Cost-Earnings Study of Hawaii's Small Boat Fishery, 1995-1996

Marcia S. Hamilton and
Stephen W. Huffman
National Marine Fisheries Service
2570 Dole Street
Honolulu, HI 96822

SOEST 97–06
JIMAR Contribution 97-314

Hamilton, Marcia S., and Stephen W. Huffman, Cost-Earnings Study of Hawaii's Small Boat Fishery, 1995-1996, 102 pp, University of Hawaii, Joint Institute for Marine and Atmospheric Research, 1000 Pope Road, Honolulu, HI, 96822, 1997.

Table of Contents

Acknowledgments

This study was conducted by two researchers from the University of Hawaii's Joint Institute for Marine and Atmospheric Research (JIMAR), Marcia Hamilton and Steve Huffman. Additional field assistance was provided by Kristen Miller, a student intern from the University of California at Santa Cruz.

We would like to thank the staff of the NMFS Honolulu Laboratory for their support, as well as the Hawaii Division of Aquatic Resources and the Hawaii Division of Boating and Ocean Recreation. We are especially grateful to William Aila, Kurt Kawamoto, and Sam Pooley for their informed assistance. Finally, we thank the many fishermen who participated in this project. Their willingness to contribute to a better understanding of Hawaii's fisheries speaks well of their interest in effective fishery management.

This project was funded by cooperative agreement #MA67RJ0154 between the Joint Institute for Marine and Atmospheric Research and the National Oceanic and Atmospheric Administration. It was part of the Hawaii Fishing Industry and Vessel Economics (HIFIVE) project under the Pelagic Fisheries Research Program. The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its subdivisions.

Abstract

The focus of study was Hawaii's 1995-1996 small boat pelagic fishery. Vessel owners and operators were surveyed through both in-person and mailback surveys. Information was obtained on 569 small boat fishermen. Data includes information on vessel operations and characteristics, investment and fixed costs, trip costs, annual catches, sales and gross revenue, as well as operator demographics. Surveys were stratified into four groups based on fishermen's motivations and reliance on fishing income: fulltime fishermen were defined as those who reported receiving over 50% of their income from fishing profits, parttime fishermen received 50% or less of their income from fishing, expense fishermen sold fish only to cover trip costs, and recreational fishermen did not sell any part of their catch over the previous 12 months. Clear differences were evident among groups. Fishing intensity (number of trips taken over the previous 12 months), catch and gross revenue were all found to decrease as operators' reliance on fishing income decreased (from fulltime to recreational). A majority of fishermen reported using more than one gear type, however fulltime fishermen reported doing more handlining relative to trolling when compared to other groups. Average trip costs were similar across groups, with fulltime fishermen spending more on ice and bait than others. An examination of the data on pelagic vessels by vessel length was also carried out. Sixty-six percent of the completed surveys belonged to vessels between 16 and 24 feet in length overall. In general, investment, costs, and catches rose along with vessel size. Operators of larger vessels reported a greater emphasis on handlining than did smaller vessels but all sizes utilized multiple gear types during the previous 12 months.

I. Introduction

This project focuses on Hawaii's 1995-1996 small boat pelagic fishery which is defined as Hawaii-based fishing vessels that targeted pelagic species during the 12 months prior to being surveyed. Charter boats were excluded from this study because most of their income is unrelated to fishing. We also did not consider longline vessels, vessels which target skipjack tuna using pole and line techniques (aku boats), or distant water albacore trollers. The 1995 ex-vessel value of Hawaii's small boat pelagic fishery (including charter boats' fish sales) was $7,700,000 which represents sales of 4,860,000 pounds of pelagic fish (Western Pacific Regional Fishery Management Council, 1996 p. 3-52[1]). According to the most recent study available (Pooley, 1993a), the 1990 ex-vessel value of Hawaii's commercial fishing industry as a whole totaled $50 million, which represented less than 1% of Hawaii's gross state product. Of this, approximately 60% was derived from longlining operations, 15% from troll and pelagic handline operations, and the remaining 25% from aku, albacore, bottomfish, lobster, and other gear types combined. Hawaii law does not require licenses, fish catch reports, or other data from recreational fishermen so the total number of fishery participants is unknown. Although several studies have addressed this issue, to date there are no valid estimates of recreational participation or catch by Hawaii-based fishermen (Pooley, 1993b).

Although this project was designed for and emphasizes the costs and earnings of commercial pelagic fishermen, information was also collected from recreational as well as from non-pelagic fishermen. This was due to the difficulty of screening out these fishermen during the survey process. Considerable confusion exists as to the definition of the term "commercial fisherman" in Hawaii; many people who sell relatively few fish consider themselves to be recreational fishermen. Additionally, others who sell large quantities without a commercial marine license (CML) or without filing catch reports may also define themselves as recreational fishermen if asked directly. Thus we quickly adopted a protocol of approaching every boat which was not clearly a non-pelagic, longline, aku, or charter boat and conducting a full survey with every willing participant. Post stratification was used to classify completed surveys.

This project did not attempt to estimate the aggregate magnitude of this small boat pelagic fishery in dollars, landings, or number of participants. Rather, it provides a picture of the costs and earnings associated with typical small pelagic fishing vessels as well as information on vessel operations and operator characteristics. A second JIMAR study will undertake a one year rolling phone survey of all registered boat owners in Hawaii. Information on vessel operations will be gathered along with further data on fishermen's motivations and behavior. When the results of these two projects are combined, a clearer view of Hawaii's small boat pelagic fishery should emerge.

II. Survey Methodology

The survey was administered through a combination of direct and mailback surveys. Development of the survey instrument began late in 1995 with a draft form which was reviewed and pretested by several key respondents. Following revisions, the survey process then began at Waianae boat harbor, where the feasibility and response rates to both in-person and mailback surveys were tested.

---

[1] Western Pacific Fishery Management Council, *Pelagic Fisheries of the Western Pacific Region 1995 Annual Report*. Data is based on catch reports submitted to Hawaii's Department of Aquatic Resources. These catch reports and an associated commercial marine license are required of all Hawaii fishermen who sell any portion of their catch. In 1995, 3,481 licenses were issued. Each license is valid for 12 months and costs $25.00.

Of the 132 mailback surveys distributed between January 22 and April 6, 1996, 17 were returned, a positive response rate of only 12.9 %. Meanwhile, an in-person approach yielded 11 completed interviews with no direct refusals, for a positive response rate of 100 % during this same period. For the remainder of the project, in-person interviews were attempted with all participants and mailback forms were only used when respondents were unwilling to be interviewed in person.

The survey was administered by three researchers beginning on January 22, 1996 and ending on November 20, 1996 (with five additional interviews in March, 1997). However, 80% of surveys were completed between April and August 1996, which is a peak fishing season in Hawaii when tunas and other pelagic fishes migrate through local waters. A total of 808 small boat fishermen were approached, with an overall response rate of 77% leading to 625 completed surveys. Mailback forms were received from 23 participants; the remaining 602 interviews were in person.

Boat harbors on every island were sampled with the intent of intercepting the maximum number of fishermen on any given day. Thus there is geographic as well as avidity and seasonal bias in the data. It is believed that the results shown here provide insight into Hawaii's small boat fishery and are representative of a large portion of this population. This is especially true of information relating to fixed and variable vessel costs, but less true of data on vessel operations such as number of trips per year. The precise extent of seasonal and avidity bias in this sample is not known.

Fishermen were intercepted at small boat harbors and launch ramps, and both trailered and moored boats were intercepted. Interviewers approached fishermen at the end of fishing trips, often as the fishermen washed their boats. Interviewers introduced themselves, explained the purpose of the survey and asked if the boat owner or captain would be willing to participate. The majority of vessels surveyed were owner operated, and so most interviews were with owners.

The survey process took 7–30 minutes and at the conclusion respondents received a cover letter which thanked them for their participation and included a correspondence address for further comments or questions. Respondents were also offered a free handbook published by the University of Hawaii's Sea Grant program[2] on maintaining fish quality and preventing ahi burn.

III. Survey Instrument

Three survey instruments were developed, one for all types of in-person interviews, one mailback for those fishermen who consider themselves to be commercial fishermen and a second mailback for those who don't. Samples of these may be found in the appendix. Survey questions can be divided into four areas: vessel and operating characteristics, fixed and variable costs, catch and sales, and demographic information.

As stated above, the terms "recreational" and "commercial" have various meanings in Hawaii. According to Hawaii state law any fisherman who sells at least one fish in a year is considered a commercial fisherman for that year. However, fishermen and industry members generally consider a commercial fisherman to be one who depends on profits derived from selling fish for at least a portion of his income. This definition would exclude a large number of Hawaii fishermen who sell fish in an attempt to cover their fishing costs but never realize or expect to realize a profit from their operation. This group exists because of a mix of easy access to markets and the lack of recreational bag limits.

---

[2] *The Management of Yellowfin Tuna in the Handline Fishing Industry of Hawaii.* Sea Grant Advisory Report, Contribution No. 36, University of Hawaii Sea Grant College Program, Honolulu Hawaii.

This combination also means that many otherwise "recreational" fishermen who find a good fishing spot will continue fishing past the point of supplying enough fish to meet their family's needs since they know they can easily sell any excess fish. Again, Hawaii state law considers this group to be commercial fishermen—but most industry members recognize the difference between a fisherman who sells to earn a living and a fisherman who sells only to cover a portion of his expenses or to dispose of excess catch. A fisherman who fishes for his livelihood will take more and longer trips, fish in rougher weather, and generally have higher catches than someone who sells fish only to cover his expenses. Thus, surveys were screened into three types of operations based on the operators' responses to the following questions.

> *"What do you do with the fish that you catch?"*

If no sales of fish were made in the previous twelve months, surveys were coded as belonging to **recreational vessels**.

If any fish were sold in the previous twelve months, an additional question was asked to further ascertain fishermen's motivations.

> *"When you sell your fish, do you consider yourself a commercial fisherman, trying to make some income, or do you sell only to cover your trip costs?"*

If sales were made to create income and/or participants considered themselves to be commercial fishermen, surveys were coded as belonging to **income vessels**. Surveys for participants who responded that they sold only to cover trip costs were coded as belonging to **expense vessels**. The relevance of this classification system is found in the fact that the vast majority of participants understood and easily answered this question, and the results show clear differences between the groups. All fishermen who sold fish were asked a third question to distinguish individual trip objectives.

> *"Do you also use your boat for purely recreational trips? For example taking your wife or kids out?"*

Based on this information, annual trips were allocated between objectives and gear types on a percentage basis. The following is an example of a typical response.

> "Yes, I sell fish but only if I catch a lot, just to try and cover some of my expenses. I would say I took a total of 50 trips in the past twelve months. I guess I took about 5 trips recreationally, the rest were fishing. When I take my kids we don't fish, just snorkel. When I'm fishing, I mostly troll and in the summer I handline the FADs for yellowfin. I would say 75% of my trips were trolling, for the rest I handlined the FADs."

This would be coded as an expense vessel with 5 recreational non-fishing trips, 33.75 (45*75%) expense trolling trips and 11.25 (45*25%) expense pelagic handlining trips. Cost and operational data on the two most common types of trips were collected, along with vessel characteristics and demographic information.

Because of confidentiality requirements, information on any group consisting of less than three vessels may not be published, thus in general this report will focus on differences between vessel types, sizes, and islands rather than between ports. Additionally, because of small sample sizes responses from Molokai and Lanai are combined into one group to allow the publication of information from these islands. The island of Hawaii (locally known as the Big Island) is generally referred to as Hawaii throughout this report. The state of Hawaii is referred to as such where clarification is needed.

IV. Sample Frame

Six hundred and twenty-five survey forms were completed. Of these, 578 were initially found to be usable. The remainder were either fragmentary because the respondent was unable to answer key questions, had owned his boat for less than six months, or had used his boat for at least one charter trip in the previous 12 months. Fishermen who had owned their vessels for less than 6 months were excluded because of the difficulty of deriving their annual totals in such a seasonal fishery. Vessels which were also used for charters were excluded because the operators of these vessels have additional income and expenses unassociated with the catch or sale of fish.

The vast majority of participants reported taking only single day trips but 21 respondents reported taking multi-day trips during the previous 12 months. Of these, 12 are included only in Tables 1-6, Figures 1-11, and Section E because they form cohesive gear groups. The remaining 9 utilized a variety of gears and were deleted from the database because mixing the costs and earnings resulting from single day trips with those from multi-day trips does not provide useful information. Thus, our complete database consists of 569 vessels.

Usable interviews were from 21 ports (Table 1). Also presented are the number of owner-operated (meaning that the owner operates the vessel on all trips) and the number of trailered vessels intercepted. Again, our sampling procedure was designed to intercept the maximum number of pelagic fishermen on any given day and thus we chose our survey site each day based on where we heard the fish were biting. Because the majority of our sample consists of trailered vessels, which can easily move between launching ramps, this process may have reduced geographic sampling bias, because we positioned ourselves in accordance with the majority of fishermen each day. Moored vessels were also approached and surveyed if the owner or captain was available. In general we were able to obtain prior information on the status and target of moored vessels. We made special efforts to locate the operators of active, pelagic vessels. We did not emphasize operators of inactive or non-pelagic boats. At Kewalo Basin, we were able to locate only one active small pelagic vessel. The remaining vessels moored there were either longliners, charter boats, or specialized in deep sea bottomfishing. We did not sample any Northwestern Hawaiian Islands trollers or Hawaii-based albacore vessels.

