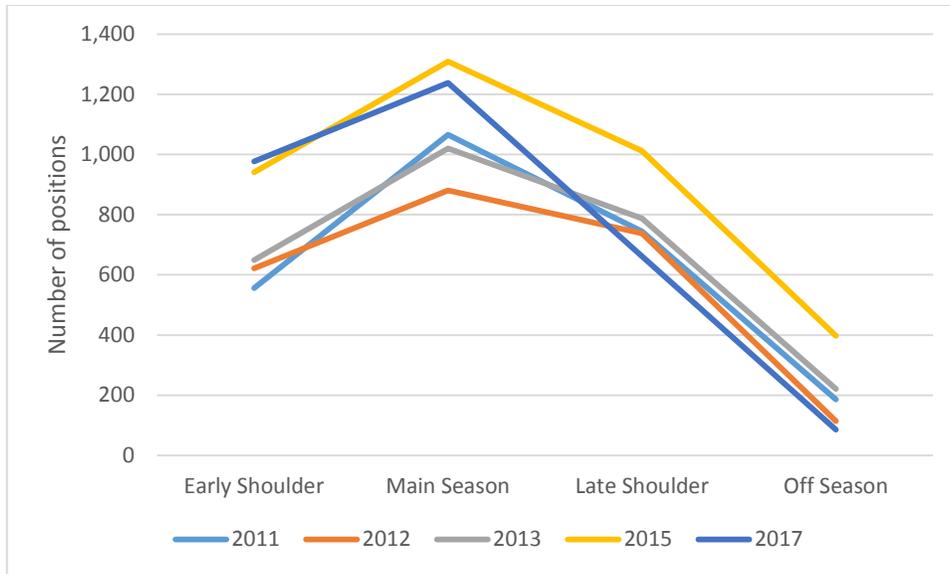


Figure 27. -- Charter business population estimates for the total (full- and part-time) number of guides/operator positions by fishing season, 2011-2013, 2015, and 2017.

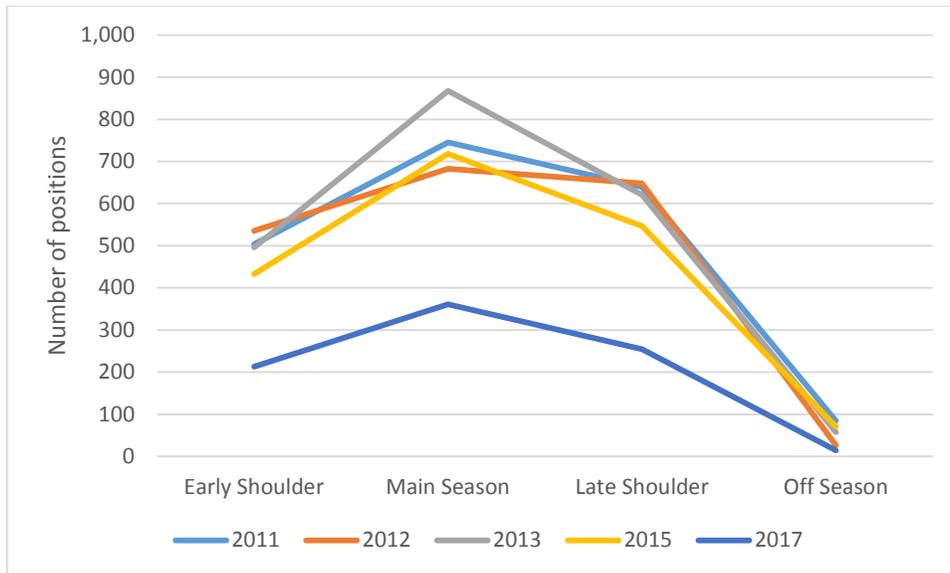


Figure 28. -- Charter business population estimates for the total (full- and part-time) number of crew positions by season, 2011-2013, 2015, and 2017.

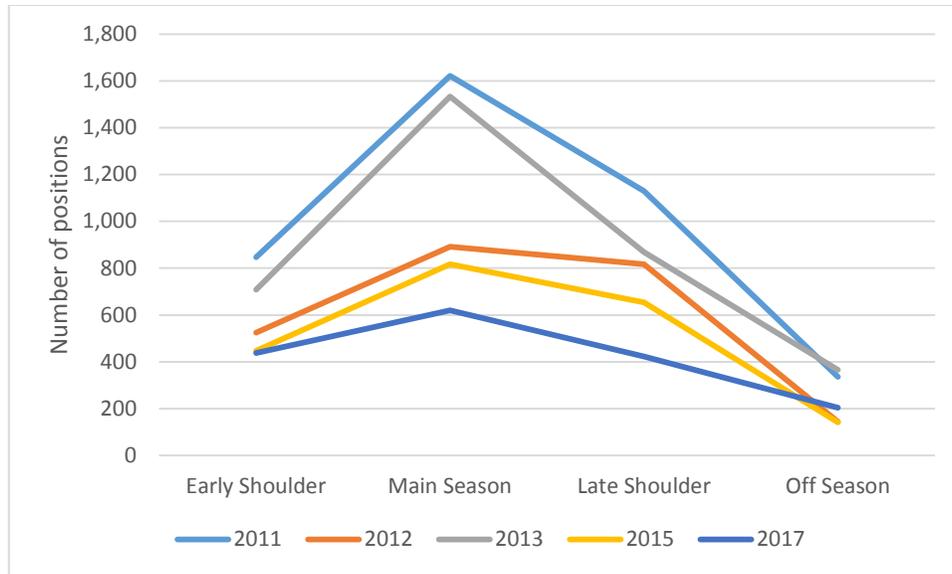


Figure 29. -- Charter business population estimates for the total (full and part-time) number of shore worker positions by fishing season, 2011-2013, 2015, and 2017.

For half-day charter fishing trips, the estimated mean price charged per individual for halibut trips in 2017 (\$229, S.E. = \$6.56) was statistically larger than in past years (Fig. 30). The mean price of a salmon half-day trip (\$226, S.E. = \$8.52) was larger in 2017 than in 2015 (\$214, S.E. = \$4.19), but the difference was not statistically significant. Mean half-day charter trip prices in 2017 ranged from approximately \$219 (S.E. = \$5.82) for a 2-species trip to \$229 (S.E. = \$6.56) for a halibut trip. For 2011-2017, the mean half-day trip prices ranged from \$166 (S.E. = \$3.36) for a halibut trip in 2012 to \$229 for halibut (S.E. = \$6.56) in 2017. The mean prices for multi-species and other-species half-day trips in 2017 could not be estimated given insufficient data (the item response rate was too low to apply data imputation methods).

