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Economic and Social Characteristics of the Hawaii Small Boat Fishery 2014

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National Marine Fisheries Service
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U.S. Department of Commerce

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Economic and Social Characteristics of the Hawaii Small Boat Fishery 2014

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Executive Summary

This report presents an empirical description of the economic and social characteristics of the Hawaii small boat fishery using results from the cost-earnings study of the fleet conducted in 2014. Those surveyed included fishermen who held a State of Hawaii Commercial Marine License (CML) and fished using small vessels and sold at least one fish during 2013. The survey booklets were mailed to all 1,796 small boat fishermen in the summer of 2014, with an online survey option. Excluding 33 undeliverable or inactive fishermen, this made the effective population 1,763 CML holders who met the survey criteria. We received 824 returns, including 733 via the mail and 91 online, and achieved a 47% response rate. An identification number printed on each survey booklet and a unique password for online surveys were used for response tracking and response rate analysis. In addition, we compared the survey responses with State of Hawaii Division of Aquatic Resources (HDAR) fishing reports and dealer reports to analyze the survey response representativeness for landings and sale values, respectively. All the survey results were presented in aggregate forms, and no individual results were disclosed. With over 800 responses, this study provides a robust economic and social description of the Hawaii small boat fleet including demographics of small boat fishermen, vessel characteristics, levels of fishing activity, social aspects of small boat fishing, market participation, fishing trip costs, and annual fishing fixed costs. The Hawaii small boat fishery comprises fishermen from different islands who use different fishing gears and target different species. The attitudes/motivations toward fishing activities among fishermen also vary. With this large number of responses, we can segment the data and examine the characteristics and differences between subgroups of the fishery, including county of residence, motivations, gear types most commonly used, and sub-fisheries within the Hawaii small boat fishery. Sub-fisheries are defined by the types of fishing trips that fishermen had in the past 12 months. This enhances information from previous cost-earnings studies of Hawaii's small boat fishery where results were presented only by county and broad fisherman types, such as commercial and non-commercial fishermen. This study results from different self-identified fisherman types; full-time commercial fishermen, part-time commercial fishermen, cultural fishermen, recreational expenses fishermen, purely recreational fishermen, and subsistence fishermen.

Results showed the Hawaii small boat fishery was 95% owner-operated, and 91% of respondents never loaned out their vessels without being present. The average vessel size was approximately 23 feet long with a 216-horsepower engine. The average age of vessels was 23 years, and the average duration of vessel ownership was 12 years. Vessel purchase price was close to $40,000 on average and their estimated current market value was higher, at $43,000. Small boat fishermen, on average, took 38 boat fishing trips in the past 12 months. Trolling was the most common type of fishing, followed by bottomfish handline and pelagic handline. Most fishermen (72% respondents) used multiple fishing gears, two on average, during their trips in the past 12 months. Trolling and bottomfish handline were the most common combination, with 20% of respondents using these two gears in the past 12 months, followed by 14% who used troll and pelagic handline gears. The combination of trolling, pelagic handline, and bottomfish handline gears accounted for another 11%.

Although the population we surveyed was small boat fishermen who held a State of Hawaii Commercial Marine License, they had diverse motivations to fish. When the survey asked

fishermen to self-identify, 7% identified as full-time commercial, 51% identified as part-time commercial, 27% identified as recreational expense, 11% as purely recreational, 3% as subsistence, and 1% as cultural. Fishing level varied by motivation, with full-time commercial fishermen taking 99 trips in the past 12 months, part-time commercial fishermen taking 41 trips, recreational expense fishermen taking 28 trips, and purely recreational fishermen taking 20 trips. Gear usage also varied by fisherman type. Trolling was more commonly used by recreational fishermen, and pelagic handline and bottomfish gears were more commonly used by commercial fishermen.

There was variation in annual landings among different types of fishermen. In 2013, the total landings of pelagic fish, bottomfish, and reef fish reported in the survey from all 824 respondents were approximately 2.18 million pounds, and sold for $5.54 million. Full-time commercial fishermen reported considerably higher landings than other fisherman types, with over 10,000 lbs of fish (pelagic fish, bottomfish, and reef fish) sold per year compared with cultural fishermen (3,581 lbs), part-time commercial fishermen (2,837 lbs), recreational expense fishermen (1,485 lbs), subsistence fishermen (922 lbs), and purely recreational fishermen (624 lbs). Ninety-three percent of small boat fishermen had landed pelagics in the past 12 months. Though less common, about half of respondents reported that they caught and landed bottomfish or reef fish in the past 12 months.

Distributions of catch and value of fish sold varied substantially by fisherman type. Of those who responded to the survey, full-time commercial fishermen caught 28% of the total fish which represented 35% of total value of fish sold by all respondents. Part-time commercial fishermen caught 53% of total fish, and their fish sales represented 55% of total value. Recreational expense fishermen represented 14% of total catch and 8% of total value. Purely recreational fishermen's catch was 3% of total catch and 1% of total value.

The diversity of fishermen's motivations and how they relate to behavior echoes the findings in past studies, which shows a disconnection between fishermen's behavior relative to the definition of commercial and recreational fishing by the fisheries management agencies. For example, the Magnuson-Stevens Act defines commercial fishing as "fishing in which the fish harvested are intended to enter commerce"; however, the survey results show that while the majority of small boat fishermen (83%) reported selling at least part of their catch in the past 12 months, not all of them defined themselves as commercial fishermen. In addition, the intent of catch, whether to sell, keep for home consumption, or give away varied greatly by fisherman type. Full-time and part-time commercial fishermen sold 73% and 68% of their catch, respectively. A substantial portion of their landings, were distributed for home consumption and given away to friends and family; 21% and 27% for the full-time and part-time commercial fishermen, respectively. This supports past research findings that showed the vital social role small boat fishermen played in local community. On the other hand, recreational expense fishermen also sold substantial portions (52%) of their catch; and even the self-identified "purely" recreational fishermen sold 28% of their catch. However, because their catch was relatively small, the average amount they sold was limited to 800 lbs annually per recreational expense fisherman and 180 lbs per purely recreational fisherman. This finding demonstrates that selling fish is common among recreational fishermen.

Small boat fishermen used several market outlets to sell their catch; the majority (72%) sold to wholesalers or auctions, 43% to restaurants or stores, 27% to friends, neighbors, or coworkers, and 8% on the roadside or at farmers' markets. The average value of fish sold by all respondents was approximately $8,500. Full-time commercial fishermen, as expected, reported the highest value of fish sold ($35,528 annually and $558 per trip), followed by part-time commercial fishermen ($8,391 annually and $245 per trip), cultural fishermen ($3,900 annually and $150 per trip), recreational expenses fishermen ($2,690 annually and $95 per trip), and subsistence fishermen ($1,905 annually and $79 per trip). Purely recreational fishermen also reported selling close to $1,000 annually ($58 per trip). Thus, to full-time commercial fishermen, income from fish sales served as an important source of personal income since 41% of the full-time commercial fishermen reported 75% to 100% of their personal income came from fish sales.

A small boat fishing trip cost approximately $269 per trip, with a median of $230. Fuel accounted for 58% of trip costs. Ice contributed 12%. Food and beverage, daily maintenance and repair, and bait each contributed 9%. Trip costs varied by subgroups, with Maui county fishermen spending more per trip ($322) than fishermen in the other counties. Full-time commercial fishermen reported substantially higher spending ($376) than other types of fishermen, and trolling trips cost more ($292) than other types of trips.

Small boat fishermen also incurred significant annual fishing fixed costs; the costs incurred regardless of the number of trips taken in a year. On average, survey respondents reported annual fishing fixed costs of $5,557, with a median spending of $3,364. Most respondents reported fees for CML, truck and trailer registration (95%), gear replacement and repair (94%), and boat and trailer repair, maintenance, and improvements (91%). Almost half reported spending on boat insurance (48%) and lower incidence of mooring fees (18%), loan payments (15%), and financial services (6%). The highest expenditure was loan payments for those with loans ($6,429), followed by mooring fees ($2,312), boat and trailer repair and maintenance ($1,803), gear replacement and repair ($1,785), boat insurance ($874), financial services ($514), and fees ($422).

It is evident that the Hawaii small boat fishery consists of fishermen with unique demographic profiles, various fishing motivations, gear usage, and target species; therefore, it is important for fishery managers to consider the heterogeneity of the fishery as many potential regulatory changes will affect fishermen unequally. The information in this study provides an important update on the economic and social characteristics of the fishery and will allow fishery managers to make timely and better-informed decisions by having the best scientific information available.

CONTENTS

INTRODUCTION

This study profiles the current Hawaii small boat fleet and describes recent fishing experiences, market participation, fishing trip costs, annual fishing fixed costs, and opinions about fisheries management. Fishery management decisions are based, in part, on minimizing adverse economic impacts on fishing communities, making this research vital to the assessment of future ocean management plans and actions.

The small boat fishery in Hawaii is important to local communities as it provides jobs for fishing participants, food for local families and communities, and preserves cultural practices. The Hawaii small boat fishery can be described by fishing gear, with major gears including troll, handline for pelagics and bottomfish, spears, and nets. Gear type determines fishing methods and target species. Trolling is the most popular fishing method in the Hawaii small boat fishery and it targets pelagic species like yellowfin tuna, marlin, and mahi-mahi. Other popular fishing methods include bottomfishing targeting opakapaka and onaga, and handline fishing targeting yellowfin tuna and juvenile bigeye tuna. In addition, the Hawaii small boat fishery includes fishermen[1] with various levels of participation ranging from full-time commercial, to occasional recreational, to subsistence. Based on the State of Hawaii statistics, the number of participants involved in small boat fishing has increased over the past decade, from 1,587 small boat-based commercial marine license holders in 2003, to 1,843 in 2013 (excluding charter, aquarium, and precious coral fisheries) (State of Hawaii, 2013a). Together, these small boat fishermen produced 6.2 million pounds of fish in 2013, with a commercial value of $16 million.

Despite the economic importance of the fishery, cost-earnings data on the small boat-based fishery in Hawaii are limited and outdated. The first cost-earnings study for the Hawaii small boat fishery was done in 1996 (Hamilton and Huffman 1997); and Hospital, Bruce, and Pan (2011) conducted a study of the Hawaii small boat pelagic fishery in 2007. Hospital and Beavers (2012) did a similar study in 2010, but it was limited to the main Hawaiian Islands bottomfish fishery. To update the economic impact and social behavior of the small boat fishery, we conducted a survey of the Hawaii small boat fishery (all fishermen with a Hawaii Commercial Marine License) that comprises pelagic, bottomfish, coral reef, and other fisheries. The objectives of this study are to update baseline cost-earnings economic information for the Hawaii small boat fleet and to explore the economic and cultural value of these fisheries to support current management actions.

[1] These included 2% of female respondents in the sample.

MATERIALS AND METHODS

Population

Fishermen in Hawaii who intend to sell fish must hold a Hawaii Commercial Marine License (CML). The list of CML holders provides a registry of commercial fishermen in the State of Hawaii. The population for this study was provided by the State of Hawaii Division of Aquatic Resources (HDAR). It included 1,796 fishermen who held a State of Hawaii CML and met the following criteria which characterize the small boat fishery: fishermen who caught, landed, and sold at least one fish using small vessels during 2013 and with valid mailing address. It excluded fishermen in charter, longline, aquarium, and precious coral fisheries. The number of CML holders (who caught and sold marine life) increased 16% from 1,560 in 2003 to 1,811 in 2013 (Table 1). The number of CML holders who did not sell any fish or those who went fishing but had no catch was minimal. In 2013 for example, among the 1,843 CML holders, only 5 fishermen did not report any sales to HDAR.

Table 1.--CML small boat holders (excluding charter, longline, aquarium, and precious coral fisheries), 2003-2013.

Number of CML holders who:	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Caught & sold	1,560	1,556	1,518	1,489	1,563	1,666	1,807	1,708	1,742	1,838	1,811*
Caught & not sold	5	4	1	6	5	5	2	4	5	3	5
Effort but no catch	22	27	15	19	21	24	29	27	33	33	27
Total	1,587	1,587	1,534	1,514	1,589	1,695	1,838	1,739	1,780	1,874	1,843

Source: State of Hawaii (2013a).

*1,811 CML holders represent small vessel licensees who caught and sold marine life, and are non-chartered vessels and do not belong to the longline, aquarium, & precious coral fisheries in 2013 but only 1,796 with valid mailing addresses.

Methodology

Two survey types were developed; one to be mailed in and one to be completed online. The mail survey adopted a modified Dillman's Total Design Method which comprised a four-wave mailing, including: (a) an advance letter notifying fishermen a week before they received the survey, (b) first mailing of survey booklet with personalized cover letter and pre-addressed stamped return envelope, (c) a reminder postcard mailed a week after the first survey mailing, and (d) second mailing of survey booklet with cover letter to non-respondents four weeks after the reminder postcard (Dillman, Smyth, and Christian 2009). Respondents were also provided an online survey option. The website address for the survey and the unique password were printed on the cover letter and sent together with the survey booklet in the first and second mailings. This unique password and identification number were printed on each survey booklet and used for response tracking and response rate analysis. In addition, we compared the survey responses with HDAR's fishing reports and dealer reports to analyze the survey response representativeness for landings and sale values, respectively.

The survey booklets were mailed to 1,796 fishermen, and the timeline for the mailings is shown in Table 2.

Table 2.--Survey implementation schedule.

Sent pre-notification letter to the fishermen	June 23, 2014
Sent first survey booklet and cover letter to the fishermen	June 30, 2014
Sent a postcard reminder to all fishermen 7 days after mailing the first questionnaire	July 7, 2014
Sent a second survey booklet and cover letter to non-respondents 4 weeks after mailing the reminder postcard	August 4, 2014

We used this mail methodology because the sample tends to be less biased than an in-person survey since an in-person survey is more likely to intercept more active fishermen. For example, recreational fishermen who, on average, take fewer trips are less likely to be encountered and surveyed in-person. The data collection period is shorter using a mail survey compared to the previous surveys that lasted for 10 months in Hamilton and Huffman (1997) and 8 months in Hospital, Bruce, and Pan (2011), thereby avoiding seasonal bias. However, when compared to in-person interviews, respondents cannot ask or clarify questions with interviewers in a mail survey, so the interpretation of the questions may differ for each person.

The online option was first implemented on cost-earnings surveys as many Hawaiian fishermen already submit their fishing reports online to HDAR.

The survey instrument was adapted from the past small boat cost-earnings surveys (Hamilton and Huffman 1997; Hospital, Bruce, and Pan 2011; and Hospital and Beavers 2012), with several modifications. 1) A category was added for fisherman type so respondents could self-identify. 2) Open-ended answers for the highest category of response bins were added, such as fish landings (more than 1,000 pounds) and value of fish sold (more than $50,000), to estimate the landings and values more accurately. 3) There were new questions added to investigate the use of new fishing gear and the use of scuba gear as regulations on scuba gear usage differ by island. 4) New questions regarding the number of non-boat fishing trips and gear usage were added to gauge the non-boat fishing activities in which small boat fishermen take part. 5) The survey was shortened to avoid survey fatigue. The online version of the survey was essentially the same as the mail version, with slight changes in wording and format to enhance online readability. The online survey form was designed using the Survey Monkey platform. The survey was divided into seven sections: 1) fishing experiences, 2) market participation, 3) vessel characteristics, 4) fishing trip costs, 5) annual fishing fixed costs, 6) basic demographics, and 7) opinions about fisheries management. Fishermen were asked about fishing activities, market participation, and fishing trip costs only within the past 12 months to avoid recall bias. Questions about annual fishing fixed costs were for the 2013 calendar year since fixed costs, such as loan payments, are usually recorded in calendar year for accounting and tax purposes. A copy of the survey questionnaire is shown in Appendix A.

Response Rates

Table 3 presents the survey population and response rates by county. Among the 1,796 fishermen in the population, 33 were excluded (including 24 undeliverable, 7 inactive (not

fishing anymore), and 2 deceased). This makes the effective small boat population 1,763 participants. We received 824 returns, including 733 by mail and 91 online for an overall response rate of 47%. Among the four counties, response rate was highest in Oahu, with more than half of the fishermen responding; the lowest response rate was found in Hawaii County, with a 43% response rate. The distribution of the survey respondents by county is representative of the effective population.

Table 3.--Survey population and response rates.

	No. of effective population (n)	Completed surveys (n)[b]	Response rate (%)	% distribution of effective population	% distribution of completed surveys
Oahu	588	298	50.7%	33%	36%
Hawaii	691	297	43.0%	39%	36%
Maui[a]	257	126	49.0%	15%	15%
Kauai	217	96	44.2%	12%	12%
US mainland	10	4	40.0%	1%	0%
No zip code	0	3	n.a.	0%	0%
Total	1,763	824	46.7%	100%	100%

[a] The response rate was 40% for Molokai (8 of 20) and 38% for Lanai (3 of 8).

[b] We received 4 completed surveys from other states and 3 completed surveys without respondent ID. These responses are not presented separately in this report, but the 7 respondents are included in the total responses when the analyses are not area specific.

The survey responses by mail were entered into an Access database with quality control checks, including predefined value ranges for variables and skip patterns for questions associated with a conditional response. Internet responses were extracted from the Survey Monkey platform into an Excel file. These two data files were merged into Statistical Package for the Social Sciences (SPSS) for further cleaning, processing, and analysis. The metadata for this report can be found in: https://inport.nmfs.noaa.gov/inport/item/29820.

Among the 824 total completed surveys, we excluded 18 cases from the analysis for various reasons. These included 4 cases with no fishing activity during the survey period (past 12 months), 4 charters, 3 cases in which kayaks were used for fishing, 3 that fished the seamounts, 2 that targeted shrimp, and 2 replies which came after the survey closeout date. Although the mail-out sample already excluded the CMLs which self-identified as charters, we still received 4 returns from charter fishermen, probably due to the change of vessel use after registration with HDAR. Kayak fishing is not considered boat fishing as it does not require fuel. Seamount fishing and shrimp fishing usually require a larger vessel. In addition, seamount fishing usually takes multi-day trips, which differs from typical small boat fishing trips that are single day trips. Therefore, the charters, shrimp fishing, and seamount fishing are not considered part of the small boat fishery. The total sample for the analysis in this report is 806. With the effective population of 1,763, the sampling error at 95% confidence level is +/-3%. With over 800 responses, this provides a robust description of Hawaii small boat fleet.

This is the first cost-earnings study with an online survey component; it is interesting to see whether the respondents' demographics vary by survey method. In general, the majority (89%) responded by mail, while only 11% responded online. Table 4 shows the demographic distribution of the survey respondents by survey method. Comparing the two survey methods, subgroups that were more likely to respond online included Oahu fishermen, Asian, mixed,

fishermen who are younger than 55 years old with income $100,000 or more, with bachelor's degree or higher education, and recreational fishermen. The subgroups that were more likely to respond by mail included non-Oahu fishermen, White, or Hawaiian, 55 years and older, without bachelor's degree, and commercial fishermen (part-time and full-time).

Table 4.--Demographics by mail and online respondents.

Percentage of responses		All respondents	Mail respondents	Online respondents
	Number of respondents (n)	*800*	*710*	*90*
County	Oahu	36.5	35.1	47.8
	Big Island	36.3	37.0	30.0
	Maui	15.5	15.9	12.2
	Kauai	11.8	12.0	10.0
Race	American Indian/Alaska Native	0.3	0.3	0.0
	Asian	40.8	39.6	50.0
	Hispanic or Latino	0.8	0.6	2.3
	Native Hawaiian	15.0	16.0	7.0
	Other Pacific Islander	3.1	3.1	2.3
	White	26.0	26.8	19.8
	Mixed	14.1	13.6	18.6
Age	Less than 25 years	0.6	0.7	0.0
	25 - 34 years	8.5	8.2	11.6
	35 - 44 years	14.3	13.9	17.4
	45 - 54 years	21.5	19.7	36.0
	55 - 64 years	32.4	33.2	25.6
	More than 64 years	22.7	24.3	9.3
Income	Less than $10,000	2.8	2.8	2.4
	$10,000 - $24,999	8.8	9.0	7.2
	$25,000 - $49,999	19.0	20.3	8.4
	$50,000 - $99,999	40.3	40.8	36.1
	$100,000 or more	29.1	27.1	45.8
Education	Less than high school	4.7	5.1	1.2
	High school graduate	25.5	26.9	14.0
	Some college or associate's degree	46.3	46.5	44.2
	Bachelor's degree or higher	23.5	21.4	40.7
Fisherman	Full-time commercial	7.1	7.8	2.2
Classification	Part-time commercial	51.0	51.7	45.6
	Recreational expense	26.7	25.8	33.3
	Purely recreational	10.8	10.0	16.7
	Subsistence	3.4	3.5	2.2
	Cultural	1.0	1.1	0.0

RESULTS

In this report, survey responses are presented for all respondents and segmented by different subgroups including counties, fisherman classifications, most common gear used, and sub-fisheries. This report provides analysis by sub-fishery since fishery management and regulations are often tied to specific types of fishing. The most common gear is defined by fishermen as "the most common type of fishing trip in the past 12 months". The types of fishing trips listed in the survey included trolling, handline for pelagic species, handline for bottomfish species, spearfishing, nets, and others (specify). Sub-fisheries include troll pelagic, handline pelagic, bottomfish, and coral reef fisheries and are defined by the types of fishing trip that fishermen reported to have in the past 12 months. If fishermen conducted different types of fishing trips in the past 12 months, they are included in all different sub-fishery groups. Thus, the sum of sub-fisheries groups is greater than the total number of respondents. For example, if fishermen reported trolling, pelagic handlining, and bottomfish handlining trips in the past 12 months, they are included in troll pelagic, handline pelagic, and bottomfish fisheries, respectively. Determining whether fishermen should be included in the coral reef fishery is more complicated because coral reef fishing trips involve different gear types such as spears and nets. The coral reef fishery is defined as any fishing trip that targeted reef-like fish and used spears or nets, as well as reporting any landings of reef fish in the past 12 months. Tables with noticeable differences between subgroups are shown in the main text, and tables without noticeable differences between subgroups are shown in Appendix B.

Respondents by Subgroup

The summary results from all respondents combined are presented and discussed in this report, as well as summary results by subgroups of the fishery, focusing on those with notable differences among subgroups. Figure 1 shows the distribution of respondents by county. Among all respondents, 37% were from Oahu, 36% were from Hawaii County, 15% were from Maui county, and 12% were from Kauai.

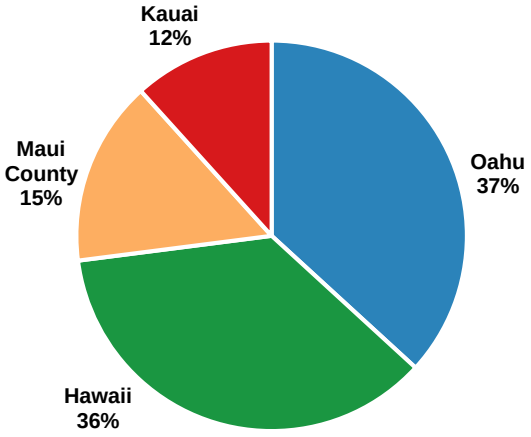

Figure 1.--Survey respondents by county.

Figure 2 shows the distribution of respondents by fishermen's self-identified motivations. Seven percent of respondents self-identified as full-time commercial fishermen, 51% identified as part-time commercial fishermen, 27% identified as recreational expense fishermen, 11% as purely recreational, 3% as subsistence, and 1% as cultural fishermen.

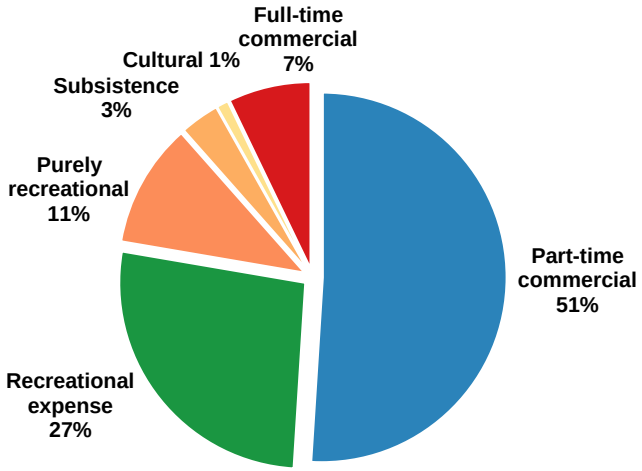

Figure 2.--Fishermen self-identified motivations.

Figure 3 shows the distribution of respondents by most common gear. Most of the small boat fishermen trolled, and about 526 fishermen (65% of respondents) stated that trolling was the most common gear they used, while 128 fishermen (16%) stated bottomfish handline, and 93 fishermen (12%) stated pelagic handline were their most commonly used gears. The same information across subgroups is listed in Appendix Table B1.

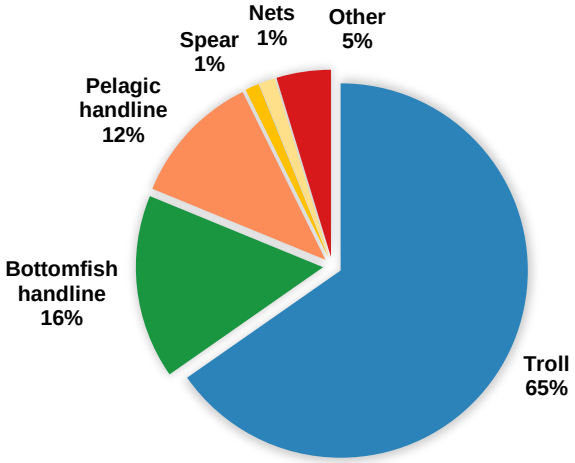

Figure 3.--The most common gear composition.

Table 5 presents the distribution of respondents by county for various subgroups. The larger percentage of full-time commercial, part-time commercial, and subsistence fishermen were from

Hawaii County, while the greater percentage of recreational expense and purely recreational fishermen were from Oahu. Across different gears, troll and spear were more commonly used by Oahu fishermen; pelagic handline gear and nets were more commonly used by Hawaii County fishermen. Bottomfish handline gear was more commonly used by Oahu and Maui county fishermen. When compared across sub-fisheries, the handline pelagic fishery had more Hawaii County fishermen and the coral reef fishery had more Oahu fishermen.

Table 5.--Distribution of survey responses by county and subgroup.

	Number of respondents (n)	Oahu (%)	Hawaii (%)	Maui (%)	Kauai (%)
All Respondents	***800***	**36.5**	**36.3**	**15.5**	**11.8**
By Fisherman Classification					
Full-time commercial	*56*	25.0	42.9	17.9	14.3
Part-time commercial	*403*	33.3	39.5	15.9	11.4
Recreational expense	*213*	43.7	30.5	13.6	12.2
Purely recreational	*86*	43.0	31.4	15.1	10.5
Subsistence	*26*	26.9	46.2	19.2	7.7
Cultural	*8*	37.5	37.5	0.0	25.0
By Most Common Gear					
Troll	*521*	39.7	34.2	12.5	13.6
Pelagic handline	*92*	12.0	76.1	5.4	6.5
Bottomfish handline	*128*	36.7	20.3	34.4	8.6
Spear	*10*	70.0	0.0	30.0	0.0
Nets	*11*	36.4	45.5	9.1	9.1
By Sub-fishery					
Troll pelagic	*740*	36.2	37.6	14.2	12.0
Handline pelagic	*294*	15.6	58.2	13.9	12.2
Bottomfish	*381*	38.1	28.6	18.6	14.7
Coral reef	*151*	41.1	28.5	19.9	10.6

Table 6 shows the distribution of respondents by self-identified motivation for various subgroups. Trolling was more commonly used by recreational fishermen, whereas pelagic handline and bottomfish handline gears were more commonly used by commercial fishermen. When comparing across sub-fisheries, the handline pelagic fishery had more commercial fishermen.

Table 6.--Distribution of survey responses by fisherman classification and subgroup.

	Number of respondents (n)	Full-time commercial (%)	Part-time commercial (%)	Recreational expense (%)	Purely recreational (%)	Subsistence (%)	Cultural (%)
All Respondents	***798***	**7.1**	**51.0**	**26.7**	**10.8**	**3.4**	**1.0**
By County							
Oahu	*288*	4.9	46.5	32.3	12.8	2.4	1.0
Hawaii	*290*	8.3	54.8	22.4	9.3	4.1	1.0
Maui	*121*	8.3	52.9	24.0	10.7	4.1	0.0
Kauai	*93*	8.6	49.5	28.0	9.7	2.2	2.2
By Most Common Gear							
Troll	*522*	4.8	47.9	30.5	13.4	2.7	0.8
Pelagic handline	*92*	13.0	63.0	17.4	2.2	3.3	1.1
Bottomfish handline	*126*	11.1	53.2	20.6	8.7	5.6	0.8
Spear	*10*	0.0	50.0	30.0	0.0	20.0	0.0
Nets	*11*	36.4	45.5	9.1	0.0	0.0	9.1
By Sub-fishery							
Troll pelagic	*738*	6.1	50.1	28.3	11.2	3.3	0.9
Handline pelagic	*294*	10.9	59.2	22.4	3.1	2.7	1.7
Bottomfish	*376*	9.0	50.8	27.1	8.0	4.3	0.8
Coral reef	*149*	9.4	55.7	23.5	6.0	3.4	2.0

Demographics

This section presents the demographic profile of the Hawaii small boat fishermen including gender, race, age, income, and education attainment and compares the profile with the general population of the State of Hawaii. Knowing the demographic profile of the fishing community is important for recognizing the potential impacts to different socioeconomic groups from conservation and management measures.

Fishing is traditionally a male dominated activity; our survey reflected this, as 98% of respondents were male. In terms of race, the composition of the small boat fishery community was in line with the state population, especially the top two races: Asian and White. Table 7 shows the race distribution of survey respondents versus the whole State of Hawaii population based on 2010 U.S. Census (State of Hawaii 2013b). The largest two races, Asian and White, comprised 41% and 26% of the small boat fishermen, respectively, and 39% and 25% in the state population. However, proportionally there were more Native Hawaiians and Pacific Islanders who responded to the survey than in the general population (18% vs. 10%).

Table 7.--Survey Responses: "How would you describe your race? (check all that apply)."

	All Survey Respondents (%)	State of Hawaii Population[1] (%)
American Indian and Alaska Native	0.3	0.3
Asian	41	39
Black or African American	0	2
Native Hawaiian and Other Pacific Islander	18	10
White	26	25
Hispanic or Latino	0.8	0
Two or more races	14	24

Source: [1] State of Hawaii (2013b).

The distributions of race for subgroups of the survey respondents are presented in Appendix Table B2. When compared with all respondents, there were relatively more Asian small boat fishermen in Oahu, more Hawaiian and Pacific Islander fishermen in Hawaii County and Kauai, and more White fishermen in the counties of Hawaii and Maui. Across different types of fishermen, full-time commercial fishermen were more likely to be Hawaiian or Pacific Islander, recreational expense fishermen were more likely to be Asian, and purely recreational fishermen were more likely to be White. For those who used bottomfish handline gear most often, 62% were Asian.

Table 8 shows the age distribution of the survey respondents and general adult-age population. Compared to the general population, the Hawaii small boat fishermen tended to skew toward older age groups, with more than half (55%) over 54 years old, versus 36% in the general population. The age distribution in the State of Hawaii was based on the table in the 2013 State of Hawaii Data Book, 18 years and over (State of Hawaii 2013b). Only 10% of the Hawaii small boat fishermen were 34 years old or under, versus 32% in the state population.[2]

Table 8.--Survey Responses: "What is your age?"

	All Survey Respondents (%)	State of Hawaii Population[1] (%)
18-24 years	1	13
25 to 34 years	9	19
35 to 44 years	14	16
45 to 54 years	21	16
55 to 64 years	32	16
More than 64 years	23	20

Source: [1] State of Hawaii (2013b).

Subsistence fishermen tended to be older; 74% were over 54 years. Fishermen who used bottomfish handline gear most often also tended to be older; 67% were over 54. This is likely due to more skill and experience required for bottomfishing. In addition, fishermen who participated in the coral reef fishery tended to be younger; 56% of them under 55 years, versus 41% in the bottomfish fishery. Distributions by subgroup are shown in Appendix Table B3.

Table 9 shows the income distribution of survey respondents and general population. Sixty-nine percent of small boat fishermen had $50,000 or more household income versus 63% in the

[2] Only compared with adult-age population characteristics (18 and above).

general population. The income distribution in the State of Hawaii was based on the American Community Survey 2008-2012 estimates administered by the U.S. Census Bureau (U.S. Census Bureau, 2012).

Table 9.--Survey Responses: "What was your total household income, before taxes, in 2013, including fishing income?"

	All Survey Respondents (%)	State of Hawaii Population[1] (%)
Less than $10,000	3	6
$10,000 to $24,999	9	11
$25,000 to $49,999	19	20
$50,000 to $99,999	40	33
$100,000 and more	29	30

Source: 1) U.S. Census (2012).

Seventy-six percent of Oahu fishermen made $50,000 or more while only 61% of Hawaii County fishermen had the same income level. Income also varied by fisherman type and gear usage. Fifty-two percent of full-time commercial fishermen had household income of $50,000 or more; 76% of recreational expense and 78% of purely recreational fishermen had the same income level. Only half of fishermen who used pelagic handline gear or spears and 36% of those who used nets most often had household income $50,000 or more, versus 73% of fishermen who trolled or used bottomfish handline gear most often. Appendix Table B4 shows the income distribution of survey respondents by different subgroups.

Table 10 presents the education attainment of survey respondents and general population. Hawaii small boat fishermen tended to be somewhat better educated than the state average, with 69% reporting to have some college, associate's degree, bachelor's degree or higher, versus 61% for the state. The education attainment in the State of Hawaii was based on 2013 State of Hawaii Data Book, 18 years and over (State of Hawaii, 2013b).

Table 10.--Survey Responses: "What is the highest level of education you have completed?"

	All Survey Respondents (%)	State of Hawaii Population[1] (%)
Less than high school	5	9
High school graduate	26	30
Some college or associate's degree	46	34
Bachelor's degree or higher	23	27

Source: State of Hawaii (2013b).

Twenty-three percent of the respondents had bachelor's or higher degrees. Oahu fishermen tended to be better educated as 32% had bachelor's or higher degrees. The better educated groups included recreational expense and purely recreational fishermen compared to full-time commercial and subsistence fishermen. In addition, fishermen who used bottomfish handline gear most often had higher education attainment; 30% had bachelor's degrees or higher. This was in contrast with those who used pelagic handline gear most often (15%) and those who used spears most often (0%). Among different sub-fisheries, 30% of the coral reef fishermen had bachelor's degree or higher. Appendix Table B5 shows the education distribution of the survey respondents by different subgroups.