Table 1. Number of completed interviews, owner-operated and trailered vessels intercepted, by port

Island	Port	Total Completed Surveys	Number Owner-Operated	Number Trailered
Oahu	Waianae	129	104	124
N=340	Haleiwa	53	45	45
	Heeia Kea	69	60	66
	Keehi	70	62	62
	Hawaii Kai	13	12	13
	Kewalo Basin	1	1	0
	Unknown	5	3	5
Hawaii	Honokohau	41	35	38
N=112	Keahou	20	15	20
	Hilo	48	38	40
	Pohoiki	3	2	3
Kauai	Port Allen	18	14	17
N=56	Nawiliwili	13	11	13
	Kapaa	13	12	13
	Kikiaola	11	5	11
	Anini	1	1	1
Maui	Kihei	10	9	10
N=48	Maalaea	2	2	1
	Kahului	20	15	20
	Maliko	1	1	1
	Mala	15	14	15
Molokai N=6	Kaunakakai	6	5	2
Lanai N=7	Manele Bay	7	5	4
Total	All ports	569	471	524

Participants' motivations were distributed as indicated in Tables 2 and 3. Although 72% of our sample sold at least some of their catch, recreational fishermen who sold no fish during the previous year were nonetheless a relatively large percentage (28%). Many people believe that very few fishermen in Hawaii are truly recreational and that the self-definition allowed by our survey process may have led to strategic bias reflecting underreporting of income from fish sales. However, we saw clear differences between this group and others. Recreational fishermen generally had higher levels of household income, took fewer trips, and caught fewer fish than did other groups (Section A). This lower level of fishing avidity has two implications. First, recreational fishermen may be underrepresented in our sample because they were less likely to be fishing and thus less likely to be intercepted on any given day. Second, those that were surveyed were apt to be among the most avid of recreational fishermen. This means that the results presented here may overstate the activity levels of a "typical" Hawaii recreational fishermen while understating the proportion of Hawaii fishermen who fish recreationally.

Whether these currently recreational fishermen **would** sell a portion of their catch if they had an especially good trip or year is unknown. However we do know that these were generally not very avid fishermen and that many stated categorically that they "never sell."

Table 2. Respondents' motivations

Motivation of Respondent	Number of Respondents	Percent of Sample
Income	184	32.3
Expense	227	39.9
Recreational	158	27.8

Table 3. Respondents' motivations by island

Motivation of Respondent	Oahu	Hawaii	Kauai	Maui	Molokai/Lanai
Income	85	67	16	12	4
Expense	128	36	31	24	8
Recreational	127	9	9	12	1

Vessels were further stratified into size classes based on vessel length overall as follows:

Size 1 less than 16 feet
Size 2 16 to 24 feet
Size 3 greater than 24 feet to less than 30 feet
Size 4 30 feet or longer

These size classes were chosen to reflect at sea limitations as well as expected variations in costs and earnings. The number of vessels in each class is presented in Table 4.

Table 4. Number of vessels by size class

Size Class	Number of Vessels	Percent of Sample
1	31	5.4
2	378	66.4
3	111	19.5
4	49	8.6

Over 40 different gear types were found to be used; these were aggregated into nine categories (Table 5): trolling (includes live baiting), palu ahi (daytime pelagic handlining), ika shibi (nighttime pelagic handlining) (Boggs, 1993), deep sea bottomfishing (referred to as "bottomfishing" in this report), akule and opelu fishing (with net or hook), reef fishing (with net or hook), and collecting aquarium fish. The "other" category includes a variety of techniques used by a small group of large vessels which fish seamounts and weather buoys (see Section E). These techniques include pelagic handlining (both day and nighttime), trolling, and the use of other specialized gear. Also included in the "other" category are all other gears (primarily dragging for octopus, collecting lobsters, and crabbing). The majority of vessels reported using more than one type of gear during the previous 12 months, either within one trip or on separate trips. If more than one gear type was used on one trip, trips were coded according to the **primary** gear used. Finally, vessels were categorized by gear type based on the gear used on the **majority** (greater than 50%) of trips (Sections E and F). Vessels which had an equal number of trips of two gear types were categorized as **dual** gear vessels.

Table 5. Primary gear types (number of vessels)

Primary Gear Type	At Least One Trip	More Than 50% of Trips	Exclusively (All Trips)
Trolling	457	277	100
Palu ahi	73	26	7
Ika shibi	74	19	4
Reef fishing	143	51	27
Bottomfishing	230	45	14
Akule/Opelu fishing	47	15	2
Collecting aquarium fish	8	5	2
Other	106	41	12
Dual gear	N/A	N/A	90

The ethnicity of respondents is presented in Tables 6 and 7 and summarizes their answers to the question "How would you describe your ethnicity?" This is admittedly an imprecise question, but one which allows for self-definition. When prompts were needed the phrase "such as Japanese, Chinese or Hawaiian" was used. These are well understood terms in Hawaii and refer largely to one's racial composition (if such a thing exists) rather than place of birth or culture. Respondents were allowed to list as many answers as desired; those who gave more than one answer are included in the mixed category, with the exception of those who included Hawaiian as a part of their ethnic composition—these are in the "Mixed with part Hawaiian" group. The category "Other" includes Black, American Indian, and Puerto Rican as well as responses such as "American" and "Cosmopolitan."

There was one female respondent who operated (but did not own) a trailered vessel on Oahu; all other respondents were male.

The overall distribution of survey participants' ethnicities is similar to that found in Hawaii's statewide population by the Hawaii Department of Health in 1992 (the most recent year for which data is available) in that the three most common ethnicities are Caucasian, Japanese, and Mixed with part-Hawaiian. Differences exist in the ranking and proportions of these groups. Census records reveal that Caucasians comprise 23% of our state's population, Japanese 20%, and Mixed with part-Hawaiian 19%. In our sample Japanese represent 33%, followed by part-Hawaiians at 16%, and Caucasians at 12%. These variations between Hawaii's total population and our sample seem in accordance with expectations of a greater identification with the sea by Japanese and Hawaiians.

Table 6. Ethnicity of respondents

Ethnicity of Respondent	Number of Respondents	Percent of Sample
Caucasian	70	12.3
Chinese	19	3.3
Filipino	41	7.2
Hawaiian	26	4.6
Japanese	187	32.9
Korean	3	0.5
Mixed with part Hawaiian	90	15.8
Mixed non-Hawaiian	48	8.4
Portuguese	15	2.6
Samoan	2	0.4
Other	48	8.4
Missing/refused answer	20	3.5

Table 7. Ethnicity of respondents by island

	Number of Respondents by Island				
Ethnicity of Respondent	**Oahu**	**Hawaii**	**Kauai**	**Maui**	**Molokai/ Lanai**
Caucasian	27	22	5	14	2
Chinese	18	0	1	0	0
Filipino	26	7	5	2	1
Hawaiian	19	5	1	0	1
Japanese	120	33	20	10	4
Korean	3	0	0	0	0
Mixed with part-Hawaiian	49	20	10	9	2
Mixed non-Hawaiian	29	11	5	2	1
Portuguese	5	4	4	2	0
Samoan	2	0	0	0	0
Other	27	9	3	7	2
Missing/Refused Answer	15	1	2	2	0

V. Results

Outline of Tables

Tables A1 through A7 present means and standard deviations (std) of overall survey results. Subsequent sections present analogous information based on various stratification methods. This section contains a brief description of variables contained in each table.

Table A1 presents average vessel activity (number and types of trips) by operator motivation, with the number of respondents in each group (n) indicated in the first row. Commercial trips refer to trips which led to sales of fish, recreational trips are those which did not (see p. 7). By definition recreational vessels did not take any commercial trips. Some vessels were also used for non-fishing trips. These were typically for special events such as funerals or escorting canoe racers, and are not enumerated here.

Table A2 portrays vessel characteristics as well as respondents' investment in their fishing operations. Trailer, electronics, vessel upgrades, and major fishing gear represent amounts paid in addition to the purchase price of the vessel (which often came with a trailer and some electronics). Vessel upgrades typically consist of improvements such as adding fish boxes, hydraulic systems, or additional motors. Major fishing gear includes items such as rods, reels, and winches or pullers. It does not include expenditures on lines, lures, leads, hooks, or other frequently replaced tackle. Other investment generally consists of freezers and ice makers kept at home, as well as fish bags and coolers. The purchase price of trucks to haul trailered boats was included only when participants specifically mentioned this as a fishing related investment, otherwise it was assumed that the truck was not obtained primarily for this reason. In one case the cost of building a carport was included in this category because the respondent reported that this was required under the covenants of his subdivision in order to keep a boat at his home.

Table A3 illustrates costs assumed to be fixed over a year of fishing. As with all data presented here, these are unconditional averages of costs encountered over the previous 12 months. This means that included in their calculation are the zero costs of fishermen who reported no expenditures on a given item (for example many do not carry boat insurance or have outstanding loans). Annual charges for fishing gear are costs for small tackle such as lines, lures, and hooks. Many respondents were not sure how much they paid for vessel registration, ramp fees, and their fishing

license. Because these are relatively minor costs we have totaled fixed costs despite missing this figure in several sections. Miscellaneous costs include mooring fees, accounting costs, and other annual expenses not listed above. Due to the difficulty of separating taxes paid by income source, they are not included in this or any other category.

Table A4 presents a weighted mean of trip costs, based on the number of trips of each type by vessels within each group.

Table A5 lists vessel operating characteristics by operator motivation. These are largely self-explanatory and are again based on weighted means of all trips taken over the previous 12 months.

Table A6 presents data on catch, sales, and sales revenue over the previous 12 months. Pelagic species are defined as tunas (*Thunnus* spp.), mahimahi (*Coryphaena* spp.), ono (*Acanthocybium solandri*), and billfish (*Xiphias gladius, Makaira* and *Tetrapterus* spp.). Akule and opelu (*Scomber* spp.), which some consider to be near-shore pelagics, are included in the non-pelagic category because they generally fall within state rather than federal jurisdiction. Total sales revenue includes all gross revenues from the sales of fish, before expenses and taxes.

Table A7 portrays respondent characteristics, including responses to the question "After expenses, what percent of your personal income came from fishing over the previous 12 months?" Interpretations of this question may have varied because the terms "expenses" and "personal income" were not specifically defined. Total household income was defined as the combined pretax income of all members of the respondents' household.

Section A. Results by Operator Motivation

Overall survey results are presented in Tables A1 through A7. These tables represent vessels which were used for one day trips only. In the case of income vessels, operators were further stratified into fulltime and parttime fishermen based on the percentage of their personal income which came from fishing (after expenses) during the previous 12 months. **Fulltime** fishermen derived more than 50% of their personal income from fishing, **parttime** fishermen derived 50% or less from fishing. **Expense** fishermen are defined as those who reported that they sold fish only to try and cover their expenses rather than as a source of income. **Recreational** fishermen are those who did not sell any portion of their catch in the 12 months previous to being surveyed. Table A1 reveals that fishing intensity (number of trips) decreases as reliance on fishing income decreases (from fulltime to recreational fishermen). Additionally, the types of trips taken indicates that the percentage of trips devoted to handlining follows this same pattern (see Figure 1). This difference in gear types is reflected in the average trip costs presented in Table A4 (see Figure 2). For example, because recreational boats took few ika shibi or palu ahi trips (Table A1) their average trip costs include very little bait while fulltime boats, which did more handlining than trolling, spent more on bait than fuel.

Overall investment and annual fixed costs are represented in Tables A2 and A3 and indicate a high level of investment and annual expenditures by Hawaii's fishing community. Again, the exact aggregate level is difficult to estimate because of a lack of data on total fishing effort in Hawaii.

Not every boat owner carried boat insurance or had outstanding loans. Thirty-six percent of fulltime fishermen, 45% of parttime fishermen, 47% of expense fishermen, and 44% of recreational fishermen had no insurance. In terms of loan payments, 38% of fulltime fishermen had their boats paid off (no outstanding loans), 26% of parttime fishermen reported no loan payments, 19% of expense fishermen and 13% of recreational fishermen said the same.

We can derive from Table A6 that fulltime fishermen sold an average of 91% of their catch, parttime fishermen sold 85% and expense fishermen sold 57%. When this is combined with the

much higher catches reported by fulltime fishermen, the result is gross revenues almost four times higher than parttimers and more than eight times higher than expense fishermen.

Table A7 illustrates that fulltime fishermen reported receiving a mean of 96% of their personal income from fishing profits over the past 12 months, for parttime fishermen this drops to 16%, for expense fishermen to 4%. Although mean household incomes are above Hawaii's average across all groups, they ascend in reverse order, with recreational fishermen reporting the highest of any group. Perhaps this implies that in Hawaii fulltime fishing is not a high paying profession (and that the more time one devotes to fishing and thus not working other jobs, the lower will be one's overall household income). However, we did not ask how many persons lived and worked in each household so this remains unproven.