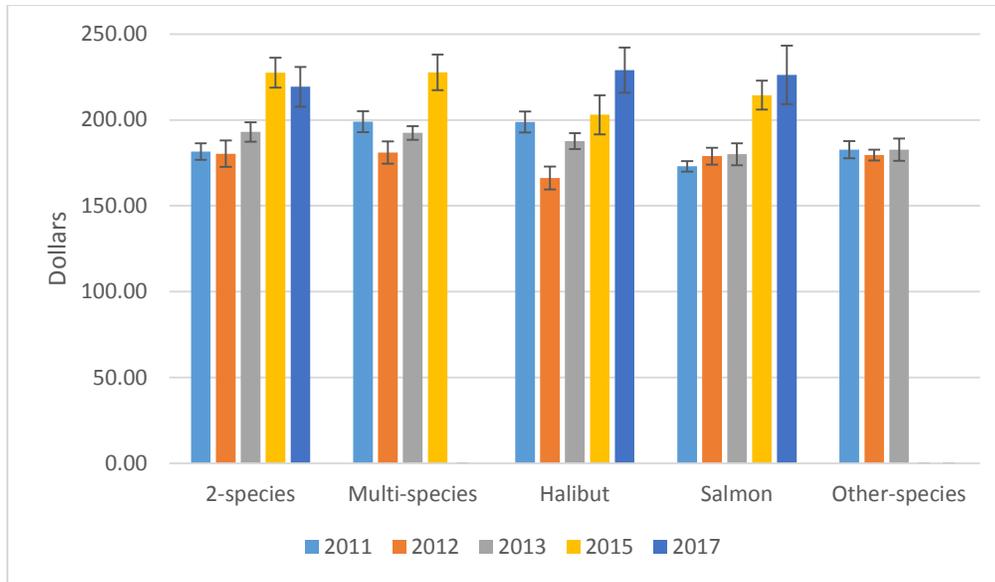


Figure 30. -- Mean estimated prices (in 2017 dollars) charged per individual for half-day trips for the population of charter businesses. Error bars represent two standard errors around the mean.

Mean prices charged for three-quarter day trips could not be estimated for halibut, multi-species, other species, or salmon trips in 2017 due to insufficient data for the data imputation methods to be employed (see Discussion for more details). Across all five years, there was insufficient data to estimate mean prices for other species three-quarter day trips. For 2-species trips, the three-quarter day trip mean price was \$294 (S.E. = \$14.34), which is statistically larger than the 2011-2013 mean prices (Fig. 31).

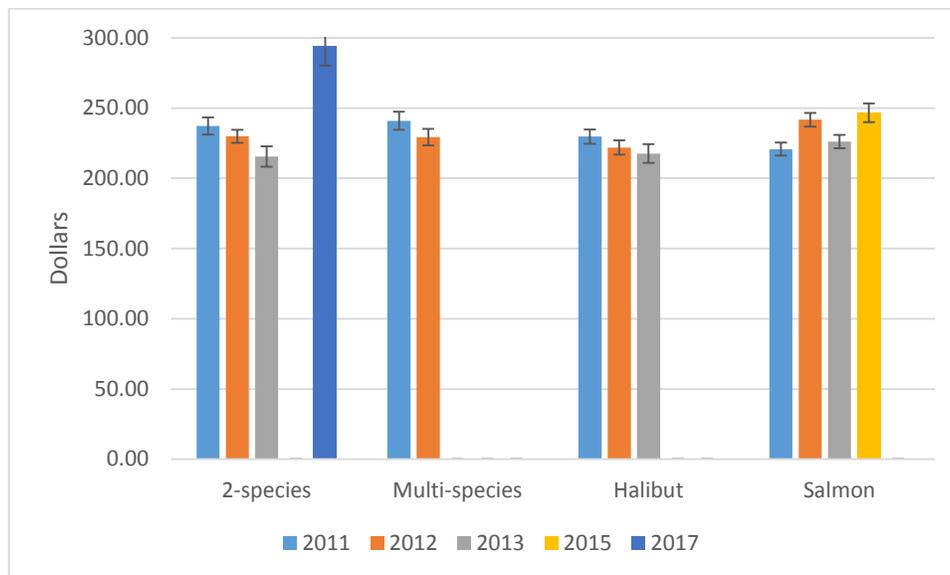


Figure 31. -- Mean estimated prices (in 2017 dollars) charged per individual for three-quarter day trips for the population of charter businesses. Error bars represent two standard errors around the mean.

Mean prices for full-day charter trips in 2017 were estimated to range from approximately \$315 for halibut (S.E. = \$6.97) and other species (S.E. = \$8.57) to \$375 (S.E. = \$23.24) for two-species trips (Fig. 32). For 2017, the mean prices across the single-species (halibut, salmon, and other species) trip offerings were not statistically different from each other or from the corresponding 2015 mean prices. The mean price for a multi-species trip in 2017 was statistically larger than the mean prices for single-species trip offerings but is statistically indistinguishable from the 2012-2013 prices for multi-species trips.

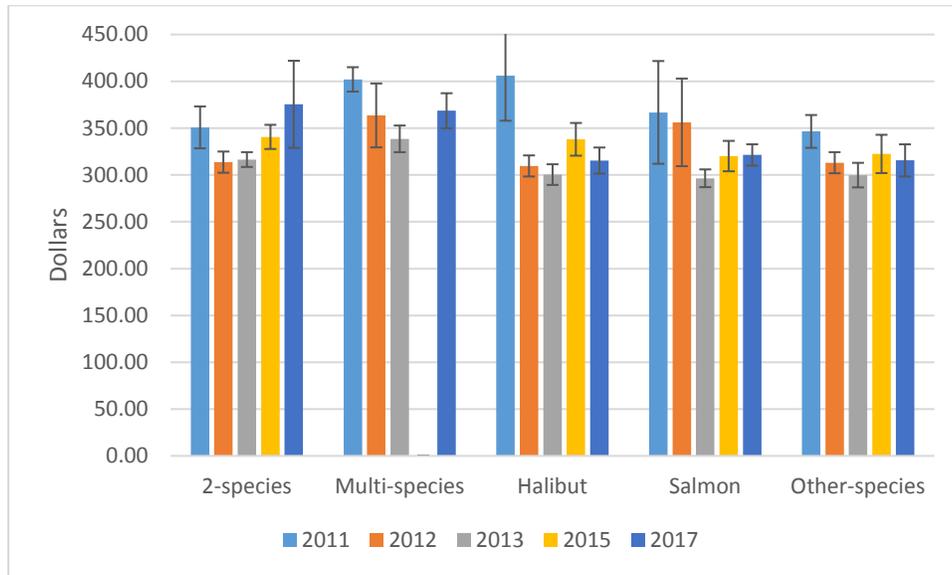


Figure 32. --Mean estimated prices (in 2017 dollars) charged per individual for full-day trips for the population of charter businesses. Error bars represent two standard errors around the mean.