Vessel Characteristics

This section presents the characteristics of vessels used in the Hawaii small boat fishery. The majority of the small boat fishermen (95%) owned the boat that they used for fishing (Figure 4). Across subgroups, 98% of Maui county fishermen, 100% of subsistence fishermen, and 100% of the fishermen that used spears and nets most often owned their own boats (Appendix Table B6).

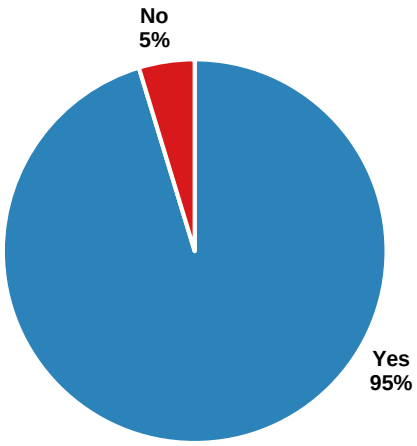

Figure 4.--Own your fishing boat.

Only 9% of the respondents had non-family members use their boat without being present themselves, and this is done infrequently. Appendix Table B7 shows the percent of time non-family members used the boat without the owner by different subgroups. Across counties, Kauai fishermen (13%) were more likely to have non-family members use their boat. Among gear types, fishermen who most often used spears (20%) or nets (18%) were more likely to have non-family members use their boat in contrast to those who often used bottomfish handline gear, with only 4% sharing their boat. Comparing fisherman types, almost all (98%) full-time commercial and all (100%) cultural fishermen did not share their boat with others (non-family members).

Figure 5 shows the distribution of vessel sizes. The most common (65%) vessel size was 16 to 24 feet, while the second most common vessel size (23%) was 25 to 30 feet. Only 4% of small boat fishermen owned boats less than 16 feet, while 9% owned boats longer than 30 feet. Appendix Table B8 presents the distribution of vessel sizes by different subgroups.

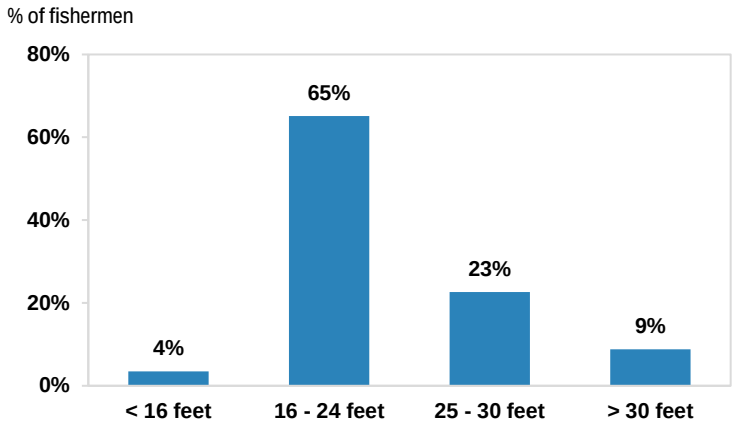

Figure 5.--Vessel size.

Table 11 shows the characteristics of vessels used in small boat fishery. The average vessel length was approximately 23 feet with a 216-horsepower engine. The average age of vessels was 23 years, and the average duration of ownership was 12 years. The average purchase price of vessel was close to $40,000 and the estimated current market value was approximately $43,000.

Table 11.--Vessel characteristics by county (mean, standard error, and median).

	Number of respondents			
Variable	*(n)*	**Mean**	Standard error	Median
Boat length (feet)	*762*	**22.9**	0.2	22
Boat horsepower	*751*	**216.2**	6.7	180
Age of boat (years)	*711*	**22.8**	0.5	22
Current boat ownership (years)	*729*	**11.7**	0.4	9
Boat purchase price ($)	*717*	**39,661**	1,813	26,000
Boat current market value ($)	*700*	**43,039**	1,931	30,000

Appendix Table B9 shows vessel characteristics by county. Oahu fishermen tended to have slightly larger and more powerful vessels; however, their vessels also tended to be slightly older with longer ownership. Vessels owned by fishermen in Hawaii County tended to be smaller in size and power and had, therefore, lower average purchase price and market value. Average purchase price was highest for fishermen in Maui county because their vessels were newer, but the average estimated current market value was highest in Kauai.

Appendix Table B10 shows the characteristics of vessels used by different fisherman types. Not surprisingly, full-time commercial fishermen's vessels were larger and had higher value. Their vessels tended to be older with longer ownership than vessels owned by other types of fishermen. Purely recreational fishermen also tended to have bigger, more powerful vessels. They also owned their vessels for shorter periods of time. Subsistence fishermen's vessels were smaller and less powerful and, therefore, of lower value.

Appendix Table B11 shows the characteristics of vessels by gear most commonly used. Fishermen who trolled most often tended to have bigger, more powerful, and newer vessels, with relatively short ownership. Those who used nets most often tended to have smaller, less powerful, older vessels with longer ownership. Vessel differences also reflected in the values:

vessels for fishermen who trolled most often were most valuable versus vessels for fishermen who used nets. In addition, fishermen who used spears most often owned newer vessels with shorter ownership.

Fishing Activity Characteristics

Fishing Trips and Gear Used

This section presents small boat fishermen's fishing experiences in the past 12 months, including the number of boat and non-boat fishing trips, gear usage, spatial aspect of the trips, number of people on board, and pounds of fish caught. This information is essential to understand the distribution of fishing effort and trip characteristics within a year and gauge the degree of impact from any potential regulatory changes to the fishery.

Figure 6 shows the number of boat fishing trips survey respondents took in the past 12 months in percentage distribution using the response bins in the survey. The average number of boat fishing trips reported by all respondents was 39, calculated using the medians of the response bins (e.g. assuming small boat fishing trips are mostly one-day trips, the maximum number of trips in a year is 365, and the median for the response bin "more than 200 trips" is 283 trips). More than half of the survey respondents (53%) took fewer than 25 trips in the past 12 months, and only 7% took 100 trips or more.

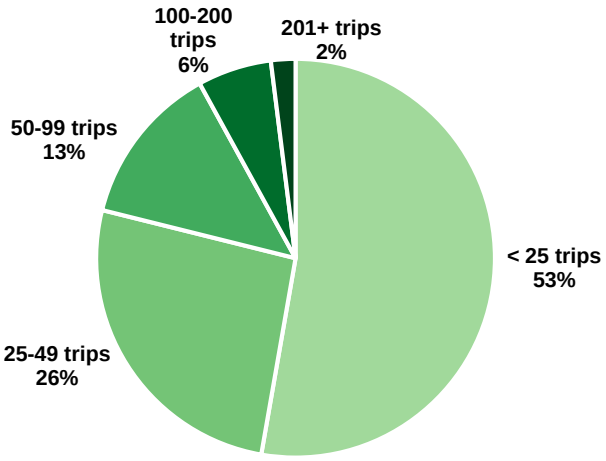

Figure 6.--Number of boat fishing trips in past 12 months.

Hawaii County fishermen reported an average of 46 fishing trips per year, whereas Maui county fishermen reported fewer trips (31) on average. As expected, full-time commercial fishermen made the most trips in the past 12 months (99 trips on average), followed by part-time commercial fishermen (41 trips), and purely recreational and cultural fishermen made only 20 and 18 trips, respectively. Fishermen who used nets most often made more than 100 trips per year, while those who trolled and used bottomfish handline gears most often took, on average, 35 trips. Table 12 shows the distribution of fishing trips in response bins and average number of trips per year by different subgroups.

Table 12. --Survey Responses: "Approximately how many BOAT fishing trips did you take in the past 12 months?" (percentage of responses and mean).

	Number of respondents (n)	Fewer than 25 trips (%)	25-49 trips (%)	50-99 trips (%)	100-200 trips (%)	More than 200 trips (%)	Number of trips (Mean)[1]
All Respondents	*795*	53.1	26.3	13.2	6.0	1.4	38.5
By County							
Oahu	*287*	57.8	26.1	11.8	3.5	0.7	32.4
Hawaii	*288*	48.3	25.0	14.9	9.7	2.1	46.3
Maui	*121*	59.5	25.6	11.6	2.5	0.8	30.6
Kauai	*93*	46.2	31.2	12.9	7.5	2.2	43.9
By Fisherman Classification							
Full-time commercial	*55*	20.0	12.7	32.7	21.8	12.7	99.2
Part-time commercial	*401*	46.9	28.9	16.2	7.2	0.7	41.1
Recreational expense	*211*	63.0	25.6	8.5	2.4	0.5	27.9
Purely recreational	*85*	75.3	20.0	3.5	1.2	0.0	20.3
Subsistence	*27*	59.3	33.3	3.7	3.7	0.0	27.6
Cultural	*8*	75.0	25.0	0.0	0.0	0.0	18.0
By Most Common Gear							
Troll	*519*	56.1	26.4	11.8	4.2	1.5	35.6
Pelagic handline	*90*	42.2	25.6	17.8	13.3	1.1	50.9
Bottomfish handline	*127*	52.0	29.1	12.6	6.3	0.0	35.3
Spear	*10*	40.0	30.0	30.0	0.0	0.0	38.1
Nets	*11*	27.3	0.0	36.4	18.2	18.2	106.3
By Sub-fishery							
Troll pelagic	*736*	52.9	27.3	13.2	5.4	1.2	37.5
Handline pelagic	*290*	43.1	25.9	19.0	10.3	1.7	49.1
Bottomfish	*372*	48.4	30.6	14.8	5.4	0.8	38.3
Coral reef	*149*	45.6	25.5	18.1	7.4	3.4	48.7

[1] Calculated using the medians of the response bins.

Figure 7 shows the number of gears used in boat fishing trips in the past 12 months. Most of the survey respondents (72%) used more than one fishing gear. We do not know whether multiple gears were used in the same trip since the question merely asked which types of gears were used in their boat fishing trips in the past 12 months.[3] On average, most small boat fishermen used one or two types of fishing gears.

[3] The number of gears was derived from this question: In the past 12 months, what percent of your BOAT fishing trip were: trolling, handling for pelagic species, handline for bottomfish species, spearfishing, nets, other gear?

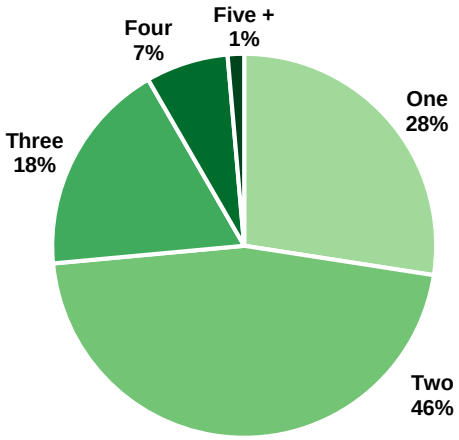

Figure 7.--Number of gears used in boat fishing trips in past 12 months.

Among different subgroups, proportionally more Oahu fishermen used single gear, whereas Hawaii County and Kauai fishermen used multiple gears. Full-time commercial and cultural fishermen used more gears, while more than half of the purely recreational fishermen were single gear users. Those who trolled most often were more likely to use single gear (35%), and those who used spears most often used, on average, three different types of gears. Fishermen who participated in the coral reef fishery were more likely to use multiple gears; 3 on average. Table 13 shows the details.

Table 13.--Number of gears used in BOAT fishing trips in the past 12 months (percentage of responses and mean).

	Number of respondents (n)	One (%)	Two (%)	Three (%)	Four (%)	Five or more (%)	Number of gears (Mean)
All Respondents	***789***	**27.6**	**46.4**	**18.3**	**6.3**	**1.4**	**2.1**
By County							
Oahu	*288*	34.0	47.6	13.5	4.5	0.3	1.9
Hawaii	*282*	21.6	46.1	23.8	6.4	2.1	2.2
Maui	*121*	25.6	48.8	15.7	8.3	1.7	2.1
Kauai	*92*	26.1	42.4	19.6	9.8	2.2	2.2
By Fisherman Classification							
Full-time commercial	*54*	24.1	31.5	29.6	9.3	5.6	2.4
Part-time commercial	*397*	23.2	49.1	18.9	7.3	1.5	2.2
Recreational expense	*210*	29.0	46.7	18.1	5.7	0.5	2.0
Purely recreational	*86*	51.2	38.4	9.3	1.2	0.0	1.6
Subsistence	*27*	22.2	51.9	18.5	7.4	0.0	2.1
Cultural	*8*	12.5	50.0	12.5	12.5	12.5	2.6
By Most Common Gear							
Troll	*518*	35.3	44.6	15.1	4.1	1.0	1.9
Pelagic handline	*92*	7.6	48.9	32.6	8.7	2.2	2.5
Bottomfish handline	*126*	13.5	54.0	19.0	12.7	0.8	2.3
Spear	*9*	11.1	33.3	22.2	22.2	11.1	3.0
Nets	*10*	30.0	20.0	30.0	10.0	10.0	2.5
By Sub-fishery							
Troll pelagic	*734*	24.9	47.4	19.3	6.8	1.5	2.1
Handline pelagic	*292*	2.4	41.8	36.0	16.1	3.8	2.8
Bottomfish	*376*	4.5	50.5	30.3	12.0	2.7	2.6
Coral reef	*148*	4.7	32.4	29.1	26.4	7.4	3.0

Figure 8 shows gear usage in boat fishing trips by all fishermen combined. Troll was the most commonly used gear by small boat fishermen; almost all (93%) survey respondents trolled in the past 12 months. Almost half (45%) used bottomfish handline gear. Thirty-seven percent of fishermen used pelagic handline in the past 12 months.

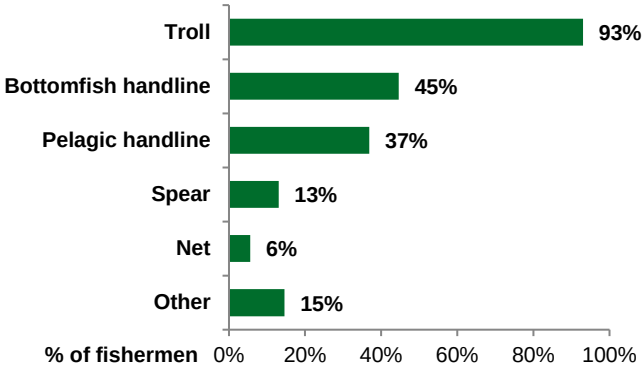

Figure 8.--Gear usage in boat fishing trips in the past 12 months.

Table 14 shows the gear usage in boat fishing trips in the past 12 months by different subgroups. Trolling was most commonly used gear across all subgroups. Relatively, more Hawaii County fishermen used pelagic handline gear (60%) and more Maui county fishermen used bottomfish handline gear (57%). Across different fisherman types, full-time commercial fishermen were more likely to use pelagic handline (57%) and bottomfish handline (59%), whereas almost all recreational expense and purely recreational fishermen trolled.

Table 14.--Gear usage in BOAT fishing trips in the past 12 months (percentage of responses).

	Number of respondents (n)	Troll (%)	Pelagic handline (%)	Bottomfish handline (%)	Spear (%)	Net (%)	Other (%)
All Respondents	***789***	**93.0**	**36.9**	**44.6**	**13.1**	**5.6**	**14.6**
By County							
Oahu	*288*	92.0	15.3	45.8	15.3	5.2	16.0
Hawaii	*282*	96.8	60.3	35.5	11.3	6.0	11.7
Maui	*121*	85.1	33.9	57.0	15.7	6.6	14.0
Kauai	*92*	94.6	38.0	55.4	8.7	4.3	18.5
By Fisherman Classification							
Full-time commercial	*54*	77.8	57.4	59.3	14.8	16.7	16.7
Part-time commercial	*397*	91.7	43.3	44.6	15.6	5.5	14.4
Recreational expense	*210*	98.6	31.4	44.8	10.5	2.9	13.8
Purely recreational	*86*	96.5	10.5	32.6	4.7	2.3	14.0
Subsistence	*27*	88.9	29.6	55.6	14.8	7.4	14.8
Cultural	*8*	87.5	62.5	37.5	25.0	25.0	25.0
By Most Common Gear							
Troll	*518*	100.0	29.9	34.9	10.0	4.1	11.8
Pelagic handline	*92*	88.0	100.0	35.9	14.1	5.4	5.4
Bottomfish handline	*126*	80.2	27.0	100.0	15.9	1.6	9.5
Spear	*9*	66.7	33.3	33.3	100.0	22.2	44.4
Nets	*10*	60.0	30.0	20.0	30.0	100.0	10.0
By Sub-fishery							
Troll pelagic	*734*	100.0	37.5	44.1	12.7	5.0	13.5
Handline pelagic	*292*	94.2	99.7	48.6	17.8	7.9	9.6
Bottomfish	*376*	92.3	38.3	93.6	14.1	5.1	14.9
Coral reef	*148*	87.8	42.6	48.0	60.8	22.3	39.2

Figure 9 shows the combination of fishing gear usage (percentages sum to 100%). The top panel shows results for those who only used one gear throughout the year. Trolling and bottomfish handline were the most common combination for those who used multiple gears (20%), followed by trolling and pelagic handline gears (14%). The combination of trolling, pelagic handline, and bottomfish handline gears accounted for another 11%, and four or more gears accounted for 8%.

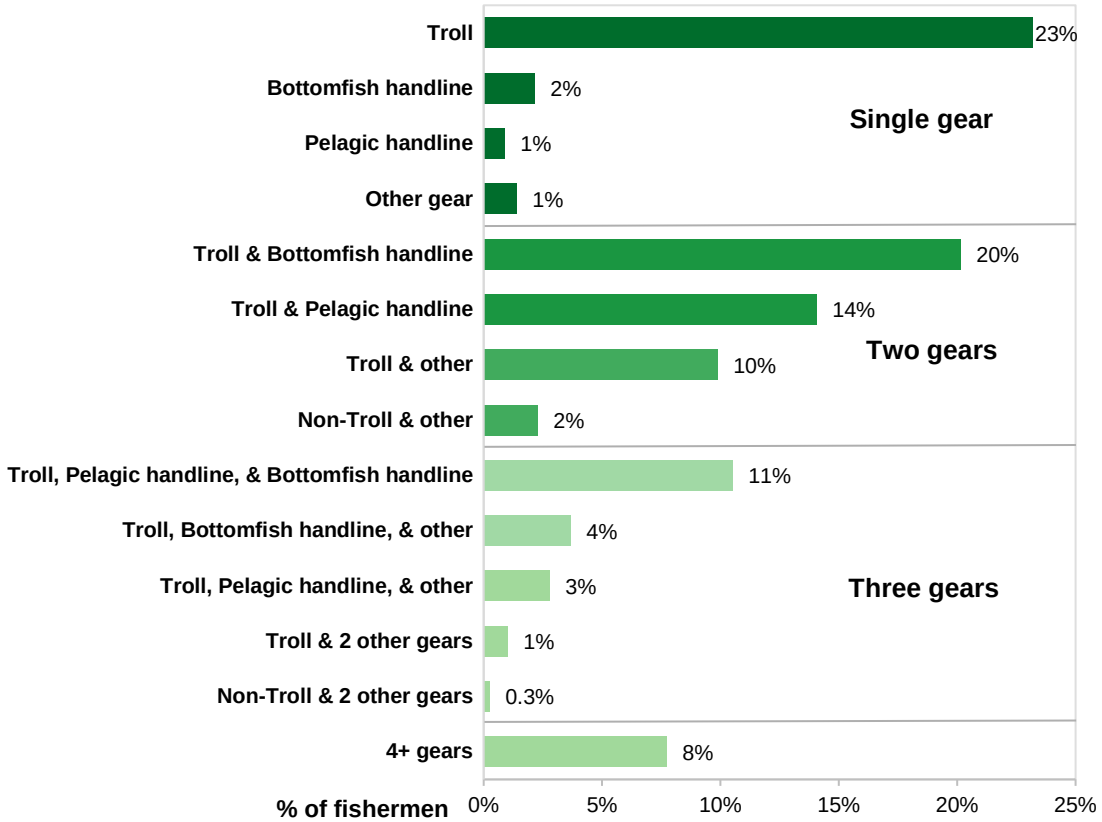

Figure 9.--Combination of gear usage in boat fishing trips in the past 12 months (percentages sum to 100%).

The previous section presents the number of gears and the types of gears fishermen used in the past 12 months derived from the survey question: In the past 12 months, what percent of your boat fishing trip were: trolling, handling for pelagic species, handline for bottomfish species, spearfishing, nets, other gear? Appendix Tables B12 to B16 show the results of this question in percent distribution based on the survey response bins and average percentage calculated by the medians of response bins for all respondents and subgroups.

Figure 10 shows the average annual number of fishing trips by gear type. This was calculated by using the medians of survey response bins from percentage of fishing trips by gear type and the number of boat fishing trips taken in the past 12 months. It only included fishing trips which used a particular gear type (excluding those who did not take a trip with that particular gear (those in the 0-trip response bin)). On average, survey respondents had taken 21 trolling trips, 19 pelagic handlining trips, 15 bottomfish handlining trips, 10 spearfishing trips, and 25 nets trips in the past 12 months. Appendix Table B17 shows the number of boat fishing trips by subgroup.

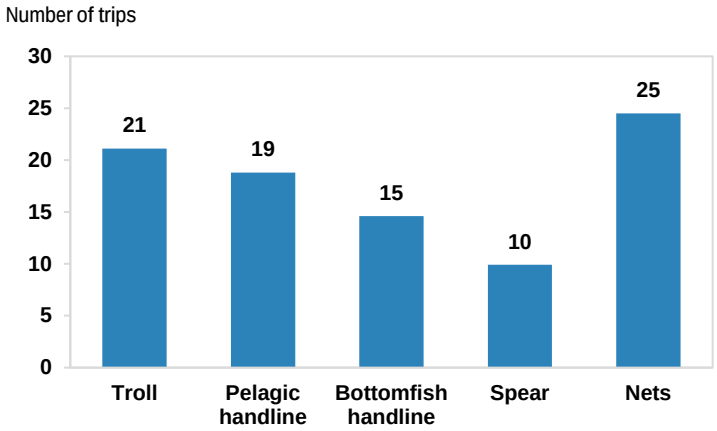

Figure 10.--Average number of boat fishing trips by gear type.

Besides the common gear types used in boat fishing trips, the survey also asked about the usage of gears that were less common, such as green-stick[4] and scuba gear, when fishermen went spearfishing. Figure 11 shows that 8% of survey respondents used green-stick as one of the gear types for their boat-fishing trips in the past 12 months. Eighteen percent of Kauai fishermen used green-stick versus 4% of Maui fishermen. Green-stick was more likely to be used by full-time commercial fishermen and less likely by purely recreational, subsistence, or cultural fishermen. Appendix Table B18 shows the green-stick usage rate by subgroup.

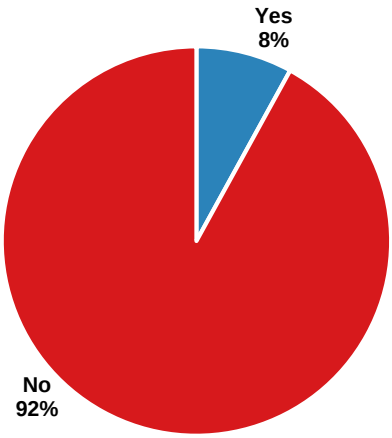

Figure 11.--Used green-stick for boat fishing trips in the past 12 months.

Among all respondents, 103 fishermen (13%) went spearfishing in the past 12 months. Among those, 73% did not use any scuba gear (Figure 12). For those who used scuba gear, it was done on 60% of the trips. Appendix Table B19 shows the scuba gear usage by subgroup. Forty-five percent of the spearfishing fishermen in Oahu used scuba, compared to less than 20% of spearfishing fishermen in Hawaii, Kauai, and Maui. The county differences may reflect area-specified scuba gear restrictions. For example, spearfishing with the aid of scuba gear in waters

[4] Green-stick fishing is a fishing technique that primarily targets tuna; it trolls artificial squid from a fiberglass pole (called green-stick) just above the water surface to attract tuna.

off West Hawaii has been prohibited since 2013. In addition, scuba gear is not allowed from June 1 to October 1, in collection of banded urchin, long-spined urchin, and helmet urchin in the Old Kona Airport Marine Life Conservation District.[5]

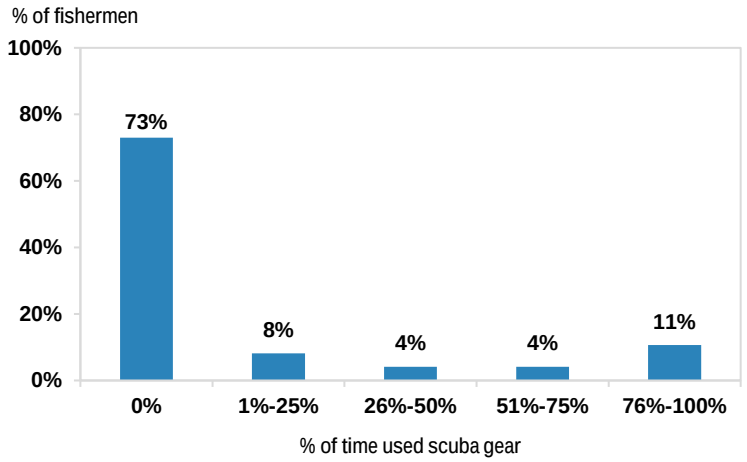

Figure 12.--Percent of time used scuba gear in the past 12 months.

Sixty-five percent of small boat fishermen survey respondents did not take any non-boat fishing trips in the past 12 months (Figure 13). Appendix Table B20 shows the distribution and the average number of non-boat fishing trips by subgroup.

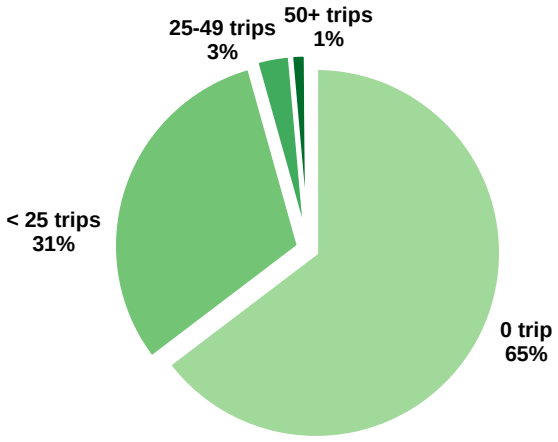

Figure 13.--Number of non-boat fishing trips in past 12 months.

Figure 14 shows the gear usage for non-boat fishing trips in the past 12 months. For fishermen who took non-boat fishing trips, most of them (85%) used rod and reel, 43% used spears, 23% cast nets, and 5% used other gears. Appendix Table B21 shows the gear usage for non-boat fishing trips by subgroup.

[5] More information about Hawaii's fishing regulations is available on: http://dlnr.hawaii.gov/dar/files/2015/08/fishing_regs_Aug_2015.pdf.

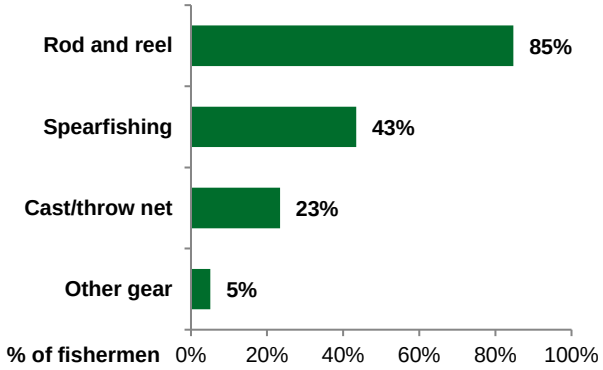

Figure 14.--Gear usage in non-boat fishing trips in the past 12 months.

Figure 15 shows the average number of non-boat fishing trips by gear type. This was calculated by the percentage of non-boat fishing trips by gear type (medians of survey response bins) multiplied by the number of non-boat fishing trips over the past 12 months (excluding those who did not take a trip with that particular gear (those in the 0-trip response bin)). On average, survey respondents took 12 rod and reel trips, 9 spearfishing trips, 9 net trips, and 8 other non-boat fishing trips. Appendix Table B22 shows the average number of non-boat fishing trips by gear type by subgroup.

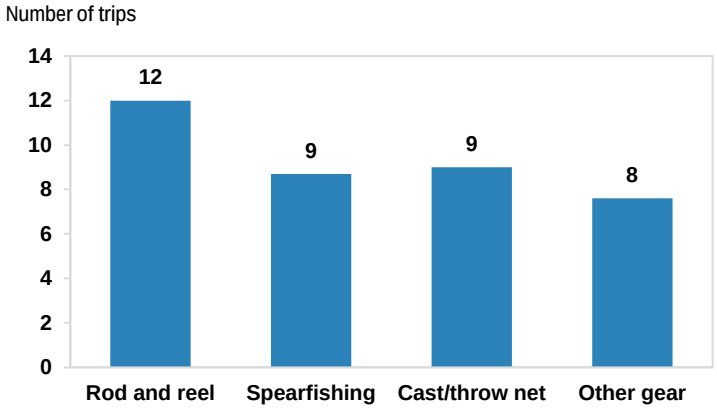

Figure 15.--Average number of non-boat fishing trips by gear type.

Fishing Areas and Fish Aggregating Devices (FADs)

Questions regarding the spatial aspect of small boat fishing trips included percentage of fishing trips in state and federal waters and percentage of trips around Fish Aggregating Devices (FADs). Table 15 shows the average percentage of fishing trips in state and federal waters. On average, slightly more than half (55%) of boat fishing trips occurred in state waters and 45% in federal waters. Spatial behavior differed by county, fisherman type, and gear usage. Hawaii County fishermen were more active within state waters (67% of fishing trips), while Oahu fishermen were more active within federal waters (55% of fishing trips or fishing time). Part-time commercial and purely recreational fishermen were more active within state waters (58% -

59%), while recreational fishermen fished in both jurisdictional waters evenly. Fishermen who trolled were also equally distributed in state and federal waters, while fishermen who used other (non-troll) gears most often were more active within state waters. Fishermen who participated in the coral reef fishery were more likely to fish within state waters.

Table 15.--Survey Responses: "In the past 12 months, what percent of your fishing trips occurred in state and/or federal jurisdiction?" (percentage of responses).

	Number of respondents (n)	State waters[1] (%)	Federal waters[1] (%)
All Respondents	***768***	**55.5**	**44.5**
By County			
Oahu	*280*	44.8	55.2
Hawaii	*276*	66.7	33.3
Maui	*119*	53.0	47.0
Kauai	*87*	58.3	41.7
By Fisherman Classification			
Full-time commercial	*53*	53.8	46.2
Part-time commercial	*388*	58.4	41.6
Recreational expense	*206*	49.3	50.7
Purely recreational	*80*	58.7	41.3
Subsistence	*25*	56.4	43.6
Cultural	*8*	40.6	59.4
By Most Common Gear			
Troll	*500*	49.8	50.2
Pelagic handline	*85*	61.7	38.3
Bottomfish handline	*125*	62.9	37.1
Spear	*9*	80.6	19.4
Nets	*11*	88.6	11.4
By Sub-fishery			
Troll pelagic	*712*	53.8	46.2
Handline pelagic	*278*	56.9	43.1
Bottomfish	*365*	56.8	43.2
Coral reef	*149*	62.1	37.9

[1] Calculated using the medians of the response bins.

Figure 16 shows the percent of fishing trips at FADs. Appendix Table B23 shows the use of FADs by subgroup. Across counties, Kauai fishermen (86%) were more likely to use FADs, whereas Maui county fishermen were less likely (71%). FAD usage was tied to the fishing trip types. Fishermen who took trolling or pelagic handlining trips most often were more reliant on FADs compared with those who had bottomfishing and spearfishing trips most often. Gear preference differed by fisherman type; more recreational expense fishermen were reliant on FADs since they were more likely to troll. Cultural fishermen also relied on FADs since they were more likely to use pelagic handline gear. On the other hand, full-time commercial and subsistence fishermen were less likely to use FADs as they preferred bottomfish handline gear.

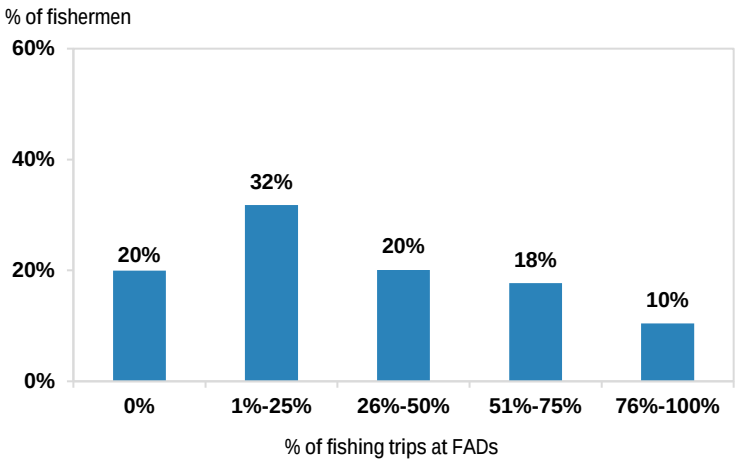

Figure 16.--Percent of time used FADs in the past 12 months.

Approximately half of respondents reported two fishermen on board during an average trip, and 20% of them fished alone (Figure 17). Subgroups of fishermen who were more likely to fish alone included Kauai fishermen (29%), full-time commercial fishermen (56%), and fishermen who used bottomfish handline (36%) or nets most often (60%). Subgroups with more people on board included purely recreational fishermen and those who trolled most often (Appendix Table B24).

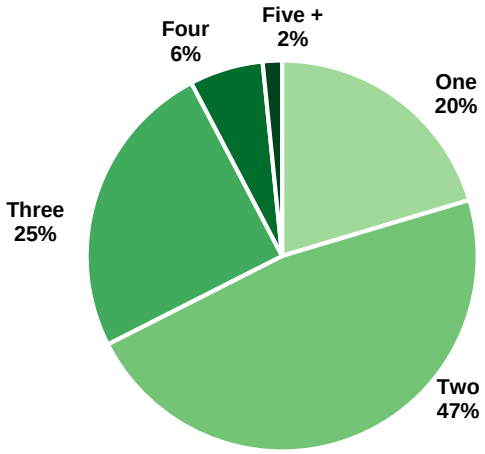

Figure 17.--Number of people on board for an average fishing trip.