Table A1. Number of trips per vessel by operator motivation (previous 12 months, 1995-1996)

		Annual Trips Per Vessel			
Operator Motivation		**Fulltime (n=53)**	**Parttime (n=119)**	**Expense (n=227)**	**Recreational (n=158)**
Total Fishing Trips	mean	158.76	85.81	58.41	35.75
	std	(63.24)	(61.06)	(41.56)	(33.35)
Total Commercial Fishing Trips	mean	153.72	81.21	54.02	0.00
	std	(63.93)	(60.92)	(40.39)	(0.00)
Total Recreational Fishing Trips	mean	5.04	4.44	3.45	35.28
	std	(12.44)	(10.35)	(10.67)	(33.38)
Commercial Troll Trips	mean	49.22	38.89	31.81	0.00
	std	(63.02)	(46.82)	(29.97)	(0.00)
Commercial Palu Ahi Trips	mean	18.38	7.93	2.61	0.00
	std	(46.48)	(24.53)	(14.47)	(0.00)
Commercial Ika Shibi Trips	mean	27.21	9.04	1.43	0.00
	std	(43.76)	(24.51)	(7.14)	(0.00)
Commercial Bottomfish Trips	mean	17.05	11.55	9.18	0.00
	std	(28.17)	(23.88)	(20.53)	(0.00)
Commercial Akule/Opelu Trips	mean	16.93	2.06	2.32	0.00
	std	(43.71)	(17.84)	(9.90)	(0.00)
Commercial Reef Fish Trips	mean	7.37	6.39	4.12	0.00
	std	(26.63)	(22.88)	(11.90)	(0.00)
Commercial Aquarium Fish Trips	mean	12.77	2.56	0.00	0.00
	std	(40.34)	(19.69)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	4.79	2.69	1.92	0.00
	std	(16.86)	(9.89)	(8.95)	(0.00)
Recreational Troll Trips	mean	2.98	2.11	1.53	16.43
	std	(11.84)	(6.66)	(6.36)	(19.30)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.12	0.24
	std	(0.00)	(0.00)	(0.94)	(2.67)
Recreational Bottomfishing Trips	mean	0.08	0.28	0.76	3.81
	std	(0.50)	(1.63)	(6.89)	(9.97)
Recreational Akule/Opelu Trips	mean	0.00	0.20	0.00	0.80
	std	(0.00)	(2.17)	(0.07)	(4.67)
Recreational Reef Fishing Trips	mean	0.64	0.21	0.07	9.37
	std	(3.08)	(2.02)	(0.81)	(23.09)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	1.34	1.62	0.96	4.20
	std	(4.15)	(5.23)	(5.27)	(20.75)

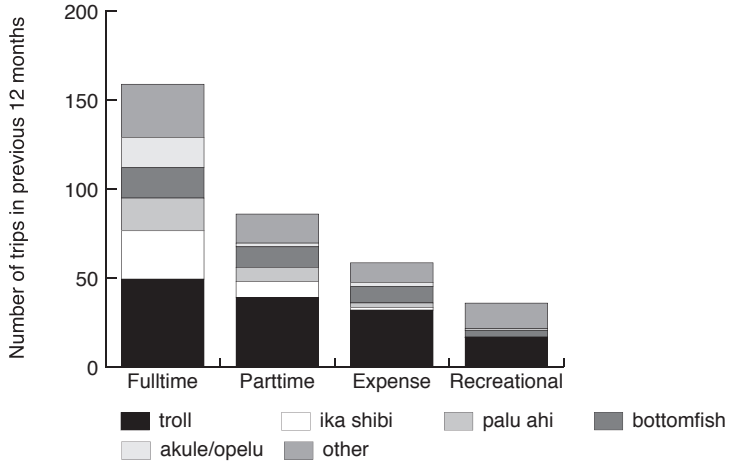

Figure 1. Annual trips per vessel by operator motivation

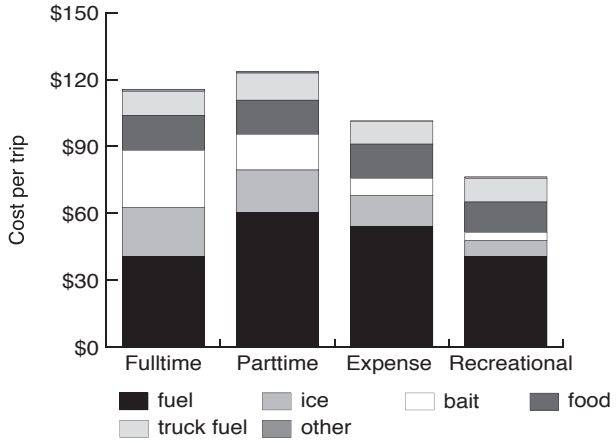

Figure 2. Cost per trip by operator motivation

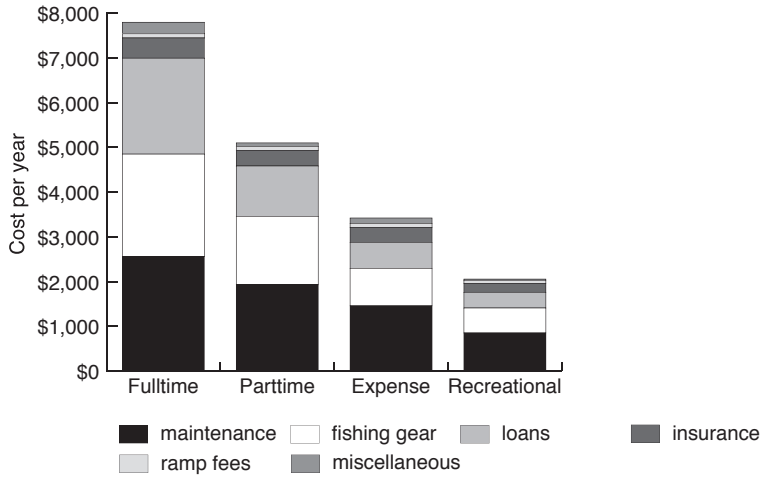

Figure 3. Annual fixed costs per vessel by operator motivation

Table A2. Vessel characteristics by operator motivation

Vessel Characteristic		Operator Motivation: Fulltime	Parttime	Expense	Recreational
Vessel Length (feet)	mean	24.07	23.24	22.50	19.67
	std	(5.84)	(4.55)	(4.32)	(4.15)
Year Built	mean	1984	1984	1984	1983
	std	(8.66)	(7.12)	(8.81)	(8.45)
Year Bought	mean	1990	1990	1989	1990
	std	(5.02)	(5.62)	(6.26)	(5.94)
Purchase Price ($)	mean	29,142	25,866	23,506	13,927
	std	(22,766)	(20,565)	(24,085)	(12,266)
Trailer Cost ($)	mean	2,352	3,093	3,112	2,221
	std	(1,957)	(2,267)	(2,583)	(3,021)
Cost of Additional Electronics ($)	mean	3,580	3,255	2,949	1,582
	std	(3,385)	(3,625)	(2,803)	(1,814)
Cost of Other Vessel Upgrades ($)	mean	4,331	4,339	4,439	2,210
	std	(6,273)	(6,224)	(6,923)	(4,847)
Cost of Major Fishing Gear ($)	mean	4,909	5,567	4,850	3,250
	std	(3,902)	(3,985)	(3,485)	(2,816)
Other Investment ($)	mean	3,535	1,580	1,082	523
	std	(7,947)	(5,564)	(3,582)	(2,793)

Table A3. Fixed costs per vessel (previous 12 months) by operator motivation

Cost Item		Operator Motivation: Fulltime	Parttime	Expense	Recreational
Insurance	mean	453	342	338	198
	std	(951)	(565)	(515)	(313)
Loan Payments	mean	2,143	1,127	580	351
	std	(3,744)	(2,502)	(1,546)	(1,203)
Maintenance and Repairs	mean	2,567	1,931	1,461	855
	std	(2,745)	(2,715)	(1,909)	(1,472)
Fishing Gear	mean	2,283	1,527	835	557
	std	(3,189)	(2,558)	(1,143)	(1,448)
Ramp, License, and Registration Fees	mean	93	91	89	71
	std	(50)	(48)	(75)	(43)
Miscellaneous	mean	257	83	120	26
	std	(450)	(304)	(485)	(129)
Total	sum	7,796	5,101	3,423	2,058

Table A4. Trip cost per vessel (annual mean cost of all fishing trips) by operator motivation

		Operator Motivation			
Cost Item		**Fulltime**	**Parttime**	**Expense**	**Recreational**
Ice	mean	22.08	19.13	14.04	7.18
	std	(9.03)	(3.38)	(1.87)	(2.35)
Boat Fuel	mean	40.65	60.33	54.07	40.69
	std	(10.57)	(11.23)	(10.34)	(15.80)
Bait	mean	25.42	15.99	7.47	(3.57
	std	(25.18)	(12.24)	(4.47)	(2.21)
Food	mean	15.85	15.31	15.49	13.67
	std	(2.50)	(2.76)	(0.84)	(2.37)
Truck Fuel	mean	10.70	12.15	10.17	10.54
	std	(0.77)	(2.14)	(0.82)	(2.92)
Miscellaneous	mean	0.97	0.65	0.29	0.77
	std	(3.00)	(1.48)	(0.41)	(0.72)
Total	sum	115.67	123.56	101.53	76.42

Table A5. Vessel operating characteristics by operator motivation

		Operator Motivation			
Operating Characteristic		**Fulltime**	**Parttime**	**Expense**	**Recreational**
Number of Crew (includes captain)	mean	1.76	2.18	2.27	2.49
	std	(0.11)	(0.20)	(0.12)	(0.23)
Usual Fishing Distance From Shore	minimum	0.50	1.03	1.61	0.50
(miles)	maximum	22.45	20.79	19.88	16.33
	mean	9.99	13.93	14.41	9.95
	std	(5.31)	(5.50)	(5.22)	(5.92)
Maximum Fishing Distance From Shore	minimum	0.69	1.47	3.22	1.94
(miles)	maximum	36.69	34.57	31.66	9.41
	mean	18.05	23.48	22.61	16.28
	std	(9.15)	(8.92)	(8.49)	(9.41)

Table A6. Catch, sales, and revenue per vessel (previous 12 months) by operator motivation

		Operator Motivation			
Catch, Sales, and Revenue		**Fulltime**	**Parttime**	**Expense**	**Recreational**
Total Pounds Caught	mean	21,787	7,630	3,675	1,171
	std	(17,145)	(9,432)	(6,834)	(2,473)
Total Pelagic Pounds Caught	mean	15,695	5,752	2,949	696
	std	(14,774)	(6,961)	(5,727)	(1,217)
Total Nonpelagic Pounds Caught	mean	4,743	1,949	692	456
	std	(8,820)	(7,179)	(1,630)	(1,492)
Total Pounds Sold	mean	19,844	6,496	2,104	0
	std	(16,486)	(8,954)	(5,110)	(0)
Total Pelagic Pounds Sold	mean	14,289	4,825	1,789	0
	std	(13,913)	(6,611)	(4,420)	(0)
Total Nonpelagic Pounds Sold	mean	4,225	1,724	315	0
	std	(8,244)	(6,644)	(948)	(0)
Total Sales Revenue ($)	mean	49,548	13,803	4,041	0
	std	(43,385)	(16,927)	(5,172)	(0)

Table A7. Respondent characteristics by operator motivation

Respondent Characteristic		Operator Motivation			
		Fulltime	Parttime	Expense	Recreational
Percent of Personal Income From Fishing	mean	96.13	16.42	3.77	0.00
	std	(9.39)	(18.88)	(12.31)	(0.00)
Total Household Income ($)	mean	51,919	54,297	57,245	68,467
	std	(40,215)	(33,487)	(40,658)	(39,390)
Age (years)	mean	40.45	42.14	45.06	45.74
	std	(12.35)	(11.22)	(11.46)	(12.06)

As can be seen from the large standard deviations, there is high variability in these observations. Figures 4–14 illustrate the distribution of trips, catch, and revenue for these groups.

Although all groups have quite uneven distributions of these variables, in general fulltime vessels took more trips, caught more pounds of fish, and had higher gross revenues than other groups. Within this group 64% took more than 150 trips, while only 19% of parttime vessels did so. In terms of catch, 69% of fulltime vessels caught at least 20,000 pounds of fish while only 9% of parttime vessels did so. In addition, 51% of fulltime vessels realized gross revenues of $30,000 or more, for parttime vessels this number is 14%. Expense and recreational vessels also show some clear differences, 23% of expense vessels took at least 75 trips, while only 11% of recreational vessels did so. These variations in catch and effort persist throughout this report, despite our attempts to stratify the sample into more homogeneous groups. One conclusion may be that Hawaii fishermen are quite varied in their behavior, avidity, and catch rates.

Table A8 presents information on labor arrangements and costs. The majority of respondents paid their crew according to one of three systems. The first and most common is to give each crew member a share of the fish caught. This is especially prevalent among expense and recreational fishermen, however the percentage given varies widely between vessels, trips, and crew members. Generally shares are decided based on a variety of factors including how many fish were caught, who caught them, who paid the trip costs and who needs the fish the most. The second system is to pay each crew member a percentage of gross revenues received. This is relatively uncommon. The last system involves the distribution of net revenues after specified costs are subtracted. This system is relatively common among full and parttime operators although the exact costs subtracted may vary. For example some operators subtract trip costs, keep 50% of what is left to cover fixed costs and then divide the remaining 50% among crew members. Others subtract only trip costs and distribute the remainder. Other systems used include paying each crew member a flat fee and no pay (found among recreational and expense vessels as well as parttime vessels which are family operations).

In general, labor share information was very difficult to obtain and quantify. Although respondents were willing to reveal the type of system used, exact shares were considered confidential information by the interviewees. Due to the lack of complete information we have not attempted to calculate net revenues for any vessel of group of vessels.