There was insufficient data available to apply the data imputation methods to estimate 2017 mean prices of overnight charter fishing trips. This also occurred for the 2015 data (Lew and Lee 2018). As a result, no estimates are presented for overnight charter fishing trip prices in this report.

In 2017, estimated mean prices charged per individual for multi-day trips were generally lowest for trips targeting 2 species (\$1,072, S.E. = \$169.79), followed by trips targeting other species (\$1,138, S.E. = \$173.43) (Fig. 33). Multi-species trips had the highest estimated mean price (\$2,218, S.E. = \$253.08). The mean price of salmon multi-day trips in 2017 (\$1,752, S.E. = \$189.33) was statistically larger than in 2015 (\$1,125, S.E. = \$101.96). Mean prices increased from 2015 to 2017 for multi-species and halibut multi-day trips, and decreased for other species multi-day trips, but the differences were not statistically significant.

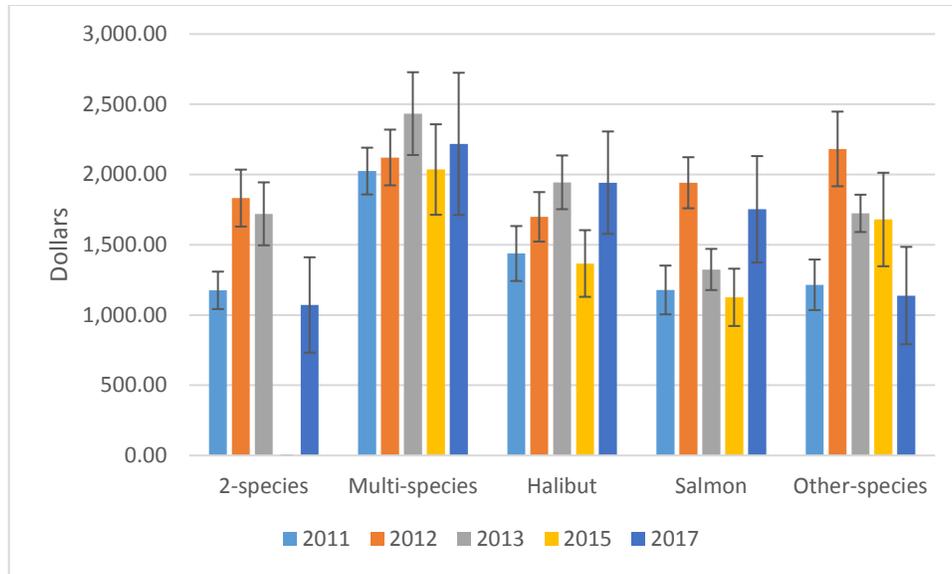


Figure 33. -- Mean estimated prices (in 2017 dollars) charged per individual for multi-day trips for the population of charter businesses by species targeted. Error bars represent two standard errors around the mean.

DISCUSSION

In this report, we have described the Alaska Saltwater Sport Fishing Charter Business Survey that was fielded in 2018 and collected data on 2017 costs, earnings, employment, and other information from 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 2017 the Alaska saltwater sport fishing charter sector as a whole operated at a roughly break-even level. This is similar to the findings reported in Lew and Lee (2018) for 2015, but is a change from 2013, when the charter sector as a whole was estimated to have operated at a profitable level. A major change in the management landscape for the charter sector occurred in 2014 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 (Kroetz et al. 2019). During this period, there was some, but not much, exit from the fishery (the active charter business population decreased from 572 to 550), 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.

A comparison of results for 2017 with those from 2015 suggests several notable changes in employment and spending patterns within the charter sector. This includes a shift to using proportionately more part-time than full-time guides/operators and a decline in full-time and part-time crew employees. There was also a substantial decrease in investments in capital (vessels) in 2017 compared with 2015, which represents a return to levels seen in earlier survey years. In addition, average general overhead costs were higher in 2017 than in any other survey year. At the same time, average revenues increased to levels that exceed those estimated for previous years, though the large variances associated with the 2017 estimates suggest they do not necessarily represent a true (statistical) increase over past levels.

There was also some evidence that average prices charged for half-day halibut charter trips increased relative to earlier years, but most inflation-adjusted trip prices appear to be similar to previous year estimates.

As in previous reports, the population-level estimates relied upon sample weighting and data imputation methods, and we emphasize the limitations previously outlined in Lew and Lee (2018). The data imputation method used in this report requires a sufficient number of donor values ($K > 3$), and due to the high item non-response rate for some variables, we were unable to apply this approach in some cases. Additionally, due to the smaller sample size available in the 2018 survey (2017 data), there were numerous variables for which we could not generate population-level estimates. This issue occurred with a similar number of variables in the 2016 survey (2015 data) and was most conspicuous with the charter trip price variables. Note that using a less data-demanding method for data imputation, 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 maximum threshold 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 three years after the implementation of the Alaska Halibut Catch Sharing Plan and compares it to information from the period immediately following implementation (2015) and before implementation (2011-2013). The 2018 survey culminates an effort to collect data from the Alaska saltwater recreational charter sector intended to provide insights into the economic conditions of the sector during the period 2011-2017. For example, Lew and Seung (2019) used the basic information from the 2012-2014 and 2016 surveys to generate estimates of the economic contribution—as measured by total economic output, employment, and tax revenue—the Alaska charter sector makes to the Alaska economy. The survey data also improves our ability to evaluate economic effects of the CSP on the sector. The development of structural economic models are a next step necessary for modeling the behavioral responses to management changes and other factors (e.g., broader economy changes) at the individual business level. These analyses will better explain the factors that influence charter business decisions and their likely response to management actions.