Fish Landings

This study compares fishermen's total landings reported to HDAR by the entire small boat population versus the landings of pelagic fish, bottomfish, and reef fish reported by all survey respondents (seamount fishing, shrimp fishing, charters, kayak fishers; those who did no boat fishing in the past 12 months were excluded from the analysis). Table 16 presents the results of landings from these two sources. The total landings reported by survey respondents were calculated using the medians of catch bins. For those who reported the highest category of landing bin (>1,000 lbs; 86%), the actual reported landings of all types of fish were used. For the 14% who did not report the actual landings, the missing values were replaced by the average

of the actual landings reported by other fishermen. The State of Hawaii landings data are available in HDAR's Fishermen Reporting System (FRS). We used FRS data from July 2013 to June 2014 to match the 12 months recall in our surveys (our first surveys were sent out in early July 2014). There were 154 fishermen in the survey population (1,796 fishermen) and 42 survey respondents who had no fishing record in the FRS during this period, thus they were excluded in this analysis. Figure 18 shows the overall distribution of landings reported to HDAR by the entire survey population and the landings reported by the survey respondents. Overall survey respondents are representative for each category (classified by total landings amount) of the survey population. For the four groups with landings 500 lbs or less, the percentages are consistent between sample and population. There were more survey respondents who reported landings ranging from 501 lbs to 1,000 lbs than the general population and fewer who reported over 1,000 lbs. Thus, the average landings per fisherman reported in FRS was 14% higher than the average calculated from the survey sample; 3,199 lbs versus 2,798 lbs. Similar results are found at county levels. The means between population and survey respondents shows higher average landings in the population than in the survey respondents (except for Kauai), particularly in the county of Hawaii.

Table 16.--Total landings for the survey population from State of Hawaii DAR's Fishermen Reporting System vs. survey respondents (percentage of responses).

	All		Oahu		Hawaii		Maui		Kauai	
Total landings kept (lbs)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)
0	0.4	1.7	0.9	3.3	0.2	0.7	0.0	0.8	0.5	1.1
1-50	4.6	3.7	4.3	3.6	4.5	4.0	6.3	4.2	4.3	2.2
51-100	4.1	4.7	4.5	4.7	3.2	4.4	5.9	5.8	3.8	4.4
101-500	25.3	28.0	27.9	28.3	21.9	29.2	28.0	27.5	25.5	24.4
501-1,000	16.0	23.9	17.0	24.6	16.2	23.4	14.2	20.8	14.9	26.7
More than 1,000	49.5	38.0	45.4	35.5	54.1	38.3	45.6	40.8	51.0	41.1
Number of fishermen	*1,616*	*763*	*535*	*276*	*625*	*274*	*239*	*120*	*208*	*90*
Total landings kept per fisherman										
Mean (lbs)	3,199	2,798	2,553	2,459	3,931	2,971	2,779	2,437	3,175	3,839
Standard error (lbs)	204	235	432	362	316	427	366	372	426	898
Median (lbs)	984	750	873	750	1,139	750	743	750	1,015	800

Note: The survey population included all species landings from small boat trips in the State of Hawaii DAR's fishermen reporting system from July 2013 to June 2014. It excluded those without fishing record in FRS during July 2013 to June 2014 (n = 154) and 11 seamount fishing, 4 shrimp fishing, 4 charters, 4 cases identified as no boat fishing in the past 12 months in the survey, and 3 cases where kayaks were used for fishing. Survey responses only included landings for pelagic fish, bottomfish, and reef fish. Survey responses excluded fishermen with no HDAR FRS record during July 2013 to June 2014 (n = 42) and one fishermen who did not answer fish landings question.

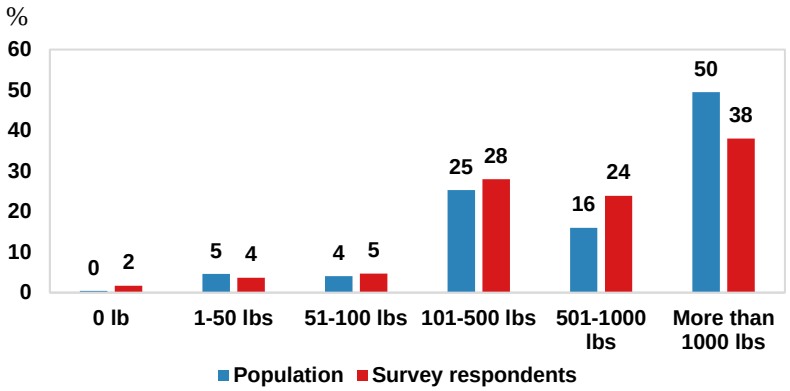

Figure 18.--Total landings distribution for the survey population (HDAR FRS statistics) vs. survey respondents.

We also compared the landings reported to HDAR versus the landings reported in the survey for survey respondents, and they corresponded well (Table 17). The average landings between fishing reports and survey responses match very well at the state level. The average landings per fisherman was 2,606 lbs based on the HDAR reports and 2,798 lbs based on the survey. However, differences at the county level are somewhat larger.

Table 17.--Total landings for survey respondents: State of Hawaii DAR's Fishermen Reporting System vs. survey responses (percentage of responses).

	All Respondents		Oahu		Hawaii		Maui		Kauai	
Total landings kept (lbs)	Fishing Reports (%)	Survey Responses (%)	Fishing Reports (%)	Survey Responses (%)	Fishing Reports (%)	Survey Responses (%)	Fishing Reports (%)	Survey Responses (%)	Fishing Reports (%)	Survey Responses (%)
0	0.4	1.7	1.1	3.3	0.0	0.7	0.0	0.8	0.0	1.1
1-50	3.9	3.7	2.9	3.6	5.1	4.0	5.8	4.2	1.1	2.2
51-100	4.2	4.7	4.0	4.7	3.6	4.4	5.8	5.8	4.4	4.4
101-500	23.7	28.0	26.4	28.3	19.3	29.2	29.2	27.5	22.2	24.4
501-1,000	19.0	23.9	18.8	24.6	21.2	23.4	15.0	20.8	16.7	26.7
More than 1,000	48.8	38.0	46.7	35.5	50.7	38.3	44.2	40.8	55.6	41.1
Number of fishermen	*763*	*763*	*276*	*276*	*274*	*274*	*120*	*120*	*90*	*90*
Total landings kept per fisherman										
Mean (lbs)	2,606	2,798	1,890	2,459	3,132	2,971	2,683	2,437	3,116	3,839
Standard error (lbs)	201	235	179	362	436	427	526	372	579	898
Median (lbs)	962	750	913	750	1,031	750	763	750	1,215	800

Note: Excluded fishermen with no DAR FRS records during July 2013 to June 2014 (n=42) and one fishermen who did not answer fish landings question.

Table 18 shows the average landings per respondent in the past 12 months for the sum of three species groups (pelagic fish, bottomfish, and reef fish), and each of these groups separately, based on the survey results. The average landings per respondent was approximately 2,700 lbs, including 2,150 lbs pelagic fish, 312 lbs bottomfish, and 267 lbs reef fish. Kauai fishermen landed more fish on average than other counties. However, Maui county fishermen caught more bottomfish.

Total landings as reported to the survey varied among fishermen with different motivations, and there were great differences between full-time commercial fishermen and other groups of fishermen. Full-time commercial fishermen landed over 10,000 lbs of fish a year, while part-

time commercial landed just 3,000 lbs, recreational expense landed 1,500 lbs, and purely recreational landed 600 lbs. The small group of fishermen self-identified with cultural motivation landed 3,600 lbs a year per person.

Table 18.--Catch Composition: "In the past 12 months, approximately how many total pounds of pelagic fish, bottomfish, and reef fish did you catch?" (mean and median).

	Number of respondents (n)	Annual landings of pelagic fish, bottomfish, and reef fish (Mean)	Annual landings of pelagic fish, bottomfish, and reef fish (Median)	Annual landings of pelagic fish (Mean)	Annual landings of bottomfish (Mean)	Annual landings of reef fish (Mean)
All Respondents	***805***	2,719	750	2,150	312	267
By County						
Oahu	*292*	2,383	750	1,870	249	271
Hawaii	*290*	2,888	750	2,469	154	274
Maui	*123*	2,395	750	1,482	804	115
Kauai	*94*	3,686	788	2,907	370	449
By Fisherman Classification						
Full-time commercial	*57*	10,632	5,575	7,656	1,447	1,529
Part-time commercial	*407*	2,837	800	2,299	324	235
Recreational expense	*212*	1,485	675	1,241	126	120
Purely recreational	*86*	624	338	531	58	36
Subsistence	*27*	922	600	731	120	71
Cultural	*8*	3,581	775	3,394	91	97
By Most Common Gear						
Troll	*526*	2,535	750	2,345	133	64
Pelagic handline	*93*	4,139	1,125	3,585	263	291
Bottomfish handline	*128*	2,648	875	956	1,149	564
Spear	*9*	1,242	400	325	50	867
Nets	*11*	4,905	2,100	1,136	380	3,389
By Sub-fishery						
Troll pelagic	*746*	2,729	750	2,258	283	197
Handline pelagic	*295*	4,437	900	3,768	355	315
Bottomfish	*381*	3,053	850	2,130	622	317
Coral reef	*151*	3,375	1,125	2,215	382	793

Note: All the means were calculated using the medians of the response bins.

Figure 19 shows the distribution of the fishermen with different levels of landings based on the survey responses. About 60% of small boat fishermen caught more than 500 lbs in the past 12 months. Two percent of survey respondents did not catch any fish (pelagic fish, bottomfish, or reef fish) in the past 12 months. Distribution of total landings by subgroup is shown in Appendix Table B25.

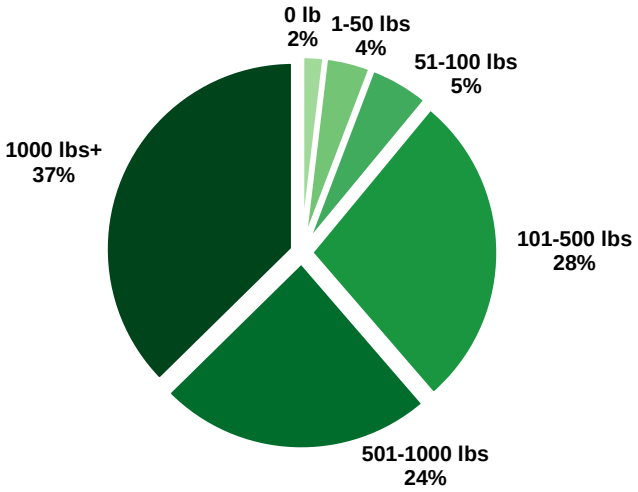

Figure 19.--Distribution of fishermen with different levels of landings.

Table 19 shows the distribution of the fishermen with different levels of landings of pelagic fish, bottomfish, and reef fish. Ninety-three percent of the respondents reported landing pelagic fish in the past 12 months. Landings of bottomfish and reef fish were less common, yet about half of respondents reported having caught and landed bottomfish or reef fish in the past 12 months. Appendix Tables B26 to B28 show the distribution of pelagic fish, bottomfish, and reef fish landings by subgroup, respectively.

Table 19.--Distribution of fishermen with different levels of landings (total of pelagic fish, bottomfish, reef fish) in the past 12 months (percentage of responses).

	Number of respondents (n)	None (%)	1-50 pounds (%)	51-100 pounds (%)	101-500 pounds (%)	501-1,000 pounds (%)	More than 1,000 pounds (%)
Pelagic fish	*802*	7.0	5.9	7.1	29.4	26.6	24.1
Bottomfish	*800*	49.0	16.3	8.9	13.9	6.9	5.1
Reef fish	*801*	50.2	20.2	8.9	12.5	4.7	3.5

Table 20 shows the average landings per trip, which were calculated by the total landings of pelagic fish, bottomfish, and reef fish (by summing the medians of the catch bins for each type of fish) divided by the number of boat fishing trips in the past 12 months (using the median of survey response bins). For all respondents, the average landings per trip was approximately 76 lbs. As expected, full-time commercial fishermen and part-time commercial fishermen reported higher landings per trip (150 lbs and 89 lbs, respectively). Recreational expense, subsistence, and purely recreational fishermen reported lower catch per trip. Fishermen who self-identified with "cultural" motivation for fishing also had higher landings per trip (126 lbs). Fishermen who used pelagic handline gear most often caught more fish per trip (109 lbs), and fishermen who used spears most often caught fewer fish per trip (33 lbs).

Table 20.--Average per trip landings (sum of pelagic fish, bottomfish, and reef fish) (percentage of responses, mean, and median).

	Number of respondents (n)	None (%)	1-20 pounds (%)	21-50 pounds (%)	51-100 pounds (%)	More than 100 pounds (%)	Landings per trip (Mean)[1]	Landings per trip (Median)
All Respondents	***795***	**1.9**	**23.9**	**37.2**	**20.4**	**16.6**	**76.2**	**30.0**
By County								
Oahu	*288*	3.1	20.8	38.9	20.8	16.3	74.3	31.3
Hawaii	*288*	1.0	27.8	38.9	17.7	14.6	79.4	27.1
Maui	*120*	0.8	20.8	35.0	24.2	19.2	74.9	37.4
Kauai	*93*	2.2	24.7	31.2	21.5	20.4	75.0	29.2
By Fisherman Classification								
Full-time commercial	*55*	0.0	16.4	25.5	20.0	38.2	149.5	74.3
Part-time commercial	*402*	2.2	24.1	32.8	20.1	20.6	89.2	31.3
Recreational expense	*210*	1.0	24.3	42.4	22.9	9.5	53.0	29.2
Purely recreational	*85*	3.5	22.4	55.3	14.1	4.7	35.4	25.0
Subsistence	*27*	3.7	37.0	37.0	14.8	7.4	38.8	21.5
Cultural	*8*	0.0	0.0	25.0	50.0	25.0	125.5	64.6
By Most Common Gear								
Troll	*519*	1.5	22.7	38.9	21.6	15.2	71.8	29.2
Pelagic handline	*91*	2.2	19.8	37.4	16.5	24.2	108.6	37.3
Bottomfish handline	*127*	0.0	27.6	33.1	19.7	19.7	78.8	41.2
Spear	*9*	11.1	33.3	33.3	11.1	11.1	32.6	21.5
Nets	*11*	0.0	27.3	45.5	18.2	9.1	48.1	25.0
By Sub-fishery								
Troll pelagic	*736*	1.1	24.2	37.5	20.7	16.6	75.7	30.2
Handline pelagic	*291*	0.7	23.4	33.0	19.2	23.7	106.0	33.7
Bottomfish	*372*	0.0	24.5	37.1	19.1	19.4	77.8	33.3
Coral reef	*149*	0.0	22.8	32.2	22.8	22.1	107.7	41.7

[1] Calculated using the medians of the response bins.

Catch Disposition and Market Participation

This section presents disposition of fish landed by the small boat fishermen and their market participation. Understanding the landing disposition among fish sales and other uses, such as home consumption or give away to friends and family, may shed light on the social and cultural importance of the small boat fishery to the community. Market participation is related to economic aspects of fishing, including percent of fishermen selling fish, value of fish sold, and portion of personal income derived from fish sales. Market access will also be discussed. The information discussed in this section satisfies the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requirements under section 303(a)(9), to consider fishermen's dependence on fishery and cultural value relevant to the fishery when developing management plans.

Catch distribution and disposition

Figure 20 shows the landing distribution among fishermen on board after a fishing trip. Twenty-five percent of survey respondents kept all the fish they caught, 24% kept/received a portion of the total fish caught, and 6% kept/received a portion of trip revenue. The rest (44%) of survey respondents stated that the distribution among fishermen on board may vary trip by trip or "do not know". Catch distribution by subgroup is shown in Appendix Table B29. Forty-eight

percent of purely recreational fishermen were more likely to keep their entire catch, whereas 54% of full-time commercial fishermen were more likely to distribute their catch among fishermen on board.

Respondents who shared fish caught among fishermen on board kept, on average, 46% of the total. Respondents who shared the trip revenue kept, on average, 63% of trip revenue. Average percentages of fish and revenue kept/received by subgroup are presented in Appendix Table B30.

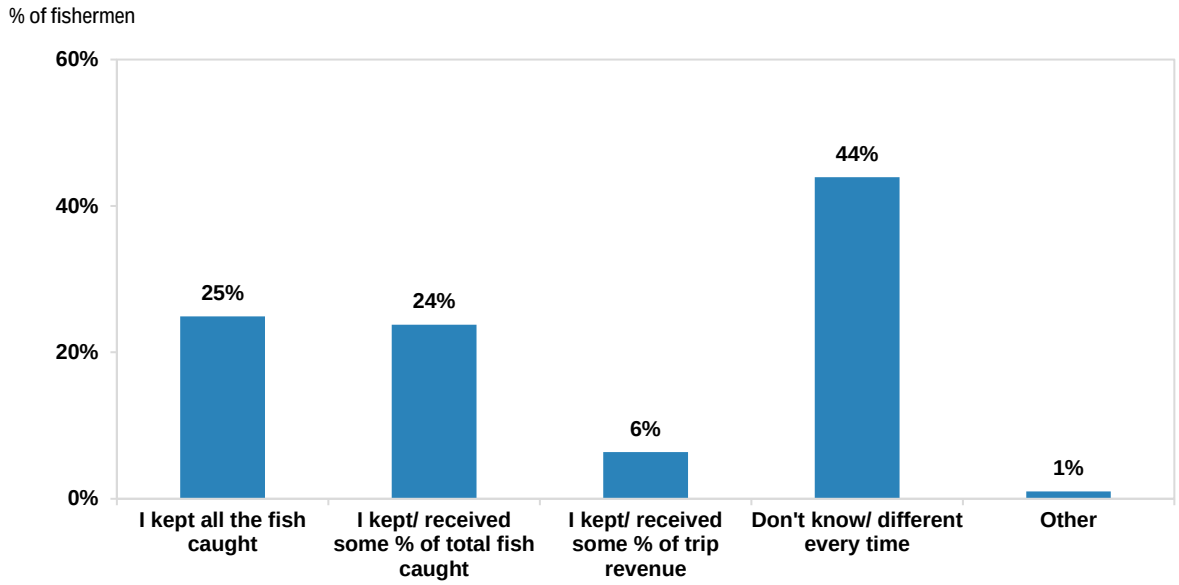

Figure 20.--Catch distribution among fishermen over the past 12 months.

Figure 21 shows the catch disposition by all survey respondents in the past 12 months.

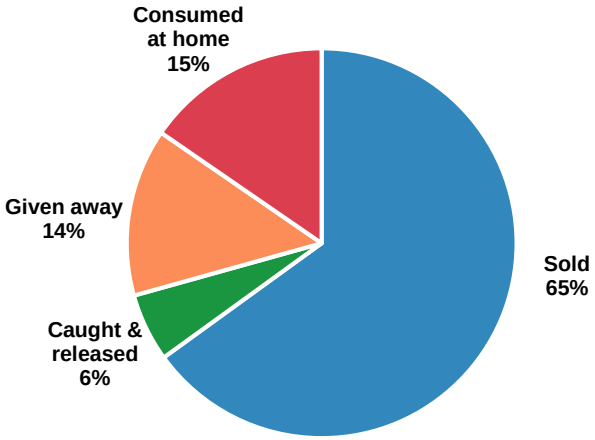

Figure 21.--Catch disposition in the past 12 months.

Table 21 shows the fish disposition by subgroup which varied by fisherman type. Full-time and part-time commercial fishermen sold 73% and 68% of their catch, respectively, with most of the balance distributed between home consumption or given away to friends and family. This

supports past research findings that showed the vital social role commercial small boat fishermen play in the local community (Hospital and Beavers, 2012; Hospital, Bruce, and Pan, 2011). "Recreational" fishermen also sold substantial portions of their catch to the market. Recreational expense and purely recreational fishermen sold 52% and 28% of their catch, respectively. This finding demonstrates that selling fish for supplemental income is common among self-identified recreational fishermen. Subsistence fishermen sold less than half of their catch and kept about one-third for home consumption, which was the highest among fisherman types. Cultural fishermen sold and gave away the same proportion of their catch (37%). Figures 22–25 show the catch disposition for each category of fishermen.

Table 21.--Survey Responses: "In the past 12 months, what percent of your catch was: caught and released, given away, consumed at home, or sold?" (percentage of catches).

	Number of respondents (n)	Caught and released (%)	Given away (%)	Consumed at home (%)	Sold (%)
All Respondents	***738***	**5.6**	**13.9**	**15.4**	**65.0**
By County					
Oahu	*265*	6.2	16.2	14.9	62.6
Hawaii	*266*	4.9	12.7	16.1	66.3
Maui	*115*	6.9	12.8	16.5	63.7
Kauai	*88*	5.2	13.4	13.9	67.5
By Fisherman Classification					
Full-time commercial	*55*	6.2	9.4	11.6	72.8
Part-time commercial	*369*	5.2	12.9	14.4	67.5
Recreational expense	*200*	6.7	19.8	21.7	51.8
Purely recreational	*78*	5.4	37.3	29.6	27.6
Subsistence	*24*	1.9	20.7	31.0	46.5
Cultural	*8*	4.0	36.8	22.5	36.7
By Most Common Gear					
Troll	*492*	6.1	14.6	16.0	63.3
Pelagic handline	*81*	5.8	11.9	13.8	68.5
Bottomfish handline	*118*	4.1	14.2	15.2	66.5
Spear	*8*	3.6	14.2	19.3	62.9
Nets	*9*	1.5	5.4	11.8	81.4
By Sub-fishery					
Troll pelagic	*695*	5.8	14.2	15.6	64.3
Handline pelagic	*276*	5.9	12.1	13.6	68.3
Bottomfish	*358*	5.9	13.9	15.1	65.1
Coral reef	*148*	6.5	13.4	16.7	63.4

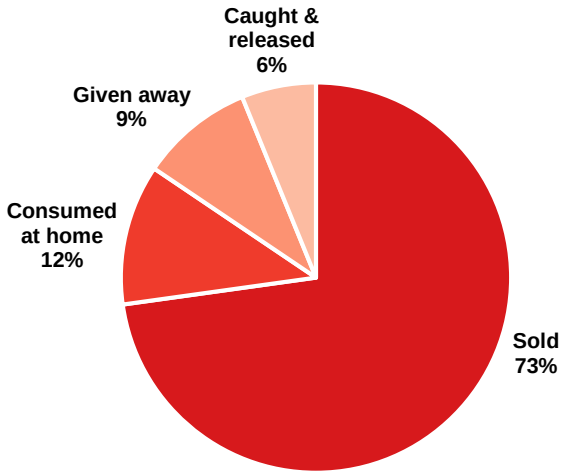

Figure 22.--Disposition of catch by full-time commercial fishermen.

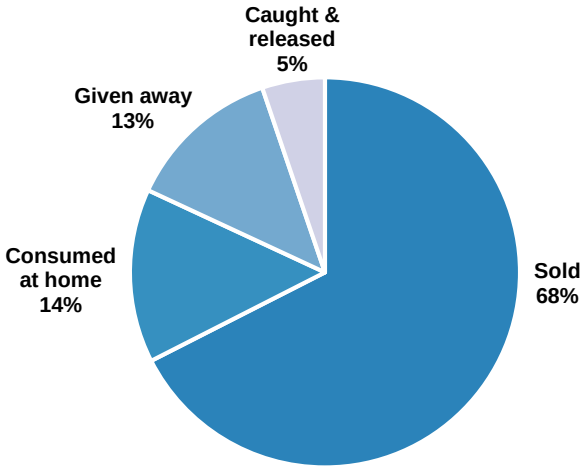

Figure 23.--Disposition of catch by part-time commercial fishermen.

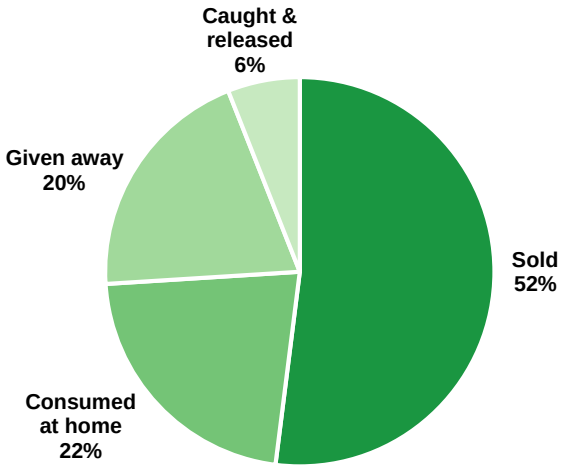

Figure 24.--Disposition of catch by recreational expense fishermen.

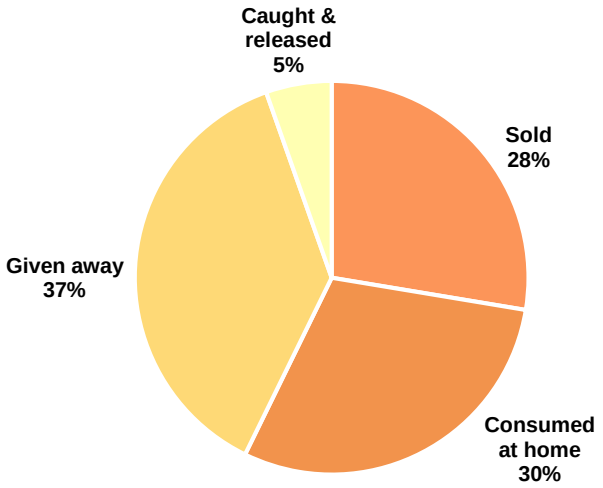

Figure 25.--Disposition of catch by purely recreational fishermen.

Figure 26 shows the catch disposition by fisherman type in terms of average amount of catch (lbs). Although full-time commercial fishermen kept a smaller percentage of catch for home consumption or to give away, the average amount kept and shared was the largest (2,274 lbs) among all groups. Selling fish was also common for non-commercial fishermen, to a lesser extent. For example, recreational expense fishermen sold 800 lbs annually, and purely recreational fishermen only sold 180 lbs. Cultural fishermen had a unique pattern of disposition. Their annual landings were higher than the part-time commercial fishermen's, but cultural fishermen sold less and gave away much more (1,300 lbs) compared to the part-time commercial fishermen.

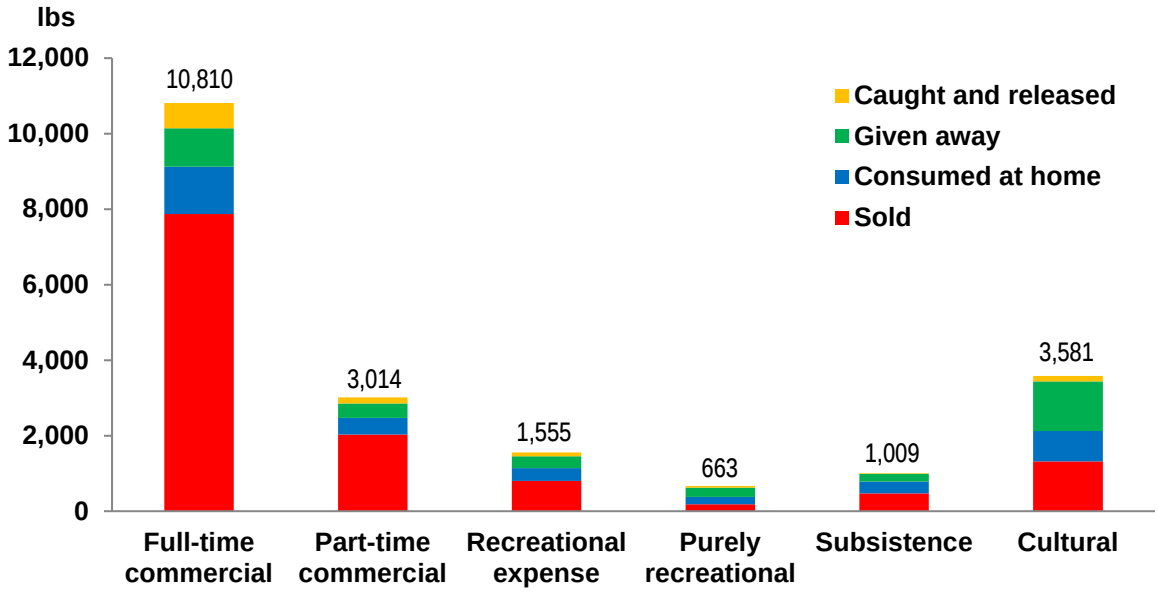

Figure 26.--Catch disposition by fisherman type.

Market participation

The survey asked fishermen: "In the past 12 months, did you ever sell any of the fish you caught?" Eighty-three percent of the survey respondents stated that they sold at least some fish in the past 12 months, and 17% sold none though all had CMLs. Appendix Table B31 shows the market participation among subgroups.

Table 22 shows the percentage of respondents that used particular market outlets for their catch. Seventy-two percent of survey respondents sold some or all their catch to wholesalers or auctions, 43% to restaurants or stores, 27% to friends, neighbors, or coworkers, and 8% on the roadside or at farmers' markets. The use of market outlet differed across counties and fisherman types. Oahu and Hawaii County fishermen were more likely to sell to wholesalers or auctions (almost 80%), whereas Maui county fishermen were more likely to sell to other channels including 65% to restaurants or stores. Eighty-four percent of full-time commercial fishermen sold to wholesalers or auctions, 54% to restaurants or stores, and 12% to roadside or farmers' markets. For other types of fishermen, wholesaler or auction was also the most commonly used outlet, but the percentages were lower compared to the full-time commercial fishermen. Among sub-fisheries, wholesaler or auction was the most common outlet, but fishermen in the coral reef fishery were more likely to use other outlets.

Table 22.--Survey Responses: "In the past 12 months, where did you sell your fish: wholesaler/auction, restaurants/stores, friends/neighbors/coworkers, roadside/farmers' market, other?"[1] (percentage of responses).

	Number of respondents (n)	Wholesaler/ auction (%)	Restaurants/ stores (%)	Friends/ neighbors/ coworkers (%)	Roadside/ farmers' market (%)	Other (%)
All Respondents	***659***	**71.6**	**42.5**	**27.3**	**7.9**	**0.6**
By County						
Oahu	*229*	79.5	27.9	27.5	7.4	0.9
Hawaii	*245*	78.8	42.9	22.4	6.5	0.4
Maui	*101*	48.5	65.3	41.6	15.8	1.0
Kauai	*79*	54.4	55.7	24.1	3.8	0.0
By Fisherman Classification						
Full-time commercial	*57*	84.2	54.4	26.3	12.3	1.8
Part-time commercial	*368*	70.1	44.6	29.3	9.8	0.5
Recreational expense	*171*	74.3	37.4	24.0	2.9	0.6
Purely recreational	*42*	61.9	26.2	21.4	2.4	0.0
Subsistence	*12*	58.3	50.0	33.3	0.0	0.0
Cultural	*6*	83.3	50.0	50.0	33.3	0.0
By Most Common Gear						
Troll	*433*	71.4	41.1	27.9	8.5	0.5
Pelagic handline	*85*	78.8	40.0	29.4	8.2	0.0
Bottomfish handline	*97*	73.2	49.5	26.8	5.2	0.0
Spear	*7*	42.9	71.4	0.0	0.0	14.3
Nets	*10*	70.0	20.0	30.0	0.0	10.0
By Sub-fishery						
Troll pelagic	*612*	73.2	42.8	27.5	7.5	0.5
Handline pelagic	*266*	73.7	46.2	29.3	10.2	0.0
Bottomfish	*310*	74.5	44.5	29.0	7.1	0.6
Coral reef	*132*	65.2	58.3	37.9	11.4	1.5

[1] The sum of percentages of responses are greater than 100% due to multiple answers allowed.

Revenue of fish sold

In addition to fish landings in the past 12 months, fishermen were also asked about revenue from the fish they sold. To check whether the sold values reported in the survey are representative of the entire Hawaii small boat fleet, Table 23 shows the distribution of values reported to HDAR for the survey population and for survey respondents. The number of respondents is consistent with Tables 16 and 17. Marine fish dealers (which includes any business that purchases fish directly from fishermen, i.e., wholesalers and auctions, restaurants, and retail stores) are required to report data on seafood purchased from fishermen, including the fisherman from whom the dealer purchased the fish. These reports are submitted to HDAR monthly. The dealer data are then compiled in HDAR's Dealer Reporting System (DRS). The data summary presented in Table 23 is from July 2013 to June 2014. The survey asked about the value of fish sold over the past 12 months and some fishermen may have only had fish sales in the first half of 2013 or second half of 2014, so they did not have sale record in DRS during the survey period. These included 162 fishermen in the survey population and 46 survey respondents. In addition, 114 respondents reported no fish sales in the past 12 months, and the 19 respondents who did not answer the fish sale question in the survey were also excluded. Figure 27 shows the overall distribution of value of fish sold reported to HDAR for the survey population and the value reported in the survey. Overall, survey respondents are representative of the survey population

in each value range, though slightly over-represented in the lower value range, $501 to $1,000. Therefore, the average value of fish sold reported by the survey respondents was slightly lower than the average value of the whole population (7% lower overall).

Table 23.--Revenue from fish sold for the survey population from State of Hawaii DAR's Dealer Reporting System vs. survey respondents (percentage of responses).

Revenue from fish sold	All		Oahu		Hawaii		Maui		Kauai	
	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)	Survey Population (%)	Survey Responses (%)
$1-$100	4.5	1.9	6.3	2.3	2.7	2.1	5.6	2.1	4.6	0.0
$101-$500	15.2	16.9	12.9	18.9	15.6	15.8	16.9	15.8	17.9	16.7
$501-$1,000	11.9	16.9	13.9	15.7	10.1	15.4	12.2	17.9	11.8	23.1
$1,001-$2,000	15.1	12.0	18.1	15.2	13.2	10.3	11.7	10.5	16.4	9.0
$2,001-$5,000	19.7	19.9	21.9	22.6	20.0	19.7	16.4	14.7	17.4	20.5
$5,001-$10,000	12.9	12.9	12.7	9.7	13.0	15.8	13.6	15.8	13.3	10.3
$10,001-$20,000	8.5	8.0	6.8	6.5	9.8	9.0	10.8	7.4	6.2	10.3
$20,001-$50,000	8.0	8.5	4.9	8.3	9.9	9.4	8.5	9.5	8.7	3.8
Over $50,000	4.1	3.0	2.5	0.9	5.7	2.6	4.2	6.3	3.6	6.4
Number of fishermen	*1,475*	*627*	*474*	*217*	*584*	*234*	*213*	*95*	*195*	*78*
Revenue per fisherman										
Mean ($)	9,327	8,694	7,203	6,288	10,919	9,037	9,956	11,473	9,070	10,833
Standard error ($)	574	684	1,077	720	883	1,142	1,479	2,150	1,527	2,702
Median ($)	2,341	3,500	1,883	1,500	2,891	3,500	2,555	3,500	1,933	3,500

Note: Population included in the State of Hawaii DAR's Dealer reporting system included all species sales from small boat trips, July 2013 to June 2014, and excluded those without dealer records between July 2013 and June 2014 (n=162). It also excluded respondents who reported no fish sales in the past 12 months in the survey (n=114), fishermen who did not answer fish sale question (n=19), and 11 seamount fishing, 4 shrimp fishing, 4 charters, 4 cases identified as no boat fishing in the past 12 months in the survey, and 3 cases where kayaks were used for fishing. Survey responses excluded cases with no DAR's Dealer records between July 2013 and June 2014 (n=46) and respondents who reported no fish sales in the past 12 months in the survey (n=114) and fishermen did not answer fish sale question (n=19).