Table A8. Crew shares paid per crew member, by operator motivation

		Operator Motivation			
Share System		**Fulltime**	**Parttime**	**Expense**	**Recreational**
Percentage of Catch	N	7	35	144	113
	mean	19%	24%	34%	35%
	std	(19)	(8)	(15)	(10)
Percentage of Gross Revenue	N	2	4	2	N/A
	mean	25%	33%	30%	N/A
	std	(0)	(6.14)	(0)	(N/A)
Percentage of Net Revenue	N	14	26	13	N/A
	mean	31%	33%	35%	N/A
	std	(10)	(9)	(11)	(N/A)
Other	N	6	16	21	16
Fishes Alone	N	16	19	27	10
Missing/Refused Answer	N	8	19	20	19

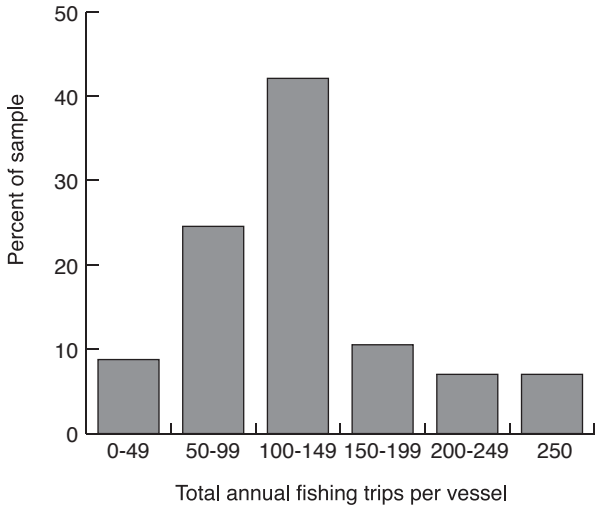

Figure 4. Distribution of annual fishing trips by fulltime vessels

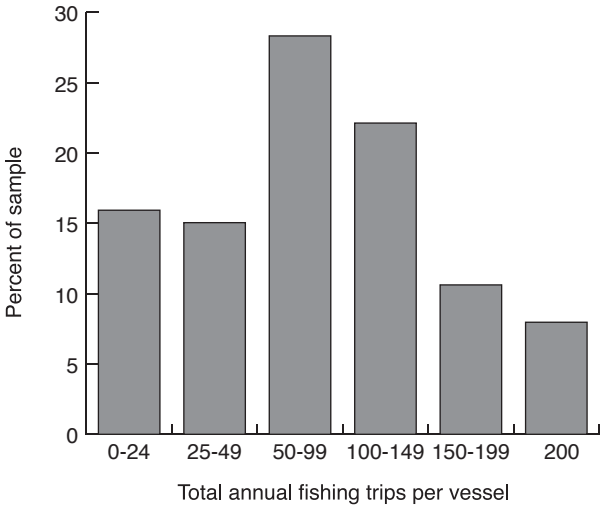

Figure 5. Distribution of annual fishing trips by parttime vessels

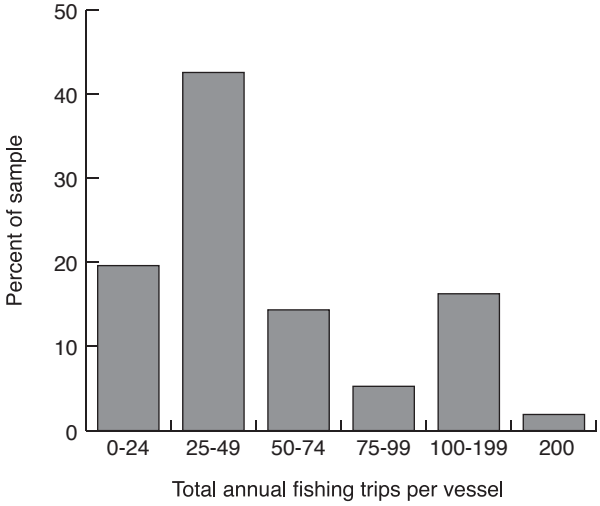

Figure 6. Distribution of annual fishing trips by expense vessels

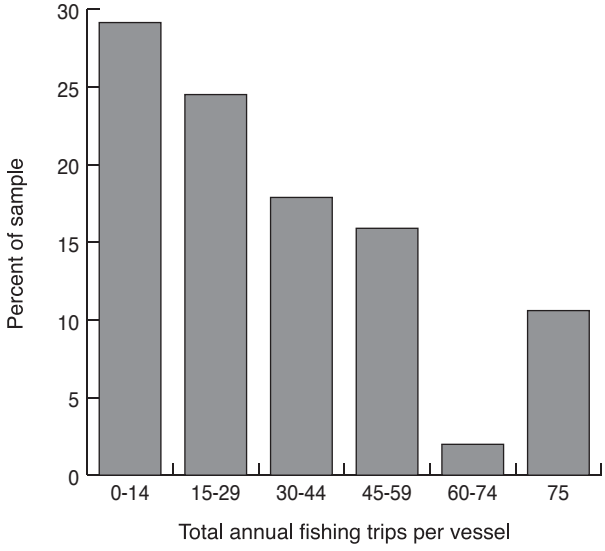

Figure 7. Distribution of annual fishing trips by recreational vessels

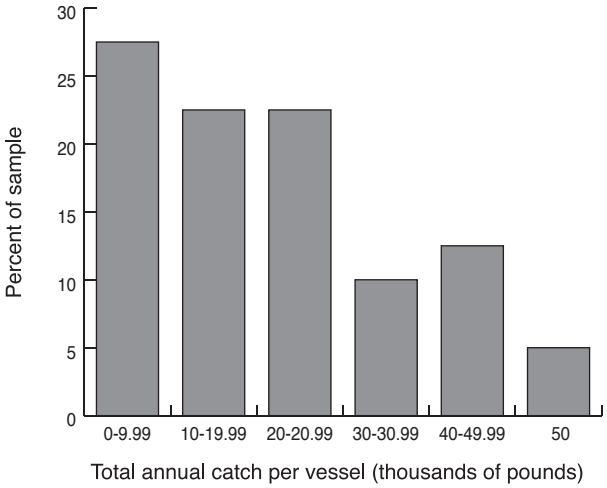

Figure 8. Distribution of total annual catch by fulltime vessels

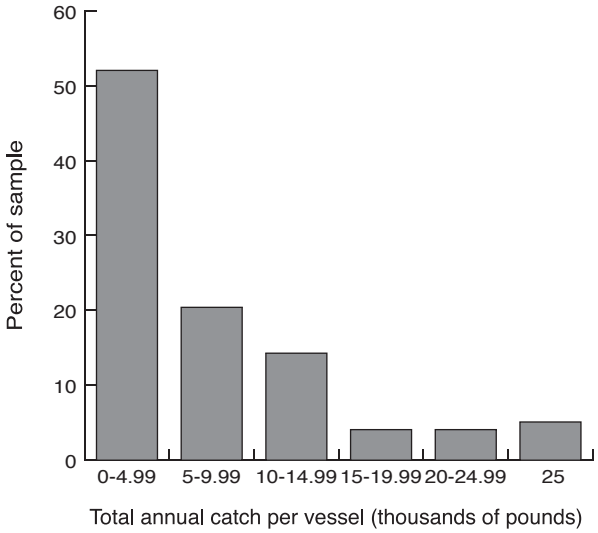

Figure 9. Distribution of total annual catch by parttime vessels

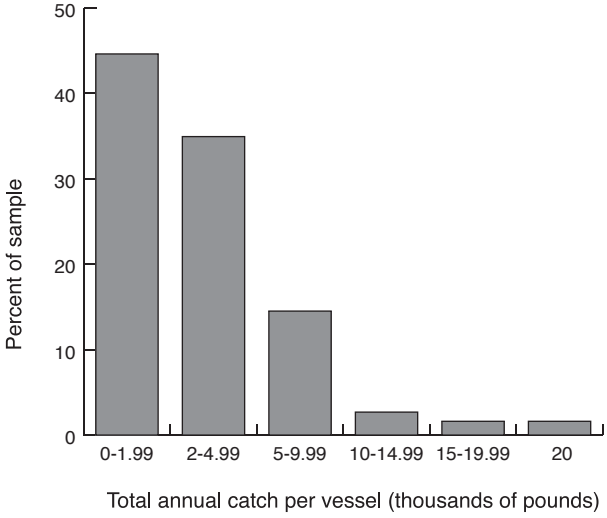

Figure 10. Distribution of total annual catch by expense vessels

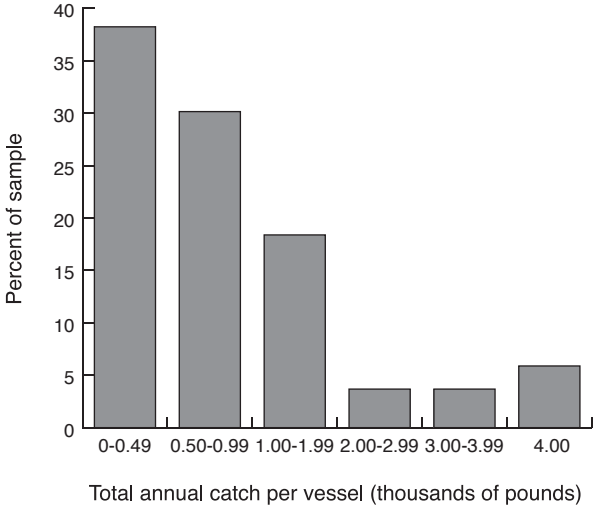

Figure 11. Distribution of total annual catch by recreational vessels

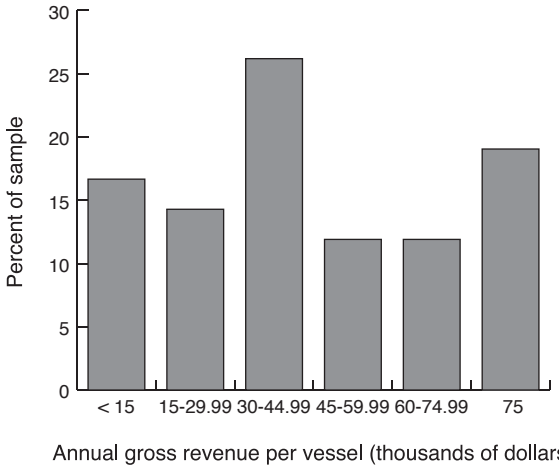

Figure 12. Distribution of annual gross revenue by fulltime vessels

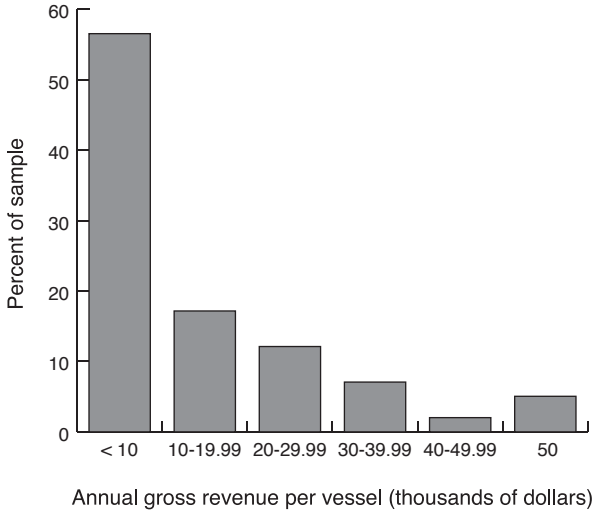

Figure 13. Distribution of annual gross revenue by parttime vessels

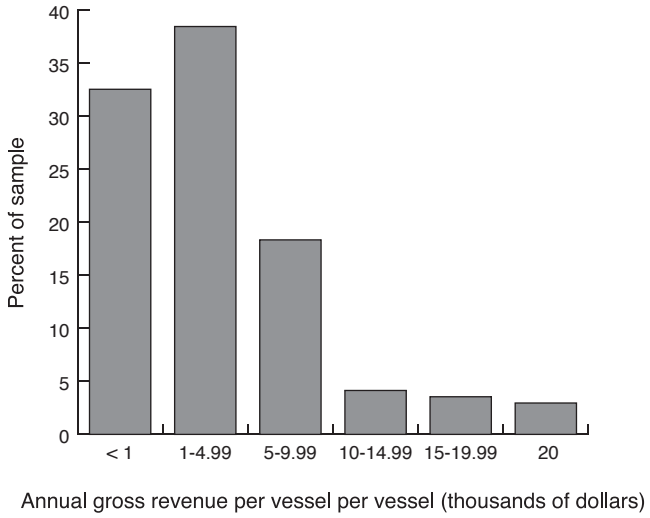

Figure 14. Distribution of annual gross revenue by expense vessels

Section B. Results by Vessel Target, Full and Parttime Vessels

Section B and Tables B1 to B7 examine income fishermen based on their primary target (pelagic vs. non-pelagic). These targets were classified according to the target of the **majority** of fishing trips over the previous 12 months. Pelagic target trips are trolling, ika shibi, or palu ahi trips. Non-pelagic target trips are hooking or netting akule and opelu, reef fishing, deep sea bottomfishing, crabbing or collecting aquarium fish.

Large variations (standard deviations) exist within groups but there are also clear differences between pelagic and non-pelagic vessels surveyed. These differences are most apparent in the types of trips taken, although mean annual effort (number of fishing trips) is remarkably consistent by operator motivation across vessel targets, and both groups took pelagic as well as non-pelagic target trips. However, non-pelagic vessels took far more bottomfishing trips, as well as akule and opelu, reef fish, and aquarium fish collecting trips than pelagic trolling or handlining trips. Similarly, pelagic vessels clearly spent the majority of their time targeting pelagics but were also used for bottomfishing, reef fishing, akule, and/or opelu fishing. This was expected because only one third of the vessels in our sample were used for only one type of fishing. Most vessels used two or more gear types within in the previous 12 months (Table 5).

Pelagic vessels tended to be slightly larger (and more expensive) than non-pelagic vessels, probably because trolling requires stronger boats that can handle the waves and pounding. Larger vessels are also generally safer and more likely to have diesel engines, and larger hold space needed to store large pelagic fishes. They also had higher trip and fixed costs. Trip costs were higher because of greater ice, fuel, and bait costs. Fixed costs are partially related to vessel value (i.e. insurance and loans) and reflect the higher purchase prices (and additional investment) paid for pelagic vessels.

Catches largely reflect trip targets, with both pelagic and non-pelagic vessels catching pelagic as well as non-pelagic species. Fulltime pelagic vessels reported total catches over twice those of fulltime non-pelagic vessels. Parttime non-pelagic vessels caught more pounds than parttime pelagic vessels. For fulltime vessels, these volume differences are reflected in sales and revenues, with the higher sales and revenues accruing to pelagic vessels rather than to non-pelagic vessels. In the case of parttime vessels, those that targeted non-pelagics caught and sold more pounds than did pelagic vessels. However pelagic vessel operators evidently realized higher prices for their fish because they achieved a higher gross revenue despite selling less pounds overall and vastly less pounds of non-pelagics. A likely explanation for this is that the category of non-pelagics includes lower valued species such as taape, akule, and opelu as well as the more valuable deep sea bottomfish species.