CITATIONS

- Alaska Department of Fish and Game. 2014. Pacific Halibut Species Profile. Retrieved July 22, 2014, from <http://www.adfg.alaska.gov/index.cfm?adfg=halibut.main>.
- Andridge, R. R., and R. J. Little. 2010. A review of hot deck imputation for survey non-response. *Int. Stat. Rev.* 78(1): 40-64.
- Brick, J., and G. Kalton. 1996. Handling missing data in survey research. *Stat. Meth. Med. Res.* 5(3): 215-238.
- Chen, J., and J. Shao. 2000. Nearest neighbor imputation for survey data. *J. Off. Stat.* 16(2): 113-132.
- Dillman, D. A., J. D. Smyth, and L. M. Christian. 2009. *Internet, Mail, and Mixed-Mode Surveys: the Tailored Design Method*. Hoboken, New Jersey, John Wiley and Sons.
- Dolsen, D. E., and G. E. Machlis. 1991. Response rates and mail recreation surveys - How much is enough? *J. Leisure Res.* 23(3): 272-277.
- Durrant, G. B. 2009. Imputation methods for handling item-nonresponse in practice: methodological issues and recent debates. *Int. J. Soc. Res. Methodol.* 12(4): 293-304.
- Fina, M. 2011. Evolution of catch share management: Lessons from catch share management in the North Pacific. *Fisheries.* 36(4): 164-177.
- Fisher, M. R. 1996. Estimating the effect of nonresponse bias on angler surveys. *Trans. Am. Fish. Soc.* 125(1): 118-126.
- Graham, J. W. 2012. *Missing Data: Analysis and Design*. Springer Science & Business Media.
- Groves, R. M. 2006. Nonresponse Rates and Nonresponse Bias in Household Surveys. *Public Opinion Quarterly.* 70(5): 646-675.
- Groves, R. M., D. A. Dillman, J. L. Eltinge and R. J. A. Little, Eds. 2002. *Survey Nonresponse*. New York, USA, Wiley.
- Heard, W. R. 2009. Alaska Salmon. Unit 13 in *Our Living Oceans*, 6th edition. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-F/SPO-80.
- Holland, S. M., C-O. Oh, S. L. Larkin and A. W. Hodges. 2012. *The Operations and Economics of the For-Hire Fishing Fleets of the South Atlantic States and the Atlantic Coast of Florida*. University of Florida, Report prepared for the National Marine Fisheries Service. 130 p.
- Hunt, K. M., and R. B. Ditton 2002. Freshwater fishing participation patterns of racial and ethnic groups in Texas. *N. Am. J. Fish. Manage.* 22(1): 52-65.
- Knapp, G. 1996. Alaska halibut captains' attitude toward IFQs. *Mar. Res. Econ.* 11: 43-55.

- Knapp, G. 1997. Initial effects of the Alaska halibut IFQ Program: Survey comments of Alaska fishermen. *Mar. Res. Econ.* 12: 239-248.
- Kroetz, K., D. K. Lew, J. N. Sanchirico, and P. Donovan. 2019. Recreational Leasing of Alaska Commercial Halibut Quota: The Early Years of the Guided Angler Fish Provision. *Coastal Mgt.* 47(2): 207-226.
- Lew, D. K., A. Himes-Cornell, and J. Lee. 2015a. Weighting and data imputation for missing data in a cost and earnings fishery survey. *Mar. Res. Econ.* 30(2): 219-230.
- Lew, D. K., and D. M. Larson. 2012. Economic values for saltwater sport fishing in Alaska: a Stated preference analysis. *N. Am. J. Fish. Manage.* 32(4): 745-759.
- Lew, D. K., and D. M. Larson. 2015. Stated preferences for size and bag limits of Alaska charter boat anglers. *Mar. Policy* 61: 66-76.
- Lew, D. K., and D. M. Larson. 2017. Stated preferences of Alaska resident saltwater anglers for contemporary regulatory policies. *Mar. Fish. Rev.* 79(3-4): 12-25.
- 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.
- Lew, D. K., D. Putman, and D. M. Larson. 2016. Attitudes and preferences toward Pacific halibut management alternatives in the saltwater sport fishing charter sector in Alaska: Results from a survey of charter halibut permit holders. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-326, 58 p.
- Lew, D. K., G. Sampson, A. Himes-Cornell, J. Lee, and B. Garber-Yonts. 2015b. Costs, earnings, and employment in the Alaska saltwater sport fishing charter sector, 2011-2013. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-299, 134 p.
- Lew, D. K., and C. K. Seung. 2010. The economic impact of saltwater sportfishing harvest restrictions in Alaska: an Empirical analysis of nonresident anglers. *N. Am. J. Fish. Manage.* 30(2): 538-551.
- Lew, D. K., and C. K. Seung. 2019. Measuring Economic Contributions of the Marine Recreational Charter Fishing Sector Using a Resampling Approach. *ICES J. Mar. Sci.* Early online. <https://doi.org/10.1093/icesjms/fsz027>.
- Little, R. J., and S. Vartivarian. 2003. On weighting the rates in non-response weights. *Stat. Med.* 22(9): 1589-1599.
- Lohr, S. 2010. *Sampling: design and analysis*. Boston, MA, Brooks/Cole Cengage Learning.
- Meyer, S. 2010. Changes Coming for Alaska's Charter Halibut Fishery. *Alaska Fish & Wildlife News*. Alaska Dep. Fish Game. October 2010.

- Powers, B., and D. Sigurdsson. 2016. Participation, effort, and harvest in the sport fish business/guide licensing and logbook programs, 2014. Alaska Department of Fish and Game, Fishery Data Series No. 16-2, Anchorage.
- Rao, J. N. K., and J. Shao. 1992. Jackknife variance estimation with survey data under hot deck imputation. *Biometrika*. 79(4): 811-822.
- Shao, J. 2002. Replication Methods for Variance Estimation in Complex Surveys with Imputed Data. In *Survey Nonresponse*, ed. R. M. Groves, D. A. Dillman, J. L. Eltinge, and R. J. A. Little, New York: John Wiley and Sons, 303–314.
- Train, K. E. 2003. *Discrete choice methods with simulation*. New York, Cambridge University Press.
- Tseng, Y.-P., Y.-C. Huang and R. Ditton. 2012. Developing a longitudinal perspective on the human dimensions of recreational fisheries. *J. Coast. Res.* 28(6): 1418-1425.