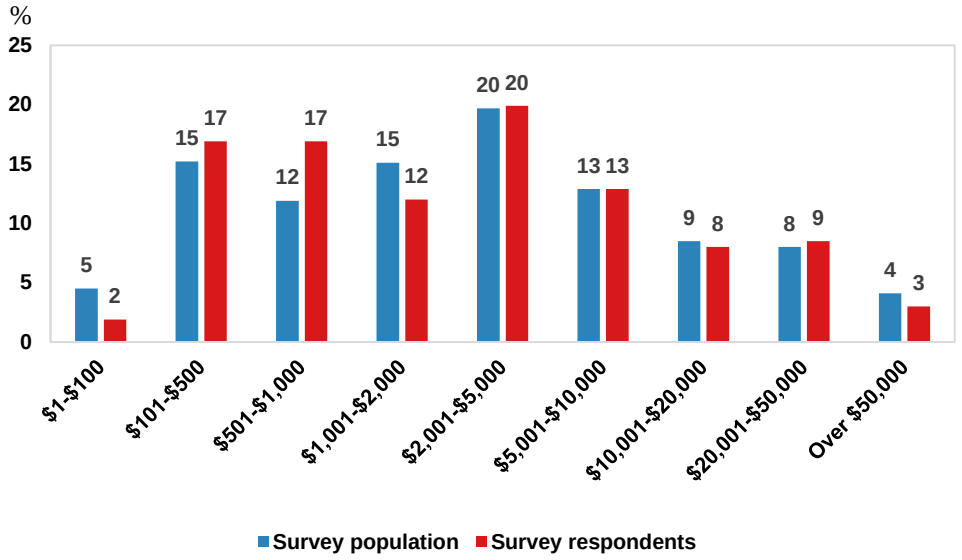

Figure 27.--Revenue from fish sold for the survey population (HDAR DRS statistics) vs. survey respondents.

To compare the results from survey and HDAR dealer reports, Table 24 lists the distribution of value of fish sold reported to HDAR versus the value reported in the survey for survey respondents. These distributions match very well. Survey responses show only slightly higher average sale values (about 6% for all respondents) than the dealer reports.

Table 24.--Revenue from fish sold for survey respondents: State of Hawaii DAR's Dealer Reporting System vs. survey responses (percentage of responses).

	All Respondents		Oahu		Hawaii		Maui		Kauai	
Revenue from fish sold	Dealer Reports (%)	Survey Responses (%)	Dealer Reports (%)	Survey Responses (%)	Dealer Reports (%)	Survey Responses (%)	Dealer Reports (%)	Survey Responses (%)	Dealer Reports (%)	Survey Responses (%)
$1-$100	2.2	1.9	3.2	2.3	1.3	2.1	4.2	2.1	0.0	0.0
$101-$500	13.4	16.9	12.0	18.9	14.1	15.8	13.7	15.8	15.4	16.7
$501-$1,000	11.3	16.9	12.9	15.7	9.0	15.4	14.7	17.9	10.3	23.1
$1,001-$2,000	18.2	12.0	19.4	15.2	17.9	10.3	13.7	10.5	19.2	9.0
$2,001-$5,000	22.6	19.9	23.5	22.6	25.2	19.7	15.8	14.7	21.8	20.5
$5,001-$10,000	13.7	12.9	13.8	9.7	12.8	15.8	13.7	15.8	16.7	10.3
$10,001-$20,000	7.2	8.0	7.4	6.5	7.7	9.0	8.4	7.4	3.8	10.3
$20,001-$50,000	7.8	8.5	6.5	8.3	8.5	9.4	9.5	9.5	6.4	3.8
Over $50,000	3.5	3.0	1.4	0.9	3.4	2.6	6.3	6.3	6.4	6.4
Number of fishermen	*627*	*627*	*217*	*217*	*234*	*234*	*95*	*95*	*78*	*78*
Revenue per fisherman										
Mean ($)	8,224	8,694	5,974	6,288	8,502	9,037	11,540	11,473	9,591	10,833
Standard error ($)	690	684	691	720	1,169	1,142	2,552	2,150	2,199	2,702
Median ($)	2,423	3,500	2,230	1,500	2,588	3,500	2,539	3,500	2,320	3,500

Note: Excluded cases with no DAR's Dealer records between July 2013 and June 2014 (n=46) and respondents reported no fish sales in the past 12 months in the survey (n=114) and fishermen did not answer fish sale question (n=19).

Table 25 shows the distribution, average, and median of revenue from fish sold reported by survey respondents. The average revenue from fish sales was calculated using the medians of response bins, except for those who reported the highest category of sale value bin (>$50,000). In these cases, the actual reported values were used. There were 19 respondents who reported this category; 14 of them answered the open-ended question to report the actual sale values. For the other 5 fishermen, the missing values were compared with the dealer records. Three records were over $50,000 and they were used to replace the missing values. Two records were below $50,000, and the lower end value of the category $50,001 was used to replace the missing values. The average revenue from fish sold by all respondents was approximately $8,500. Maui county and Kauai fishermen reported higher value of fish sold (approximately $11,000) than Hawaii County fishermen ($8,782). Oahu fishermen reported the lowest value ($6,226). Across fisherman types, full-time commercial fishermen, as expected, reported the highest value of fish sold ($35,528), followed by part-time commercial fishermen ($8,391), cultural fishermen ($3,900), recreational expenses fishermen ($2,690), and subsistence ($1,905). Self-identified purely recreational fishermen reported selling close to $1,000 of their catch. Fishermen who used nets most often reported the highest value of fish sold ($18,672, but only a small number of respondents were in this category). Those who used bottomfish handline and pelagic handline gears most often sold approximately $12,000.

Table 25.--Survey Responses: "In the past 12 months, what was the approximate value of all the fish you sold?" (percentage of responses, mean, and median).

	Number of respond-ents (n)	$1 - $100 (%)	$101 - $500 (%)	$501 - $1000 (%)	$1001 - $2000 (%)	$2001 - $5000 (%)	$5001 - $10000 (%)	$10001 - $20000 (%)	$20001 - $50000 (%)	Over $50000 (%)	Value of fish sold (Mean)[1]	Value of fish sold (Median)
All Respondents	***648***	**2**	**17**	**17**	**12**	**20**	**13**	**8**	**8**	**3**	**8,546**	**3,500**
By County												
Oahu	*224*	2	19	16	16	22	10	7	8	1	6,226	1,500
Hawaii	*243*	2	17	15	11	19	15	9	9	2	8,782	3,500
Maui	*97*	2	15	18	10	15	16	7	9	6	11,350	3,500
Kauai	*79*	0	16	23	9	20	11	10	4	6	10,790	3,500
By Fisherman Classification												
Full-time commercial	*55*	0	2	4	4	18	5	11	31	25	35,528	35,000
Part-time commercial	*363*	1	12	12	11	23	18	11	10	1	8,391	3,500
Recreational expense	*168*	2	27	24	18	15	8	3	1	1	2,690	750
Purely recreational	*43*	7	42	30	9	9	2	0	0	0	995	750
Subsistence	*11*	18	18	27	0	27	9	0	0	0	1,905	750
Cultural	*5*	0	0	40	40	0	0	20	0	0	3,900	1,500
By Most Common Gear												
Troll	*430*	3	21	18	13	20	13	4	7	2	6,855	1,500
Pelagic handline	*83*	1	12	11	10	19	14	14	14	4	11,998	3,500
Bottomfish handline	*93*	1	10	14	12	17	14	16	10	6	12,457	3,500
Spear	*7*	0	0	14	0	57	0	29	0	0	6,393	3,500
Nets	*9*	0	11	11	0	22	0	33	11	11	18,672	15,000
By Sub-fishery												
Troll pelagic	*602*	2	18	17	12	20	13	7	8	3	8,187	3,500
Handline pelagic	*262*	1	13	11	11	20	15	11	12	5	12,049	3,500
Bottomfish	*303*	2	14	15	14	20	14	8	10	5	10,426	3,500
Coral reef	*126*	0	13	14	18	15	18	10	7	5	9,512	3,500

[1] Calculated using the medians of the response bins.

Table 26 presents the distribution, average, and median of value of fish sold per trip. Average value of fish sold per trip was calculated based on the value of fish sold divided by the number of boat fishing trips in the past 12 months (using the median of value bins defined in the questionnaires). The average value of fish sold for all respondents was $215 and varied greatly by fisherman type. Full-time commercial fishermen sold over $550 per trip, part-time commercial fishermen sold half of that at $245. Recreational expense fishermen sold $95, and purely recreational fishermen sold $58. Across different gears, fishermen who used bottomfish handline gear most often sold the most at $376 per trip.

Table 26.--Revenue from fish sold per trip (percentage of responses, mean, and median).

	Number of respondents (n)	<= $50 (%)	$51 - $100 (%)	$101 - $500 (%)	More than $500 (%)	Value of fish sold per trip (Mean)[1]	Value of fish sold per trip (Median)
All Respondents	***638***	**33.7**	**24.0**	**33.2**	**9.1**	**215**	**97**
By County							
Oahu	*219*	38.4	20.1	33.3	8.2	200	75
Hawaii	*241*	35.3	24.9	32.8	7.1	197	97
Maui	*95*	20.0	28.4	32.6	18.9	306	125
Kauai	*78*	33.3	25.6	34.6	6.4	202	97
By Fisherman Classification							
Full-time commercial	*53*	13.2	11.3	43.4	32.1	558	292
Part-time commercial	*357*	27.5	23.8	37.8	10.9	245	100
Recreational expense	*166*	45.2	27.7	25.9	1.2	95	63
Purely recreational	*43*	62.8	23.3	14.0	.0	58	25
Subsistence	*11*	45.5	36.4	18.2	.0	79	63
Cultural	*5*	20.0	20.0	60.0	.0	150	125
By Most Common Gear							
Troll	*424*	39.6	23.8	30.2	6.4	172	63
Pelagic handline	*80*	22.5	23.8	43.8	10.0	239	125
Bottomfish handline	*92*	21.7	22.8	33.7	21.7	376	125
Spear	*7*	.0	42.9	57.1	.0	177	200
Nets	*9*	33.3	22.2	44.4	.0	120	100
By Sub-fishery							
Troll pelagic	*593*	34.9	23.9	32.5	8.6	204	97
Handline pelagic	*257*	27.2	21.4	40.5	10.9	259	125
Bottomfish	*295*	30.2	23.4	34.2	12.2	254	97
Coral reef	*124*	27.4	24.2	39.5	8.9	253	100

[1] Calculated using the medians of the response bins.

Fishermen were asked the percentage of value of fish sold from three major species groups (pelagic, bottomfish, and reef fish). Results are presented in Table 27. Half of the survey respondents reported that 76% to 100% of the revenue was from pelagic fish sales; only 6% and 4% respondents reported that the same percentage of revenue came from bottomfish and reef fish, respectively. The average percentage of value of fish sold was calculated using the medians of the revenue bins and percentage of the value of fish sold from pelagic fish, bottomfish, and reef fish. As shown in Figure 28, pelagic fish represented a higher percentage of catch than sold value (79% of total catch vs. 63% of total value). The opposite was true for bottomfish (11% of total catch vs. 23% of total value). This may be due to bottomfish generally having a higher unit price than pelagic fish. On the other hand, it is interesting to note that most of the "no fish sold" were from bottomfish and reef fish groups.

Table 27.--Survey Responses: "In the past 12 months, what percent of the value of fish sold came from the sale of pelagic fish, bottomfish, and reef fish?" (percentage of responses and mean).

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of value of % fish sold (Mean)[1]
Pelagic fish	*627*	13.2	11.3	12.8	13.1	49.6	62.9
Bottomfish	*627*	62.7	16.7	10.0	4.8	5.7	23.3
Reef fish	*627*	80.7	12.0	2.6	1.1	3.7	7.5

[1] Calculated using the medians of the response bins.

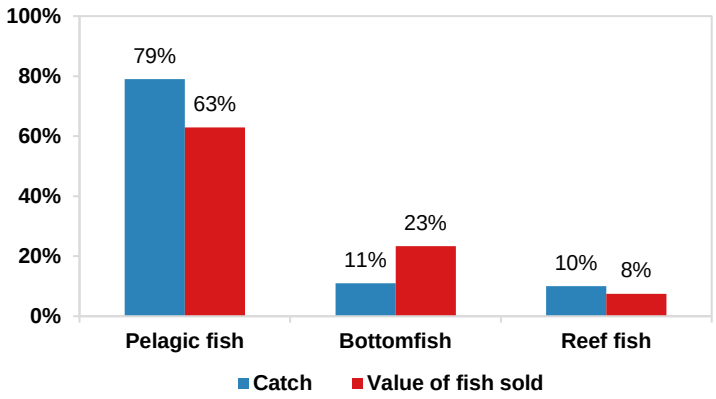

Figure 28.--Distribution of catch and value of fish sold by species group.

Average percentages of value of pelagic fish, bottomfish, and reef fish sold are presented in Appendix Table B32. In Hawaii County, 70% of value of fish sold was from pelagic fish. In Maui county, 45% of value of fish sold was from bottomfish. Reef fish revenue in Oahu was 15% of the value of total fish sold. Comparing across fisherman types, cultural and recreational expense fishermen derived 99% and 73% of their fish sales from pelagic fish, respectively; full-time commercial fishermen derived only 55% of sales from pelagic fish. On the other hand, commercial fishermen derived higher proportion of fish sales from bottomfish (28%) than other types of fishermen.

Income from fishing plays different roles among fisherman types. Figure 29 shows the contribution of fishing income to total personal income. Most respondents (74%) reported fishing income contributed only 1% to 25% of their personal income, and 6% of survey respondents reported fishing income contributed 76% to 100% of their personal income. The latter is not surprising since about 7% of fishermen self-identified as full-time commercial fishermen. On average, fishing income contributed about 23% of their total personal income (calculated using medians of response bins), quite a substantial contribution.

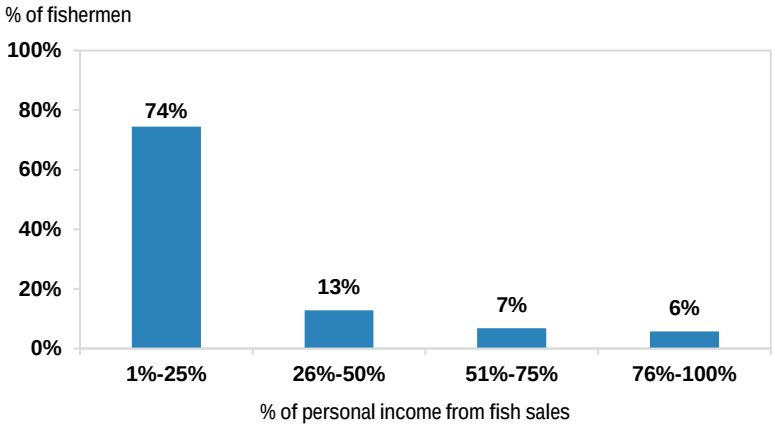

Figure 29.--Percent of personal income came from fish sales.

Appendix Table B33 shows the percentage of personal income from fish sales by subgroup. Fishermen in Hawaii County were more reliant on fishing income; an average of 25% came from fish sales compared with fishermen in other counties. Full-time commercial fishermen were heavily reliant on fish sales as 41% reported that sales were responsible for 76% to 100% of their personal income. In addition, fishermen who used pelagic handline and bottomfish handline gears most commonly had a higher percentage of personal income from fish sales than fishermen who used other gears.

Total Catch and Revenue by Fisherman Type

The previous section shows the distribution of catch and value of fish sold for all respondents and within each individual subgroup. The diversity of fishermen can also be shown by comparing their reported catch and revenue. Figure 30 shows the distribution of respondents by fisherman type, and Figures 31 and 32 represent the percentage of catch and revenue by fisherman type.

Figure 30 shows that full-time commercial fishermen represented 7% of survey respondents, and together they caught 28% of pelagic fish, bottomfish, and reef fish (Figure 31) and 35% of total value of fish sold (Figure 32). Part-time commercial fishermen represented 51% of survey respondents, and their catch represented 53% of total fish caught and 55% of total value. Recreational expense fishermen were the second most represented group (27%), but their catch only represented 14% of total catch and 8% of total value. Purely recreational fishermen represented 11% of respondents, but their catch represented only 3% of total catch and 1% of total value.

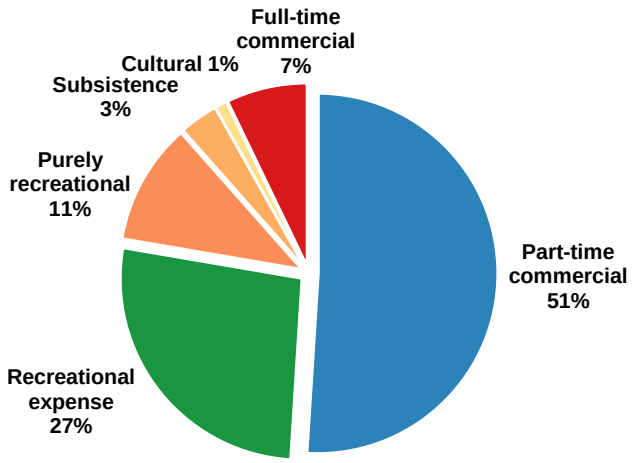

Figure 30.--Survey responses by fisherman classification.

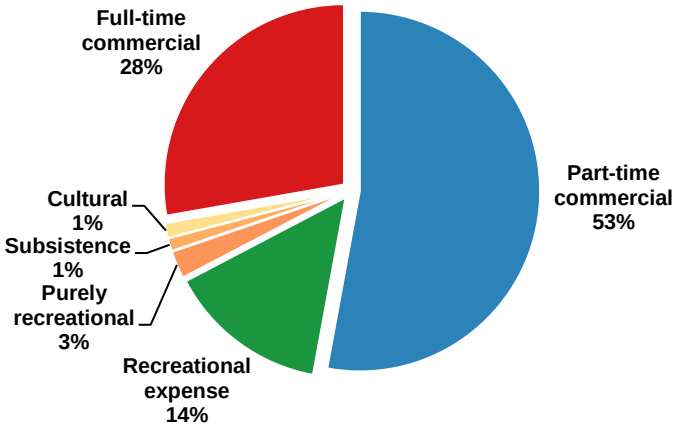

Figure 31.--Pounds of pelagic fish, bottomfish, and reef fish caught by fisherman classification.

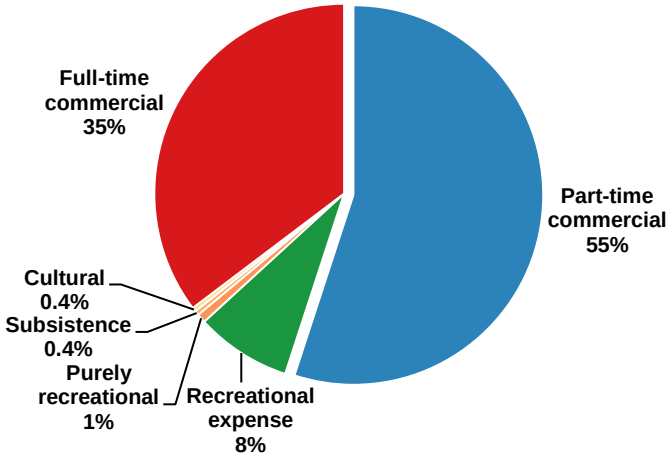

Figure 32.--Value of fish sold by fisherman classification.

Trip Costs

One of the primary goals of this study is to update our understanding of the costs of fishing and to detail current levels of investment in the fishery. In the survey, fishermen were asked about their trip costs for the two most common types of gear they had used in the past 12 months. This information provides us with the variable costs for the operation of vessels including boat fuel, truck fuel, oil, ice, bait, food and beverage, daily maintenance and repair, and other. Table 28 shows the average fishing trip costs for all respondents and the itemized costs. A typical small boat fishing trip averaged $269 with a median cost of $230. The highest cost category was fuel ($156, including $131 for boat fuel and $25 for truck fuel) which contributed 58% of the total. The second most important cost item was ice ($32), which contributed 12%. Food and beverage ($25), daily maintenance and repair ($24), and bait ($23) each contributed 9% of trip costs. Other costs included oil ($7) and other ($1).

Table 28.--Fishing trip costs for most common and second most common gear usage (total and itemized) (mean, standard error, and median).

Category	*Number of respondents (n)*	**Mean**	Standard error	Median	Percentage of total trip cost (%)
Boat fuel	*1193*	**130.86**	2.89	100	48.7
Truck fuel	*1193*	**25.03**	0.64	20	9.3
Oil	*1193*	**7.39**	0.46	0	2.7
Ice	*1193*	**32.39**	0.84	25	12.1
Bait	*1193*	**23.33**	0.99	15	8.7
Food and beverage	*1193*	**25.31**	0.77	20	9.4
Daily maintenance & repair	*1193*	**23.89**	1.16	10	8.9
Other trip cost	*1193*	**0.69**	0.17	0	0.3
Total trip cost	*1193*	**268.63**	5.29	230	

Appendix Table B34 shows the fishing trip costs by county. Maui county fishermen reported highest average trip cost ($322), followed by Oahu fishermen ($262), Hawaii County fishermen ($255), and Kauai fishermen ($252).

Table 29 shows the fishing trip costs by gear type. The highest costs were for trolling trips ($292), followed by pelagic handlining trips ($284), and bottomfish handlining trips ($253). Lower trip costs were found for netting trips ($175) and spearfishing trips ($159). More than half of the trolling trip costs were for boat fuel ($154). Bait was a higher contributor for pelagic handlining trips ($45), and ice was a higher contributor for trolling and pelagic handlining trips ($35 and $34, respectively).

Table 29.--Fishing trip costs by gear type (based on fishermen using this gear as their most common and second most common gear types) (mean, standard error, and median).

Category	Gear type	*Number of respondents (n)*	Mean	Standard error	Median	Percentage of total trip cost (%)
Boat fuel	Troll	*622*	**153.74**	3.89	140	52.7
	Pelagic handline	*183*	**120.64**	6.98	100	42.5
	Bottomfish handline	*242*	110.94	6.72	80	43.9
	Spear	*39*	**62.64**	8.28	50	39.4
	Nets	*18*	**74.17**	16.49	57.5	42.4
Truck fuel	Troll	*622*	**25.26**	0.90	20	8.7
	Pelagic handline	*183*	**28.02**	1.81	20	9.9
	Bottomfish handline	*242*	**23.30**	1.35	20	9.2
	Spear	*39*	**23.62**	2.84	20	14.9
	Nets	*18*	**23.83**	3.65	20	13.6
Oil	Troll	*622*	**7.89**	0.66	0	2.7
	Pelagic handline	*183*	**8.32**	1.18	0	2.9
	Bottomfish handline	*242*	**7.30**	1.17	0	2.9
	Spear	*39*	**4.68**	0.90	3	2.9
	Nets	*18*	**4.10**	0.98	4.5	2.3
Ice	Troll	*622*	**35.39**	1.21	30	12.1
	Pelagic handline	*183*	**34.06**	2.21	30	12.0
	Bottomfish handline	*242*	**29.90**	1.85	20	11.8
	Spear	*39*	**19.87**	2.81	16	12.5
	Nets	*18*	**30.39**	5.11	24.5	17.4
Bait	Troll	*622*	**17.28**	1.20	8	5.9
	Pelagic handline	*183*	**44.72**	3.24	30	15.8
	Bottomfish handline	*242*	**30.27**	2.33	20	12.0
	Spear	*39*	**5.38**	1.91	0	3.4
	Nets	*18*	**5.56**	2.14	0	3.2
Food and beverage	Troll	*622*	**26.56**	1.06	20	9.1
	Pelagic handline	*183*	**25.27**	1.70	20	8.9
	Bottomfish handline	*242*	**24.94**	2.06	20	9.9
	Spear	*39*	**23.28**	2.68	20	14.6
	Nets	*18*	**16.83**	4.69	11	9.6
Daily maintenance & repair	Troll	*622*	**25.30**	1.60	10	8.7
	Pelagic handline	*183*	**22.84**	3.05	10	8.1
	Bottomfish handline	*242*	**24.60**	2.89	10	9.7
	Spear	*39*	**16.64**	4.02	10	10.5
	Nets	*18*	**16.67**	4.12	15	9.5
Other trip cost	Troll	*622*	**0.39**	0.17	0	0.1
	Pelagic handline	*183*	**0.32**	0.19	0	0.1
	Bottomfish handline	*242*	**1.34**	0.59	0	0.5
	Spear	*39*	**2.82**	1.98	0	1.8
	Nets	*18*	**3.33**	3.33	0	1.9
Total trip cost	Troll	622	**291.67**	7.06	255	
	Pelagic handline	183	**283.72**	13.53	235	
	Bottomfish handline	242	**252.58**	13.38	197.5	
	Spear	39	**158.94**	15.80	150	
	Nets	18	**174.88**	24.35	148.5	

Table 30 shows fishing trip costs by fisherman type. Full-time commercial fishermen spent most per fishing trip ($376), followed by subsistence fishermen ($278), purely recreational fishermen ($271), and part-time commercial fishermen ($262). Recreational expense fishermen ($253) and

cultural fishermen ($237) reported lower trip costs. Full-time commercial fishermen spent more on boat and truck fuels ($214), ice ($56), bait ($37), and oil ($13); and purely recreational fishermen spent more on daily maintenance and repair ($33).

Table 30.--Fishing trip costs by fisherman type (based on fishermen using this gear as their most common and second most common gear types) (mean, standard error, and median).

Category	Gear type	*Number of respondents (n)*	Mean	Standard error	Median	Percentage of total trip cost (%)
Boat fuel	Full-time commercial	*83*	**184.08**	19.97	145	48.9
	Part-time commercial	*603*	**125.39**	3.60	100	47.8
	Recreational expense	*327*	**125.00**	4.72	100	49.4
	Purely recreational	*116*	**138.53**	8.72	130	51.2
	Subsistence	*38*	**135.08**	20.58	100	48.6
	Cultural	*13*	**114.62**	15.12	120	48.3
Truck fuel	Full-time commercial	*83*	**30.09**	3.34	20	8.0
	Part-time commercial	*603*	**24.69**	0.92	20	9.4
	Recreational expense	*327*	**25.00**	1.13	20	9.9
	Purely recreational	*116*	**24.23**	1.80	20	9.0
	Subsistence	*38*	**23.42**	3.33	20	8.4
	Cultural	*13*	**24.23**	3.71	25	10.2
Oil	Full-time commercial	*83*	**13.28**	3.77	4	3.5
	Part-time commercial	*603*	**7.56**	0.60	1	2.9
	Recreational expense	*327*	**5.88**	0.65	0	2.3
	Purely recreational	*116*	**5.88**	0.90	0	2.2
	Subsistence	*38*	**11.25**	3.43	0	4.0
	Cultural	*13*	**4.77**	2.12	0	2.0
Ice	Full-time commercial	*83*	**56.09**	5.26	45	14.9
	Part-time commercial	*603*	**32.05**	1.15	25	12.2
	Recreational expense	*327*	**29.81**	1.25	25	11.8
	Purely recreational	*116*	**28.13**	2.66	24	10.4
	Subsistence	*38*	**22.56**	2.88	20	8.1
	Cultural	*13*	**33.85**	7.56	25	14.3
Bait	Full-time commercial	*83*	**37.45**	4.55	22	10.0
	Part-time commercial	*603*	**26.11**	1.60	20	9.9
	Recreational expense	*327*	**18.76**	1.38	10	7.4
	Purely recreational	*116*	**12.40**	1.61	5	4.6
	Subsistence	*38*	**23.27**	5.92	20	8.4
	Cultural	*13*	**22.69**	8.18	20	9.6
Food and beverage	Full-time commercial	*83*	**26.08**	2.39	20	6.9
	Part-time commercial	*603*	**24.13**	0.93	20	9.2
	Recreational expense	*327*	**24.26**	0.98	20	9.6
	Purely recreational	*116*	**28.03**	1.94	20	10.4
	Subsistence	*38*	**45.75**	14.59	22.5	16.5
	Cultural	*13*	**18.62**	3.29	20	7.9
Daily maintenance & repair	Full-time commercial	*83*	**28.19**	4.51	10	7.5
	Part-time commercial	*603*	**22.18**	1.46	10	8.5
	Recreational expense	*327*	**23.99**	2.03	10	9.5
	Purely recreational	*116*	**33.48**	6.17	10	12.4
	Subsistence	*38*	**15.82**	3.15	10	5.7
	Cultural	*13*	**17.38**	7.44	3	7.3
Other trip cost	Full-time commercial	*83*	**0.96**	0.65	0	0.3
	Part-time commercial	*603*	**0.85**	0.30	0	0.3
	Recreational expense	*327*	**0.57**	0.26	0	0.2
	Purely recreational	*116*	**0.00**	0.00	0	0.0
	Subsistence	*38*	**0.89**	0.51	0	0.3
	Cultural	*13*	**0.92**	0.92	0	0.4
Total Trip Cost	Full-time commercial	*83*	**376.23**	33.75	300	
	Part-time commercial	*603*	**262.49**	7.14	225	
	Recreational expense	*327*	**253.28**	7.68	225	
	Purely recreational	*116*	**270.70**	16.08	251	
	Subsistence	*38*	**278.04**	39.31	200	
	Cultural	*13*	**237.08**	29.35	220	

Fishermen who used the same gear type, regardless their motivations, had similar fishing trip costs, except for full-time commercial fishermen. As shown in Figure 33, fishing trip costs for full-time commercial fishermen were substantially higher than other types of fishermen. For trolling trips, full-time commercial fishermen reported 46% higher costs than other fishermen. Bottomfishing trips cost 83% more for the full-time commercial fishermen than the other groups.

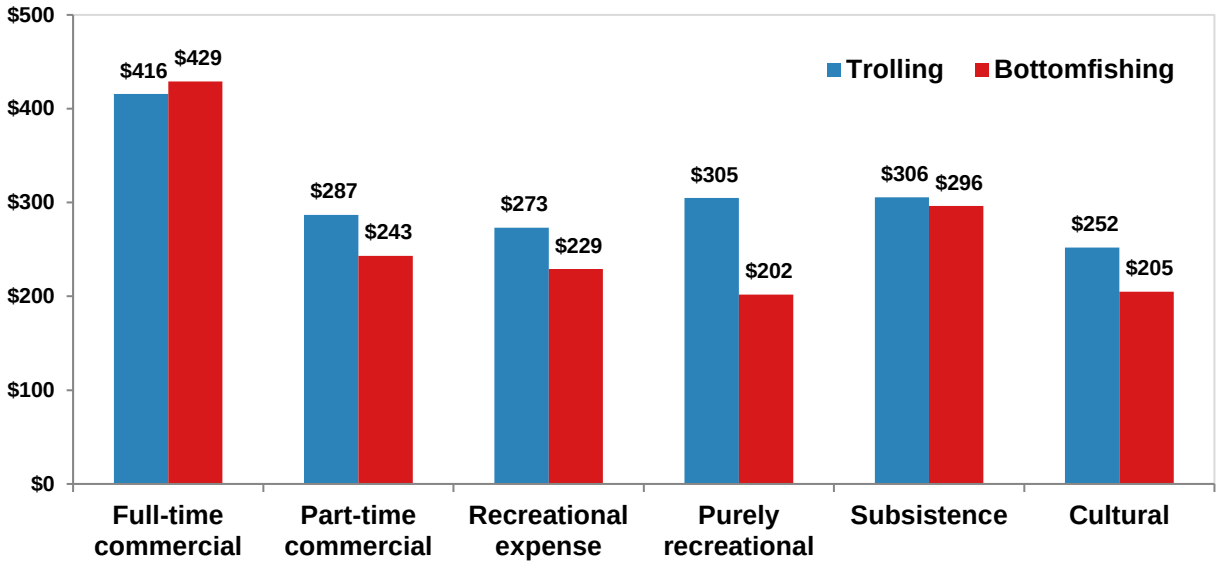

Figure 33.--Trolling and bottomfishing trip costs by fisherman type.

Fishermen were asked how their trip costs were shared among fishermen on board. Most respondents (92%) paid all trip costs themselves (Appendix Table B35 shows the details). Those who shared some percentage of total trip costs paid an average of 61% of the total, and those who shared a fixed amount of fishing costs paid an average of $112 per trip.

Annual Fishing Fixed Costs

Besides fishing trip costs, small boat fishing in Hawaii incurred considerable annual fishing fixed costs like insurance, loan payments, mooring fees, gear replacement and repair, boat and trailer repair, maintenance and improvement, fees, and financial services. Table 31 shows the annual fixed costs in 2013 for all respondents and the percentage of total fleet that incurred some expenditure in each category. All respondents reported some spending on fixed costs, and 95% reported spending on fees (e.g. CML, non-commercial permit ramp, registration for truck and trailer, safety), 94% on gear replacement and repair, and 91% on boat and trailer repair, maintenance, and improvements. Forty-eight percent reported spending on boat insurance. Only 18% incurred mooring fees which shows most small boat fishermen used trailers rather than mooring their boats.

On average, survey respondents reported an annual fixed cost of $5,557 and a median spending of $3,364. Thirty percent of annual fixed costs were spent on gear replacement and repair ($1,671) and another 29% on boat and trailer repair, maintenance, and improvement ($1,635).

Note that due to large variations in fixed costs among respondents, a few large outliers would inflate the mean. This is evident in Table 31 since the median fixed costs were lower than the average fixed costs for overall and individual categories. If large differences between means and medians exist, medians would provide better representation of the typical fixed costs for fishermen. We also present the actual out-of-pocket fixed costs (excluding zero expenditure responses) later in this section (Table 34).

Table 31.--Annual fishing fixed costs in 2013 for all respondents (mean, standard error, median, and percentage of fleet with expenditure).