Table B1. Number of trips (previous 12 months, 1995-1996), by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Annual Trips Per Vessel		**Fulltime (n=20)**	**Parttime (n=35)**	**Fulltime (n=33)**	**Parttime (n=84)**
Total Fishing Trips	mean	157.35	89.93	159.62	84.25
	std	(71.03)	(57.49)	(59.16)	(62.63)
Total Commercial Fishing Trips	mean	155.32	82.41	152.75	80.76
	std	(71.33)	(57.22)	(60.14)	(62.59)
Total Recreational Fishing Trips	mean	2.03	7.07	6.87	3.41
	std	(4.29)	(13.98)	(15.21)	(8.41)
Commercial Troll Trips	mean	13.72	9.29	70.73	49.81
	std	(21.67)	(13.12)	(70.08)	(50.01)
Commercial Palu Ahi Trips	mean	6.00	2.05	25.89	10.38
	std	(17.81)	(7.27)	(56.29)	(28.51)
Commercial Ika Shibi Trips	mean	17.89	5.84	32.86	10.31
	std	(43.07)	(14.34)	(43.86)	(27.51)
Commercial Bottomfish Trips	mean	20.64	17.07	14.88	9.39
	std	(36.80)	(28.96)	(21.73)	(21.39)
Commercial Akule/Opelu Trips	mean	35.30	6.57	5.79	0.18
	std	(63.19)	(32.68)	(19.88)	(1.60)
Commercial Reef Fish Trips	mean	19.28	19.68	0.15	0.85
	std	(41.23)	(39.16)	(0.87)	(3.20)
Commercial Aquarium Fish Trips	mean	32.69	8.70	0.69	0.00
	std	(61.29)	(35.93)	(3.97)	(0.00)
Commercial Other Gear Trips	mean	9.80	6.64	1.76	1.04
	std	(24.43)	(16.29)	(9.08)	(4.59)
Recreational Troll Trips	mean	1.23	2.20	4.05	2.07
	std	(3.79)	(5.86)	(14.70)	(6.98)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.02	0.23	0.11	0.30
	std	(0.09)	(1.31)	(0.63)	(1.74)
Recreational Akule/Opelu Trips	mean	0.00	0.68	0.00	0.00
	std	(0.00)	(3.00)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	0.70	0.67	0.61	0.01
	std	(2.36)	(3.72)	(3.48)	(0.11)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.08	3.03	2.10	1.03
	std	(0.36)	(7.99)	(5.13)	(3.40)

Table B2. Vessel characteristics (mean) by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Vessel Characteristic		**Fulltime**	**Parttime**	**Fulltime**	**Parttime**
Vessel Length (feet)	mean	20.94	22.29	25.97	23.64
	std	(4.50)	(3.93)	(5.79)	(4.75)
Year Built	mean	82.89	82.26	84.32	84.13
	std	(7.44)	(6.41)	(9.37)	(7.38)
Year Bought	mean	89.61	89.38	90.84	89.69
	std	(5.93)	(5.14)	(4.30)	(5.83)
Purchase Price	mean	20,821	17,771	34,242	29,239
	std	(19,787)	(11,789)	(23,256)	(22,476)
Trailer Cost	mean	2,350	2,938	2,353	3,134
	std	(2,044)	(1,763)	(1,969)	(2,401)
Cost of Additional Electronics	mean	2,503	2,536	4,254	3,536
	std	(2,527)	(2,469)	(3,703)	(3,964)
Cost of Other Vessel Upgrades	mean	2,698	4,286	5,385	4,360
	std	(3,036)	(5,529)	(7,538)	(6,507)
Cost of Major Fishing Gear	mean	5,094	5,480	4,798	5,597
	std	(3,485)	(3,849)	(4,186)	(4,054)
Other Investment	mean	3,315	1,409	3,668	1,648
	std	(7,898)	(4,946)	(8,096)	(5,815)

Table B3. Fixed costs (annual mean) per vessel by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Cost Item		**Fulltime**	**Parttime**	**Fulltime**	**Parttime**
Insurance	mean	394	229	486	384
	std	(971)	(567)	(953)	(562)
Loan Payments	mean	2,277	864	2,060	1,229
	std	(4,472)	(1,752)	(3,298)	(2,742)
Maintenance and Repairs	mean	2,513	1,451	2,601	2,125
	std	(3,029)	(1,518)	(2,602)	(3,058)
Fishing Gear	mean	1,647	1,056	2,629	1,713
	std	(1,923)	(2,503)	(3,685)	(2,574)
Ramp, License , and Registration Fees	mean	90	76	94	101
	std	(47)	(41)	(53)	(50)
Miscellaneous	mean	225	76	277	86
	std	(426)	(303)	(471)	(306)
Total	sum	7,146	3,752	8,147	5,638

Table B4. Trip costs per vessel (mean of all fishing trips over previous 12 months), by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Cost Item		**Fulltime**	**Parttime**	**Fulltime**	**Parttime**
Ice	mean	15.46	16.24	26.59	20.28
	std	(8.27)	(5.79)	(7.82)	(2.55)
Boat Fuel	mean	33.52	46.47	45.96	65.12
	std	(7.38)	(11.89)	(9.04)	(6.04)
Bait	mean	12.09)	(12.10	35.88	16.28
	std	(13.71)	(7.25)	(27.74)	(12.03)
Food	mean	13.20	11.17	17.50	16.80
	std	(2.50)	(3.68)	(1.75)	(1.49)
Truck Fuel	mean	11.85	8.54	9.47	12.75
	std	(1.28)	(4.39)	(1.55)	(1.81)
Miscellaneous	mean	2.97	2.86	0.00	0.11
	std	(5.61)	(3.91)	(0.00)	(0.26)
Total	sum	89.09	97.38	135.40	131.34

Table B5. Vessel operating characteristics (mean), by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Operating Characteristic		**Fulltime**	**Parttime**	**Fulltime**	**Parttime**
Number of Crew	mean	1.64	2.26	1.81	2.16
(includes captain)	std	(0.22)	(0.34)	(0.05)	(0.08)
Usual Fishing Distance From	minimum	0.26	1.38	5.57	6.88
Shore (miles)	maximum	10.91	15.05	28.28	21.57
	mean	5.38	7.45	13.05	16.58
	std	(3.75)	(3.47)	(6.00)	(4.61)
Maximum Fishing Distance From	minimum	0.58	1.86	11.37	13.10
Shore (Miles)	maximum	18.69	22.76	44.38	35.75
	mean	9.31	13.13	23.97	27.83
	std	(5.35)	(6.05)	(8.95)	(6.93)

Table B6. Catch, sales and revenue per vessel (previous 12 months) by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Catch, Sales, and Revenue		**Fulltime**	**Parttime**	**Fulltime**	**Parttime**
Total Pounds Caught	mean	12,872	8,269	25,607	7,434
	std	(12,330)	(13,535)	(17,669)	(7,873)
Total Pelagic Pounds Caught	mean	5,492	2,820	21,324	6,704
	std	(8,003)	(3,109)	(14,709)	(7,589)
Total Non-Pelagic Pounds Caught	mean	6,300	5,496	4,120	844
	std	(5,956)	(13,753)	(9,752)	(2,316)
Total Pounds Sold	mean	12,165	7,131	23,135	6,310
	std	(12,412)	(12,923)	(17,099)	(7,513)
Total Pelagic Pounds Sold	mean	5,210	2,008	19,297	5,703
	std	(7,945)	(2,631)	(14,046)	(7,220)
Total Non-Pelagic Pounds Sold	mean	5,968	4,979	3,550	710
	std	(5,903)	(12,759)	(8,982)	(2,105)
Total Sales Revenue	mean	41,962	11,332	52,948	14,730
	std	(34,614)	(13,640)	(46,947)	(18,004)

Table B7. Respondent characteristics (mean) by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Respondent Characteristic		**Fulltime**	**Parttime**	**Fulltime**	**Parttime**
Percent of Personal Income	mean	98.50	23.37	94.70	13.57
From Fishing	std	(4.89)	(20.03)	(11.11)	(17.77)
Total Household Income	mean	65,625	52,586	43,796	55,037
	std	(51,603)	(36,453)	(29,866)	(32,382)
Age	mean	42.89	42.81	39.00	41.88
	std	(12.17)	(8.13)	(12.41)	(12.27)

Section C. Results by Island, Full and Parttime Pelagic Vessels

Because the focus of this report is pelagic fishing, Section C examines pelagic income vessels by island. Only those vessels which took one day trips are included—section C1 and Tables C1 to C7 present information on fulltime pelagic vessels. Section C2 and Tables C8 to C14 focus on parttime pelagic vessels. Maui based vessels are not included in section C1 as we were unable to locate and interview the requisite three vessels which took only one day trips in order to present their data. Fulltime pelagic Maui fishermen do exist; however many routinely take two to three day trips and thus are not included in this analysis. When examining differences in costs between locations it is important to remember that total cost is a combination of price and quantity. Thus higher costs may reflect either higher prices or a larger quantity used or both. We did not gather information on these individual factors.

1. Fulltime pelagic vessels by island.

The types of trips (Table C1 and Figure 15) and catches reported by island by these vessels (Table C6) are largely consistent with those submitted to the Hawaii Division of Aquatic Resources (HDAR) through fish catch reports. This was expected as (successful) fishing gear and targets are determined more by oceanographic conditions and features (geographic location) than by the desire of vessel operators. For example, we found that vessels on all islands engaged in trolling, and that Oahu-based vessels did very little pelagic handlining while Kauai and Hawaii island vessels did relatively more. We also found bottomfishing to be more common off of Oahu and Kauai than around the island of Hawaii. This corresponds to what is commonly believed about fishing areas around the islands (keeping in mind that these are vessels which primarily fish for pelagic species). Oahu is known for its ahi and trolling, as well as some nearby bottomfishing areas (Penguin Banks). Kauai is thought to have good trolling areas as well as ledges for pelagic handlining and nearby bottomfishing areas around Niihau and Ka'ula Rock. The island of Hawaii has an ika shibi fishery operating primarily on the Hilo side but also out of Keahou. There is also quite a bit of daytime handlining (palu ahi) and some bottomfishing. All islands have reef fishing areas, as well as akule and/or opelu fishing.

According to our survey, operators of fulltime Kauai based vessels took the most trips, had the highest levels of investment (Table C2) and fixed costs (Table C3 and Figure 17), had the highest catch overall and realized the greatest gross revenues. By contrast, Hawaii based boats took the fewest trips yet still caught more pounds and achieved higher gross revenues than did Oahu vessels. This is probably because the ika shibi fishery is known to yield larger, better quality fish than either the palu ahi or troll fisheries. Trip costs (Table C4 and Figure 16) reflect trip targets, Oahu vessels troll more and thus use more fuel per trip, Hawaii boats do more handlining and thus buy more bait. Oahu fishermen were found to be the most dependent on fishing for their personal income (Table C7), while Hawaii island fishermen reported the lowest household incomes.

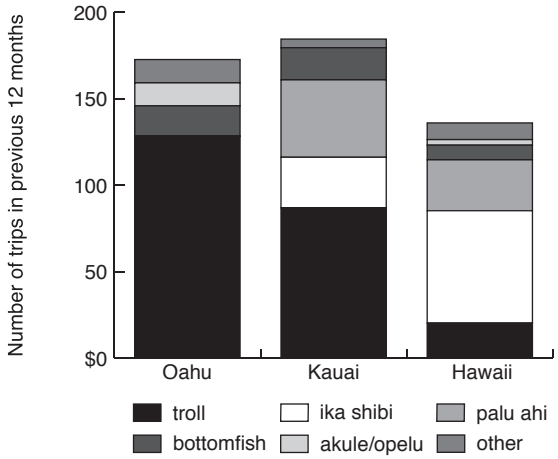

Figure 15. Annual trips per vessel by island—fulltime pelagic vessels

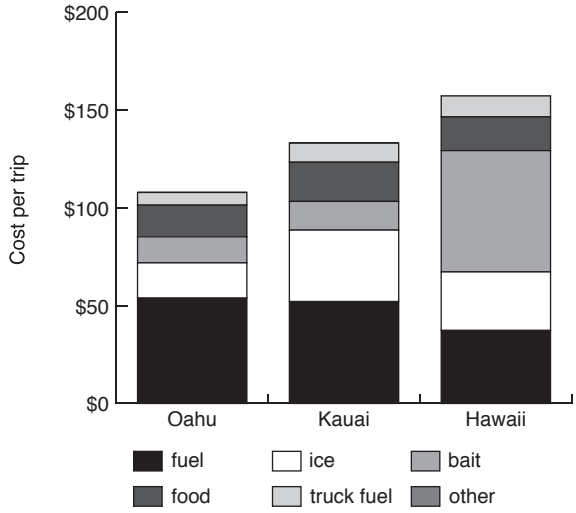

Figure 16. Cost per trip by island—fulltime pelagic vessels

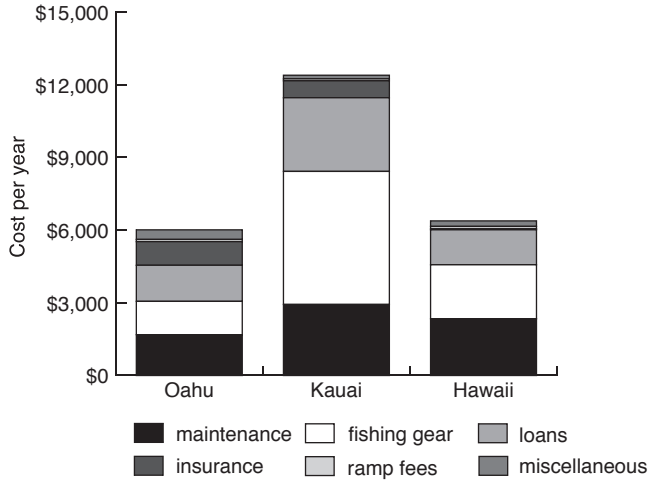

Figure 17. Annual fixed costs per vessel by island—fulltime pelagic vessels

Table C1. Number of trips (previous 12 months, 1995-1996), fulltime pelagic vessels, by island