APPENDIX A

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

Description	Mean	Median	St. Dev.	Min	Max	Sum
Total number of vessels of any type	1.81	1.00	1.51	1.00	9.00	152.00
OPERATOR Full-time season workers for the year	8.58	4.00	15.97	1.00	110.00	429.00
OPERATOR Part-time season workers for the year	4.78	2.00	8.01	1.00	39.00	110.00
CREW Full-time season workers for the year	5.19	4.00	5.46	1.00	30.00	187.00
CREW Part-time season workers for the year	2.67	2.50	1.67	1.00	6.00	32.00
SHORE Full-time season workers for the year	12.88	5.50	23.76	1.00	138.00	438.00
SHORE Part-time season workers for the year	5.42	3.50	6.17	1.00	18.00	65.00
Total sold trips any type	87.79	56.00	99.28	3.00	450.00	4,653.00
Total seats sold any type	524.10	203.00	965.43	2.00	6,140.00	27,253.00
No. of trips of this type not offered, halibut	2.40	2.00	1.62	1.00	5.00	144.00
No. of trips of this type not offered, salmon	2.50	2.00	1.67	1.00	5.00	145.00
No. of trips of this type not offered, two species	2.31	1.50	1.64	1.00	5.00	171.00
No. of trips of this type not offered, other species	2.98	3.00	1.82	1.00	5.00	122.00
No. of trips of this type not offered, multi-species	2.26	2.00	1.58	1.00	5.00	156.00
Total labor payments (operators/guides , crew, onshore labor)	96,022	29,500	235,699	125	1,669,975	5,569,304
Charter trip expenses (vessel fuel and cleaning, processing, fees, supplies, etc.)	66,344	21,000	145,151	450	1,072,985	4,445,039
Overhead expenses (non-wage benefits, repair & maintenance, insurance, taxes and fees, etc.)	198,915	31,200	770,844	150	5,889,191	12,531,615
Capital expenditures (across vehicles, machinery, and equipment, buildings, land, and other real estate)	86,345	17,500	217,078	200	1,397,933	4,230,892
Investment payments (across vehicles, machinery, equipment, buildings, land, and other property)	50,614	34,813	64,427	200	254,000	1,265,346
Total revenue (over charter and non-charter trips, plus all other forms of revenue)	422,612	102,575	1,142,863	2,685	7,265,073	23,666,285

Appendix Table A2. -- 2017 survey variable descriptions, number of blank or not applicable cases, and item non-response rate (raw data, N = 89).

Variable/survey question	Description	Blanks and N/A	Item-response rate
A2	Number of vessels owned	0	1.00
A2	Number of vessels leased	0	1.00
B1	# of employees: guides/full-time/early shoulder	24	0.73
B1	# of employees: guides/full-time/main season	11	0.88
B1	# of employees: guides/full-time/late shoulder	19	0.79
B1	# of employees: guides/full-time/off-season	36	0.60
B1	# of employees: guides/part-time/early shoulder	41	0.54
B1	# of employees: guides/part-time/main season	39	0.56
B1	# of employees: guides/part-time/late shoulder	41	0.54
B1	# of employees: guides/part-time/off-season	46	0.48
B2	# of employees: other crew/full-time/early shoulder	25	0.72
B2	# of employees: other crew/full-time/main season	15	0.83
B2	# of employees: other crew/full-time/late shoulder	23	0.74
B2	# of employees: other crew/full-time/off-season	37	0.58
B2	# of employees: other crew/part-time/early shoulder	46	0.48
B2	# of employees: other crew/part-time/main season	45	0.49
B2	# of employees: other crew/part-time/late shoulder	47	0.47
B2	# of employees: other crew/part-time/off-season	48	0.46
B3	# of employees: shore/full-time/early shoulder	25	0.72
B3	# of employees: shore/full-time/main season	19	0.79
B3	# of employees: shore/full-time/late shoulder	24	0.73
B3	# of employees: shore/full-time/off-season	32	0.64
B3	# of employees: shore/part-time/early shoulder	44	0.51
B3	# of employees: shore/part-time/main season	45	0.49
B3	# of employees: shore/part-time/late shoulder	45	0.49

B3	# of employees: shore/part-time/off-season	47	0.47
B4	employee pay: guides	19	0.79
B4	employee pay: other crew	24	0.73
B4	employee pay: shore employees	26	0.71
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	0	1.00
C1	trip offerings, fishing only option	0	1.00
C1	trip offerings, combination fishing and hunting option	0	1.00
C1	trip offerings, combination fishing and tour option	0	1.00
C1	trip offerings, tour only option	0	1.00
C1	trip offerings, outfitting option	0	1.00
C1	trip offerings, game transport option	0	1.00
C1	trip offerings, general transportation option	0	1.00
C1	trip offerings, event hosting option	0	1.00
C1	trip offerings, research or oil spill services option	0	1.00
C1	trip offerings, other services option	82	0.08
C2	trip offerings: 2-species/half-day: not offered option	0	1.00
C2	trip offerings: 2-species/half-day: individual price	71	0.20
C2	trip offerings: 2-species/half-day: boat price	76	0.15

C2	trip offerings: 2-species/three-quarter day: not offered option	0	1.00
C2	trip offerings: 2-species/three-quarter day: individual price	80	0.10
C2	trip offerings: 2-species/three-quarter day: boat price	82	0.08
C2	trip offerings: 2-species/full-day: not offered option	0	1.00
C2	trip offerings: 2-species/full-day: individual price	41	0.54
C2	trip offerings: 2-species/full-day: boat price	47	0.47
C2	trip offerings: 2-species/overnight: not offered option	0	1.00
C2	trip offerings: 2-species/overnight: individual price	85	0.04
C2	trip offerings: 2-species/overnight: boat price	84	0.06
C2	trip offerings: 2-species/multi-day: not offered option	0	1.00
C2	trip offerings: 2-species/multi-day: individual price	70	0.21
C2	trip offerings: 2-species/multi-day: boat price	71	0.20
C2	trip offerings: multi-species/half-day: not offered option	0	1.00
C2	trip offerings: multi-species/half-day: individual price	80	0.10
C2	trip offerings: multi-species/half-day: boat price	83	0.07
C2	trip offerings: multi-species/three-quarter day: not offered option	0	1.00
C2	trip offerings: multi-species/three-quarter day: individual price	86	0.03
C2	trip offerings: multi-species/three-quarter day: boat price	87	0.02
C2	trip offerings: multi-species/full-day: not offered option	0	1.00
C2	trip offerings: multi-species/full-day: individual price	48	0.46
C2	trip offerings: multi-species/full-day: boat price	55	0.38
C2	trip offerings: multi-species/overnight: not offered option	0	1.00
C2	trip offerings: multi-species/overnight: individual price	84	0.06
C2	trip offerings: multi-species/overnight: boat price	83	0.07
C2	trip offerings: multi-species/multi-day: not offered option	0	1.00