Category	*Number of respondents (n)*	Mean	Standard error	Median	Percentage of fleet with this expenditure (%)
Gear replacement/repair	*749*	**1,671**	93	800	93.6
Boat and trailer repair/maintenance	*749*	**1,635**	104	750	90.7
Loan payments	*749*	**970**	125	0	15.1
Boat insurance	*749*	**420**	30	0	48.1
Mooring fees	*749*	**414**	48	0	17.9
Fees	*749*	**399**	18	250	94.5
Financial services	*749*	**30**	7	0	5.9
Other	*749*	**19**	6	0	1.6
Annual fixed costs	*749*	**5,557**	238	3,364	

Appendix Table B36 shows the annual fishing fixed costs by county. Oahu fishermen reported highest fixed costs (mean = $6,317), and Hawaii County fishermen reported lowest (mean = $4,713). For individuals, Kauai fishermen reported higher spending on gear replacement and repair ($2,099), and Maui county fishermen reported higher spending on boat and trailer repair and improvement ($1,910). Oahu fishermen reported higher spending on boat insurance ($628), mooring fees ($746), and other fees ($485).

Table 32 shows the annual fixed costs in 2013 by fisherman type. As expected, full-time commercial fishermen reported higher annual fixed costs (mean = $10,617) than any other types of fishermen, and the other groups (except for subsistence fishermen) reported annual fixed costs in the range of $5,000. Full-time commercial fishermen reported more than twice the amount spent on gear replacement and repair, boat and trailer repair and maintenance, and loan payments than other types of fishermen.

Table 32.--Annual fishing fixed costs in 2013 by fisherman type (mean, standard error, and median).

Fixed cost item		Full-time commercial	Part-time commercial	Recreational expense	Purely recreational	Subsistence	Cultural
	Number of respondents(n)	*53*	*379*	*200*	*77*	*26*	*8*
Gear replacement/ repair	**Mean**	**3,556**	**1,678**	**1,443**	**1,246**	**1,113**	**1,229**
	Standard error	663	131	130	168	316	570
	Median	2,000	800	700	500	550	475
Boat and trailer repair/ maintenance/ improvements	**Mean**	**3,268**	**1,360**	**1,780**	**1,636**	**847**	**2,914**
	Standard error	694	105	242	252	175	2,171
	Median	1,500	600	875	847	500	875
Loan payments	**Mean**	**2,123**	**924**	**1,015**	**668**	**362**	**0**
	Standard error	744	156	290	213	194	0
	Median	0	0	0	0	0	0
Boat insurance	**Mean**	**477**	**441**	**362**	**478**	**276**	**439**
	Standard error	118	50	39	70	101	172
	Median	0	0	50	300	15	325
Mooring fees	**Mean**	**586**	**328**	**411**	**773**	**309**	**311**
	Standard error	187	64	88	209	190	311
	Median	0	0	0	0	0	0
Fees	**Mean**	**518**	**375**	**421**	**331**	**550**	**337**
	Standard error	81	21	40	37	192	135
	Median	300	250	250	250	325	110
Financial services	**Mean**	**90**	**35**	**10**	**0**	**14**	**0**
	Standard error	44	10	3	0	14	0
	Median	0	0	0	0	0	0
Other	**Mean**	**0**	**19**	**14**	**55**	**0**	**0**
	Standard error	0	9	9	37	0	0
	Median	0	0	0	0	0	0
Annual fixed costs	**Mean**	**10,617**	**5,160**	**5,456**	**5,187**	**3,471**	**5,229**
	Standard error	1,454	314	433	585	603	2,759
	Median	6,300	3,150	3,605	3,550	2,411	2,735

Table 33 shows the annual fishing fixed costs in 2013 by the gear most commonly used. Fishermen who trolled most often reported highest fixed costs (mean = $5,830), closely followed by those who used pelagic handline gear (mean = $5,734), and those who used bottomfish handline gear (mean = $5,012). Those who used pelagic handline gear most often reported higher spending on gear replacement and repair and boat and trailer repair, maintenance, and improvements. Those who trolled most often spent more on loan payments, boat insurance, and mooring fees.

Table 33.--Annual fishing fixed costs in 2013 by the fisherman's most common gear (mean, standard error, and median).

Fixed cost item		Troll	Pelagic handline	Bottomfish handline	Spear	Nets
	Number of respondents(n)	*493*	*80*	*118*	*9*	*11*
Gear replacement/ repair	**Mean**	**1,667**	**2,124**	**1,413**	**1,144**	**1,465**
	Standard error	117	304	204	363	612
	Median	1,000	1,000	500	500	400
Boat and trailer repair/ maintenance/ improvements	**Mean**	**1,601**	**2,089**	**1,735**	**983**	**922**
	Standard error	124	440	271	276	405
	Median	900	675	550	500	300
Loan payments	**Mean**	**1,118**	**795**	**641**	**0**	**1,346**
	Standard error	177	255	191	0	659
	Median	0	0	0	0	0
Boat insurance	**Mean**	**503**	**226**	**318**	**456**	**133**
	Standard error	42	59	54	219	70
	Median	150	0	0	300	0
Mooring fees	**Mean**	**487**	**114**	**427**	**80**	**65**
	Standard error	67	53	107	80	65
	Median	0	0	0	0	0
Fees	**Mean**	**400**	**350**	**438**	**304**	**322**
	Standard error	23	42	51	66	96
	Median	250	200	250	300	120
Financial services	**Mean**	**29**	**33**	**26**	**75**	**30**
	Standard error	9	17	18	50	30
	Median	0	0	0	0	0
Other	**Mean**	**25**	**3**	**14**	**0**	**0**
	Standard error	9	3	10	0	0
	Median	0	0	0	0	0
Annual fixed costs	**Mean**	**5,830**	**5,734**	**5,012**	**3,042**	**4,283**
	Standard error	306	759	533	785	1,160
	Median	3,550	3,623	2,825	2,000	5,183

The percentage of fishermen who reported annual fixed costs on different categories varied from 94% for gear replacement and repair to as low as 6% for financial services. The actual out-of-pocket expenditures for low incidence categories could be quite different from the averages when including all respondents with zero expenditure. Table 34 shows the out-of-pocket expenditures for all respondents who had non-zero spending in that category. Loan payments were the highest spending category ($6,429), followed by mooring fees ($2,312), boat and trailer repair and maintenance ($1,803), and gear replacement and repair ($1,785). Appendix Tables B37, B38, B39 show the non-zero annual fixed costs by county, fisherman type, and most common gear type used, respectively.

Table 34.--Annual fishing fixed costs in 2013 for all respondents (non-zero expenditures on individual category) (mean, standard error, and median).

Category	*Number of respondents (n)*	Mean	Standard error	Median
Gear replacement/repair	*701*	**1,785**	98	1,000
Boat and trailer repair/maintenance	*679*	**1,803**	113	1,000
Loan payments	*113*	**6,429**	616	4,680
Boat insurance	*360*	**874**	53	600
Mooring fees	*134*	**2,312**	198	1,588
Fees	*708*	**422**	19	250
Financial services	*44*	**514**	90	300
Other	*12*	**1,178**	211	1,275
Annual fixed costs	*749*	**5,557**	238	3,364

Analysis by Fishery

This section provides the analysis by fishery since fishery management and regulations are often categorized by type of fish caught and the fishermen who are involved with the fishery. It presents the survey results by three major sub-fisheries within the Hawaii small boat fishery: pelagic, bottomfish, and coral reef fisheries. The three fisheries are grouped by the types of fishing trips over past 12 months. Any fishermen who took trolling or pelagic handlining trips are included in the pelagic fishery; any fishermen who took bottomfish handlining trips are included in the bottomfish fishery; and any fishermen who took coral reef fishing trips are included in the coral reef fishery. It is common in the Hawaii small boat fishing community for fishermen to be involved in different sub-fisheries (e.g. mixed trolling and bottomfishing during a trip or over the course of a year), hence the sum of the fishermen from the three sub-fisheries is greater than the number of surveys returned. For those in the bottomfish fishery, 94% were also in the pelagic fishery, and for those in the coral reef fishery, 89% were also in the pelagic fishery. Due to the overlapping of fishermen in different sub-fisheries, fishing activities (like catch and revenue) from other trip types conducted by the fishermen in a specific sub-fishery are included as part of the activities of the sub-fishery. For example, the total catch from the coral reef fishery not only shows the catch by all the coral reef fishing trips, but also includes the non-coral reef fishing trips taken by all fishermen who took coral reef fishing trips.

Table 35 shows the demographics of fishermen for the three fisheries. Among the 797 respondents who filled out the questions on fishing trip type, 755 were involved in the pelagic fishery, 379 were involved in the bottomfish fishery, and 148 were involved in the coral reef fishery. Fishermen in the pelagic fishery were more likely to be White. Fishermen in the bottomfish fishery were more likely to be Asian and/or in an older age group. Fishermen in the coral reef fish fishery were more likely to be Native Hawaiian, younger, have higher income, and/or have more education. Of those who were involved in the pelagic fishery, 57% self-identified as full-time or part-time commercial fishermen compared to 60% in the bottomfish fishery, and 65% in the coral reef fishery who self-identified in the same categories.

Table 35.--Fishermen demographics by fishery (percentage of responses).

Percentage of responses		All Respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
	Number of respondents (n)	*797*	*755*	*379*	*148*
Race	American Indian/Alaska Native	0.3	0.3	0.0	0.0
	Asian	40.8	40.2	56.1	39.7
	Hispanic or Latino	0.8	0.8	0.5	0.7
	Native Hawaiian	15.0	14.2	9.8	19.2
	Other Pacific Islander	3.1	3.0	3.7	4.1
	White	26.0	27.0	16.2	19.9
	Mixed	14.1	14.5	13.6	16.4
Age	Less than 25 years	0.6	0.7	0.3	0.7
	25 - 34 years	8.5	9.0	7.1	10.1
	35 - 44 years	14.3	14.8	12.1	18.9
	45 - 54 years	21.5	21.9	21.9	26.4
	55 - 64 years	32.4	32.3	32.5	26.4
	More than 64 years	22.7	21.3	26.1	17.6
Income	Less than $10,000	2.8	2.8	3.0	1.4
	$10,000 - $24,999	8.8	8.6	9.1	8.2
	$25,000 - $49,999	19.0	18.7	16.6	15.1
	$50,000 - $99,999	40.3	40.7	41.0	45.2
	$100,000 or more	29.1	29.2	30.2	30.1
Education	Less than high school	4.7	4.4	2.9	2.7
	High school graduate	25.5	25.6	22.0	20.9
	Some college or associate's degree	46.3	46.2	49.6	46.6
	Bachelor's degree or higher	23.5	23.9	25.5	29.7
Fisherman Classification	Full-time commercial	7.1	6.6	9.0	9.4
	Part-time commercial	51.0	50.2	50.8	55.7
	Recreational expense	26.7	27.8	27.1	23.5
	Purely recreational	10.8	11.1	8.0	6.0
	Subsistence	3.4	3.3	4.3	3.4
	Cultural	1.0	0.9	0.8	2.0

Table 36 shows the vessel characteristics by fishery. Vessels used in both pelagic and bottomfish fisheries were similar in size and horsepower. Vessels used in the coral reef fishery tended to be smaller, less powerful, older, less expansive, and had lower market value. Fishermen in the bottomfish fishery tended to have longer ownership of their vessel.

Table 36.--Vessel characteristics by fishery (mean, standard error, median, and percentage of responses).

		All Respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Boat length	*Number of respondents (n)*	*762*	*720*	*364*	*146*
	Mean	**22.9**	**23.1**	**22.8**	**21.7**
	Standard error	0.2	0.2	0.3	0.4
	Median	22.0	22.0	22.0	21.0
Boat horsepower	*Number of respondents (n)*	*751*	*709*	*363*	*144*
	Mean	**216.2**	**219.5**	**209.1**	**195.0**
	Standard error	6.7	7.0	8.1	14.1
	Median	180.0	190.0	180.0	150.0
Age of boat (years)	*Number of respondents (n)*	*711*	*673*	*346*	*136*
	Mean	**22.8**	**22.3**	**22.4**	**23.4**
	Standard error	0.5	0.5	0.7	1.1
	Median	22.0	22.0	22.0	24.0
Current boat ownership (years)	*Number of respondents (n)*	*729*	*691*	*348*	*138*
	Mean	**11.7**	**11.4**	**12.7**	**11.0**
	Standard error	0.4	0.4	0.6	0.9
	Median	9.0	8.0	10.0	7.0
Boat purchase price ($)	*Number of respondents (n)*	*717*	*678*	*347*	*137*
	Mean	**39,661**	**40,963**	**40,533**	**34,174**
	Standard error	1,813	1,899	2,296	3,531
	Median	26,000	27,500	27,000	20,000
Boat current market value ($)	*Number of respondents (n)*	*700*	*663*	*343*	*140*
	Mean	**43,039**	**44,499**	**42,651**	**36,816**
	Standard error	1,931	2,016	2,289	3,417
	Median	30,000	30,000	30,000	25,000
Own boat that fish on	*Number of respondents (n)*	*804*	*761*	*381*	*151*
	% Yes	95.3	95.1	95.8	96.7
Others used boat without you	*Number of respondents (n)*	*762*	*720*	*363*	*145*
	% of time				
	0%	90.8	90.7	91.5	87.6
	1%-25%	7.0	7.2	6.6	9.7
	26%-100%	2.2	1.7	1.7	2.8

Table 37 shows the characteristics of fishing activity by fishery. When compared across three fisheries, fishermen in the coral reef fishery made more trips in the past 12 months, used more different types of gears, and were more likely to fish in the state waters. Fishermen in the pelagic fishery were more likely to fish at FADs (84%) and had more people on board during a fishing trip.

Table 37.--Fishing activity characteristics by fishery (percentage of responses and mean).

	All Respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Number of BOAT fishing trips in the past 12 months (%)				
Number of respondents (n)	*795*	*752*	*372*	*149*
Fewer than 25 trips	53.1	52.8	48.4	45.6
25-49 trips	26.3	26.7	30.6	25.5
50-99 trips	13.2	13.3	14.8	18.1
100-200 trips	6.0	6.0	5.4	7.4
More than 200 trips	1.4	1.2	0.8	3.4
Mean[1]	**38.5**	**38.2**	**38.3**	**48.7**
Number of gears used in BOAT fishing trips in the past 12 months (%)				
Number of respondents (n)	*789*	*751*	*376*	*148*
One	27.6	25.3	4.5	4.7
Two	46.4	47.7	50.5	32.4
Three	18.3	18.9	30.3	29.1
Four	6.3	6.7	12.0	26.4
Five or more	1.4	1.5	2.7	7.4
Mean	**2.1**	**2.1**	**2.6**	**3.0**
Percent of your fishing trips occurred in state and federal jurisdiction (%)				
Number of respondents	*768*	*727*	*365*	*149*
State waters[1]	55.5	54.1	56.8	62.1
Federal waters[1]	45.5	45.9	43.2	37.9
Percent of fishing trips fished at Fish Aggregating Devices (%)				
Number of respondents (n)	*796*	*754*	*377*	*151*
0%	20.0	16.4	22.3	23.8
1%-25%	31.8	33.2	35.3	35.1
26%-50%	20.1	21.1	20.2	14.6
51%-75%	17.7	18.4	15.1	15.9
76%-100%	10.4	10.9	7.2	10.6
Mean percentage, exclude 0[1]	**39.5**	**39.5**	**35.5**	**38.0**
Number of people (including yourself) on board for an average trip (%)				
Number of respondents (n)	*755*	*718*	*355*	*145*
One	20.4	18.8	24.8	26.2
Two	47.2	47.6	49.0	38.6
Three	24.8	25.6	20.6	24.1
Four	6.1	6.3	4.2	8.3
Five or more	1.6	1.7	1.4	2.8
Mean	**2.2**	**2.3**	**2.1**	**2.2**

[1] Calculated using the medians of the response bins.

Table 38 shows the landings of pelagic fish, bottomfish, and reef fish by fishery. Across three fisheries, the volume of pelagic fish landings was similar (over 2,000 lbs) because small boat fishermen overlapped in multiple sub-fisheries. On average, fishermen in the coral reef fishery landed more fish annually and per trip compared to the other fisheries. This was due to several high landings of pelagic fish by fishermen who were in both pelagic and coral reef fisheries. On average, fishermen in the pelagic fishery landed 2,238 lbs pelagic fish, fishermen in the bottomfish fishery landed 622 lbs bottomfish, and fishermen in the coral reef fishery landed 793 lbs reef fish.

Table 38.--Landings by species group under each fishery (percentage of responses, mean, and median).

		All Respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Annual landings of pelagic fish, bottomfish, and reef fish					
	Number of respondents (n)	*805*	*763*	*381*	*151*
	None (%)	1.9	1.3	0.0	0.0
	1-50 pounds (%)	3.9	3.7	2.9	2.6
	51-100 pounds (%)	5.2	5.4	4.2	4.0
	101-500 pounds (%)	27.7	27.7	25.5	20.5
	501-1,000 pounds (%)	24.0	24.8	21.8	19.2
	More than 1,000 pounds (%)	37.4	37.2	45.7	53.6
	Mean (lbs)[1]	**2,719**	**2,740**	**3,053**	**3,375**
	Median (lbs)	750	750	850	1,125
Annual landings of pelagic fish	**Mean (lbs)**[1]	**2,150**	**2,238**	**2,130**	**2,215**
	Median (lbs)	750	750	300	750
Annual landings of bottomfish	**Mean (lbs)**[1]	**312**	**305**	**622**	**382**
	Median (lbs)	25	25	75	25
Annual landings of reef fish	**Mean (lbs)**[1]	**267**	**206**	**317**	**793**
	Median (lbs)	0	0	25	300
Average per trip landings of pelagic fish, bottomfish, and reef fish					
	Number of respondents (n)	*795*	*753*	*372*	*149*
	None (%)	1.9	1.3	0.0	0.0
	1-20 pounds (%)	23.9	24.2	24.5	22.8
	21-50 pounds (%)	37.2	37.3	37.1	32.2
	51-100 pounds (%)	20.4	20.6	19.1	22.8
	More than 100 pounds (%)	16.6	16.6	19.4	22.1
	Mean (lbs)[1]	**76.2**	**75.2**	**77.8**	**107.7**
	Median (lbs)	30.0	30.0	33.3	41.7

[1] Calculated using the medians of the response bins.

Table 39 shows the catch disposition and market participation by fishery. Almost half the fishermen in the coral reef fishery reported the distribution among fishermen on board varying by trip or did not know, and more than 44% of fishermen in the pelagic fishery reported the same. Catch disposition was similar across fisheries; two-thirds of the catch was sold. A majority of fishermen sold fish, particularly fishermen involved in the coral reef fishery (88%). Across three fisheries, pelagic fish represented the highest percentage of value of fish sold (63% overall). Most fishermen in the pelagic and bottomfish fisheries sold fish to wholesalers or auctions, and proportionally more fishermen in the coral reef fishery sold to other channels. Value of fish sold was higher in the bottomfish fishery with an average of $10,426 annually versus $8,375 in the pelagic fishery.

Table 39.--Catch disposition and market participation by fishery (percentage of responses, mean, and median).

		All Respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Catch distribution	*Number of respondents (n)*	*706*	666	328	134
	I kept all the fish I caught (%)	24.9	24.5	22.6	20.1
	I kept/received some % of total fish caught (%)	23.8	24.5	23.5	23.1
	I kept/ received some % of trip revenue (%)	6.4	6.3	6.7	6.7
	Don't know/different every time (%)	43.9	43.7	46.6	48.5
	Other (%)	1.0	1.1	0.6	1.5
Catch disposition	*Number of respondents (n)*	*738*	*710*	*358*	*148*
	Caught and released (%)	5.6	5.8	5.9	6.5
	Given away (%)	13.9	14.1	13.9	13.4
	Consumed at home (%)	15.4	15.5	15.1	16.7
	Sold (%)	65.0	64.6	65.1	63.4
Sold fish	*Number of respondents (n)*	*798*	*756*	*378*	*150*
	Yes (%)	82.8	83.2	82.0	88.0
Market outlet	*Number of respondents (n)*	*659*	*627*	*310*	*132*
	Wholesaler/auction (%)	71.6	72.9	74.5	65.2
	Restaurants/stores (%)	42.5	42.3	44.5	58.3
	Roadside/farmers' market (%)	7.9	7.7	7.1	11.4
	Friends/neighbors/coworkers (%)	27.3	27.8	29.0	37.9
	Other (%)	0.6	0.5	0.6	1.5
Value of fish sold	*Number of respondents (n)*	*648*	*617*	*303*	*126*
	Percentage of responses				
	$1-$100	2	2	2	0
	$101-$500	17	18	14	13
	$501-$1,000	17	16	15	14
	$1,001-$2,000	12	12	14	18
	$2,001-$5,000	20	20	20	15
	$5,001-$10,000	13	13	14	18
	$10,001-$20,000	8	8	8	10
	$20,001-$50,000	8	8	10	7
	Over $50,000	3	3	5	5
	Mean ($)[1]	**8,546**	**8,375**	**10,426**	**9,512**
	Median ($)	3,500	3,500	3,500	3,500
Percentage of value of fish sold from pelagic, bottomfish, reef fish, and other					
	Number of respondents (n)	*627*	*598*	*298*	*129*
	Pelagic fish (%)	62.9	66.8	50.6	48.6
	Bottomfish (%)	23.3	23.3	39.0	19.9
	Reef fish (%)	7.5	6.0	6.9	21.1
	Other (%)	6.4	3.9	3.5	10.4
Percentage of personal income came from the sale of fish					
	Number of respondents (n)	*644*	612	304	131
	1%-25% (%)	74.5	75.7	72.0	75.6
	26%-50% (%)	12.9	12.3	12.8	10.7
	51%-75% (%)	6.8	6.4	6.9	8.4
	76%-100% (%)	5.7	5.7	8.2	5.3
	Mean percentage[1]	**23.1**	**22.7**	**25.0**	**23.0**

[1] Calculated using the medians of the response bins.

Table 40 shows the fishing trip costs by fishery. The pelagic fishery shows the highest trip cost ($290), mostly due to higher fuel costs.

Table 40.--Fishing trip costs by fishery (mean, standard error, median, and percentage of total trip cost).

		Pelagic Fishery		Bottomfish Fishery		Coral Reef Fishery	
Variable cost		$ per trip	% of total trip cost	$ per trip	% of total trip cost	$ per trip	% of total trip cost
	Number of responses (n)	*806*		*257*		*71*	
Boat fuel	**Mean**	**146.11**	50.4	**109.29**	43.7	**61.28**	38.2
	Standard error	3.43		6.40		6.53	
	Median	121.37		80.00		50.00	
Truck fuel	**Mean**	**25.88**	8.9	**23.12**	9.3	**23.69**	14.8
	Standard error	0.81		1.30		2.47	
	Median	20.00		20.00		20.00	
Oil	**Mean**	**7.98**	2.8	**7.03**	2.8	**4.81**	3.0
	Standard error	0.58		1.10		0.93	
	Median	0.00		0.00		1.00	
Ice	**Mean**	**35.09**	12.1	**29.27**	11.7	**20.83**	13.0
	Standard error	1.06		1.76		2.24	
	Median	30.00		20.00		16.00	
Bait	**Mean**	**23.48**	8.1	**29.75**	11.9	**7.77**	4.8
	Standard error	1.25		2.24		1.65	
	Median	15.00		20.00		0.00	
Food and beverage	**Mean**	**26.23**	9.1	**24.92**	10.0	**21.56**	13.4
	Standard error	0.91		1.97		2.24	
	Median	20.00		20.00		20.00	
Daily maintenance & repair	**Mean**	**24.71**	8.5	**25.31**	10.1	**18.94**	11.8
	Standard error	1.42		2.86		2.89	
	Median	10.00		10.00		10.00	
Other trip cost	**Mean**	**0.39**	0.1	**1.26**	0.5	**1.69**	1.1
	Standard error	0.14		0.55		1.19	
	Median	0.00		0.00		0.00	
Total trip cost	**Mean**	**289.64**		**249.95**		**160.58**	
	Standard error	6.26		12.86		13.04	
	Median	250.00		193.00		140.00	

A previous study (Hospital, Bruce, and Pan, 2011) estimated the fishing trip costs for the pelagic fishery. Table 41 shows the comparison between the two studies. The previous study estimated the average pelagic fishery trip cost at $169 based on surveys fielded from 2007 to 2008. When adjusted for inflation, this became $198 in 2014 dollars. We estimated the pelagic fishing trip cost at $290, a 71% increase over 6 years in nominal values or a 46% increase in real values. The largest increase was in boat and truck fuel; a 50% increase in nominal values or a 28% increase in real values. Fuel price per gallon increased by about 20% between the two sampling periods. Thus, most of the increases in fuel costs were due to the increase in fuel price. Ice, bait, and daily maintenance and repair each showed approximately $16 increase in nominal values or $13 to $15 increase in real values. Compositions of fishing trip costs were similar. Fuel was the most important cost in both studies, followed by ice, food, and beverage. However, fuel costs comprised less of the total trip costs in this study (59% vs. 66% in Hospital, Bruce, and Pan 2011), whereas bait and daily maintenance and repair contributed more in this study (4% more for each item).

Table 41.--Fishing trip costs for pelagic fishery: this study (2013-14 survey values) vs. Hospital, Bruce, and Pan (2011, 2007-08 survey values) (mean, standard error, median, and percentage of total trip cost).

Variable	Study	Mean	Standard error	Median	Percentage of total trip cost (%)
Boat fuel	Hospital, Bruce, and Pan 2011	**99.98**	57.80	1000	57.8
	This study	**146.11**	3.43	121	50.4
Truck fuel	Hospital, Bruce, and Pan 2011	**14.86**	0.72	10	8.6
	This study	**25.88**	0.81	20	8.9
Oil	Hospital, Bruce, and Pan 2011	**2.28**	0.69	0	1.3
	This study	**7.98**	0.58	0	2.8
Ice	Hospital, Bruce, and Pan 2011	**18.74**	1.18	20	10.8
	This study	**35.09**	1.06	30	12.1
Bait	Hospital, Bruce, and Pan 2011	**7.39**	1.01	0	4.3
	This study	**23.48**	1.25	15	8.1
Food and beverage	Hospital, Bruce, and Pan 2011	**17.99**	0.97	18	10.4
	This study	**26.23**	0.91	20	9.1
Daily maintenance & repair	Hospital, Bruce, and Pan 2011	**7.79**	3.40	0	4.5
	This study	**24.71**	1.42	10	8.5
Other trip cost	Hospital, Bruce, and Pan 2011	-	-	-	-
	This study	**0.39**	0.14	0	0.1
Total trip cost	Hospital, Bruce, and Pan 2011	**169.03**	6.71	147.5	
	This study	**289.64**	6.26	250	

Fishing trip costs for bottomfish fishery in this survey (Table 42) were comparable with the estimates in Hospital and Beavers (2012). The average trip cost in Hospital and Beavers (2012) was $212, based on bottomfish fishery trips in 2009 and 2010. When adjusted for inflation, their average trip cost became $230 in 2014 dollars. The estimated trip cost in this study for bottomfish fishery was $250, which was 18% higher than in Hospital and Beavers (2012) in nominal values or 5% higher in inflation-adjusted values. The composition of trip costs was similar. In Hospital and Beavers (2012), fuel costs (boat and truck) were estimated at $119 in nominal values or $134 in real values, and they accounted for 56% of total trip costs; while in this study fuel costs were estimated at $132 and accounted for 53% of total trip costs. The second most important cost, bait, was slightly lower in this study ($30 vs. $32 in Hospital and Beavers (2012) in nominal values or $36 in real values). Ice and food and beverage costs were comparable.

Table 42.--Fishing trip costs for bottomfish fishery: this study (2013-14 survey values) vs. Hospital and Beavers (2012, 2009-10 survey values) (mean, standard error, median, and percentage of total trip cost).

Category	Study	Mean	Standard error	Median	Percentage of total trip cost (%)
Boat fuel	Hospital and Beavers 2012	**100.28**	4.25	80	47.3
	This study	**109.29**	6.40	80	43.7
Truck fuel	Hospital and Beavers 2012	**18.97**	0.85	15	9
	This study	**23.12**	1.30	20	9.3
Oil	Hospital and Beavers 2012	**-**	-	-	-
	This study	**7.03**	1.10	0	2.8
Ice	Hospital and Beavers 2012	**27.99**	1.65	20	13.2
	This study	**29.27**	1.76	20	11.7
Bait	Hospital and Beavers 2012	**32.11**	2.05	20	15.2
	This study	**29.75**	2.24	20	11.9
Food and beverage	Hospital and Beavers 2012	**25.29**	1.96	20	11.9
	This study	**24.92**	1.97	20	10
Daily maintenance & repair	Hospital and Beavers 2012	**-**	-	-	-
	This study	**25.31**	2.86	10	10.1
Other trip cost	Hospital and Beavers 2012	**7.25**	1.50	0	3.4
	This study	**1.26**	0.55	0	0.5
Total trip cost	Hospital and Beavers 2012	**211.90**	8.88	160	
	This study	**249.95**	12.86	193	

Table 43 shows the annual fixed costs in 2013 by fishery. On average, the coral reef fishery showed higher annual expenditure than the other two fisheries ($6,630 vs. $5,668 in the pelagic fishery and $5,864 in the bottomfish fishery). The differences were mainly due to more spending on gear replacement and repair and loan payments. There was a large proportion of fishermen in the coral reef fishery who identified themselves as commercial fishermen and reported higher spending in gear replacement and loan payments than non-commercial fishermen.

Table 43.--Annual fishing fixed costs in 2013 by fishery (mean, standard error, median, and percentage of fleet with expenditure).

Fixed cost		% of fleet with expenditure	Pelagic Fishery	% of fleet with expenditure	Bottomfish Fishery	% of fleet with expenditure	Coral Reef Fishery
	Number of respondents (n)		*709*		*362*		*145*
Gear replacement/ repair	**Mean**	**94.1**	**1,699**	**95.0**	**1,769**	**98.6**	**1,948**
	Standard error		96		132		236
	Median		1,000		787		1,000
Boat and trailer repair/ maintenance/ improvements	**Mean**	**91.1**	**1,661**	**92.5**	**1,939**	**97.2**	**1,891**
	Standard error		109		187		259
	Median		800		814		1,000
Loan payments	**Mean**	**15.1**	**998**	**14.9**	**953**	**18.6**	**1,581**
	Standard error		132		194		454
	Median		0		0		0
Boat insurance	**Mean**	**48.8**	**437**	**47.0**	**362**	**44.1**	**361**
	Standard error		31		32		50
	Median		0		0		0
Mooring fees	**Mean**	**18.1**	**425**	**16.3**	**360**	**15.9**	**365**
	Standard error		50		60		98
	Median		0		0		0
Fees	**Mean**	**94.5**	**397**	**95.6**	**424**	**96.6**	**414**
	Standard error		19		27		35
	Median		250		250		300
Financial services	**Mean**	**5.9**	**30**	**7.2**	**45**	**9.0**	**46**
	Standard error		7		13		17
	Median		0		0		0
Other	**Mean**	**1.7**	**20**	**1.4**	**11**	**2.1**	**24**
	Standard error		7		6		14
	Median		0		0		0
Annual fixed costs	**Mean**		**5,668**		**5,864**		**6,630**
	Standard error		248		365		746
	Median		3,470		3,600		3,350

Table 44 shows the comparison of annual fixed costs for the pelagic fishery estimated in this study versus in Hospital, Bruce, and Pan (2011). Their estimation of annual fixed costs of $11,102 in nominal values ($12,843 in 2013 dollars) was substantially higher than our estimation of $5,668. The major differences appeared in boat and trailer repair and maintenance. They also had a higher estimation in gear replacement and repair. Our estimations were higher for loan payments, boat insurance, and fees. There are two possible reasons for the lower expenditures in this study: 1) the previous study used in-person interviews with more active commercial fishermen who spent more on boat and trailer repair and maintenance than non-commercial fishermen, and 2) the fishermen may actually have spent less in repair and maintenance in recent years. The latter will need further study.

Table 44.--Annual fishing fixed costs for pelagic fishery: this study (2013 survey values) vs. Hospital, Bruce, and Pan (2011, 2007-2008 survey values) (mean, standard error, and median).

Category	Study	Mean	Standard error	Median
Gear replacement/repair	Hospital, Bruce, and Pan 2011	**2,588**	264	1,200
	This study	**1,699**	96	1,000
Boat and trailer repair/maintenance	Hospital, Bruce, and Pan 2011	**6,880***	-	-
	This study	**1,661**	109	800
Loan payments	Hospital, Bruce, and Pan 2011	**878**	178	0
	This study	**998**	132	0
Boat insurance	Hospital, Bruce, and Pan 2011	**401**	71	0
	This study	**437**	31	0
Mooring fees	Hospital, Bruce, and Pan 2011	-	-	-
	This study	**425**	50	0
Fees	Hospital, Bruce, and Pan 2011	**240**	18	200
	This study	**397**	19	250
Financial services	Hospital, Bruce, and Pan 2011	**60**	24	0
	This study	**30**	7	0
Other	Hospital, Bruce, and Pan 2011	**55**	22	0
	This study	**20**	7	0
Annual fixed costs	Hospital, Bruce, and Pan 2011	**11,102**	704	6,675
	This study	**5,668**	248	3,470

* Sum of two categories: major upgrades and improvements to the boat ($4,912) and maintenance/repair of the boat and trailer ($1,968)

When comparing the bottomfish fishery fixed costs estimated in Hospital and Beavers (2012), higher expenditure was found in their study ($8,211 in nominal values or $9,063 in 2013 dollars vs. $5,864 in this study). The differences were mainly from boat and trailer repair and maintenance and the additional categories listed in Hospital and Beavers (2012) including electronics, oil and lube, and safety equipment. These comparisons are presented in Table 45.

Table 45.--Annual fishing fixed costs for bottomfish fishery: this study (2013 survey values) vs. Hospital and Beavers (2012, 2009 survey values) (mean, standard error, median, and percentage of fleet with expenditure).