		Island		
		Kauai	**Oahu**	**Hawaii**
Annual Trips Per Vessel		**(n=6)**	**(n=11)**	**(n=14)**
Total Fishing Trips	mean	184.42	172.59	135.95
	std	(66.91)	(60.98)	(49.87)
Total Commercial Fishing Trips	mean	178.30	162.87	130.02
	std	(73.47)	(58.82)	(51.53)
Total Recreational Fishing Trips	mean	6.13	9.72	5.93
	std	(8.10)	(13.11)	(19.92)
Commercial Troll Trips	mean	86.86	128.11	20.27
	std	(80.95)	(63.14)	(16.73)
Commercial Palu Ahi Trips	mean	44.74	0.27	29.42
	std	(76.86)	(0.90)	(55.88)
Commercial Ika Shibi Trips	mean	29.24	0.00	64.92
	std	(35.80)	(0.00)	(45.28)
Commercial Bottomfish Trips	mean	17.46	18.60	8.48
	std	(29.12)	(21.20)	(15.39)
Commercial Akule/Opelu Trips	mean	0.00	13.27	3.22
	std	(0.00)	(31.27)	(12.05)
Commercial Reef Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Aquarium Fish Trips	mean	0.00	2.07	0.00
	std	(0.00)	(6.87)	(0.00)
Commercial Other Gear Trips	mean	0.00	0.55	3.71
	std	(0.00)	(1.81)	(13.90)

Table C2. Vessel characteristics (mean), fulltime pelagic vessels, by island

		Island		
Vessel Characteristic		**Kauai**	**Oahu**	**Hawaii**
Vessel Length (feet)	mean	25.83	27.82	24.36
	std	(5.71)	(7.24)	(4.77)
Year Built	mean	83.33	84.22	83.86
	std	(11.40)	(10.28)	(8.95)
Year Bought	mean	86.00	90.90	91.50
	std	(1.00)	(3.73)	(4.88)
Purchase Price ($)	mean	38,250	37,636	25,667
	std	(37,438)	(17,154)	(19,117)
Trailer Cost	mean	2,667	2,457	2,020
	std	(2,082)	(2,552)	(1,184)
Cost of Additional Electronics	mean	6,892	3,110	4,170
	std	(5,283)	(1,804)	(3,774)
Cost of Other Vessel Upgrades	mean	6,417	8,318	2,704
	std	(8,857)	(9,839)	(3,402)
Cost of Major Fishing Gear	mean	5,500	4,148	4,738
	std	(2,881)	(2,633)	(5,726)
Other Investment	mean	10,867	841	1,643
	std	(13,483)	(1,667)	(4,752)

Table C3. Fixed costs (annual mean) per vessel, fulltime pelagic vessels by island

			Island	
Cost Item		**Kauai**	**Oahu**	**Hawaii**
Insurance	mean	700	975	43
	std	(1,225)	(1,265)	(160)
Loan Payments	mean	3,040	1,489	1,444
	std	(4,736)	(3,005)	(2,634)
Maintenance and Repairs	mean	2,933	1,685	2,343
	std	(1,745)	(1,576)	(2,717)
Fishing Gear	mean	5,492	1,376	2,227
	std	(7,336)	(1,377)	(2,387)
Ramp, License, and Registration Fees	mean	80	92	98
	std	(.)	(81)	(28)
Miscellaneous	mean	150	396	227
	std	(367)	(625)	(394)
Total	sum	12,395	6,013	6,382

Table C4. Trip costs per vessel, (mean of all fishing trips over previous 12 months), fulltime pelagic vessels by island

Cost Item		Island Hawaii	Kauai	Oahu
Ice	mean	29.88	36.49	18.01
	std	(8.81)	(25.57)	(1.55)
Boat Fuel	mean	37.29	52.04	53.79
	std	(6.94)	(19.59)	(6.70)
Bait	mean	61.95	14.66	13.31
	std	(21.94)	(12.21)	(2.48)
Food	mean	17.23	20.02	16.17
	std	(2.68)	(12.24)	(2.64)
Truck Fuel	mean	10.73	9.72	6.47
	std	(0.74)	(1.72)	(0.85)
Miscellaneous	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Total	sum	157.08	132.93	107.75

Table C5. Vessel operating characteristics (mean), fulltime pelagic vessels by island

Operating Characteristic		Island Hawaii	Kauai	Oahu
Number of Crew (includes captain)	mean	1.83	1.41	1.95
	std	(0.06)	(0.17)	(0.13)
Usual Fishing Distance From Shore	minimum	5.65	1.87	13.19
(miles)	maximum	35.42	8.75	28.75
	mean	10.72	5.20	23.83
	std	(8.83)	(2.54)	(4.63)
Maximum Fishing Distance From Shore	minimum	12.10	2.61	21.92
(miles)	maximum	53.48	33.66	48.40
	mean	18.96	17.67	40.12
	std	(12.20)	(11.70)	(7.90)

Table C6. Catch, sales and revenue (previous 12 months) per vessel, fulltime pelagic vessels by island

Catch, Sales, and Revenue		Island		
		Kauai	Oahu	Hawaii
Total Pounds Caught	mean	30,833	17,643	25,231
	std	(19,426)	(11,281)	(19,780)
Total Pelagic Pounds Caught	mean	29,667	14,363	20,038
	std	(20,017)	(11,466)	(13,055)
Total Non-Pelagic Pounds Caught	mean	1,167	4,200	4,821
	std	(1,602)	(6,843)	(13,088)
Total Pounds Sold	mean	27,533	14,317	23,905
	std	(18,706)	(10,429)	(19,135)
Total Pelagic Pounds Sold	mean	26,633	12,113	18,955
	std	(19,268)	(10,501)	(12,905)
Total Non-Pelagic Pounds Sold	mean	900	2,802	4,596
	std	(1,212)	(4,891)	(12,480)
Total Sales Revenue	mean	85,600	36,863	47,682
	std	(84,893)	(22,948)	(39,302)

Table C7. Respondent characteristics (mean), fulltime pelagic vessels by island

Respondent Characteristic		Island		
		Kauai	Oahu	Hawaii
Percent of Personal Income From Fishing	mean	95.83	100.00	91.43
	std	(10.21)	(0.00)	(13.36)
Total Household Income	mean	62,500	44,444	31,818
	std	(57,663)	(20,983)	(15,854)
Age	mean	33.33	38.70	42.93
	std	(5.16)	(15.74)	(11.90)

2. Parttime pelagic vessels by island.

Overall, parttime pelagic vessels took fewer trips than did fulltime vessels. The types of trips taken from each island are similar to those shown for fulltime vessels. Maui based pelagic vessels are now included and were found to be engaged primarily in trolling, with some reef fishing as well as some bottomfishing. Trip costs again reflect trip types, with Maui boats having the highest fuel cost because of the predominance of trolling as well as the fact that these vessels reported fishing at a usual distance of almost 20 miles from shore (Table C12). Fuel costs were also high for Kauai boats, probably because of the prevalence of trolling by these vessels as well as higher fuel prices. Fixed costs did not vary significantly between Oahu, Kauai, and Maui, however Hawaii vessels experienced lower costs. There are differences in the specific fixed costs paid, for example Kauai boats paid more for maintenance while Maui boats had the highest loan payments. This latter is probably a reflection of the fact that the average Maui vessel surveyed was purchased in 1994 as compared to 1990 or earlier for all other groups (Table C9). Additionally, the mean purchase price for Maui boats was the highest of all groups.

In terms of pounds caught Kauai vessels again dominate in pelagic and non-pelagic species. However, Hawaii based vessels led in total pounds sold because Kauai operators kept (didn't sell) a larger percentage of their catch then did other groups. On average, parttime pelagic Kauai vessels sold 74% of their catch, Maui vessels sold 79%, Oahu vessels sold 85%, and Hawaii island boats sold 90%. Despite this, Kauai vessels again achieved the highest gross revenue—perhaps because they sold more non-pelagics than did vessels from any other island and that these non-pelagics were most likely bottomfish (bottomfishing was a relatively important gear for these boats).

Table C8. Number of trips (previous 12 months, 1995-1996), parttime pelagic vessels by island

		Island			
		Hawaii	**Kauai**	**Oahu**	**Maui**
Annual Trips per Vessel		**(n=25)**	**(n=9)**	**(n=40)**	**(n=9)**
Total Fishing Trips	mean	102.89	95.83	81.16	42.56
	std	(69.57)	(57.98)	(61.23)	(30.00)
Total Commercial Fishing Trips	mean	100.16	90.50	76.70	42.28
	std	(70.80)	(50.73)	(61.69)	(29.93)
Total Recreational Fishing Trips	mean	2.74	4.15	4.46	0.28
	std	(7.89)	(7.45)	(9.82)	(0.83)
Commercial Troll Trips	mean	36.81	63.77	58.43	35.20
	std	(47.47)	(45.69)	(55.07)	(30.49)
Commercial Palu Ahi Trips	mean	22.71	12.90	4.64	0.31
	std	(38.75)	(23.50)	(23.10)	(0.92)
Commercial Ika Shibi Trips	mean	32.58	2.94	0.37	0.31
	std	(42.80)	(4.83)	(1.74)	(0.92)
Commercial Bottomfish Trips	mean	6.78	16.49	11.59	2.44
	std	(24.96)	(17.21)	(22.02)	(4.88)
Commercial Akule/Opelu Trips	mean	0.00	0.00	0.37	0.00
	std	(0.00)	(0.00)	(2.32)	(0.00)
Commercial Reef Fish Trips	mean	0.63	2.20	0.00	4.02
	std	(1.83)	(6.60)	(0.00)	(5.92)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	0.66	2.03	1.31	0.00
	std	(1.88)	(3.18)	(6.32)	(0.00)

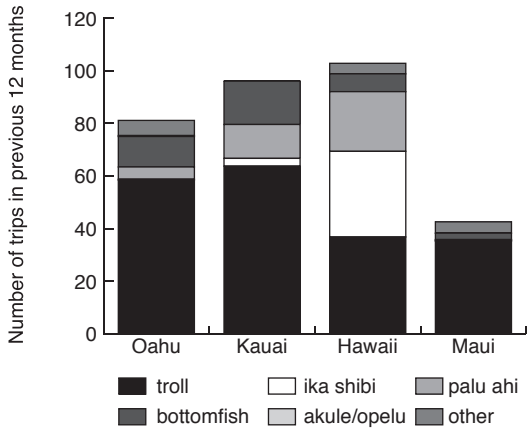

Figure 18. Annual trips per vessel by island—parttime pelagic vessels

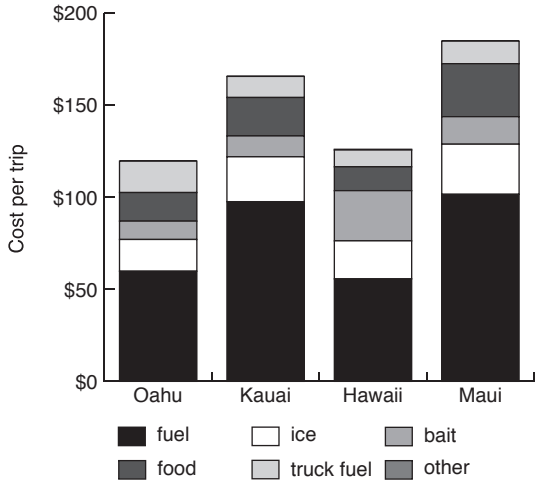

Figure 19. Cost per trip by island—parttime pelagic vessels

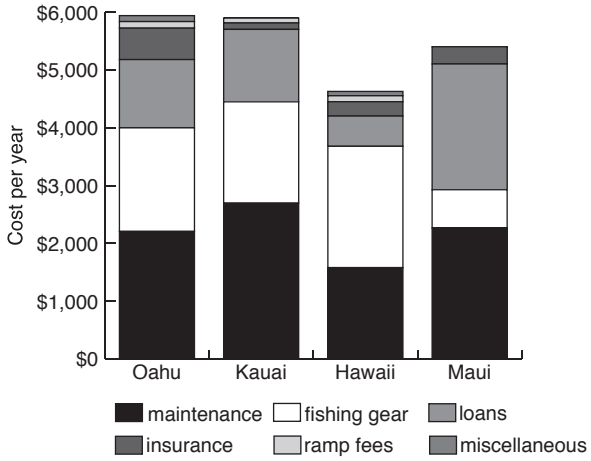

Figure 20. Annual fixed costs per vessel by island—parttime pelagic vessels

Table C9. Vessel characteristics (mean), parttime pelagic vessels by island

		Island			
Vessel Characteristic		**Hawaii**	**Kauai**	**Oahu**	**Maui**
Vessel Length (Feet)	mean	22.69	23.27	24.28	22.89
	std	(3.68)	(3.55)	(5.63)	(3.52)
Year Built	mean	82.81	85.88	84.21	85.63
	std	(8.26)	(6.73)	(6.78)	(9.55)
Year Bought	mean	89.82	90.13	88.28	93.75
	std	(5.70)	(5.00)	(6.42)	(1.16)
Purchase Price	mean	22,804	28,167	31,862	32,000
	std	(16,443)	(10,706)	(26,860)	(20,421)
Trailer Cost	mean	2,975	4,257	2,974	3,000
	std	(2,497)	(1,745)	(2,615)	(1,414)
Cost of Additional Electronics	mean	3,014	3,348	4,261	2,511
	std	(4,310)	(3,076)	(4,293)	(1,593)
Cost of Other Vessel Upgrades	mean	3,963	1,688	5,386	3,722
	std	(3,874)	(3,150)	(8,451)	(3,598)
Cost of Major Fishing Gear	mean	4,210	7,900	6,095	4,889
	std	(2,703)	(3,693)	(4,615)	(3,959)
Other Investment	mean	1,812	3,389	1,479	383
	std	(7,053)	(7,449)	(5,362)	(420)