C2	trip offerings: multi-species/multi-day: individual price	69	0.22
C2	trip offerings: multi-species/multi-day: boat price	72	0.19
C3	trip offerings: halibut/half-day: not offered option	0	1.00
C3	trip offerings: halibut/half-day: individual price	77	0.13
C3	trip offerings: halibut/half-day: boat price	81	0.09
C3	trip offerings: halibut/three-quarter day: not offered option	0	1.00
C3	trip offerings: halibut/three-quarter day: individual price	83	0.07
C3	trip offerings: halibut/three-quarter day: boat price	84	0.06
C3	trip offerings: halibut/full-day: not offered option	0	1.00
C3	trip offerings: halibut/full-day: individual price	51	0.43
C3	trip offerings: halibut/full-day: boat price	58	0.35
C3	trip offerings: halibut/overnight: not offered option	0	1.00
C3	trip offerings: halibut/overnight: individual price	88	0.01
C3	trip offerings: halibut/overnight: boat price	86	0.03
C3	trip offerings: halibut/multi-day: not offered option	0	1.00
C3	trip offerings: halibut/multi-day: individual price	79	0.11
C3	trip offerings: halibut/multi-day: boat price	78	0.12
C3	trip offerings: salmon/half-day: not offered option	0	1.00
C3	trip offerings: salmon/half-day: individual price	75	0.16
C3	trip offerings: salmon/half-day: boat price	79	0.11
C3	trip offerings: salmon/three-quarter day: not offered option	0	1.00
C3	trip offerings: salmon/three-quarter day: individual price	84	0.06
C3	trip offerings: salmon/three-quarter day: boat price	85	0.04
C3	trip offerings: salmon/full-day: not offered option	0	1.00
C3	trip offerings: salmon/full-day: individual price	53	0.40
C3	trip offerings: salmon/full-day: boat price	59	0.34
C3	trip offerings: salmon/overnight: not offered option	0	1.00

C3	trip offerings: salmon/overnight: individual price	88	0.01
C3	trip offerings: salmon/overnight: boat price	87	0.02
C3	trip offerings: salmon/multi-day: not offered option	0	1.00
C3	trip offerings: salmon/multi-day: individual price	77	0.13
C3	trip offerings: salmon/multi-day: boat price	77	0.13
C3	trip offerings: other species/half-day: not offered option	0	1.00
C3	trip offerings: other species/half-day: individual price	83	0.07
C3	trip offerings: other species/half-day: boat price	85	0.04
C3	trip offerings: other species/three-quarter day: not offered option	0	1.00
C3	trip offerings: other species/three-quarter day: individual price	86	0.03
C3	trip offerings: other species/three-quarter day: boat price	87	0.02
C3	trip offerings: other species/full-day: not offered option	0	1.00
C3	trip offerings: other species/full-day: individual price	70	0.21
C3	trip offerings: other species/full-day: boat price	75	0.16
C3	trip offerings: other species/overnight: not offered option	0	1.00
C3	trip offerings: other species/overnight: individual price	89	0.00
C3	trip offerings: other species/overnight: boat price	88	0.01
C3	trip offerings: other species/multi-day: not offered option	0	1.00
C3	trip offerings: other species/multi-day: individual price	82	0.08
C3	trip offerings: other species/multi-day: boat price	82	0.08
C4	fishing-related services: long-distance fishing: not offered option	0	1.00
C4	fishing-related services: long-distance fishing: included in trip package option	0	1.00
C4	fishing-related services: long-distance fishing: added fee option	0	1.00
C4	fishing-related services: long-distance fishing: added fee amount	85	0.04

C4	fishing-related services: fish cleaning (h/g): not offered option	0	1.00
C4	fishing-related services: fish cleaning (h/g): included in trip package option	0	1.00
C4	fishing-related services: fish cleaning (h/g): added fee option	0	1.00
C4	fishing-related services: fish cleaning (h/g): added fee amount	87	0.02
C4	fishing-related services: fish cleaning (skinning, etc.): not offered option	0	1.00
C4	fishing-related services: fish cleaning (skinning, etc.): included in trip package option	0	1.00
C4	fishing-related services: fish cleaning (skinning, etc.): added fee option	0	1.00
C4	fishing-related services: fish cleaning (skinning, etc.): added fee amount	86	0.03
C4	fishing-related services: packing and shipping: not offered option	0	1.00
C4	fishing-related services: packing and shipping: included in trip package option	0	1.00
C4	fishing-related services: packing and shipping: added fee option	0	1.00
C4	fishing-related services: packing and shipping: added fee amount	84	0.06
C4	fishing-related services: transport to/from vessel: not offered option	0	1.00
C4	fishing-related services: transport to/from vessel: included in trip package option	0	1.00
C4	fishing-related services: transport to/from vessel: added fee option	0	1.00
C4	fishing-related services: transport to/from vessel: added fee amount	88	0.01
C4	fishing-related services: on-shore lodging: not offered option	0	1.00
C4	fishing-related services: on-shore lodging: included in trip package option	0	1.00

C4		0	1.00
C4	fishing-related services: on-shore lodging: added fee amount	82	0.08
C4	fishing-related services: on-vessel lodging: not offered option	0	1.00
C4	fishing-related services: on-vessel lodging: included in trip package option	0	1.00
C4	fishing-related services: on-vessel lodging: added fee option	0	1.00
C4	fishing-related services: on-vessel lodging: added fee amount	88	0.01
C4	fishing-related services: cooked meals: not offered option	0	1.00
C4	fishing-related services: cooked meals: included in trip package option	0	1.00
C4	fishing-related services: cooked meals: added fee option	0	1.00
C4	fishing-related services: cooked meals: added fee amount	86	0.03
C4	fishing-related services: beverages/snacks: not offered option	0	1.00
C4	fishing-related services: beverages/snacks: included in trip package option	0	1.00
C4	fishing-related services: beverages/snacks: added fee option	0	1.00
C4	fishing-related services: beverages/snacks: added fee amount	88	0.01
C4	fishing-related services: bait: not offered option	0	1.00
C4	fishing-related services: bait: included in trip package option	0	1.00
C4	fishing-related services: bait: added fee option	0	1.00
C4	fishing-related services: bait: added fee amount	88	0.01
C4	fishing-related services: ice: not offered option	0	1.00
C4	fishing-related services: ice: included in trip package option	0	1.00
C4	fishing-related services: ice: added fee option	0	1.00