Category	Study	Mean	Standard error	Median	Percentage of fleet with expenditure (%)
Gear replacement/repair	Hospital and Beavers 2012	**1,544**	122	600	89.7
	This study	**1,769**	132	787	95.0
Boat and trailer repair/maintenance	Hospital and Beavers 2012	**3,247**	319	1,200	92.7
	This study	**1,939**	187	814	92.5
Loan payments	Hospital and Beavers 2012	**809**	129	0	26.9
	This study	**953**	194	0	14.9
Boat insurance	Hospital and Beavers 2012	**380**	45	0	38.2
	This study	**362**	32	0	47.0
Mooring fees	Hospital and Beavers 2012	**254**	39	0	18.1
	This study	**360**	60	0	16.3
Fees	Hospital and Beavers 2012	**306**	21	200	92.0
	This study	**424**	27	250	95.6
Financial services	Hospital and Beavers 2012	**197**	36	0	33.4
	This study	**45**	13	0	7.2
Other	Hospital and Beavers 2012	**264**	80	0	8.8
	This study	**11**	6	0	1.4
Electronics	Hospital and Beavers 2012	**702**	95	0	41.0
	This study	**-**	-	-	-
Oil and lube	Hospital and Beavers 2012	**320**	30	150	87.9
	This study	**-**	-	-	-
Safety equipment	Hospital and Beavers 2012	**187**	19	50	60.2
	This study	**-**	-	-	-
Annual fixed costs	Hospital and Beavers 2012	**8,211**	493	4,875	
	This study	**5,864**	365	3,600	

Table 46 shows the itemized expenditures for fishermen who reported non-zero fixed costs for particular items by fishery. The loan payments in the coral reef fishery were highest, probably due to more commercial fishermen in that fishery. Other categories were comparable across the fisheries. When compared with the annual expenditures for bottomfish fishery reported in Hospital and Beavers (2012), the larger differences appeared in loan payments, boat and trailer repair and maintenance, and other.

Table 46.--Annual fishing fixed costs in 2013 by fishery (non-zero expenditures) and comparison with Hospital and Beavers (2012, 2009 survey values) (mean, standard error, and median).

Fixed cost		This study Pelagic Fishery	Bottomfish Fishery	Coral Reef Fishery	Bottomfish Fishery (Hospital and Beavers 2012)
Gear replacement/repair	*Number of respondents(n)*	*667*	*344*	*143*	*395*
	Mean	**1,806**	**1,862**	**1,975**	**1,722**
	Standard error	100	137	239	133
	Median	1,000	1,000	1,000	800
Boat and trailer repair/ maintenance/ improvements	*Number of respondents(n)*	*646*	*335*	*141*	*409*
	Mean	**1,823**	**2,095**	**1,944**	**3,480**
	Standard error	118	199	265	338
	Median	1,000	1,000	1,000	1500
Loan payments	*Number of respondents(n)*	107	54	27	74
	Mean	**6,613**	**6,386**	**8,492**	**4,780**
	Standard error	645	1,027	1,966	575
	Median	4,800	4,800	6,000	3,720
Boat insurance	*Number of respondents(n)*	*346*	*170*	*64*	*169*
	Mean	**896**	**771**	**818**	**989**
	Standard error	55	53	84	100
	Median	600	513	600	600
Mooring fees	*Number of respondents(n)*	*128*	*59*	*23*	*80*
	Mean	**2,353**	**2,210**	**2,302**	**1,419**
	Standard error	206	256	442	163
	Median	1,652	1,560	1,860	1,150
Fees	*Number of respondents(n)*	*670*	*346*	*140*	*406*
	Mean	**420**	**444**	**429**	**332**
	Standard error	19	28	35	22
	Median	250	300	300	250
Financial services	*Number of respondents(n)*	*42*	*26*	*13*	*148*
	Mean	**507**	**633**	**512**	**583**
	Standard error	94	141	138	99
	Median	300	300	325	290
Other	*Number of respondents(n)*	*12*	*5*	*3*	*36*
	Mean	**1,178**	**816**	**1,150**	**3,199**
	Standard error	211	328	278	837
	Median	1,275	600	1,350	1,160
Electronics	*Number of respondents(n)*				*181*
	Mean				**1,706**
	Standard error				209
	Median				1,000

Table 46.--Continued.

Fixed cost		Pelagic Fishery	Bottomfish Fishery	Coral Reef Fishery	Bottomfish Fishery (Hospital and Beavers 2012)
Oil and lube	*Number of respondents(n)*				*388*
	Mean				**364**
	Standard error				33
	Median				200
Safety equipment	*Number of respondents(n)*				*264*
	Mean				**318**
	Standard error				30
	Median				138
Annual fixed costs	*Number of respondents(n)*	*709*	*362*	*145*	*437*
	Mean	**5,668**	**5,864**	**6,630**	**8,211**
	Standard error	248	365	746	493
	Median	3,470	3,600	3,350	4,875

This concludes the reporting of the empirical results from our survey. It should provide a high level of detail to include in the analysis of regulatory impacts, particularly when combined with the more detailed breakdown material in the Appendix B.

Fishermen's Comments and Suggestions for How Hawaii's Fisheries Should be Managed and Topics for Further Study

The last section of the survey was an open-ended topic to ask for fishermen's suggestions about how Hawaii's fisheries should be managed or topics that they feel need further study. The results are grouped into major subjects. Among the 806 respondents, 394 of them (49%) provided comments about fishery management or topics for further study. Figure 34 shows the frequency distribution of the comments among the 394 respondents. The dark color bars in the figure represent the sum of a subject, while the light color bars represent the detailed comments about the subject. The most mentioned subject was regulations (by 133 fishermen), including suggestions for new regulations and changes to existing regulations. Opening Bottomfish Restricted Fishing Areas (BRFAs) was the most addressed regulation (by 28 fishermen). The second most mentioned subject was FADs, with replacement of missing FADs as the top concern (by 60 fishermen), followed by general support of FADs (by 28 fishermen) since they help attract fish. However, there was also some opposition to private FADs (by 13 fishermen) and FADs in general (by 12 fishermen) as they attract and kill small fish. The third most mentioned subject was allowing an increase in size limit of catch and imposing a catch limit (by 72 fishermen). Most respondents wanted to impose a bigger size limit for ahi (bigeye and yellowfin tuna) which would allow small ahi to grow to a bigger size before being harvested. Other subjects included banning nets and traps, concerns about longline fishing pressure on the shared stock, imposing more regulations on longline fishing, better overall enforcement of regulations, improvement in maintenance and management, and concerns about low fish prices and high fishing costs.

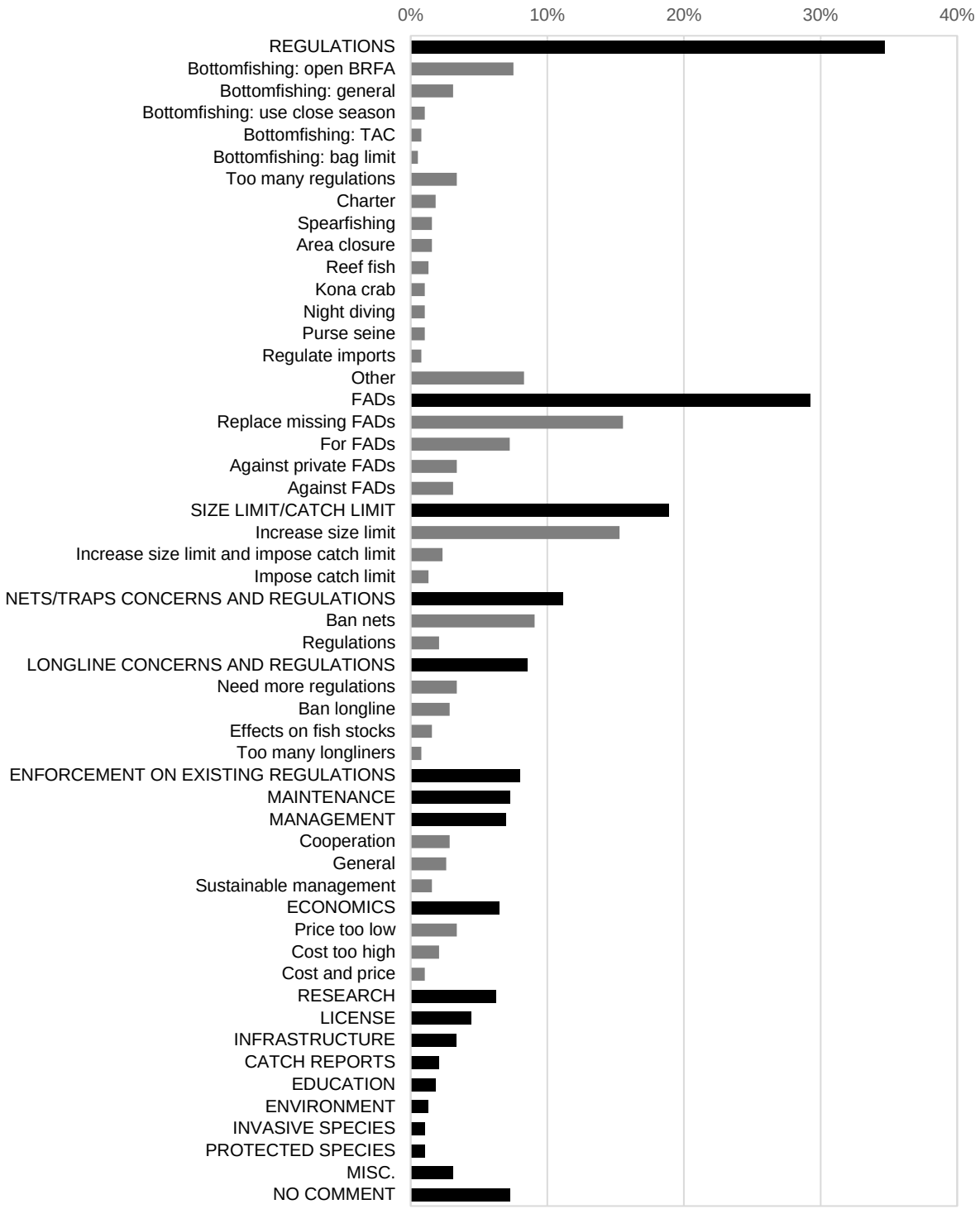

Figure 34.--Frequency distribution for fishermen's comments.

Fishermen's comments are also presented by commercial fishermen (including full-time and part-time) and non-commercial fishermen (including recreational expense, purely recreational, subsistence, cultural). Table 47 shows the top comments by commercial and non-commerical fishermen. The most addressed subjects were similar between the two types of fishermen.

These included replacing missing FADs and support of FADs, increasing size limit/imposing catch limits, bottomfishing regulations, nets/traps concerns and regulations, and longline concerns and regulations. For commercial fishermen, other important topics included opposition to FADs (in general) and private FADs. Non-commercial fishermen were more concerned about enforcement of existing regulations, maintenance, and management.

Table 47.--Most-mentioned subjects by fisherman type.

Commercial Fishermen		Non-commercial Fishermen	
Top concerns	% of fishermen	Top concerns	% of fishermen
FADs: for and replace missing FADs[1]	22.1	FADs: for and replace missing FADs[1]	23.8
Increase size limit	19.4	Increase size limit/impose catch limit	14.0
Regulation: bottomfishing	14.4	Nets/traps concerns and regulations	14.0
Nets/traps concerns and regulations	9.0	Regulation: bottomfishing	10.4
Against FADs and against private FADs	8.1	Enforcement	10.4
Longline concerns and regulations	8.1	Longline concerns and regulations	9.1
		Maintenance	9.1
		Management	7.9

[1] These included those who supported FADs and/or those who wanted the missing FADs be replaced.

Appendix Table B40 presents the frequency distribution of comments from all respondents and by commercial and non-commercial fishermen. The differences between comments made by commercial and non-commercial fishermen mostly occurred where the small boat commercial fishermen were in favor of bigger size limits, opening up (removing) BRFAs, and against FADs. Non-commerical fishermen were more likely to support net and trap bans, better enforcement of existing regulations, and were more concerned about sustainable management and over-regulation of the fishery.

DISCUSSION

This report summarizes the results of the Hawaii small boat survey conducted in 2014. With approximately half of the active small boat participants responding to the survey, this report provides a comprehensive description of the economic and social aspects of Hawaii small boat fishery including fishermen's demographic profiles, vessel characteristics, current fishing activity, social aspects of fishing, market participation, and economic costs of fishing including fishing trip costs and annual fixed costs.

Within the fishery, there are various types of fishermen with different fishing motivations. Selling fish for income was the primary motivation for full-time and part-time commercial fishermen since they sold approximately 70% of their catch. However, these fishermen also played important social roles in local community because they kept and gave away a substantial amount of their catch. Selling fish was common for the non-commercial fishermen, but to a lesser degree. On average, income from fish sold contributed 23% to personal income for all respondents. Clearly, different types of fishermen had different levels of involvement in fishing, such as number of trips, landings, and revenue annually. Variations also existed across islands. Participation in the small boat fishery over the past decade has increased, despite the increased

trip costs, primarily due to higher fuel prices. Any potential regulatory changes will have varying impacts across fisherman types and islands. With the last comprehensive cost-earnings study of Hawaii's small boat fishery that was conducted almost 20 years ago, this report provides an important update on the economic and social characteristics of the fishery, and it conducts a comparative analysis of the subgroups of the fishery. This information is crucial for fishery managers to evaluate the impacts from regulatory alternatives to the fishery and to various subgroups in the fishery.

ACKNOWLEDGMENTS

We want to thank many people who contributed to the success of this study. First and most importantly, we would like to thank all 824 fishermen who participated in this study and provided us valuable information regarding their fishing activities, income, and fishing costs. We particularly appreciate their willingness to provide written comments on fisheries management. Without their participation, we could not provide an accurate description of the Hawaii small boat fishery. We also want to thank Ed Watamura and Roy Morioka of the Waialua Boat Club who allowed us to introduce the survey during their club meeting. Moreover, we wish to thank Reginald Kokubun and Alton Miyasaka from the Division of Aquatic Resources who helped us at the planning stage of the study and provided the mailing list of the fishermen; Justin Hospital and Christopher Hawkins for reviewing and providing feedback on the survey instruments and brochure; and Kathleen Uno who designed the beautiful survey cover. Last, but not least, we wish to thank our graduate research assistance Jonathan Sweeney for his hard work in envelope stuffing, database development, and data entry.

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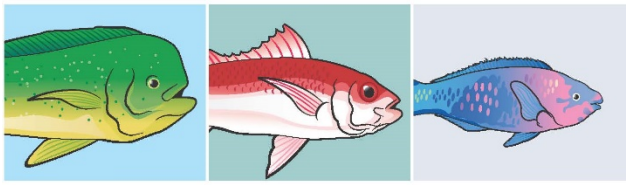
APPENDICES

Appendix A. Survey Questionnaire

NOAA FISHERIES

Hawaii Small Boat Survey 2014



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U.S. Department of Commerce | National Oceanic and Atmospheric Administration | National Marine Fisheries Service

OMB Control No. 0648-0691 Expiration Date 3/31/2017

Hello, please help us (NOAA) to better understand the importance of small boat fishing in Hawaii. Your details of fishing experiences and expenditures are important to ensure accurate results. We want to best represent Hawaii fishermen and we can only do that by hearing from as many fishermen as possible. While your response is voluntary, we hope that you will help us with this research.

SECTION A. YOUR FISHING EXPERIENCES

Different fishermen in Hawaii had different fishing experiences over the past 12 months. Please tell us about yours.

1. What type of fishing trips did you take in the past 12 months?

- ☐ I went fishing using a boat only → Go to Q2
- ☐ I went fishing sometimes using a boat and sometimes not using a boat → Go to Q2
- ☐ I went fishing not using a boat → Go to Q5

2. Approximately how many **BOAT** fishing trips did you take in the past 12 months?

- ☐ 0
- ☐ Fewer than 25 trips
- ☐ 25-49 trips
- ☐ 50-99 trips
- ☐ 100-200 trips
- ☐ More than 200 trips

3. In the past 12 months, what percent of your **BOAT** fishing trips were: (please check one for each gear type)

	0%	1%-25%	26%-50%	51%-75%	76%-100%
Trolling	☐	☐	☐	☐	☐
Handline for pelagic species	☐	☐	☐	☐	☐
Handline for bottomfish species	☐	☐	☐	☐	☐
Spearfishing	☐	☐	☐	☐	☐
Nets	☐	☐	☐	☐	☐
Other gear, please specify:					
_____	☐	☐	☐	☐	☐

4. In the past 12 months, did you use a green-stick as one of the gear types?

- ☐ YES
- ☐ NO

5. Approximately how many **NON-BOAT** fishing (shoreline) trips did you take in the past 12 months?

- ☐ 0
- ☐ Fewer than 25 trips
- ☐ 25-49 trips
- ☐ 50-99 trips
- ☐ 100-200 trips
- ☐ More than 200 trips

6. In the past 12 months, what percent of your **NON-BOAT** fishing (shoreline) trips were: (please check one for each gear type)

	0%	1%-25%	26%-50%	51%-75%	76%-100%
Rod and reel (pole)	☐	☐	☐	☐	☐
Spearfishing	☐	☐	☐	☐	☐
Cast/throw net	☐	☐	☐	☐	☐
Other gear, please specify:					
_____	☐	☐	☐	☐	☐

7. If you went **spearfishing** in the past 12 months, what percent of the time did you use scuba gear? And what percent of the time did you not use scuba gear?

	0%	1%-25%	26%-50%	51%-75%	76%-100%
Fishing trips with scuba gear	☐	☐	☐	☐	☐
Fishing trips without scuba gear	☐	☐	☐	☐	☐

8. In the past 12 months, what percent of your fishing trips occurred in state and federal jurisdiction?

	0%	1%-25%	26%-50%	51%-75%	76%-100%
State waters (0-3nm)	☐	☐	☐	☐	☐
Federal waters (greater than 3nm)	☐	☐	☐	☐	☐

9. How many people in total, including yourself, are on board for an average fishing trip? _____ people

10. In the past 12 months, approximately how many total pounds of pelagic fish (tuna, marlin, mahimahi, ono, etc., here excluding akule and opelu) did you catch?

- ☐ None
- ☐ 1 – 50 pounds
- ☐ 51 – 100 pounds
- ☐ 101 – 500 pounds
- ☐ 501 – 1000 pounds
- ☐ More than 1000 pounds → About how much? _____ pounds

11. In the past 12 months, approximately how many total pounds of bottomfish (opakapaka, onaga, uku, taape, etc.) did you catch?

- ☐ None
- ☐ 1 – 50 pounds
- ☐ 51 – 100 pounds
- ☐ 101 – 500 pounds
- ☐ 501 – 1000 pounds
- ☐ More than 1000 pounds → About how much? _____ pounds

12. In the past 12 months, approximately how many total pounds of reef fish (manini, uhu, weke ula, etc., here including akule and opelu) did you catch?

- ☐ None
- ☐ 1 – 50 pounds
- ☐ 51 – 100 pounds
- ☐ 101 – 500 pounds
- ☐ 501 – 1000 pounds
- ☐ More than 1000 pounds → About how much? _____ pounds

13. In the past 12 months, during what percent of your fishing trips did you fish at Fish Aggregating Devices (FADs):

0%	1%-25%	26%-50%	51%-75%	76%-100%
☐	☐	☐	☐	☐

SECTION B. MARKET PARTICIPATION

14. How do you define yourself as a fisherman? (check one that applies)

- ☐ Full-time commercial
- ☐ Part-time commercial
- ☐ Recreational expense
- ☐ Purely recreational
- ☐ Subsistence
- ☐ Culture
- ☐ Other, please specify _____

15. In the past 12 months, how were the catches distributed? (please check one and estimate percentage)

- ☐ I kept all the fish I caught
- ☐ I kept/received _____% of total fish caught
- ☐ I kept/received _____% of trip revenue
- ☐ Don't know/different every time
- ☐ Other, please describe: _____

16. In the past 12 months, what percent of your catch was:

	0%	1%-25%	26%-50%	51%-75%	76%-100%
Consumed at home	☐	☐	☐	☐	☐
Given away	☐	☐	☐	☐	☐
Caught and released	☐	☐	☐	☐	☐
Sold	☐	☐	☐	☐	☐

17. In the past 12 months, did you ever sell any of the fish you caught?

- ☐ YES ——→ **Go to Q18**
- ☐ NO ——→ **Go to Q22**

If you sold any of your fish...

18. In the past 12 months, where did you sell your fish?

- ☐ Wholesaler/auction
- ☐ Restaurants/stores
- ☐ Roadside/farmers' market
- ☐ Friends/neighbors/coworkers
- ☐ Other, please specify _____

If you sold any of your fish...

19. In the past 12 months, what was the approximate value of all the fish you sold?

- ☐ $1 - $100
- ☐ $101 - $500
- ☐ $501 - $1,000
- ☐ $1,001 - $2,000
- ☐ $2,001 - $5,000
- ☐ $5,001 - $10,000
- ☐ $10,001 - $20,000
- ☐ $20,001 - $50,000
- ☐ More than $50,000, specify $ _____

If you sold any of your fish...

20. In the past 12 months, what percent of the value of fish sold (question 19) came from the sale of pelagic fish, bottomfish, and reef fish?

	0%	1%-25%	26%-50%	51%-75%	76%-100%
Pelagic Fish	☐	☐	☐	☐	☐
Bottomfish	☐	☐	☐	☐	☐
Reef Fish	☐	☐	☐	☐	☐

If you sold any of your fish...

21. In the past 12 months, after expenses, what percent of your personal income came from the sale of fish?

1%-25%	26%-50%	51%-75%	76%-100%
☐	☐	☐	☐

SECTION C. YOUR VESSEL

In this section, we want to better understand the vessel and gear characteristics of the boat based fishery in Hawaii.

22. Do you own the boat that you fish on?

- ☐ YES ——→ **Go to Q23**
- ☐ NO ——→ **Go to Q30**

If you own the boat that you fish on...

23. In the past 12 months, what percent of time did other people (other than family members) use the boat **without** you?

0%	1%-25%	26%-50%	51%-75%	76%-100%
☐	☐	☐	☐	☐

24. What is the length of your boat? _____ feet

25. What is the total horsepower? _____ hp

26. In what year was the boat built? _____

27. In what year did you purchase the boat you fish on? _____
(If homebuilt - when did you complete it?)

28. How much did you pay to purchase the boat you fish on? $_____
(If homebuilt – how much did it cost to build it?)

29. What is the approximate market value of your boat?
(considering age and current condition and including motor(s) and trailer) $_____

SECTION D. YOUR FISHING TRIP COSTS

We now want to understand your per trip costs for fishing.
Please remember that all your answers are strictly confidential.

30. In the past 12 months, what was the primary gear usage for your most common trip (please check one)?

- ☐ Trolling
- ☐ Handline for pelagic species
- ☐ Handline for bottomfish species
- ☐ Spearfishing
- ☐ Nets
- ☐ Other gear, specify _____

30a. On average, how much money did you spend on your most common (question 30) gear type trip?

Type of Expenditure	Trip Expenditure
Boat fuel	$ _____
Truck fuel (round-trip)	$ _____
Oil	$ _____
Ice	$ _____
Bait	$ _____
Food and beverage	$ _____
Daily maintenance and repair	$ _____
Other, please specify: _____	$ _____

30b. How were the trip costs distributed among your most common gear type (question 30)? (please check one and estimate percentage)

- ☐ I paid all trip costs
- ☐ I paid a fixed amount of $ _____
- ☐ I paid _____% of the total trip costs
- ☐ Other, please describe: _____

31. In the past 12 months, what was your second most common gear usage (please check one)?

- ☐ Trolling
- ☐ Handline for pelagic species
- ☐ Handline for bottomfish species
- ☐ Spearfishing
- ☐ Nets
- ☐ Other gear, specify _____

31a. On average, how much money did you spend on your second most common (question 31) gear type trip?

Type of Expenditure	Trip Expenditure
Boat fuel	$ _____
Truck fuel (round-trip)	$ _____
Oil	$ _____
Ice	$ _____
Bait	$ _____
Food and beverage	$ _____
Daily maintenance and repair	$ _____
Other, please specify: _____	$ _____

31b. How were the trip costs distributed among your second most common gear type (question 31)? (please check one and estimate percentage)

- ☐ I paid all trip costs
- ☐ I paid a fixed amount of $ _____
- ☐ I paid _____% of the total trip costs
- ☐ Other, please describe: _____

SECTION E. 2013 FISHING EXPENDITURES

In an effort to better understand your economic contribution to the State of Hawaii's economy, we would like to ask about your fishing-related expenditures in 2013. In the table below please indicate how much, if any, was spent on the following items during 2013.

Enter "0" if you did not have any expenses in a category. Please do not leave blank.
Remember that all your answers are strictly confidential.

32.

Cost Category	2013 Expenditure (dollars)		
Boat insurance	$_____	☐ per month	☐ per year
Loan payments	$_____	☐ per month	☐ per year
Mooring fees	$_____	☐ per month	☐ per year
Gear replacement/repair (lines, lures, gaffs, rods, electric/hydraulic reels, spears, wetsuits, coolers, safety equipment, etc.)	$_____		
Annual boat and trailer repair, maintenance, and improvements	$_____		
Fees (CML, non-commercial permit ramp, registration for truck and trailer, safety, dry dock fees, etc.)	$_____		
Financial services	$_____		
Other, please specify: _____	$_____		

SECTION F. ABOUT YOU

Different people have different fishing experiences and different motivations for fishing. The following questions help us to better understand these differences.

33. What is your gender?

☐ Male
☐ Female

34. What is your age?

☐ Less than 25 years
☐ 25 to 34 years
☐ 35 to 44 years
☐ 45 to 54 years
☐ 55 to 64 years
☐ More than 64 years

35. What is the zip code where you live? _____

36. Are you Hispanic or Latino?

☐ Yes, Hispanic or Latino
☐ No, not Hispanic or Latino

37. How would you describe your race? (check all that apply)

☐ American Indian or Alaska Native
☐ Asian
☐ Black or African American
☐ Native Hawaiian
☐ Other Pacific Islander (specify) _____
☐ White

38. What is the highest level of education you have completed?

☐ Less than 9th grade
☐ Some high school (no diploma)
☐ High school graduate (including GED)
☐ Some college (no degree)
☐ Associates degree or technical school
☐ College graduate (bachelor degree)
☐ Advanced, professional, or doctoral degree

39. What was your total household income, before taxes, in 2013, including fishing income?

☐ Less than $10,000
☐ $10,000 to $24,999
☐ $25,000 to $49,999
☐ $50,000 to $99,999
☐ $100,000 to $249,999
☐ $250,000 or more

SECTION G. WHAT DO YOU THINK?

40. Do you have any suggestions for how Hawaii's fisheries should be managed or topics that you feel need further study?

Mahalo for participating in this survey.

Please use the enclosed postage paid return envelope to mail back your survey.

The information you have provided will improve our understanding of the importance of fishing in Hawaii.

Would you like to receive a copy of the final report for this study? (all personal information will be kept strictly confidential)

☐ YES
☐ NO

Name: _____

Address: _____

Email address: _____

May we contact you if we have any questions about your survey responses?

☐ YES Phone: _____ best time to reach you: _____
☐ NO (your phone number will be kept strictly confidential)

Appendix B. Summary Tables

Table B1.--Distribution of survey responses by most common gear (percentage of responses).

	Number of respondents (n)	Troll (%)	Pelagic handline (%)	Bottomfish handline (%)	Spear (%)	Nets (%)	Other (%)
All Respondents	***806***	**65.3**	**11.5**	**15.9**	**1.2**	**1.4**	**4.7**
By County							
Oahu	*292*	70.9	3.8	16.1	2.4	1.4	5.5
Hawaii	*290*	61.4	24.1	9.0	0.0	1.7	3.8
Maui	*124*	52.4	4.0	35.5	2.4	0.8	4.8
Kauai	*94*	75.5	6.4	11.7	0.0	1.1	5.3
By Fisherman Classification							
Full-time commercial	*57*	43.9	21.1	24.6	0.0	7.0	3.5
Part-time commercial	*407*	61.4	14.3	16.5	1.2	1.2	5.4
Recreational expense	*213*	74.6	7.5	12.2	1.4	0.5	3.8
Purely recreational	*86*	81.4	2.3	12.8	0.0	0.0	3.5
Subsistence	*27*	51.9	11.1	25.9	7.4	0.0	3.7
Cultural	*8*	50.0	12.5	12.5	0.0	12.5	12.5

Table B2.--Survey Responses: "How would you describe your race? (check all that apply)" (percentage of responses)

	Number of respondents (n)	American Indian/ Alaska Native (%)	Asian (%)	Hispanic or Latino (%)	Native Hawaiian (%)	Other Pacific Islander (%)	White (%)	Mixed (%)
All Respondents	***785***	**0.3**	**40.8**	**0.8**	**15.0**	**3.1**	**26.0**	**14.1**
By County								
Oahu	*287*	0.0	52.8	1.0	11.2	1.7	17.5	15.7
Hawaii	*287*	0.4	30.5	0.7	19.1	4.3	32.3	12.8
Maui	*122*	0.0	40.3	0.8	11.8	3.4	30.3	13.4
Kauai	*93*	1.1	37.0	0.0	18.5	2.2	26.1	15.2
By Fisherman Classification								
Full-time commercial	*55*	0.0	33.3	0.0	25.9	7.4	16.7	16.7
Part-time commercial	*402*	0.3	39.0	1.3	16.6	3.0	24.9	14.9
Recreational expense	*210*	0.5	46.2	0.5	9.6	2.4	27.9	13.0
Purely recreational	*86*	0.0	41.2	0.0	10.6	1.2	34.1	12.9
Subsistence	*27*	0.0	44.4	0.0	18.5	7.4	22.2	7.4
Cultural	*8*	0.0	25.0	0.0	37.5	0.0	12.5	25.0
By Most Common Gear								
Troll	*513*	0.4	35.7	1.0	14.2	3.5	30.2	15.0
Pelagic handline	*89*	0.0	36.0	0.0	18.0	1.1	31.5	13.5
Bottomfish handline	*124*	0.0	62.1	0.8	8.1	3.2	14.5	11.3
Spear	*10*	0.0	50.0	0.0	20.0	0.0	10.0	20.0
Nets	*11*	0.0	27.3	0.0	54.5	0.0	0.0	18.2
By Fishery								
Troll pelagic	*727*	0.3	39.6	0.8	14.6	3.0	27.1	14.6
Handline pelagic	*289*	0.0	36.3	0.0	18.0	5.2	27.3	13.1
Bottomfish	*376*	0.0	56.1	0.5	9.8	3.7	16.2	13.6
Coral reef	*146*	0.0	39.7	0.7	19.2	4.1	19.9	16.4

Table B3.--Survey Responses: "What is your age?" (percentage of responses)

	Number of respondents (n)	Less than 25 years (%)	25 - 34 years (%)	35 - 44 years (%)	45 - 54 years (%)	55 - 64 years (%)	More than 64 years (%)
All Respondents	*797*	0.6	8.5	14.3	21.5	32.4	22.7
By County							
Oahu	*288*	0.3	8.7	12.8	24.3	28.1	25.7
Hawaii	*287*	1.0	9.1	14.3	18.5	33.4	23.7
Maui	*123*	0.8	5.7	18.7	23.6	34.1	17.1
Kauai	*93*	0.0	10.8	14.0	19.4	40.9	15.1
By Fisherman Classification							
Full-time commercial	*56*	0.0	3.6	19.6	19.6	33.9	23.2
Part-time commercial	*403*	1.0	9.7	11.7	21.6	32.3	23.8
Recreational expense	*210*	0.5	6.2	19.5	23.3	31.9	18.6
Purely recreational	*86*	0.0	12.8	10.5	23.3	26.7	26.7
Subsistence	*27*	0.0	0.0	14.8	11.1	51.9	22.2
Cultural	*8*	0.0	25.0	25.0	0.0	25.0	25.0
By Most Common Gear							
Troll	*521*	0.6	9.2	15.4	21.3	32.8	20.7
Pelagic handline	*91*	2.2	12.1	13.2	19.8	37.4	15.4
Bottomfish handline	*126*	0.0	3.2	10.3	19.8	29.4	37.3
Spear	*10*	0.0	30.0	20.0	30.0	10.0	10.0
Nets	*11*	0.0	9.1	18.2	18.2	18.2	36.4
By Sub-fishery							
Troll pelagic	*738*	0.7	9.2	15.0	22.1	32.1	20.9
Handline pelagic	*292*	1.4	9.6	16.8	22.3	33.6	16.4
Bottomfish	*379*	0.3	7.1	12.1	21.9	32.5	26.1
Coral reef	*148*	0.7	10.1	18.9	26.4	26.4	17.6

Table B4.--Survey Responses: "What was your total household income, before taxes, in 2013, including fishing income?" (percentage of responses)

	Number of respondents (n)	Less than $10,000 (%)	$10,000 - $24,999 (%)	$25,000 - $49,999 (%)	$50,000 - $99,999 (%)	$100,000 or more (%)
All Respondents	***762***	**2.8**	**8.8**	**19.0**	**40.3**	**29.1**
By County						
Oahu	*275*	1.8	6.9	15.3	41.1	34.9
Hawaii	*277*	4.0	13.0	22.4	38.3	22.4
Maui	*117*	0.9	7.7	20.5	38.5	32.5
Kauai	*88*	4.5	3.4	19.3	48.9	23.9
By Fisherman Classification						
Full-time commercial	*54*	3.7	13.0	31.5	33.3	18.5
Part-time commercial	*387*	3.4	10.3	19.6	39.5	27.1
Recreational expense	*202*	1.5	7.4	14.9	43.1	33.2
Purely recreational	*81*	3.7	3.7	14.8	35.8	42.0
Subsistence	*25*	0.0	8.0	28.0	60.0	4.0
Cultural	*7*	0.0	0.0	42.9	42.9	14.3
By Most Common Gear						
Troll	*494*	2.0	7.5	17.6	40.9	32.0
Pelagic handline	*86*	5.8	18.6	24.4	36.0	15.1
Bottomfish handline	*123*	3.3	4.9	18.7	40.7	32.5
Spear	*10*	10.0	20.0	20.0	40.0	10.0
Nets	*11*	0.0	18.2	45.5	27.3	9.1
By Sub-fishery						
Troll pelagic	*706*	2.8	8.5	18.1	40.9	29.6
Handline pelagic	*282*	3.2	13.1	22.0	38.3	23.4
Bottomfish	*361*	3.0	9.1	16.6	41.0	30.2
Coral reef	*146*	1.4	8.2	15.1	45.2	30.1

Table B5.--Survey Responses: "What is the highest level of education you have completed?" (percentage of responses)

	Number of respondents (n)	Less than High School Graduate (%)	High School Graduate (%)	Some College or Associate's Degree (%)	Bachelor's Degree or Higher (%)
All Respondents	***795***	**4.7**	**25.5**	**46.3**	**23.5**
By County					
Oahu	*287*	3.8	24.0	40.4	31.7
Hawaii	*287*	5.6	29.6	42.5	22.3
Maui	*122*	4.9	21.3	59.8	13.9
Kauai	*93*	4.3	23.7	58.1	14.0
By Fisherman Classification					
Full-time commercial	*55*	7.3	40.0	45.5	7.3
Part-time commercial	*402*	6.5	27.1	45.3	21.1
Recreational expense	*210*	2.4	17.6	51.9	28.1
Purely recreational	*86*	2.3	26.7	36.0	34.9
Subsistence	*27*	0.0	25.9	59.3	14.8
Cultural	*8*	0.0	50.0	12.5	37.5
By Most Common Gear					
Troll	*521*	4.6	23.6	47.8	24.0
Pelagic handline	*91*	7.7	38.5	38.5	15.4
Bottomfish handline	*124*	3.2	21.8	45.2	29.8
Spear	*10*	10.0	50.0	40.0	0.0
Nets	*11*	9.1	27.3	45.5	18.2
By Sub-fishery					
Troll pelagic	*737*	4.2	25.1	46.3	24.4
Handline pelagic	*292*	4.5	31.2	45.2	19.2
Bottomfish	*377*	2.9	22.0	49.6	25.5
Coral reef	*148*	2.7	20.9	46.6	29.7