Table C10. Fixed costs per vessel (annual mean), parttime pelagic vessels by island

		Island			
Cost Item		**Hawaii**	**Kauai**	**Oahu**	**Maui**
Insurance	mean	248	111	543	298
	std	(618)	(333)	(568)	(359)
Loan Payments	mean	523	1,253	1,181	2,175
	std	(1,952)	(2,606)	(2,525)	(3,369)
Maintenance and Repair	mean	1,583	2,698	2,209	2,272
	std	(2,115)	(3,096)	(3,565)	(3,126)
Fishing Gear	mean	2,098	1,752	1,791	658
	std	(3,392)	(1,196)	(2,539)	(705)
Ramp, License, and Registration Fees	mean	103	84	114	.
	std	(24)	(56)	(54)	(.)
Miscellaneous	mean	75	0	103	0
	std	(261)	(0)	(346)	(0)
Total	sum	4,630	5,898	5,941	5,403

Table C11. Trip costs per vessel, (mean of all fishing trips over previous 12 months) parttime pelagic vessels by island

		Island			
Cost Item		**Hawaii**	**Kauai**	**Oahu**	**Maui**
Ice	mean	20.60	24.33	17.22	27.18
	std	(4.29)	(4.50)	(1.90)	(2.71)
Boat Fuel	mean	55.62	97.48	59.75	101.47
	std	(3.82)	(27.88)	(4.31)	(14.83)
Bait	mean	27.23	11.33	9.95	14.93
	std	(16.66)	(9.52)	(4.00)	(3.66)
Food	mean	12.94	20.85	15.51	28.75
	std	(0.73)	(2.30)	(0.55)	(3.54)
Truck Fuel	mean	9.12	11.44	17.01	12.22
	std	(1.45)	(0.55)	(0.72)	(1.02)
Miscellaneous	mean	0.38	0.00	0.00	0.00
	std	(0.52)	(0.00)	(0.00)	(0.00)
Total	sum	125.89	165.43	119.44	184.55

Table C12. Vessel operating characteristics (mean), parttime pelagic vessels by island

		Island			
Operating Characteristic		**Hawaii**	**Kauai**	**Oahu**	**Maui**
Number of Crew (includes captain)	mean	2.05	1.91	2.10	2.63
	std	(0.16)	(0.11)	(0.02)	(0.22)
Usual Fishing Distance From Shore	minimum	4.05	3.39	19.19	12.99
(miles)	maximum	8.23	6.92	28.68	25.67
	mean	6.72	5.64	25.46	19.89
	std	(1.30)	(1.64)	(3.42)	(5.39)
Maximum Fishing Distance From Shore	minimum	9.06	11.58	28.64	20.45
(miles)	maximum	17.40	25.61	43.92	40.33
	mean	14.25	19.33	38.40	31.29
	std	(2.19)	(6.01)	(5.82)	(8.43)

Table C13. Catch, sales and revenue (previous 12 months) per vessel, parttime pelagic vessels by island

		Island			
Catch, Sales, and Revenue		**Hawaii**	**Kauai**	**Oahu**	**Maui**
Total Pounds Caught	mean	8,340	10,671	7,305	3,818
	std	(7,152)	(9,051)	(8,682)	(4,404)
Total Pelagic Pounds Caught	mean	7,057	7,975	7,190	3,359
	std	(6,580)	(7,672)	(8,784)	(4,401)
Total Non-Pelagic Pounds Caught	mean	1,180	1,843	527	459
	std	(3,813)	(1,562)	(898)	(417)
Total Pounds Sold	mean	7,514	7,920	6,216	3,012
	std	(7,120)	(8,217)	(8,352)	(3,530)
Total Pelagic Pounds Sold	mean	6,388	5,774	6,148	2,713
	std	(6,590)	(6,556)	(8,410)	(3,581)
Total Non-Pelagic Pounds Sold	mean	1,036	1,564	432	298
	std	(3,452)	(1,556)	(821)	(330)
Total Sales Revenue	mean	16,064	24,269	14,313	6,443
	std	(12,535)	(30,392)	(18,714)	(7,226)

Table C14. Respondent characteristics (mean), fulltime pelagic vessels by island

		Island			
Respondent Characteristic		**Hawaii**	**Kauai**	**Oahu**	**Maui**
Percent of Personal Income	mean	19.29	22.81	8.45	10.63
From Fishing	std	(21.31)	(18.30)	(13.59)	(18.02)
Total Household Income	mean	39,028	63,889	65,323	40,625
	std	(21,645)	(33,613)	(36,146)	(19,719)
Age	mean	40.24	36.67	44.76	38.89
	std	(12.39)	(7.07)	(13.44)	(9.28)

Section D. Results by Vessel Size, Full and Parttime Pelagic Vessels

Section D examines pelagic vessels by size with size classes based on vessel length overall and defined as follows:

Size 1 less than 16 feet;

Size 2 16 to 24 feet;

Size 3 Greater than 24 feet and less than 30 feet; and

Size 4 30 feet or longer.

Section D1 and Tables D1 to D7 examine fulltime pelagic vessels based on size. Section D2 and Tables D8 to D14 present data on parttime pelagic vessels by size.

1. Fulltime pelagic vessels by size.

Size 2 was the most common size for fulltime pelagic vessels in our sample (Table 4). As can be seen in Table D1, although all vessels primarily trolled each size class tended to specialize in certain activities. Size 3 vessels were the most active, and were used relatively more for pelagic handlining, especially ika shibi, while Size 2 vessels were used for relatively more non-pelagic handlining. Size 4 vessels had the greatest emphasis on trolling and though they took the least number of trips they caught the most on both a per trip and an annual basis (Table D6). Because the operators of these vessels kept a higher percentage of their fish (especially of non-pelagics) their sales volume was about equal to that of Size 3 vessels. Nevertheless, Size 4 boats realized higher gross revenues than did Size 3 vessels and therefore must have gotten higher average prices despite selling more pelagics than non-pelagics. Fixed and trip costs (Tables D3 and D4) generally rise with vessel size, although Size 4 vessels reported lower loan payments and maintenance costs than did Size 3 vessels. The mean percent of respondents' income from fishing also goes up with vessel size. Although this correlation is evident, it is unclear in which direction causality flows. Perhaps fishermen with larger vessels are more dependent on fishing for income, or it may be that fishermen who rely more heavily on fishing income purchase larger vessels for cost-efficiency and/or safety reasons.

Table D1. Number of trips (previous 12 months 1995-1996), fulltime pelagic vessels by size (small to large)

		Vessel Size		
		2	**3**	**4**
Annual Trips Per Vessel		**(n=13)**	**(n=9)**	**(n=11)**
Total Fishing Trips	mean	161.36	173.46	146.23
	std	(53.75)	(58.44)	(68.04)
Total Commercial Fishing Trips	mean	149.77	170.15	142.03
	std	(54.53)	(62.12)	(67.16)
Total Recreational Fishing Trips	mean	11.59	3.31	4.20
	std	(22.40)	(6.80)	(7.26)
Commercial Troll Trips	mean	63.63	57.66	89.82
	std	(57.62)	(75.67)	(80.80)
Commercial Palu Ahi Trips	mean	25.70	37.05	16.98
	std	(58.36)	(57.90)	(56.31)
Commercial Ika Shibi Trips	mean	24.18	50.17	28.95
	std	(45.15)	(45.19)	(41.15)
Commercial Bottomfish Trips	mean	20.57	7.73	5.82
	std	(25.78)	(24.12)	(10.44)
Commercial Akule/Opelu Trips	mean	11.23	5.01	0.00
	std	(28.98)	(15.03)	(0.00)
Commercial Reef Fish Trips	mean	0.00	0.00	0.45
	std	(0.00)	(0.00)	(1.51)
Commercial Aquarium Fish	mean	0.00	2.53	0.00
	std	(0.00)	(7.60)	(0.00)
Commercial Other Gear Trips	mean	4.46	0.00	0.00
	std	(14.38)	(0.00)	(0.00)
Recreational Troll Trips	mean	8.85	0.44	1.32
	std	(22.74)	(1.33)	(4.39)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.00	0.00	0.33
	std	(0.00)	(0.00)	(1.10)
Recreational Akule/Opelu Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	1.54	0.00	0.00
	std	(5.55)	(0.00)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	1.21	2.86	2.55
	std	(3.24)	(6.88)	(5.65)

Table D2. Vessel characteristics (mean), fulltime pelagic vessels by size (small to large)

		Vessel Size		
Vessel Characteristic		**2**	**3**	**4**
Vessel Length (Feet)	mean	20.70	25.67	32.45
	std	(2.74)	(1.32)	(3.80)
Year Built	mean	81.50	89.89	82.70
	std	(9.33)	(4.65)	(11.08)
Year Bought	mean	90.69	92.20	90.14
	std	(4.66)	(4.44)	(3.89)
Purchase Price	mean	17,542	37,667	51,200
	std	(12,174)	(12,339)	(27,987)
Trailer Cost	mean	1,760	2,286	3,500
	std	(1,911)	(1,604)	(3,041)
Cost of Additional Electronics	mean	2,323	5,611	5,250
	std	(2,080)	(3,723)	(4,409)
Cost of Other Vessel Upgrades	mean	3,177	5,333	7,636
	std	(6,781)	(7,977)	(7,915)
Cost of Major Fishing Gear	mean	4,600	4,044	5,594
	std	(5,641)	(2,457)	(4,012)
Other Investment	mean	1,462	6,600	3,877
	std	(4,977)	(11,591)	(7,643)

Table D3. Fixed costs per vessel (annual mean), fulltime pelagic vessels by size (small to large)

		Vessel Size		
Cost Item		**2**	**3**	**4**
Insurance	mean	142	333	1,070
	std	(275)	(480)	(1,500)
Loan Payments	mean	471	3,261	3,156
	std	(1,180)	(3,640)	(4,286)
Maintenance and Repairs	mean	1,860	3,307	2,930
	std	(2,171)	(3,352)	(2,374)
Fishing Gear	mean	2,130	1,973	3,756
	std	(2,459)	(1,581)	(5,664)
Ramp, License, and Registration Fees	mean	98	72	100
	std	(45)	(40)	(76)
Miscellaneous	mean	35	232	629
	std	(125)	(332)	(640)
Total	sum	4,736	9,178	11,641

Table D4. Trip costs per vessel, (mean of all fishing trips over previous 12 months), fulltime pelagic vessels by size (small to large)

		Vessel Size		
Cost Item		**2**	**3**	**4**
Ice	mean	19.41	29.93	31.95
	std	(3.52)	(13.09)	(9.49)
Boat Fuel	mean	41.80	43.95	50.96
	std	(5.03)	(15.19)	(13.30)
Bait	mean	30.71	49.45	25.69
	std	(25.50)	(41.67)	(15.85)
Food	mean	15.17	17.56	19.57
	std	(2.93)	(1.84)	(1.70)
Truck Fuel	mean	9.82	12.98	6.43
	std	(0.79)	(2.03)	(2.14)
Miscellaneous	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Total	sum	116.91	153.87	134.60

Table D5. Vessel operating characteristics (mean), fulltime pelagic vessels by size (small to large)

		Vessel Size		
Operating Characteristic		**2**	**3**	**4**
Number of Crew (includes captain)	mean	1.61	1.90	1.91
	std	(0.16)	(0.09)	(0.15)
Usual Fishing Distance From Shore (miles)	minimum	4.40	3.93	6.75
	maximum	13.33	12.90	69.28
	mean	9.37	7.18	20.31
	std	(3.36)	(3.21)	(18.89)
Maximum Fishing Distance From Shore (miles)	minimum	9.88	8.52	14.00
	maximum	32.02	26.67	104.70
	mean	22.02	14.37	31.11
	std	(8.15)	(6.58)	(28.00)

Table D6. Catch, sales and revenue (previous 12 months) per vessel, fulltime pelagic vessels by size (small to large)

		Vessel Size		
Catch, Sales and Revenue		**2**	**3**	**4**
Total Pounds Caught	mean	21,067	28,063	29,963
	std	(21,297)	(10,969)	(17,527)
Total Pelagic Pounds Caught	mean	14,283	23,556	29,375
	std	(12,655)	(10,990)	(17,614)
Total Non-Pelagic Pounds Caught	mean	6,338	4,563	522
	std	(13,704)	(6,748)	(692)
Total Pounds Sold	mean	18,893	26,289	26,344
	std	(20,538)	(10,661)	(17,243)
Total Pelagic Pounds Sold	mean	12,929	21,830	26,000
	std	(12,299)	(10,528)	(17,196)
Total Non-Pelagic Pounds Sold	mean	5,575	4,356	275
	std	(12,715)	(6,676)	(530)
Total Sales Revenue	mean	28,167	67,889	73,313
	std	(20,660)	(49,248)	(59,664)

Table D7. Respondent characteristics (mean), fulltime pelagic vessels by size (small to large)

		Vessel Size		
Respondent Characteristic		**2**	**3**	**4**
Percent of Personal Income From Fishing	mean	90.77	97.22	97.27
	std	(13.67)	(8.33)	(9.05)
Total Household Income	mean	32,083	47,813	59,286
	std	(21,475)	(22,338)	(43,150)
Age	mean	39.38	35.56	41.60
	std	(11.61)	(8.82)	(16.19)

2. Parttime pelagic vessels by size.

Size 2 vessels were again the most common size intercepted. Also again, all sizes were found to use more than one gear type, and to have caught non-pelagic as well as pelagic species. As compared to fulltime vessels, these boats did less handlining—both for pelagics and for bottomfish. Size 2 vessels averaged a lower annual catch overall but made more non-pelagic trips (bottomfishing and reef fishing) and a greater percent of their catch was non-pelagic. We may conclude that a large portion of their non-pelagic sales came from bottomfish because they sold approximately half as many total pounds as Size 3 vessels yet their revenue was 60% of Size 3 vessels. Deep-sea bottomfishes are the only non-pelagic group that regularly secure higher prices than pelagic species. Investment in Size 2 vessels was substantially lower than for larger boats, the average purchase price was less than half that for Size 3 and less than one third that of Size 4 vessels. In addition, Size 2 vessels had a lower fuel cost per trip then did Size 3 boats, likely due to their emphasis on handlining (both pelagic and non-pelagic). As with fulltimers, Size 4 took the least trips but had the highest catch, sales and gross revenue although the differences are not great.