C4	fishing-related services: ice: added fee amount	88	0.01
C4	fishing-related services: fishing gear: not offered option	0	1.00
C4	fishing-related services: fishing gear: included in trip package option	0	1.00
C4	fishing-related services: fishing gear: added fee option	0	1.00
C4	fishing-related services: fishing gear: added fee amount	88	0.01
C4	fishing-related services: other gear: not offered option	0	1.00
C4	fishing-related services: other gear: included in trip package option	0	1.00
C4	fishing-related services: other gear: added fee option	0	1.00
C4	fishing-related services: other gear: added fee amount	88	0.01
C4	fishing-related services: souvenirs: not offered option	0	1.00
C4	fishing-related services: souvenirs: included in trip package option	0	1.00
C4	fishing-related services: souvenirs: added fee option	0	1.00
C4	fishing-related services: souvenirs: added fee amount	85	0.04
C4	fishing-related services: other: not offered option	83	0.07
C4	fishing-related services: other: included in trip package option	83	0.07
C4	fishing-related services: other: added fee option	83	0.07
C4	fishing-related services: other: added fee amount	86	0.03
C5	fishing-related services: paid lodging offered option	0	1.00
C6	revenue: charter trips, direct client payment: seats sold	43	0.52
C6	revenue: charter trips, direct client payment: total trips	41	0.54
C6	revenue: charter trips, direct client payment: revenue	37	0.58
C6	revenue: charter trips, agent payment: seats sold	58	0.35
C6	revenue: charter trips, agent payment: total trips	58	0.35
C6	revenue: charter trips, agent payment: revenue	55	0.38
C6	revenue: non-fishing charter trips: seats sold	58	0.35
C6	revenue: non-fishing charter trips: total trips	59	0.34

C6	revenue: non-fishing charter trips: revenue	54	0.39
C6	revenue: referrals: total referrals	67	0.25
C6	revenue: referrals: revenue	62	0.30
C6	revenue: CHP sales: endorsements sold	64	0.28
C6	revenue: CHP sales: revenue	72	0.19
C6	revenue: CHP leases: endorsements leased	62	0.30
C6	revenue: CHP leases: revenue	70	0.21
D1	costs: vessel fuel	21	0.76
D1	costs: fish handling, processing, packaging, shipping	41	0.54
D1	costs: broker or agent referral/commission fees	52	0.42
D1	costs: vessel cleaning	48	0.46
D1	costs: supplies	27	0.70
D1	costs: other vessel or trip operating expenses	49	0.45
D1	costs: non-wage payroll costs	48	0.46
D1	costs: utilities	33	0.63
D1	costs: repair and maintenance	32	0.64
D1	costs: insurance	27	0.70
D1	costs: travel, meals, entertainment	39	0.56
D1	costs: office and general supplies	34	0.62
D1	costs: legal and professional services	34	0.62
D1	costs: financial services	45	0.49
D1	costs: taxes and licensing fees	35	0.61
D1	costs: vehicle fuel costs	39	0.56
D1	costs: other general overhead expenses	43	0.52
D1	costs: Guided Angler Fish (GAF) leasing expenditures	52	0.42
D2	capital expenses: vessels and related equipment: cash payment	38	0.57
D2	capital expenses: vessels and related equipment: new investment	59	0.34

D2	capital expenses: vehicles: cash payment	41	0.54
D2	capital expenses: vehicles: new investment	61	0.31
D2	capital expenses: fishing gear, tackle, safety equipment: cash payment	48	0.46
D2	capital expenses: fishing gear, tackle, safety equipment: new investment	62	0.30
D2	capital expenses: other machinery and equipment: cash payment	51	0.43
D2	capital expenses: other machinery and equipment: new investment	65	0.27
D2	capital expenses: moorage/slip, boatyard and storage space: cash payment	53	0.40
D2	capital expenses: moorage/slip, boatyard and storage space: new investment	68	0.24
D2	capital expenses: office space, lodging, shore-side facilities: cash payment	60	0.33
D2	capital expenses: office space, lodging, shore-side facilities: new investment	71	0.20
D2	capital expenses: transferable fishing permits and licenses: cash payment	64	0.28
D2	capital expenses: transferable fishing permits and licenses: new investment	70	0.21
D2	capital expenses: other business-related property and assets: cash payment	67	0.25
D2	capital expenses: other business-related property and assets: new investment	73	0.18
E1	clients: percentage of clients that were return customers or referrals from previous customers	13	0.85
E2	clients: percentage of clients booking 1 month or more in advance	13	0.85
E3	clients: percentage of clients booking less than 48 hours in advance	13	0.85
E4	clients: percentage of clients booked independent	15	0.83
E4	clients: percentage of clients booked through cruise ship	20	0.78

E4	clients: percentage of clients booked through charter booking service	17	0.81
E4	clients: percentage of clients booked through general travel agent	23	0.74
F1	business and household: C corporation option	62	0.30
F2	business and household: business structure type	89	0.00
F3	business and household: percentage share of business by household	21	0.76
F4	business and household: household members working as guides	27	0.70
F4	business and household: household members working as other crew	55	0.38
F4	business and household: household members working on shore	37	0.58
F5	business and household: percentage of income from business	21	0.76
F6	business and household: work related to charter business option	0	1.00
F6	business and household: worked in AK, fishing not related to charter business	0	1.00
F6	business and household: worked in AK, non-fishing job	0	1.00
F6	business and household: lived in AK, did not work	0	1.00
F6	business and household: worked outside AK, fishing not related to charter business	0	1.00
F6	business and household: worked outside AK, non-fishing job	0	1.00
F6	business and household: lived outside AK, did not work	0	1.00

APPENDIX B

Alaska Saltwater Sport Fishing Charter Business Survey

2017 Season



Photo credits: R. Yamada (top left), K. MacLauchlin (top right), D. Lew (others)



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.

OMB Control No. 0648-0647
Expiration Date: February 28, 2019

SURVEY INSTRUCTIONS

This is a voluntary survey.

- ◇ Your responses to the survey questions should reflect information about your saltwater sport fishing charter business.
- ◇ If you have questions or anything is unclear, please contact Geana Tyler at the Pacific States Marine Fisheries Commission, (888) 421-4251.
- ◇ If you are unable to answer a specific 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 2017.

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*

_____ *ADF&G 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 2017 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 <input type="checkbox"/>	Leased <input type="checkbox"/>
Vessel 1: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 2: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 3: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 4: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 5: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 6: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 7: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 8: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 9: _____	<input type="checkbox"/>	<input type="checkbox"/>
Vessel 10: _____	<input type="checkbox"/>	<input type="checkbox"/>



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 2017.

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 2017, *not including owners of this business*? For each period, please report the number of individuals who worked full-time and part-time separately.