Table B6.--Survey Responses: "Do you own the boat that you fish on?"(percentage of responses)

	Number of respondents (n)	Yes (%)	No (%)
All Respondents	***804***	95.3	4.7
By County			
Oahu	*292*	95.2	4.8
Hawaii	*288*	94.1	5.9
Maui	*124*	98.4	1.6
Kauai	*94*	94.7	5.3
By Fisherman Classification			
Full-time commercial	*56*	96.4	3.6
Part-time commercial	*406*	94.6	5.4
Recreational expense	*213*	96.2	3.8
Purely recreational	*86*	94.2	5.8
Subsistence	*27*	100.0	0.0
Cultural	*8*	87.5	12.5
By Most Common Gear			
Troll	*526*	94.9	5.1
Pelagic handline	*91*	94.5	5.5
Bottomfish handline	*128*	96.1	3.9
Spear	*10*	100.0	0.0
Nets	*11*	100.0	0.0
By Sub-fishery			
Troll pelagic	*744*	95.0	5.0
Handline pelagic	*293*	95.2	4.8
Bottomfish	*381*	95.8	4.2
Coral reef	*151*	96.7	3.3

Table B7.--Survey Responses: "In the past 12 months, what percent of time did other people used boat without you?" (percentage of responses)

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)
All Respondents	***762***	**90.8**	**7.0**	**1.0**	**0.8**	**0.4**
By County						
Oahu	*275*	92.7	5.5	0.7	0.4	0.7
Hawaii	*271*	89.3	8.1	1.1	1.1	0.4
Maui	*121*	92.6	5.0	2.5	0.0	0.0
Kauai	*89*	86.5	11.2	0.0	2.2	0.0
By Fisherman Classification						
Full-time commercial	*54*	98.1	1.9	0.0	0.0	0.0
Part-time commercial	*383*	89.3	8.6	1.0	0.8	0.3
Recreational expense	*204*	90.7	6.9	0.5	1.0	1.0
Purely recreational	*81*	91.4	6.2	1.2	1.2	0.0
Subsistence	*27*	92.6	0.0	7.4	0.0	0.0
Cultural	*7*	100.0	0.0	0.0	0.0	0.0
By Most Common Gear						
Troll	*497*	90.3	7.6	0.8	0.6	0.6
Pelagic handline	*86*	87.2	8.1	2.3	2.3	0.0
Bottomfish handline	*122*	95.9	2.5	0.8	0.8	0.0
Spear	*10*	80.0	10.0	10.0	0.0	0.0
Nets	*11*	81.8	18.2	0.0	0.0	0.0
By Sub-fishery						
Troll pelagic	*703*	91.0	6.8	0.9	0.9	0.4
Handline pelagic	*279*	89.6	7.5	1.4	1.4	0.0
Bottomfish	*363*	91.5	6.6	0.8	0.8	0.3
Coral reef	*145*	87.6	9.7	2.1	0.7	0.0

Table B8.--Survey Responses: "What is the length of your boat?" (percentage of responses and mean)

	Number of respondents (n)	< 16 feet (%)	16 - 24 feet (%)	25 - 30 feet (%)	> 30 feet (%)	Mean (feet)
All Respondents	***762***	3.5	65.1	22.6	8.8	22.9
By County						
Oahu	*276*	2.9	63.0	21.4	12.7	24.1
Hawaii	*270*	5.6	74.1	17.4	3.0	21.1
Maui	*121*	0.0	56.2	36.4	7.4	23.9
Kauai	*89*	4.5	59.6	20.2	15.7	23.5
By Fisherman Classification						
Full-time commercial	*54*	3.7	38.9	35.2	22.2	25.4
Part-time commercial	*381*	3.4	65.9	24.4	6.3	22.5
Recreational expense	*204*	2.5	72.1	18.1	7.4	22.7
Purely recreational	*81*	4.9	58.0	23.5	13.6	24.1
Subsistence	*27*	7.4	81.5	3.7	7.4	20.6
Cultural	*7*	14.3	42.9	14.3	28.6	23.9
By Most Common Gear						
Troll	*496*	2.2	62.1	25.0	10.7	23.7
Pelagic handline	*86*	3.5	79.1	15.1	2.3	20.9
Bottomfish handline	*122*	3.3	63.9	24.6	8.2	22.8
Spear	*10*	20.0	80.0	0.0	0.0	18.7
Nets	*11*	18.2	81.8	0.0	0.0	18.4
By Sub-fishery						
Troll pelagic	*703*	3.3	65.0	22.8	9.0	23.1
Handline pelagic	*279*	3.9	67.7	21.5	6.8	22.2
Bottomfish	*364*	3.3	67.0	20.6	9.1	22.8
Coral reef	*146*	7.5	71.9	13.0	7.5	21.7

Table B9.--Vessel characteristics by county (mean, standard error, and median).

		All Respondents	Oahu	Hawaii	Maui	Kauai
Boat length (feet)	*Number of respondents (n)*	***762***	*276*	*270*	*121*	*89*
	Mean	**22.9**	24.1	21.1	23.9	23.5
	Standard error	**0.2**	0.4	0.3	0.4	0.7
	Median	**22.0**	23.0	20.0	24.0	22.0
Boat horsepower	*Number of respondents (n)*	***751***	*272*	*265*	*121*	*87*
	Mean	**216.2**	241.0	174.5	233.5	232.4
	Standard error	**6.7**	14.2	6.7	13.6	21.2
	Median	**180.0**	200.0	140.0	200.0	180.0
Age of boat (years)	*Number of respondents (n)*	***711***	*258*	*250*	*115*	*83*
	Mean	**22.8**	23.8	23.2	20.2	22.3
	Standard error	**0.5**	0.8	0.8	1.1	1.3
	Median	**22.0**	24.0	23.0	18.0	19.0
Current boat ownership (years)	*Number of respondents (n)*	***729***	*265*	*256*	*118*	*85*
	Mean	**11.7**	13.3	11.3	9.9	10.4
	Standard error	**0.4**	0.7	0.6	0.8	1.1
	Median	**9.0**	10.0	8.5	7.0	6.0
Boat purchase price ($)	*Number of respondents (n)*	***717***	*263*	*250*	*115*	*83*
	Mean	**39,661**	46,584	26,883	47,815	42,412
	Standard error	**1,813**	3,849	1,748	4,597	4,217
	Median	**26,000**	34,000	18,000	38,000	30,000
Boat current market value ($)	*Number of respondents (n)*	***700***	*259*	*243*	*109*	*83*
	Mean	**43,039**	48,173	32,654	45,232	52,898
	Standard error	**1,931**	4,058	1,898	4,135	6,176
	Median	**30,000**	35,000	24,000	30,000	35,000

Table B10.--Vessel characteristics by fisherman type (mean, standard error, and median).

		All Respondents	Full-time commercial	Part-time commercial	Recreational expense	Purely recreational	Subsistence	Cultural
Boat length (feet)	*Number of respondents (n)*	***762***	*54*	*381*	*204*	*81*	27	7
	Mean	**22.9**	25.4	22.5	22.7	24.1	20.6	23.9
	Standard error	**0.2**	1.0	0.3	0.4	0.8	1.0	2.5
	Median	**22.0**	25.0	22.0	22.0	23.0	19.0	21.0
Boat horsepower	*Number of respondents (n)*	***751***	*54*	*373*	*203*	*80*	26	7
	Mean	**216.2**	274.8	204.4	203.6	286.4	124.3	206.4
	Standard error	**6.7**	26.9	7.5	9.5	39.4	18.3	42.5
	Median	**180.0**	220.0	180.0	180.0	200.0	105.0	200.0
Age of boat (years)	*Number of respondents (n)*	***711***	*52*	*347*	*196*	*76*	26	7
	Mean	**22.8**	25.6	24.1	20.6	21.4	21.7	21.9
	Standard error	**0.5**	2.2	0.6	0.9	1.2	2.8	5.6
	Median	**22.0**	26.0	25.0	20.0	20.0	20.5	15.0
Current boat ownership (years)	*Number of respondents (n)*	***729***	*49*	*364*	*197*	*78*	27	7
	Mean	**11.7**	15.9	12.3	10.2	9.8	13.1	11.3
	Standard error	**0.4**	1.7	0.6	0.6	1.0	2.4	3.6
	Median	**9.0**	14.0	9.0	7.0	8.0	10.0	8.0
Boat purchase price ($)	*Number of respondents (n)*	***717***	*48*	*367*	*190*	*74*	26	6
	Mean	**39,661**	57,829	36,158	37,927	55,166	21,427	34,167
	Standard error	**1,813**	9,054	2,098	2,599	10,585	3,243	8,360
	Median	**26,000**	40,000	25,000	27,750	30,000	16,250	41,000
Boat current market value ($)	*Number of respondents (n)*	***700***	*48*	*350*	*189*	*74*	25	7
	Mean	**43,039**	63,104	40,337	40,513	58,662	20,232	28,357
	Standard error	**1,931**	7,936	2,279	2,616	11,685	3,130	8,104
	Median	**30,000**	45,000	29,000	30,000	29,500	12,000	25,000

Table B11.--Vessel characteristics by most common gear (mean, standard error, and median).

		All Respondents	Troll	Pelagic handline	Bottomfish handline	Spear	Nets
Boat length (feet)	*Number of respondents (n)*	***762***	*496*	*86*	*122*	*10*	*11*
	Mean	**22.9**	23.7	20.9	22.8	18.7	18.4
	Standard error	**0.2**	0.3	0.4	0.5	1.0	0.8
	Median	**22.0**	23.0	20.0	22.0	19.5	18.5
Boat horsepower	*Number of respondents (n)*	***751***	*486*	*85*	*122*	*10*	*11*
	Mean	**216.2**	234.6	172.2	211.8	124.4	95.3
	Standard error	**6.7**	9.3	12.6	12.6	27.7	21.1
	Median	**180.0**	200.0	140.0	200.0	120.0	60.0
Age of boat (years)	*Number of respondents (n)*	***711***	*467*	*80*	*116*	*9*	*8*
	Mean	**22.8**	21.5	24.9	25.3	20.4	38.0
	Standard error	**0.5**	0.5	1.5	1.1	5.5	7.0
	Median	**22.0**	21.0	24.5	26.0	17.0	35.5
Current boat ownership (years)	*Number of respondents (n)*	***729***	*477*	*84*	*117*	*10*	*8*
	Mean	**11.7**	10.3	13.7	15.2	7.5	17.3
	Standard error	**0.4**	0.4	1.3	1.0	1.2	5.8
	Median	**9.0**	8.0	11.5	13.0	6.5	12.0
Boat purchase price ($)	*Number of respondents (n)*	***717***	*464*	*83*	*117*	*10*	*10*
	Mean	**39,661**	44,977	24,135	39,141	18,940	8,680
	Standard error	**1,813**	2,467	2,819	4,297	5,128	2,081
	Median	**26,000**	30,000	16,000	25,000	15,500	6,650
Boat current market value ($)	*Number of respondents (n)*	***700***	*456*	*75*	*113*	*10*	*11*
	Mean	**43,039**	48,959	30,860	38,432	18,900	11,182
	Standard error	**1,931**	2,678	3,581	3,801	5,766	4,445
	Median	**30,000**	35,000	20,000	30,000	14,500	5,000

Table B12.--Survey Responses: "In the past 12 months, what percent of your BOAT fishing trips were: Trolling?" (percentage of responses and mean)

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips (Mean)
All Respondents	***789***	**7.0**	**17.4**	**25.2**	**14.1**	**36.4**	**58.2**
By County							
Oahu	*288*	8.0	13.9	21.5	13.9	42.7	62.9
Hawaii	*282*	3.2	20.9	29.1	14.5	32.3	56.3
Maui	*121*	14.9	20.7	27.3	8.3	28.9	47.8
Kauai	*92*	5.4	13.0	23.9	21.7	35.9	61.4
By Fisherman Classification							
Full-time commercial	*54*	22.2	25.9	14.8	18.5	18.5	38.1
Part-time commercial	*397*	8.3	19.9	25.2	15.6	31.0	54.2
Recreational expense	*210*	1.4	12.9	30.5	12.4	42.9	65.6
Purely recreational	*86*	3.5	8.1	18.6	9.3	60.5	74.7
Subsistence	*27*	11.1	25.9	18.5	11.1	33.3	53.2
Cultural	*8*	12.5	12.5	37.5	12.5	25.0	46.2
By Most Common Gear							
Troll	*518*	0.0	1.2	22.0	21.4	55.4	77.4
Pelagic handline	*92*	12.0	44.6	43.5	0.0	0.0	26.3
Bottomfish handline	*126*	19.8	54.0	26.2	0.0	0.0	20.5
Spear	*9*	33.3	44.4	22.2	0.0	0.0	15.6
Nets	*10*	40.0	60.0	0.0	0.0	0.0	9.2
By Sub-fishery							
Troll pelagic	*734*	0.0	18.7	27.1	15.1	39.1	62.5
Handline pelagic	*292*	5.8	25.3	37.3	18.5	13.0	43.2
Bottomfish	*376*	7.7	26.3	33.5	17.8	14.6	43.3
Coral reef	*148*	12.2	31.8	26.4	13.5	16.2	37.9

Table B13.--Survey Responses: "In the past 12 months, what percent of your BOAT fishing trips were: Handline for pelagic species?" (percentage of responses and mean)

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips (Mean)
All Respondents	***789***	**63.1**	**15.2**	**15.0**	**4.4**	**2.3**	**13.7**
By County							
Oahu	*288*	84.7	8.7	4.2	1.0	1.4	5.3
Hawaii	*282*	39.7	18.4	28.0	9.6	4.3	24.9
Maui	*121*	66.1	16.5	14.9	0.8	1.7	10.6
Kauai	*92*	62.0	25.0	9.8	3.3	0.0	9.7
By Fisherman Classification							
Full-time commercial	*54*	42.6	24.1	14.8	7.4	11.1	23.0
Part-time commercial	*397*	56.7	16.1	18.9	6.0	2.3	16.7
Recreational expense	*210*	68.6	15.7	11.9	2.9	1.0	10.4
Purely recreational	*86*	89.5	2.3	8.1	0.0	0.0	3.9
Subsistence	*27*	70.4	18.5	7.4	0.0	3.7	9.4
Cultural	*8*	37.5	37.5	12.5	12.5	0.0	20.0
By Most Common Gear							
Troll	*518*	70.1	17.4	12.5	0.0	0.0	8.0
Pelagic handline	*92*	0.0	2.2	40.2	38.0	19.6	61.7
Bottomfish handline	*126*	73.0	15.9	11.1	0.0	0.0	6.3
Spear	*9*	66.7	33.3	0.0	0.0	0.0	5.2
Nets	*10*	70.0	30.0	0.0	0.0	0.0	3.1
By Sub-fishery							
Troll pelagic	*734*	62.5	16.1	15.4	4.6	1.4	13.2
Handline pelagic	*292*	0.3	41.1	40.4	12.0	6.2	36.9
Bottomfish	*376*	61.7	21.0	13.0	3.2	1.1	10.7
Coral reef	*148*	57.4	25.7	11.5	4.7	0.7	11.0

Table B14.--Survey Responses: "In the past 12 months, what percent of your BOAT fishing trips were: Handline for bottomfish species?" (percentage of responses and mean).

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips (Mean)
All Respondents	***789***	**55.4**	**19.3**	**13.8**	**6.5**	**5.1**	**18.1**
By County							
Oahu	*288*	54.2	19.4	15.6	5.6	5.2	19.0
Hawaii	*282*	64.5	19.1	9.6	5.7	1.1	11.4
Maui	*121*	43.0	9.9	18.2	12.4	16.5	32.8
Kauai	*92*	44.6	32.6	16.3	4.3	2.2	17.3
By Fisherman Classification							
Full-time commercial	*54*	40.7	29.6	11.1	7.4	11.1	23.8
Part-time commercial	*397*	55.4	18.4	14.4	5.3	6.5	18.6
Recreational expense	*210*	55.2	22.9	14.8	5.7	1.4	15.6
Purely recreational	*86*	67.4	8.1	14.0	8.1	2.3	14.9
Subsistence	*27*	44.4	22.2	7.4	18.5	7.4	27.6
Cultural	*8*	62.5	25.0	0.0	12.5	0.0	10.6
By Most Common Gear							
Troll	*518*	65.1	22.4	12.5	0.0	0.0	9.1
Pelagic handline	*92*	64.1	26.1	9.8	0.0	0.0	7.2
Bottomfish handline	*126*	0.0	2.4	25.4	40.5	31.7	68.7
Spear	*9*	66.7	22.2	11.1	0.0	0.0	6.7
Nets	*10*	80.0	20.0	0.0	0.0	0.0	2.1
By Sub-fishery							
Troll pelagic	*734*	55.9	20.6	14.0	6.8	2.7	16.3
Handline pelagic	*292*	51.4	29.8	12.3	5.1	1.4	13.4
Bottomfish	*376*	6.4	40.4	29.0	13.6	10.6	37.9
Coral reef	*148*	52.0	23.6	12.8	7.4	4.1	16.1

Table B15.--Survey Responses: "In the past 12 months, what percent of your BOAT fishing trips were: Spearfishing?" (percentage of responses and mean).

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips (Mean)
All Respondents	***789***	**86.9**	**10.0**	**2.4**	**0.1**	**0.5**	**3.0**
By County							
Oahu	*288*	84.7	10.4	3.1	0.3	1.4	4.4
Hawaii	*282*	88.7	9.6	1.8	0.0	0.0	1.9
Maui	*121*	84.3	13.2	2.5	0.0	0.0	2.8
Kauai	*92*	91.3	6.5	2.2	0.0	0.0	2.2
By Fisherman Classification							
Full-time commercial	*54*	85.2	14.8	0.0	0.0	0.0	1.6
Part-time commercial	*397*	84.4	12.1	3.0	0.3	0.3	3.3
Recreational expense	*210*	89.5	6.7	2.9	0.0	1.0	3.2
Purely recreational	*86*	95.3	4.7	0.0	0.0	0.0	0.7
Subsistence	*27*	85.2	11.1	0.0	0.0	3.7	5.7
Cultural	*8*	75.0	25.0	0.0	0.0	0.0	3.1
By Most Common Gear							
Troll	*518*	90.0	8.3	1.7	0.0	0.0	2.0
Pelagic handline	*92*	85.9	10.9	3.3	0.0	0.0	2.8
Bottomfish handline	*126*	84.1	15.1	0.8	0.0	0.0	2.3
Spear	*9*	0.0	11.1	33.3	11.1	44.4	62.3
Nets	*10*	70.0	20.0	10.0	0.0	0.0	6.3
By Sub-fishery							
Troll pelagic	*734*	87.3	10.1	2.3	0.0	0.3	2.6
Handline pelagic	*292*	82.2	14.7	3.1	0.0	0.0	3.1
Bottomfish	*376*	85.9	11.7	1.9	0.0	0.5	2.6
Coral reef	*148*	39.2	46.6	11.5	0.7	2.0	13.3

Table B16.--Survey Responses: "In the past 12 months, what percent of your BOAT fishing trips were: Nets?" (percentage of responses and mean).

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips (Mean)
All Respondents	***789***	**94.4**	**3.4**	**1.1**	**0.4**	**0.6**	**1.7**
By County							
Oahu	*288*	94.8	2.4	1.7	0.7	0.3	1.9
Hawaii	*282*	94.0	3.9	1.1	0.0	1.1	1.9
Maui	*121*	93.4	5.8	0.0	0.8	0.0	1.2
Kauai	*92*	95.7	2.2	1.1	0.0	1.1	1.6
By Fisherman Classification							
Full-time commercial	*54*	83.3	5.6	3.7	0.0	7.4	8.8
Part-time commercial	*397*	94.5	3.5	1.3	0.5	0.3	1.5
Recreational expense	*210*	97.1	2.4	0.0	0.5	0.0	0.5
Purely recreational	*86*	97.7	1.2	1.2	0.0	0.0	0.7
Subsistence	*27*	92.6	7.4	0.0	0.0	0.0	0.9
Cultural	*8*	75.0	12.5	12.5	0.0	0.0	6.9
By Most Common Gear							
Troll	*518*	95.9	3.3	0.8	0.0	0.0	0.7
Pelagic handline	*92*	94.6	4.3	1.1	0.0	0.0	0.8
Bottomfish handline	*126*	98.4	1.6	0.0	0.0	0.0	0.2
Spear	*9*	77.8	22.2	0.0	0.0	0.0	1.7
Nets	*10*	0.0	0.0	20.0	30.0	50.0	75.9
By Sub-fishery							
Troll pelagic	*734*	95.0	3.5	1.0	0.4	0.1	1.2
Handline pelagic	*292*	92.1	6.2	1.0	0.3	0.3	1.5
Bottomfish	*376*	94.9	4.0	0.8	0.3	0.0	0.9
Coral reef	*148*	77.7	12.8	4.7	2.0	2.7	7.2

Table B17.--Average number of BOAT fishing trips by gear type (exclude 0).

	Troll (Mean)	Pelagic handline (Mean)	Bottomfish handline (Mean)	Spear (Mean)	Nets (Mean)
All Respondents	**21.1**	**18.8**	**14.6**	**9.9**	**24.5**
By County					
Oahu	20.6	15.0	13.2	10.5	20.2
Hawaii	21.8	22.4	14.1	10.1	42.6
Maui	15.8	13.3	16.8	5.8	3.9
Kauai	26.1	10.7	16.3	15.6	4.9
By Fisherman Classification					
Full-time commercial	44.4	43.4	29.7	14.8	82.2
Part-time commercial	22.1	20.2	15.5	9.3	11.8
Recreational expense	18.5	7.6	9.6	11.0	8.7
Purely recreational	15.3	8.2	10.2	2.2	3.6
Subsistence	15.4	11.1	14.4	13.5	1.4
Cultural	8.9	5.0	3.4	1.5	3.3
By Most Common Gear					
Troll	25.7	13.1	8.7	7.4	6.3
Pelagic handline	12.4	32.8	13.1	14.7	8.1
Bottomfish handline	8.3	11.0	24.0	7.6	4.0
Spear	9.2	2.9	10.2	22.8	5.9
Nets	8.5	7.0	2.5	15.8	86.9
By Sub-fishery					
Troll pelagic	21.1	17.2	13.4	9.8	12.1
Handline pelagic	20.9	18.8	15.0	9.1	13.4
Bottomfish	17.0	14.8	14.6	9.4	5.8
Coral reef	18.5	16.2	16.2	9.9	27.5

Table B18.--Survey Responses: "In the past 12 months, did you use a green-stick as one of the gear types?" (percentage of responses).

	Number of respondents (n)	Yes (%)	No (%)
All Respondents	***798***	**8.0**	**92.0**
By County			
Oahu	*291*	7.6	92.4
Hawaii	*288*	6.6	93.4
Maui	*122*	4.1	95.9
Kauai	*91*	17.6	82.4
By Fisherman Classification			
Full-time commercial	*56*	12.5	87.5
Part-time commercial	*404*	9.2	90.8
Recreational expense	*211*	7.1	92.9
Purely recreational	*84*	4.8	95.2
Subsistence	*27*	3.7	96.3
Cultural	*8*	0.0	100.0
By Most Common Gear			
Troll	*521*	8.4	91.6
Pelagic handline	*93*	7.5	92.5
Bottomfish handline	*127*	9.4	90.6
Spear	*9*	0.0	100.0
Nets	*10*	10.0	90.0
By Sub-fishery			
Troll pelagic	*740*	8.5	91.5
Handline pelagic	*292*	10.6	89.4
Bottomfish	*378*	9.5	90.5
Coral reef	*150*	4.7	95.3

Table B19.--Survey Responses: "If you went spearfishing in the past 12 months, what percent of the time did you use scuba gear?" (percentage of responses and mean).

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips (Mean, exclude 0)
All Respondents	***122***	**73.0**	**8.2**	**4.1**	**4.1**	**10.7**	**59.8**
By County							
Oahu	*49*	55.1	12.2	8.2	6.1	18.4	61.3
Hawaii	*38*	84.2	7.9	0.0	5.3	2.6	47.8
Maui	*26*	84.6	3.8	3.8	0.0	7.7	62.5
Kauai	*9*	88.9	0.0	0.0	0.0	11.1	88.0
By Fisherman Classification							
Full-time commercial	*12*	66.7	8.3	8.3	8.3	8.3	59.3
Part-time commercial	*60*	71.7	6.7	1.7	1.7	18.3	71.4
Recreational expense	*34*	73.5	11.8	5.9	8.8	0.0	40.0
Purely recreational	*8*	75.0	12.5	0.0	0.0	12.5	56.0
Subsistence	*5*	100.0	0.0	0.0	0.0	0.0	0.0
Cultural	*n.d*	n.d	n.d	n.d	n.d	n.d	n.d
By Most Common Gear							
Troll	*69*	75.4	10.1	5.8	2.9	5.8	48.4
Pelagic handline	*15*	80.0	6.7	0.0	6.7	6.7	54.0
Bottomfish handline	*24*	79.2	8.3	0.0	0.0	12.5	65.2
Spear	*6*	50.0	0.0	16.7	16.7	16.7	70.7
Nets	*n.d.*	n.d	n.d	n.d	n.d	n.d	n.d
By Sub-fishery							
Troll pelagic	*114*	75.4	8.8	4.4	3.5	7.9	54.0
Handline pelagic	*53*	75.5	11.3	3.8	1.9	7.5	48.0
Bottomfish	*63*	74.6	11.1	3.2	3.2	7.9	49.9
Coral reef	*76*	60.5	10.5	6.6	6.6	15.8	62.0

Note: n.d. = non-disclosure due to confidentiality concern because number of respondents is less than 3.

Table B20.--Survey Responses: "Approximately how many NON-BOAT fishing trips did you take in the past 12 months?" (percentage of responses and mean).

	Number of respondents (n)	0 trip (%)	Fewer than 25 trips (%)	25-49 trips (%)	50-99 trips (%)	100-200 trips (%)	Number of trips (Mean, exclude 0)
All Respondents	***777***	**64.5**	**31.1**	**3.0**	**1.3**	**0.1**	**16.8**
By County							
Oahu	*281*	66.9	29.2	2.5	1.1	0.4	17.3
Hawaii	*282*	66.7	31.2	1.1	1.1	0.0	14.8
Maui	*118*	52.5	39.8	6.8	0.8	0.0	16.6
Kauai	*90*	65.6	25.6	5.6	3.3	0.0	22.0
By Fisherman Classification							
Full-time commercial	*52*	63.5	25.0	3.8	7.7	0.0	27.8
Part-time commercial	*393*	69.2	26.7	3.1	1.0	0.0	16.5
Recreational expense	*205*	56.1	40.0	2.4	1.0	0.5	16.3
Purely recreational	*84*	66.7	31.0	2.4	0.0	0.0	13.7
Subsistence	*27*	59.3	33.3	7.4	0.0	0.0	16.4
Cultural	*8*	25.0	75.0	0.0	0.0	0.0	12.0
By Most Common Gear							
Troll	*504*	66.1	30.4	2.6	1.0	0.0	15.7
Pelagic handline	*92*	66.3	29.3	2.2	2.2	0.0	17.6
Bottomfish handline	*124*	60.5	33.9	2.4	2.4	0.8	20.1
Spear	*9*	55.6	22.2	22.2	0.0	0.0	24.0
Nets	*10*	60.0	40.0	0.0	0.0	0.0	12.0
By Sub-fishery							
Troll pelagic	*722*	63.4	32.0	3.0	1.4	0.1	16.9
Handline pelagic	*289*	57.8	36.0	3.8	2.4	0.0	17.8
Bottomfish	*371*	59.8	33.7	3.8	2.4	0.3	19.0
Coral reef	*146*	34.9	52.1	8.9	4.1	0.0	19.3

Table B21.--Gear usage in NON-BOAT fishing trips in the past 12 months (percentage of responses).

	Number of respondents (n)	Rod and reel (%)	Spear (%)	Cast/throw net (%)	Other (%)
All Respondents	***295***	**84.7**	**43.4**	**23.4**	**5.1**
By County					
Oahu	*101*	86.1	40.6	14.9	6.9
Hawaii	*98*	81.6	40.8	28.6	4.1
Maui	*60*	86.7	53.3	21.7	5.0
Kauai	*34*	88.2	44.1	35.3	2.9
By Fisherman Classification					
Full-time commercial	*24*	79.2	54.2	37.5	8.3
Part-time commercial	*131*	84.0	47.3	26.7	5.3
Recreational expense	*93*	86.0	38.7	17.2	2.2
Purely recreational	*29*	89.7	24.1	0.0	3.4
Subsistence	*11*	81.8	45.5	27.3	0.0
Cultural	*6*	83.3	66.7	83.3	33.3
By Most Common Gear					
Troll	188	84.6	37.8	22.9	4.3
Pelagic handline	31	87.1	54.8	29.0	0.0
Bottomfish handline	52	82.7	53.8	19.2	7.7
Spear	4	100.0	100.0	50.0	0.0
Nets	4	75.0	50.0	50.0	50.0
By Sub-fishery					
Troll pelagic	*280*	85.7	43.9	23.9	4.3
Handline pelagic	*125*	86.4	50.4	35.2	3.2
Bottomfish	*155*	85.2	46.5	26.5	5.2
Coral reef	*97*	83.5	71.1	34.0	8.2

Table B22.--Average number of NON-BOAT fishing trips by gear type (exclude 0).

	Rod and reel (Mean)	Spear (Mean)	Cast/throw net (Mean)	Other (Mean)
All Respondents	**12.0**	**8.7**	**9.0**	**7.6**
By County				
Oahu	13.7	8.2	10.8	6.0
Hawaii	10.0	9.2	7.4	11.3
Maui	10.5	9.2	7.9	6.8
Kauai	15.5	7.2	11.0	8.0
By Fisherman Classification				
Full-time commercial	13.8	14.0	14.9	18.8
Part-time commercial	10.8	8.6	9.2	5.7
Recreational expense	13.3	8.3	7.4	10.0
Purely recreational	13.0	5.7	0.0	12.0
Subsistence	13.3	7.9	6.8	0.0
Cultural	5.9	4.0	3.4	4.5
By Most Common Gear				
Troll	11.9	8.6	7.7	7.6
Pelagic handline	11.2	9.3	9.3	0.0
Bottomfish handline	13.0	8.9	16.7	9.8
Spear	7.3	14.0	5.3	0.0
Nets	5.8	3.5	4.3	3.0
By Sub-fishery				
Troll pelagic	12.0	8.7	9.1	7.8
Handline pelagic	10.6	10.0	8.4	10.7
Bottomfish	12.8	9.8	10.9	7.6
Coral reef	10.1	10.2	8.1	6.3

Table B23.--Survey Responses: "In the past 12 months, during what percent of your fishing trips did you fish at Fish Aggregating Devices (FADs)?" (percentage of responses and mean).

	Number of respondents (n)	0% (%)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of trips at FADs (Mean, exclude 0)
All Respondents	***796***	**20.0**	**31.8**	**20.1**	**17.7**	**10.4**	**39.5**
By County							
Oahu	*289*	20.4	39.4	17.0	15.2	8.0	34.7
Hawaii	*287*	17.8	28.9	22.0	20.9	10.5	41.3
Maui	*121*	28.9	18.2	15.7	18.2	19.0	50.9
Kauai	*93*	14.0	33.3	31.2	15.1	6.5	35.9
By Fisherman Classification							
Full-time commercial	*56*	30.4	30.4	17.9	12.5	8.9	37.4
Part-time commercial	*403*	19.9	31.5	21.6	18.4	8.7	38.7
Recreational expense	*210*	14.3	31.4	20.5	20.0	13.8	42.1
Purely recreational	*84*	22.6	34.5	17.9	13.1	11.9	38.2
Subsistence	*27*	44.4	18.5	11.1	14.8	11.1	45.7
Cultural	*8*	0.0	62.5	12.5	12.5	12.5	31.0
By Most Common Gear							
Troll	*518*	11.0	32.4	23.4	20.5	12.7	41.2
Pelagic handline	*93*	17.2	20.4	23.7	28.0	10.8	46.2
Bottomfish handline	*127*	44.1	37.0	12.6	3.1	3.1	25.0
Spear	*9*	55.6	33.3	0.0	0.0	11.1	31.0
Nets	*11*	36.4	45.5	9.1	9.1	0.0	22.9
By Sub-fishery							
Troll pelagic	*737*	15.3	33.4	21.6	18.6	11.1	39.6
Handline pelagic	*292*	14.7	27.7	24.7	21.2	11.6	42.3
Bottomfish	*377*	22.3	35.3	20.2	15.1	7.2	35.5
Coral reef	*151*	23.8	35.1	14.6	15.9	10.6	38.0

Table B24.--Survey Responses: "How many people in total, including yourself, are on board for an average trip?" (percentage of responses and mean).

	Number of respondents (n)	One (%)	Two (%)	Three (%)	Four (%)	Five or more (%)	Number of people (Mean)
All Respondents	***755***	**20.4**	**47.2**	**24.8**	**6.1**	**1.6**	**2.2**
By County							
Oahu	*274*	14.2	47.4	29.9	7.3	1.1	2.3
Hawaii	*271*	25.8	47.6	18.8	6.3	1.5	2.1
Maui	*115*	14.8	48.7	31.3	4.3	0.9	2.3
Kauai	*89*	29.2	44.9	19.1	3.4	3.4	2.1
By Fisherman Classification							
Full-time commercial	*52*	55.8	34.6	7.7	0.0	1.9	1.6
Part-time commercial	*374*	22.7	48.4	20.6	6.4	1.9	2.2
Recreational expense	*204*	11.8	51.5	29.9	6.4	0.5	2.3
Purely recreational	*86*	9.3	36.0	43.0	8.1	3.5	2.6
Subsistence	*23*	17.4	69.6	13.0	0.0	0.0	2.0
Cultural	*8*	37.5	25.0	12.5	25.0	0.0	2.3
By Most Common Gear							
Troll	*499*	13.6	45.9	31.1	7.6	1.8	2.4
Pelagic handline	*87*	27.6	55.2	12.6	2.3	2.3	2.0
Bottomfish handline	*117*	35.9	47.9	11.1	4.3	0.9	1.9
Spear	*7*	28.6	42.9	28.6	0.0	0.0	2.0
Nets	*10*	60.0	30.0	10.0	0.0	0.0	1.5
By Sub-fishery							
Troll pelagic	*703*	18.5	47.4	26.0	6.4	1.7	2.3
Handline pelagic	*274*	24.5	49.3	21.5	4.0	0.7	2.1
Bottomfish	*355*	24.8	49.0	20.6	4.2	1.4	2.1
Coral reef	*145*	26.2	38.6	24.1	8.3	2.8	2.2

Table B25.--Survey Responses: "In the past 12 months, approximately how many total pounds of pelagic, bottomfish, and reef fish did you catch?" (percentage of responses).

	Number of respondents (n)	None (%)	1-50 pounds (%)	51-100 pounds (%)	101-500 pounds (%)	501-1,000 pounds (%)	More than 1,000 pounds (%)
All Respondents	***805***	**1.9**	**3.9**	**5.2**	**27.7**	**24.0**	**37.4**
By County							
Oahu	*292*	3.1	3.8	5.1	27.7	24.0	36.3
Hawaii	*290*	1.0	4.5	4.5	29.7	23.8	36.6
Maui	*123*	0.8	4.1	5.7	26.8	22.8	39.8
Kauai	*94*	2.1	2.1	6.4	23.4	26.6	39.4
By Fisherman Classification							
Full-time commercial	*57*	0.0	3.5	0.0	10.5	1.8	84.2
Part-time commercial	*407*	2.2	3.7	5.2	21.4	23.8	43.7
Recreational expense	*212*	0.9	3.3	6.6	34.9	27.8	26.4
Purely recreational	*86*	3.5	5.8	3.5	51.2	23.3	12.8
Subsistence	*27*	3.7	0.0	14.8	25.9	40.7	14.8
Cultural	*8*	0.0	0.0	0.0	25.0	50.0	25.0
By Most Common Gear							
Troll	*526*	1.5	2.7	6.3	30.8	26.6	32.1
Pelagic handline	*93*	2.2	4.3	2.2	20.4	15.1	55.9
Bottomfish handline	*128*	0.0	3.9	3.9	22.7	22.7	46.9
Spear	*9*	11.1	0.0	11.1	33.3	11.1	33.3
Nets	*11*	0.0	9.1	0.0	27.3	9.1	54.5
By Sub-fishery							
Troll pelagic	*746*	1.1	3.6	5.5	27.9	25.1	36.9
Handline pelagic	*295*	0.7	2.7	3.4	22.4	22.0	48.8
Bottomfish	*381*	0.0	2.9	4.2	25.5	21.8	45.7
Coral reef	*151*	0.0	2.6	4.0	20.5	19.2	53.6

Table B26.--Survey Responses: "In the past 12 months, approximately how many total pounds of pelagic fish did you catch?" (percentage of responses).

	Number of respondents (n)	None (%)	1-50 pounds (%)	51-100 pounds (%)	101-500 pounds (%)	501-1,000 pounds (%)	More than 1,000 pounds (%)
All Respondents	***802***	**7.0**	**5.9**	**7.1**	**29.4**	**26.6**	**24.1**
By County							
Oahu	*291*	9.3	5.5	6.2	30.6	28.5	19.9
Hawaii	*289*	2.4	5.2	7.3	31.5	25.6	28.0
Maui	*123*	13.8	10.6	8.9	23.6	22.0	21.1
Kauai	*93*	5.4	3.2	6.5	28.0	30.1	26.9
By Fisherman Classification							
Full-time commercial	*57*	7.0	7.0	3.5	21.1	5.3	56.1
Part-time commercial	*404*	8.9	5.0	7.4	22.0	27.7	29.0
Recreational expense	*212*	2.8	5.7	7.1	39.2	28.8	16.5
Purely recreational	*86*	8.1	5.8	7.0	46.5	27.9	4.7
Subsistence	*27*	11.1	11.1	14.8	22.2	33.3	7.4
Cultural	*8*	0.0	0.0	0.0	37.5	37.5	25.0
By Most Common Gear							
Troll	*525*	1.7	3.2	7.0	31.8	30.9	25.3
Pelagic handline	*93*	4.3	4.3	4.3	23.7	23.7	39.8
Bottomfish handline	*127*	16.5	14.2	11.0	27.6	15.7	15.0
Spear	*9*	33.3	0.0	11.1	22.2	33.3	0.0
Nets	*11*	45.5	9.1	9.1	9.1	0.0	27.3
By Sub-fishery							
Troll pelagic	*744*	2.4	5.9	7.5	31.0	28.2	24.9
Handline pelagic	*295*	2.0	3.7	6.1	26.4	25.1	36.6
Bottomfish	*379*	7.7	6.6	7.7	29.0	25.1	24.0
Coral reef	*150*	14.7	4.0	4.7	22.7	28.0	26.0

Table B27.--Survey Responses: "In the past 12 months, approximately how many total pounds of bottomfish did you catch?" (percentage of responses).

	Number of respondents (n)	None (%)	1-50 pounds (%)	51-100 pounds (%)	101-500 pounds (%)	501-1,000 pounds (%)	More than 1,000 pounds (%)
All Respondents	***800***	**49.0**	**16.3**	**8.9**	**13.9**	**6.9**	**5.1**
By County							
Oahu	*291*	49.1	15.5	8.2	14.8	7.9	4.5
Hawaii	*288*	56.6	18.4	7.6	10.1	4.9	2.4
Maui	*122*	36.1	11.5	9.8	21.3	9.8	11.5
Kauai	*94*	39.4	19.1	13.8	13.8	6.4	7.4
By Fisherman Classification							
Full-time commercial	*57*	26.3	12.3	7.0	10.5	15.8	28.1
Part-time commercial	*403*	51.1	14.4	6.9	13.4	8.7	5.5
Recreational expense	*211*	48.3	19.9	12.3	14.2	3.8	1.4
Purely recreational	*86*	62.8	12.8	10.5	12.8	1.2	0.0
Subsistence	*27*	33.3	25.9	11.1	25.9	3.7	0.0
Cultural	*8*	37.5	25.0	12.5	25.0	0.0	0.0
By Most Common Gear							
Troll	*522*	59.0	16.3	8.4	10.3	3.8	2.1
Pelagic handline	*93*	54.8	20.4	6.5	6.5	6.5	5.4
Bottomfish handline	*127*	3.9	11.0	12.6	33.9	19.7	18.9
Spear	*9*	44.4	33.3	11.1	11.1	0.0	0.0
Nets	*11*	63.6	9.1	18.2	0.0	0.0	9.1
By Sub-fishery							
Troll pelagic	*741*	49.7	16.2	9.0	13.6	6.6	4.9
Handline pelagic	*295*	46.1	19.3	8.8	12.2	7.5	6.1
Bottomfish	*379*	11.6	24.0	15.6	24.8	13.5	10.6
Coral reef	*151*	35.8	20.5	10.6	13.9	12.6	6.6

Table B28.--Survey Responses: "In the past 12 months, approximately how many total pounds of reef fish did you catch?" (percentage of responses).

	Number of respondents (n)	None (%)	1-50 pounds (%)	51-100 pounds (%)	101-500 pounds (%)	501-1,000 pounds (%)	More than 1,000 pounds (%)
All Respondents	***801***	**50.2**	**20.2**	**8.9**	**12.5**	**4.7**	**3.5**
By County							
Oahu	*292*	49.0	19.5	10.6	10.6	6.2	4.1
Hawaii	*289*	57.8	19.7	6.2	9.3	4.2	2.8
Maui	*123*	39.8	24.4	10.6	20.3	4.1	0.8
Kauai	*92*	42.4	19.6	9.8	17.4	3.3	7.6
By Fisherman Classification							
Full-time commercial	*57*	35.1	7.0	8.8	15.8	15.8	17.5
Part-time commercial	*404*	51.7	17.8	9.7	11.4	5.7	3.7
Recreational expense	*211*	47.4	26.5	8.1	14.2	2.4	1.4
Purely recreational	*86*	62.8	20.9	8.1	8.1	0.0	0.0
Subsistence	*27*	51.9	29.6	3.7	11.1	3.7	0.0
Cultural	*8*	12.5	50.0	12.5	25.0	0.0	0.0
By Most Common Gear							
Troll	*524*	59.5	20.8	8.6	8.4	2.3	0.4
Pelagic handline	*93*	41.9	21.5	4.3	15.1	12.9	4.3
Bottomfish handline	*127*	27.6	20.5	13.4	23.6	7.1	7.9
Spear	*9*	11.1	22.2	22.2	22.2	0.0	22.2
Nets	*11*	18.2	9.1	0.0	27.3	9.1	36.4
By Sub-fishery							
Troll pelagic	*742*	51.1	21.2	9.0	12.1	4.4	2.2
Handline pelagic	*294*	44.6	21.4	7.1	15.6	7.8	3.4
Bottomfish	*378*	31.0	25.9	13.5	19.8	6.3	3.4
Coral reef	*151*	0.0	29.1	18.5	25.2	15.9	11.3

Table B29.--Survey Responses: "In the past 12 months, how were the catches distributed?" (percentage of responses).

	Number of respondents (n)	I kept all the fish I caught (%)	I kept/ received some % of total fish caught (%)	I kept/ received some % of trip revenue (%)	Don't know/ different every time (%)	Other (%)
All Respondents	***706***	**24.9**	**23.8**	**6.4**	**43.9**	**1.0**
By County						
Oahu	*263*	27.4	22.8	3.8	44.1	1.9
Hawaii	*250*	25.2	26.0	4.4	43.6	0.8
Maui	*108*	23.1	18.5	12.0	46.3	0.0
Kauai	*80*	18.8	23.8	13.8	43.8	0.0
By Fisherman Classification						
Full-time commercial	*43*	27.9	11.6	7.0	53.5	0.0
Part-time commercial	*357*	21.3	23.0	9.0	45.4	1.4
Recreational expense	*190*	19.5	27.4	4.2	48.4	0.5
Purely recreational	*79*	48.1	24.1	1.3	26.6	0.0
Subsistence	*25*	36.0	24.0	0.0	40.0	0.0
Cultural	*7*	28.6	28.6	14.3	28.6	0.0
By Most Common Gear						
Troll	*464*	22.8	26.9	5.6	43.3	1.3
Pelagic handline	*81*	23.5	16.0	6.2	54.3	0.0
Bottomfish handline	*109*	29.4	21.1	9.2	39.4	0.9
Spear	*10*	40.0	0.0	0.0	60.0	0.0
Nets	*10*	40.0	10.0	0.0	50.0	0.0
By Sub-fishery						
Troll pelagic	*649*	24.3	24.7	6.2	43.8	1.1
Handline pelagic	*254*	20.1	22.8	5.9	50.0	1.2
Bottomfish	*328*	22.6	23.5	6.7	46.6	0.6
Coral reef	*134*	20.1	23.1	6.7	48.5	1.5

Table B30.--Survey Responses: "In the past 12 months, how were the catches distributed?" Responses for percentage of total fish caught and percentage of trip revenue.

	Number of respondents (n)	I kept/ received some % of total fish caught (Mean percentage)	*Number of respondents (n)*	I kept/received some % of trip revenue (Mean percentage)
All Respondents	***165***	**45.5**	***41***	**62.9**
By County				
Oahu	*58*	46.3	*9*	63.8
Hawaii	*65*	44.4	*10*	58.6
Maui	*20*	49.5	*13*	65.0
Kauai	*18*	41.8	*9*	63.7
By Fisherman Classification				
Full-time commercial	*5*	19.0	*3*	90.0
Part-time commercial	*80*	37.4	*28*	64.3
Recreational expense	*51*	57.0	*8*	52.1
Purely recreational	*19*	47.0	*1*	40.0
Subsistence	*6*	67.5	*0*	-
Cultural	*n.d*	n.d	*n.d*	n.d
By Most Common Gear				
Troll	*123*	49.3	*22*	59.4
Pelagic handline	*13*	39.6	*5*	57.6
Bottomfish handline	*23*	32.8	*10*	78.5
Spear	*0*	0.0	*0*	0.0
Nets	*n.d*	n.d	*n.d*	n.d
By Sub-fishery				
Troll pelagic	*158*	45.9	*36*	61.5
Handline pelagic	*57*	41.6	*14*	62.2
Bottomfish	*75*	39.3	*21*	69.0
Coral reef	*29*	42.4	*9*	64.9

Note: n.d. = non-disclosure due to confidentiality concern because number of respondents is less than 3.

Table B31.--Survey Responses: "In the past 12 months, did you ever sell any of the fish you caught?" (percentage of responses).

	Number of respondents (n)	Yes (%)	No (%)
All Respondents	***798***	**82.8**	**17.2**
By County			
Oahu	*288*	79.5	20.5
Hawaii	*288*	85.4	14.6
Maui	*124*	82.3	17.7
Kauai	*92*	85.9	14.1
By Fisherman Classification			
Full-time commercial	*57*	100.0	0.0
Part-time commercial	*404*	91.3	8.7
Recreational expense	*210*	81.4	18.6
Purely recreational	*86*	50.0	50.0
Subsistence	*27*	44.4	55.6
Cultural	*8*	75.0	25.0
By Most Common Gear			
Troll	*523*	83.2	16.8
Pelagic handline	*92*	92.4	7.6
Bottomfish handline	*126*	77.0	23.0
Spear	*10*	70.0	30.0
Nets	*11*	90.9	9.1
By Sub-fishery			
Troll pelagic	*739*	83.1	16.9
Handline pelagic	*294*	90.5	9.5
Bottomfish	*378*	82.0	18.0
Coral reef	*150*	88.0	12.0

Table B32.--Percentage of value of fish sold from pelagic, bottomfish, reef fish, and other (percentage of responses).

	Number of respondents (n)	Pelagic fish (%)	Bottomfish (%)	Reef fish (%)	Other (%)
All Respondents	***627***	**62.9**	**23.3**	**7.5**	**6.4**
By County					
Oahu	*215*	59.3	23.5	15.2	2.0
Hawaii	*232*	69.5	14.3	5.6	10.6
Maui	*99*	53.0	45.1	0.4	1.4
Kauai	*76*	63.2	18.1	9.2	9.5
By Fisherman Classification					
Full-time commercial	*56*	55.0	28.0	7.4	9.6
Part-time commercial	*342*	66.2	22.1	8.0	3.8
Recreational expense	*169*	73.0	13.4	5.8	7.7
Purely recreational	*41*	66.5	3.2	4.8	25.5
Subsistence	*10*	70.8	26.2	0.7	2.3
Cultural	*6*	98.9	0.5	0.5	0.0
By Most Common Gear					
Troll	*417*	81.7	11.6	2.2	4.5
Pelagic handline	*77*	78.8	11.5	3.9	5.9
Bottomfish handline	*93*	19.4	70.1	9.9	0.5
Spear	*6*	16.0	4.1	71.9	8.0
Nets	*9*	6.2	2.7	21.2	69.8
By Sub-fishery					
Troll pelagic	*586*	68.8	21.6	6.0	3.6
Handline pelagic	*252*	74.4	18.2	4.7	2.7
Bottomfish	*298*	50.6	39.0	6.9	3.5
Coral reef	*129*	48.6	19.9	21.1	10.4

Table B33.--Survey Responses: “In the past 12 months, what percent of your personal income came from the sale of fish?” (percentage of responses and mean).

	Number of respondents (n)	1%-25% (%)	26%-50% (%)	51%-75% (%)	76%-100% (%)	Percentage of income from sale of fish (Mean percentage)
All Respondents	***644***	**74.5**	**12.9**	**6.8**	**5.7**	**23.1**
By County						
Oahu	*224*	77.2	12.1	5.4	5.4	21.9
Hawaii	*241*	71.0	12.9	9.1	7.1	25.3
Maui	*98*	72.4	15.3	7.1	5.1	23.4
Kauai	*77*	79.2	13.0	3.9	3.9	20.3
By Fisherman Classification						
Full-time commercial	*56*	25.0	14.3	19.6	41.1	56.8
Part-time commercial	*361*	72.3	16.9	8.0	2.8	22.5
Recreational expense	*169*	92.9	3.6	1.8	1.8	15.2
Purely recreational	*39*	82.1	15.4	2.6	0.0	17.3
Subsistence	*11*	81.8	9.1	0.0	9.1	21.3
Cultural	*6*	83.3	16.7	0.0	0.0	16.3
By Most Common Gear						
Troll	*424*	81.1	10.8	4.2	3.8	19.8
Pelagic handline	*81*	59.3	19.8	9.9	11.1	30.5
Bottomfish handline	*95*	63.2	14.7	12.6	9.5	29.3
Spear	*7*	71.4	28.6	0.0	0.0	19.4
Nets	*10*	40.0	20.0	30.0	10.0	39.8
By Sub-fishery						
Troll pelagic	*597*	76.2	12.1	6.2	5.5	22.4
Handline pelagic	*260*	67.3	13.8	10.4	8.5	27.2
Bottomfish	*304*	72.0	12.8	6.9	8.2	25.0
Coral reef	*131*	75.6	10.7	8.4	5.3	23.0

Table B34.--Fishing trip costs for most common and second most common gear usage by county (mean, standard error, and median).

		Total		Oahu		Hawaii		Maui		Kauai	
Category		$ per trip	% of total trip cost	$ per trip	% of total trip cost	$ per trip	% of total trip cost	$ per trip	% of total trip cost	$ per trip	% of total trip cost
	Number of respondents (n)	*1193*		*428*		*428*		*189*		*141*	
Boat fuel	**Mean**	**130.86**	48.7	**132.15**	50.4	**118.29**	46.3	**165.14**	51.3	**114.64**	45.5
	Standard error	2.89		4.37		4.29		9.44		8.14	
	Median	100.00		120.00		100.00		150.00		100.00	
Truck fuel	**Mean**	**25.03**	9.3	**23.44**	8.9	**27.37**	10.7	**26.01**	8.1	**21.88**	8.7
	Standard error	0.64		0.90		1.25		1.58		1.72	
	Median	20.00		20.00		20.00		20.00		20.00	
Oil	**Mean**	**7.39**	2.7	**6.82**	2.6	**6.37**	2.5	**13.12**	4.1	**4.64**	1.8
	Standard error	0.46		0.67		0.63		1.93		0.73	
	Median	0.00		0.00		0.00		5.00		0.00	
Ice	**Mean**	**32.39**	12.1	**34.09**	13.0	**26.32**	10.3	**35.59**	11.1	**41.73**	16.6
	Standard error	0.84		1.37		1.17		2.05		3.50	
	Median	25.00		30.00		20.00		30.00		30.00	
Bait	**Mean**	**23.33**	8.7	**16.45**	6.3	**30.04**	11.8	**26.74**	8.3	**18.36**	7.3
	Standard error	0.99		0.98		1.94		2.99		2.78	
	Median	15.00		10.00		20.00		20.00		5.00	
Food and	**Mean**	**25.31**	9.4	**23.80**	9.1	**24.41**	9.6	**30.35**	9.4	**25.37**	10.1
beverage	Standard error	0.77		0.77		1.69		1.92		1.74	
	Median	20.00		20.00		20.00		20.00		20.00	
Daily	**Mean**	**23.89**	8.9	**24.66**	9.4	**22.07**	8.6	**24.45**	7.6	**25.88**	10.3
maintenance	Standard error	1.16		1.87		2.04		2.42		3.87	
& repair	Median	10.00		10.00		10.00		15.00		10.00	
Other trip	**Mean**	**0.69**	0.3	**0.72**	0.3	**0.94**	0.4	**0.34**	0.1	**0.36**	0.1
cost	Standard error	0.17		0.32		0.33		0.27		0.36	
	Median	0.00		0.00		0.00		0.00		0.00	
Total trip	**Mean**	**268.63**		**262.12**		**255.46**		**321.73**		**252.12**	
cost	Standard error	5.29		7.31		8.82		16.83		15.54	
	Median	230.00		239.00		213.80		300.00		190.00	

Table B35.--Survey Responses: "How were the trip costs distributed among your most common and second most common gear type trip?" (percentage of responses).

	Number of respondents (n)	I paid all trip costs (%)	I paid a fixed amount (%)	I paid some percentage of the total trip costs (%)	Other (%)
All Respondents	*1,182*	92.0	0.9	5.8	1.3
By County					
Oahu	*422*	89.3	1.2	8.8	0.7
Hawaii	*428*	92.5	0.9	5.1	1.4
Maui	*187*	93.6	0.5	4.3	1.6
Kauai	*140*	95.7	0.7	1.4	2.1
By Fisherman Classification					
Full-time commercial	*84*	95.2	0.0	0.0	4.8
Part-time commercial	*597*	94.0	1.0	4.5	0.5
Recreational expense	*326*	89.3	0.9	8.3	1.5
Purely recreational	*113*	87.6	1.8	8.0	2.7
Subsistence	*38*	92.1	0.0	7.9	0.0
Cultural	*13*	92.3	0.0	7.7	0.0
By Most Common Gear					
Troll	*615*	91.4	1.0	6.3	1.3
Pelagic handline	*181*	94.5	0.0	3.9	1.7
Bottomfish handline	*241*	95.4	0.4	4.1	0.0
Spear	*40*	82.5	2.5	10.0	5.0
Nets	*18*	88.9	0.0	5.6	5.6
By Sub-fishery					
Troll pelagic	*615*	91.4	1.0	6.3	1.3
Handline pelagic	*182*	94.5	0.0	3.8	1.6
Bottomfish	*256*	94.1	0.8	5.1	0.0
Coral reef	*71*	85.9	2.8	7.0	4.2

			I paid a fixed amount of $___ ($)	I paid ___ % of the total trip costs (%)	
Those paid fixed amount	*10*		111.6		
Those paid some percent	*66*			60.8	

Table B36.--Annual fishing fixed costs in 2013 by county (mean, standard error, median, and percentage of fleet trip with expenditure).

Fixed cost item	% of fleet with expenditure		All Respondents	Oahu	Hawaii	Maui	Kauai
		Number of respondents(n)	*749*	*276*	*266*	*114*	*88*
Gear replacement/ repair	93.6	**Mean**	**1,671**	**1,613**	**1,711**	**1,410**	**2,099**
		Standard error	93	137	184	169	279
		Median	800	1,000	700	675	1,000
Boat and trailer repair/ maintenance/ improvements	90.7	**Mean**	**1,635**	**1,768**	**1,405**	**1,910**	**1,512**
		Standard error	104	175	175	284	262
		Median	750	775	500	1,000	750
Loan payments	15.1	**Mean**	**970**	**1,024**	**771**	**1,080**	**1,090**
		Standard error	125	238	168	346	271
		Median	0	0	0	0	0
Boat insurance	48.1	**Mean**	**420**	**628**	**262**	**338**	**299**
		Standard error	30	62	38	56	70
		Median	0	350	0	0	0
Mooring fees	17.9	**Mean**	**414**	**746**	**200**	**202**	**261**
		Standard error	48	114	37	64	113
		Median	0	0	0	0	0
Fees	94.5	**Mean**	**399**	**485**	**318**	**424**	**308**
		Standard error	18	34	27	43	33
		Median	250	300	200	250	250
Financial services	5.9	**Mean**	**30**	**30**	**17**	**38**	**61**
		Standard error	7	10	7	22	33
		Median	0	0	0	0	0
Other	1.6	**Mean**	**19**	**24**	**28**	**0**	**0**
		Standard error	6	11	14	0	0
		Median	0	0	0	0	0
Annual fixed costs		**Mean**	**5,557**	**6,317**	**4,713**	**5,401**	**5,629**
		Standard error	238	409	377	559	731
		Median	3,364	4,100	3,058	3,375	3,590

Table B37.--Annual fishing fixed costs in 2013 for all respondents and by county (non-zero expenditures on individual category) (mean, standard error, median).

Fixed cost item		All Respondents	Oahu	Hawaii	Maui	Kauai
Gear replacement/ repair	*Number of respondents (n)*	*701*	*260*	*251*	*104*	*82*
	Mean	**1,785**	**1,712**	**1,814**	**1,545**	**2,252**
	Standard error	98	143	193	180	292
	Median	1,000	1,000	800	1,000	1,100
Boat and trailer repair/ maintenance/ Improvements	*Number of respondents (n)*	*679*	*246*	*242*	*109*	*78*
	Mean	**1,803**	**1,983**	**1,544**	**1,997**	**1,706**
	Standard error	113	192	190	294	289
	Median	1,000	1,000	800	1,000	1,000
Loan payments	*Number of respondents (n)*	*113*	*39*	*35*	*17*	*21*
	Mean	**6,429**	**7,247**	**5,861**	**7,243**	**4,568**
	Standard error	616	1,309	894	1,693	740
	Median	4,680	5,472	4,200	4,422	3,300
Boat insurance	*Number of respondents (n)*	*360*	*182*	*98*	*50*	*25*
	Mean	**874**	**953**	**712**	**770**	**1,053**
	Standard error	53	85	86	100	171
	Median	600	600	500	500	800
Mooring fees	*Number of respondents (n)*	*134*	*68*	*37*	*18*	*7*
	Mean	**2,312**	**3,026**	**1,439**	**1,278**	**3,283**
	Standard error	198	335	156	305	829
	Median	1,588	2,352	1,248	1,000	3,000
Fees	*Number of respondents (n)*	*708*	*259*	*254*	*109*	*82*
	Mean	**422**	**517**	**333**	**444**	**330**
	Standard error	19	35	28	44	34
	Median	250	400	200	300	300
Financial services	*Number of respondents (n)*	*44*	*17*	*12*	*6*	*9*
	Mean	**514**	**490**	**382**	**729**	**592**
	Standard error	90	129	104	338	277
	Median	300	300	300	400	280
Other	*Number of respondents (n)*	*12*	*6*	*6*	*0*	*0*
	Mean	**1,178**	**1,100**	**1,255**	**0**	**0**
	Standard error	211	234	373	0	0
	Median	1,275	1,200	1,275	0	0
Annual fixed costs	*Number of respondents (n)*	*749*	*276*	*266*	*114*	*88*
	Mean	**5,557**	**6,317**	**4,713**	**5,401**	**5,629**
	Standard error	238	409	377	559	731
	Median	3,364	4,100	3,058	3,375	3,590

Table B38.--Annual fishing fixed costs in 2013 by fisherman type (non-zero expenditures on individual category) (mean, standard error, median).

Fixed cost item		Full-time commercial	Part-time commercial	Recreational expense	Purely recreational	Subsistence	Cultural
Gear replacement/ repair	*Number of respondents(n)*	*49*	*356*	*191*	*69*	*24*	*7*
	Mean	**3,846**	**1,786**	**1,511**	**1,391**	**1,206**	**1,404**
	Standard error	701	137	134	180	336	626
	Median	2,000	1,000	800	1,000	600	700
Boat and trailer repair/ maintenance/ Improvements	*Number of respondents(n)*	*47*	*341*	*182*	*73*	*23*	*7*
	Mean	**3,686**	**1,511**	**1,956**	**1,726**	**957**	**3,330**
	Standard error	762	114	263	262	185	2,460
	Median	2,000	900	1,000	900	500	1,000
Loan payments	*Number of respondents(n)*	*11*	*54*	*33*	*11*	*4*	*0*
	Mean	**10,228**	**6,483**	**6,154**	**4,678**	**2,355**	**0**
	Standard error	2,359	738	1,475	733	683	0
	Median	5,532	4,930	4,200	3,600	2,130	0
Boat insurance	*Number of respondents(n)*	*24*	*166*	*102*	*47*	*13*	*5*
	Mean	**1,052**	**1,008**	**710**	**783**	**551**	**702**
	Standard error	207	99	58	89	172	191
	Median	630	600	600	600	288	700
Mooring fees	*Number of respondents(n)*	*14*	*58*	*32*	*24*	*3*	*n.d*
	Mean	**2,217**	**2,145**	**2,568**	**2,481**	**2,680**	**n.d**
	Standard error	504	327	362	528	866	n.d
	Median	1,617	1,218	1,800	1,960	2,640	n.d
Fees	*Number of respondents(n)*	*48*	*360*	*191*	*71*	*24*	*8*
	Mean	**572**	**395**	**441**	**359**	**596**	**337**
	Standard error	86	21	41	38	205	135
	Median	500	250	265	250	350	110
Financial services	*Number of respondents(n)*	*7*	*24*	*10*	*0*	*n.d*	*0*
	Mean	**681**	**548**	**192**	**0**	**n.d**	**0**
	Standard error	240	119	38	0	n.d	0
	Median	442	333	175	0	n.d	0
Other	*Number of respondents(n)*	*0*	*6*	*3*	*3*	*0*	*0*
	Mean	**0**	**1,205**	**900**	**1,400**	**0**	**0**
	Standard error	0	273	379	635	0	0
	Median	0	1,275	1,000	1,400	0	0
Annual fixed costs	*Number of respondents(n)*	*53*	*379*	*200*	*77*	*26*	*8*
	Mean	**10,617**	**5,160**	**5,456**	**5,187**	**3,471**	**5,229**
	Standard error	1,454	314	433	585	603	2,759
	Median	6,300	3,150	3,605	3,550	2,411	2,735

Note: n.d. = non-disclosure due to confidentiality concern because number of respondents is less than 3.

Table B39.--Annual fishing fixed costs in 2013 by most common gear (non-zero expenditures on individual category) (mean, standard error, median).

Fixed cost item		Troll	Pelagic handline	Bottomfish handline	Spear	Nets
Gear replacement/ repair	*Number of respondents (n)*	*461*	*74*	*110*	*9*	*10*
	Mean	**1,782**	**2,296**	**1,516**	**1,144**	**1,611**
	Standard error	124	321	216	363	657
	Median	1,000	1,100	500	500	450
Boat and trailer repair/ maintenance/ Improvements	*Number of respondents (n)*	*443*	*74*	*108*	*9*	*10*
	Mean	**1,782**	**2,259**	**1,896**	**983**	**1,014**
	Standard error	135	470	291	276	436
	Median	1,000	814	800	500	300
Loan payments	*Number of respondents (n)*	*76*	*13*	*16*	*0*	*4*
	Mean	**7,254**	**4,893**	**4,725**	**0**	**3,702**
	Standard error	861	987	900	0	1,035
	Median	4,860	5,484	4,286	0	3,804
Boat insurance	*Number of respondents (n)*	*264*	*22*	*55*	*5*	*3*
	Mean	**939**	**822**	**682**	**820**	**487**
	Standard error	67	156	94	312	70
	Median	600	585	420	500	500
Mooring fees	*Number of respondents (n)*	*99*	*7*	*22*	*n.d*	*n.d*
	Mean	**2,424**	**1,306**	**2,290**	**n.d**	**n.d**
	Standard error	250	400	377	n.d	n.d
	Median	1,560	1,500	2,077	n.d	n.d
Fees	*Number of respondents (n)*	*464*	*78*	*110*	*8*	*10*
	Mean	**425**	**359**	**470**	**342**	**354**
	Standard error	24	42	53	61	100
	Median	300	200	283	350	244
Financial services	*Number of respondents (n)*	*26*	*8*	*4*	*n.d*	*n.d*
	Mean	**548**	**333**	**775**	**n.d**	**n.d**
	Standard error	132	132	419	n.d	n.d
	Median	300	228	475	n.d	n.d
Other	*Number of respondents (n)*	*9*	*n.d*	*n.d*	*0*	*0*
	Mean	**1,370**	**n.d**	**n.d**	**0**	**0**
	Standard error	243	n.d	n.d	0	0
	Median	1,400	n.d	n.d	0	0
Annual fixed costs	*Number of respondents (n)*	*493*	*80*	*118*	*9*	*11*
	Mean	**5,830**	**5,734**	**5,012**	**3,042**	**4,283**
	Standard error	306	759	533	785	1,160
	Median	3,550	3,623	2,825	2,000	5,183

Note: n.d. = non-disclosure due to confidentiality concern because number of respondents is less than 3.

Table B40.--Comments by fisherman type (percentage of responses).

	All Respondents	Commercial	Noncommercial
Number of respondents	*394*	*222*	*164*
REGULATIONS	**35%**	**36%**	**32%**
Bottomfishing: open BRFA	8%	9%	5%
Bottomfishing: general	3%	3%	3%
Bottomfishing: use close season	1%	0%	2%
Bottomfishing: TAC	1%	1%	-
Bottomfishing: bag limit	1%	0%	1%
Too many regulations	3%	2%	5%
Charter	2%	3%	1%
Spearfishing	2%	2%	1%
Area closure	2%	0%	3%
Reef fish	1%	2%	1%
Kona crab	1%	2%	-
Night diving	1%	1%	1%
Purse seine	1%	2%	-
Regulate imports	1%	1%	1%
Other	8%	7%	10%
FADs	**29%**	**30%**	**28%**
Replace missing FADs	16%	15%	16%
For FADs	7%	7%	7%
Against private FADs	3%	4%	2%
Against FADs	3%	4%	2%
SIZE LIMIT/CATCH LIMIT	**19%**	**22%**	**14%**
Increase size limit	15%	19%	9%
Increase size limit and impose catch limit	2%	1%	4%
Impose catch limit	1%	1%	1%
NETS/TRAPS CONCERNS AND REGULATIONS	**11%**	**9%**	**14%**
Ban nets	9%	7%	12%
Regulations	2%	2%	2%
LONGLINE CONCERNS AND REGULATIONS	**9%**	**8%**	**9%**
Need more regulations	3%	3%	4%
Ban longline	3%	3%	2%
Effects on fish stocks	2%	1%	2%
Too many longliners	1%	1%	-
ENFORCEMENT ON EXISTING	**8%**	**6%**	**10%**
MAINTENANCE	**7%**	**6%**	**9%**
MANAGEMENT	**7%**	**6%**	**8%**
Cooperation	3%	3%	2%
General	3%	3%	2%
Sustainable management	2%	-	4%
ECONOMICS	**6%**	**6%**	**7%**
Price too low	3%	3%	4%
Cost too high	2%	2%	2%
Cost and price	1%	1%	1%
RESEARCH	**6%**	**5%**	**7%**
LICENSE	**4%**	**5%**	**4%**
INFRASTRUCTURE	**3%**	**4%**	**3%**
CATCH REPORTS	**2%**	**1%**	**3%**
EDUCATION	**2%**	**1%**	**2%**
ENVIRONMENT	**1%**		**3%**
INVASIVE SPECIES	**1%**	**2%**	**-**
PROTECTED SPECIES	**1%**	**1%**	**-**
MISC.	**3%**	**3%**	**4%**
NO COMMENT	**7%**	**8%**	**7%**

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