	Early shoulder	Main season	Late shoulder	Off-season
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Part-time (less than 35 hours per week 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 2017, *not including owners of this business*? For each period, please report the number of individuals who worked full-time and part-time separately.

	Early shoulder	Main season	Late shoulder	Off-season
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Part-time (less than 35 hours per week during most of the period).....

B3 How many individuals were hired and worked for the business primarily on-shore during each period in 2017 (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 shoulder	Main season	Late shoulder	Off-season
Part-time (less than 35 hours per week during most of the period).....				

B4 For work performed in 2017, 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
Deckhands and other on-board crew.....	\$ _____

B5 What forms of compensation were used for hired vessel operators and guides, deckhands and other crew, and on-shore employees in 2017? *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/hourly wage <input checked="" type="checkbox"/>	Salary <input checked="" type="checkbox"/>	Revenue share <input checked="" type="checkbox"/>	Other (please describe) <input checked="" type="checkbox"/>
Deckhands and other on-board crew.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> _____

C1 During 2017, 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
- Other, please describe: _____

C2 Many businesses offer saltwater fishing trips targeting multiple species (“combination fishing trips”). During 2017, 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 <input checked="" type="checkbox"/>	Average price per person	Full boat price
<u>Two-species combination fishing trips</u>			
“Three-quarter day” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
“Overnight” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
<u>Multiple-species combination fishing trips (more than two species)</u>			
“Three-quarter day” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
“Overnight” trip.....	<input type="checkbox"/>	\$ _____	\$ _____

C3 During 2017, 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 single species fishing trip	Not offered <input checked="" type="checkbox"/>	Average price per person	Full boat price
<u>Halibut fishing trips</u>			
“Three-quarter day” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
“Overnight” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
<u>King or silver salmon fishing trips</u>			
“Three-quarter day” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
“Overnight” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
<u>Other saltwater species fishing trips</u>			
“Three-quarter day” trip.....	<input type="checkbox"/>	\$ _____	\$ _____
“Overnight” trip.....	<input type="checkbox"/>	\$ _____	\$ _____

C4 Of the following fishing-related services, which did you typically include as part of each saltwater fishing package you offered in 2017, 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 <input type="checkbox"/>	Included in one or more trip packages? <input type="checkbox"/>	Charge an added fee? <input type="checkbox"/>	Amount of added fee per person (<i>indicate if fee is charged on other basis</i>)
Long-distance fishing locations (including fuel surcharge).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Fish cleaning (head/gut).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Fish cleaning (skinning, scaling, filleting, etc).....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Packing and shipping.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Transport to/from charter vessel.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
On-shore lodging.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
On-vessel lodging.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Cooked meals (breakfast/lunch/dinner)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Beverages/snacks.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Bait.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Ice.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Fishing gear.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Other gear.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Souvenirs/keepsakes.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____
Other (please describe):	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	\$ _____

C5 During 2017, did you offer paid lodging to visitors that were not customers of the charter business?

- Yes
- No

C6 What sales and revenue were generated from your charter business in 2017? *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 from booking agent or other service.....	_____ total clients (seats sold) _____ total trips	\$ _____
Client referrals/booking commission revenue.....	_____ total client referrals/bookings	\$ _____
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.*

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 2017 for goods and services listed in the table below?

Fish handling, processing, packaging, and shipping.....	\$ _____
Vessel cleaning.....	\$ _____
Other vessel or trip operating expenses.....	\$ _____
<u>General overhead expenses</u>	
Utilities, including telephone and internet service.....	\$ _____
Insurance (vessel, hull, property & indemnity, liability, etc., <u>excluding health insurance</u>).....	\$ _____
Office and general supplies.....	\$ _____
Financial services (merchant and bank fees) and mortgage interest payments.	\$ _____
Vehicle fuel costs.....	\$ _____

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 2017 for:*

- **Cash payments** in 2017: total rental/lease payments, purchases and improvements fully paid for during 2017, and loan payments on purchases and improvements financed during or before 2017
- **New investments** in 2017: total investment costs financed by loans issued during 2017, including loan principal, taxes and fees, and down payment amount

Item	Cash payments	New investments
<u>Vehicles, machinery, and equipment</u>		
Vehicles (car/truck).....	\$ _____	\$ _____
Other machinery and equipment.....	\$ _____	\$ _____
<u>Buildings, land and other real estate</u>		
Office space, lodging, and other shore-side facilities...	\$ _____	\$ _____
Other business-related property and assets.....	\$ _____	\$ _____

E1 During 2017, about what percentage of your clients were return customers or personal referrals from previous customers? *Check the box of the best answer.*

- None
 1-25%
 26-50%
 51-75%
 75-99%
 100%

E2 During 2017, about what percentage of your clients booked their trips one month or more in advance? *Check the box of the best answer.*

- None
 1-25%
 26-50%
 51-75%
 75-99%
 100%

E3 During 2017, about what percentage of your clients booked their trips less than 48 hours in advance? *Check the box of the best answer.*

- None
 1-25%
 26-50%
 51-75%
 75-99%
 100%

E4 During 2017, 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

None 1-25% 26-50% 51-75% 75-99% 100%

Cruise ship-based booking

None 1-25% 26-50% 51-75% 75-99% 100%

Specialty charter booking service (or charter business)

None 1-25% 26-50% 51-75% 75-99% 100%

General travel agent (or other booking service)

None 1-25% 26-50% 51-75% 75-99% 100%



F1 Is your business structured as a C corporation? *A C corporation is taxed separately from its owners.*

- Yes → **skip** to the end of the survey
- No → continue to F2

F2 Which of the following business structures best describes your business? *Check the best answer.*

- Sole proprietorship
- Limited liability partnership (LLP), Limited liability company (LLC), or S Corporation
- Other: _____

F3 Please indicate the total percentage ownership share of this business held by you and other members of your household during 2017. *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: _____%

F4 During 2017, 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.*

- _____ Vessel operators/guides
- _____ Deckhands and other on-board crew
- _____ On-shore work

F5 During 2017, about what percentage of your total annual household income was earned from this business? *Check the best answer.*

- None 1-25% 26-50% 51-75% 75-99% 100%

F6 Which of the following best describes what you did during the 2016-17 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.

YOUR PARTICIPATION IS GREATLY APPRECIATED!



U.S. Secretary of Commerce
Wilbur L. Ross, Jr.

Acting Under Secretary of
Commerce for Oceans and
Atmosphere
Dr. Neil Jacobs

Assistant Administrator for
Fisheries
Chris Oliver

November 2019

www.nmfs.noaa.gov

OFFICIAL BUSINESS

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