Table D8. Number of trips (previous 12 months 1995-1996), parttime pelagic vessels by size (small to large)

Annual Trips Per Vessel		Vessel Size 2 (n=47)	3 (n=29)	4 (n=7)
Total Fishing Trips	mean	83.62	86.67	76.93
	std	(65.00)	(50.52)	(96.82)
Total Commercial Fishing Trips	mean	80.14	82.48	75.79
	std	(64.92)	(51.50)	(94.87)
Total Recreational Fishing Trips	mean	3.48	3.90	1.14
	std	(7.48)	(10.71)	(2.27)
Commercial Troll Trips	mean	41.36	59.64	61.73
	std	(42.07)	(47.22)	(96.37)
Commercial Palu Ahi Trips	mean	15.38	3.96	4.93
	std	(36.11)	(11.90)	(11.84)
Commercial Ika Shibi Trips	mean	10.22	12.10	4.53
	std	(30.59)	(25.66)	(11.97)
Commercial Bottomfish Trips	mean	11.53	7.27	4.61
	std	(25.82)	(14.54)	(7.24)
Commercial Akule/Opelu	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Reef Fish Trips	mean	1.16	0.59	0.00
	std	(3.92)	(2.13)	(0.00)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Other Gear Types	mean	0.49	2.20	0.00
	std	(1.68)	(7.46)	(0.00)
Recreational Troll Trips	mean	1.92	2.83	0.29
	std	(6.12)	(9.00)	(0.76)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Bottom Fishing Trips	mean	0.30	0.38	0.00
	std	(1.83)	(1.86)	(0.00)
Recreational Akule/Opelu Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	0.02	0.00	0.00
	std	(0.15)	(0.00)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	1.24	0.69	0.86
	std	(3.87)	(2.90)	(2.27)

Table D9. Vessel characteristics (mean), parttime pelagic vessels by size (small to large)

		Vessel Size		
Vessel Characteristic		**2**	**3**	**4**
Vessel Length (feet)	mean	20.76	26.15	33.93
	std	(2.55)	(1.23)	(4.48)
Year Built	mean	83.31	86.21	82.00
	std	(8.37)	(5.61)	(4.98)
Year Bought	mean	89.70	89.22	91.33
	std	(6.23)	(5.34)	(4.51)
Purchase Price	mean	18,472	38,772	65,786
	std	(12,893)	(15,864)	(38,974)
Trailer Cost	mean	2,771	4,047	1,880
	std	(2,571)	(2,045)	(2,227)
Cost of Additional Electronics	mean	2,828	4,050	6,643
	std	(3,456)	(4,373)	(4,250)
Cost of Other Vessel Upgrades	mean	4,436	4,609	3,429
	std	(6,985)	(6,245)	(5,255)
Cost of Major Fishing Gear	mean	4,981	5,921	9,317
	std	(3,894)	(3,685)	(5,337)
Other Investment	mean	2,211	917	1,129
	std	(7,476)	(2,523)	(1,928)

Table D10. Fixed costs per vessel (annual mean), parttime pelagic vessels by size (small to large)

		Group		
Cost Item		**2**	**3**	**4**
Insurance	mean	142	333	1,070
	std	(275)	(480)	(1,500)
Loan Payments	mean	471	3,261	3,156
	std	(1,180)	(3,640)	(4,286)
Maintenance and Repairs	mean	1,860	3,307	2,930
	std	(2,171)	(3,352)	(2,374)
Fishing Gear	mean	2,130	1,973	3,756
	std	(2,459)	(1,581)	(5,664)
Ramp, License, and Registration Fees	mean	98	72	100
	std	(45)	(40)	(76)
Miscellaneous	mean	35	232	629
	std	(125)	(332)	(640)
Total	sum	4,736	9,178	11,641

Table D11. Trip costs per vessel, (mean of all fishing trips over previous 12 months), parttime pelagic vessels by size (small to large)

		Vessel Size		
Cost Item		**2**	**3**	**4**
Ice	mean	18.59	23.70	15.48
	std	(3.65)	(2.10)	(0.54)
Boat Fuel	mean	62.02	72.74	50.61
	std	(7.61)	(10.14)	(6.43)
Bait	mean	14.52	20.85	7.86
	std	(10.71)	(16.05)	(4.42)
Food	mean	14.87	19.40	19.14
	std	(0.74)	(2.89)	(0.04)
Truck Fuel	mean	13.71	9.72	18.73
	std	(2.07)	(1.79)	(2.46)
Miscellaneous	mean	0.20	0.00	0.00
	std	(0.40)	(0.00)	(0.00)
Total	sum	123.91	146.41	111.72

Table D12. Vessel operating characteristics (mean), parttime pelagic vessels by size (small to large)

		Vessel Size		
Operating Characteristic		**2**	**3**	**4**
Number of Crew (includes captain)	mean	2.20	2.06	2.40
	std	(0.12)	(0.08)	(0.19)
Usual Fishing Distance From Shore (miles)	minimum	7.25	5.23	20.09
	maximum	19.37	24.35	26.93
	mean	14.64	18.86	23.97
	std	(3.98)	(5.64)	(3.05)
Maximum Fishing Distance From Shore (miles)	minimum	13.75	12.11	28.44
	maximum	31.70	41.90	40.29
	mean	24.28	33.14	35.15
	std	(5.86)	(8.88)	(5.29)

Table D13. Catch, sales and revenue (previous 12 months) per vessel, parttime pelagic vessels by size (small to large)

		Vessel Size		
Catch, Sales, and Revenue		**2**	**3**	**4**
Total Pounds Caught	mean	5,583	10,055	11,020
	std	(6,016)	(7,935)	(15,366)
Total Pelagic Pounds Caught	mean	5,027	8,884	10,732
	std	(5,854)	(7,424)	(15,454)
Total Non-Pelagic Pounds Caught	mean	932	816	288
	std	(2,878)	(1,393)	(446)
Total Pounds Sold	mean	4,486	8,726	10,388
	std	(5,127)	(7,964)	(15,475)
Total Pelagic Pounds Sold	mean	4,048	7,724	10,129
	std	(5,010)	(7,356)	(15,552)
Total Non-Pelagic Pounds Sold	mean	775	694	259
	std	(2,584)	(1,377)	(401)
Total Sales Revenue	mean	11,163	18,800	22,146
	std	(15,384)	(18,458)	(28,658)

Table D14. Respondent characteristics (mean), parttime pelagic vessels by size (small to large)

		Vessel Size		
Respondent Characteristic		**2**	**3**	**4**
Percent of Personal Income From Fishing	mean	11.71	17.71	9.38
	std	(16.51)	(19.61)	(18.75)
Total Household Income	mean	56,419	50,625	64,167
	std	(36,231)	(22,303)	(43,522)
Age	mean	41.30	40.56	55.83
	std	(10.09)	(11.12)	(22.23)

Section E. Results by Gear Type, Fulltime Hawaii Island Pelagic Vessels

Section E and Tables E1 to E7 present information on fulltime pelagic Hawaii island based vessels by predominant gear type (the gear used on the majority of trips during the previous 12 months). This section includes vessels which took one day as well as multi-day trips. The average trip length is presented in Table E5. Although all vessels in this section are primarily based on the island of Hawaii, some unload and refuel in Honolulu. Groupings of each gear type include boats from both the Hilo and Kona sides of the island. The three gears for which we have information are palu ahi, ika shibi, and seamount gears which are a combination of trolling and handlining techniques used by a group of vessels that fish the Cross Seamount.

As with all groups in this report, these vessels utilized more than one gear type. However the operators of these boats appear to be relatively specialized with at least 80% of their trips attributed to their predominant gear type. Palu ahi vessels were found to take the most trips, however this is undoubtedly due to the both the seasonality of the ika shibi fishery (approximately 5 months) and the length of trips to the seamounts (average 4.87 days).

Ika shibi and seamount vessels are on average larger and are associated with higher levels of investment than typical fulltime pelagic vessels. Both fixed and trip costs are highest for seamount boats and lowest for palu ahi vessels. Despite taking the fewest trips seamount vessels had the highest total catch, sales, and gross revenue. Although ika shibi vessels took fewer trips and caught less total pounds overall they still managed to realize higher gross revenues than palu ahi vessels. This is probably partially because of the price differential for ika shibi caught fish (generally believed to be larger and of better quality) versus fish caught by other methods.

Table E1. Number of trips (previous 12 months 1995-1996), Hawaii island fulltime pelagic vessels by gear type

Annual Trips Per Vessel		Gear Type		
		Palu ahi (n=3)	Ika shibi (n=10)	Seamount (n=6)
Total Fishing Trips	mean	213.57	119.90	38.83
	std	(55.25)	(47.30)	(18.59)
Total Commercial Fishing Trips	mean	204.77	119.07	38.83
	std	(47.83)	(45.50)	(18.59)
Total Recreational Fishing Trips	mean	8.80	0.84	0.00
	std	(13.22)	(2.14)	(0.00)
Commercial Troll Trips	mean	24.38	11.64	0.00
	std	(21.13)	(13.60)	(0.00)
Commercial Palu Ahi Trips	mean	176.43	1.28	35.23
	std	(58.10)	(4.05)	(19.94)
Commercial Ika Shibi Trips	mean	0.00	99.38	1.50
	std	(0.00)	(37.93)	(3.67)
Commercial Bottomfish Trips	mean	3.96	6.77	2.10
	std	(6.86)	(15.00)	(2.88)
Commercial Akule/Opelu Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Reef Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Troll Trips	mean	8.00	0.00	0.00
	std	(13.86)	(0.00)	(0.00)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Akule/Opelu Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.80	0.84	0.00
	std	(1.39)	(2.14)	(0.00)

Table E2. Vessel characteristics (mean), Hawaii island fulltime pelagic vessels by gear type

Vessel Characteristic		Gear Type: Palu ahi	Ika shibi	Seamount
Vessel Length (feet)	mean	20.20	26.65	40.17
	std	(1.59)	(4.15)	(3.49)
Year Built	mean	82.00	86.40	89.40
	std	(6.24)	(9.81)	(6.23)
Year Bought	mean	88.00	91.14	92.25
	std	(7.55)	(5.52)	(1.50)
Purchase Price	mean	11,667	42,556	150,000
	std	(8,607)	(35,409)	(112,827)
Trailer Cost	mean	2,000	3,775	11,000
	std	(.)	(4,321)	(6,557)
Cost of Additional Electronics	mean	2,167	6,780	15,333
	std	(2,466)	(6,025)	(12,028)
Cost of Other Vessel Upgrades	mean	975	2,944	15,833
	std	(1,379)	(3,828)	(19,250)
Cost of Major Fishing Gear	mean	3,075	5,510	7,717
	std	(1,520)	(6,223)	(2,871)
Other Investment	mean	18,600	1,100	8,700
	std	(18,907)	(2,477)	(12,030)

Table E3. Fixed costs per vessel (annual mean), Hawaii island fulltime pelagic vessels by gear type

Cost Item		Gear Type: Palu ahi	Ika shibi	Seamount
Insurance	mean	0	1,430	7,833
	std	(0)	(4,248)	(5,046)
Loan Payments	mean	1,440	2,592	3,400
	std	(2,494)	(4,349)	(5,389)
Maintenance and Repairs	mean	517	4,600	9,250
	std	(419)	(5,537)	(6,494)
Fishing Gear	mean	3,067	2,200	3,993
	std	(3,631)	(2,055)	(2,508)
Ramp, License, and Registration Fees	mean	80	120	.
	std	(.)	(56)	(.)
Miscellaneous	mean	0	291	1,480
	std	(0)	(458)	(864)
Total	sum	5,104	11,233	29,956

Table E4. Trip costs per vessel (mean of all fishing trips over previous 12 months), Hawaii island fulltime pelagic vessels by gear type

		Gear Type		
Cost Item		**Palu ahi**	**Ika shibi**	**Seamount**
Ice	mean	11.31	41.81	262.76
	std	(0.72)	(4.16)	(18.71)
Boat Fuel	mean	78.17	41.83	426.78
	std	(3.44)	(1.10)	(46.95)
Bait	mean	43.50	92.83	359.36
	std	(4.24)	(12.44)	(10.56)
Food	mean	36.04	19.41	221.64
	std	(2.46)	(0.65)	(12.86)
Truck Fuel	mean	10.78	11.73	22.29
	std	(0.38)	(0.93)	(2.55)
Miscellaneous	mean	0.00	0.00	10.60
	std	(0.00)	(0.00)	(1.98)
Total	sum	179.80	207.61	1,303.43

Table E5. Vessel operating characteristics (mean), Hawaii island fulltime pelagic vessels by gear type

		Gear Type		
Operating Characteristic		**Palu ahi**	**Ika shibi**	**Seamount**
Days per Trip	mean	1.25	1.00	4.87
	std	(0.05)	(0.00)	(0.53)
Number of Crew (includes captain)	mean	1.61	1.72	3.35
	std	(0.06)	(0.02)	(0.04)
Usual Fishing Distance From Shore (miles)	minimum	1.44	5.20	121.82
	maximum	2.44	6.40	189.94
	mean	1.87	5.96	164.83
	std	(0.51)	(0.41)	(23.45)
Maximum Fishing Distance From Shore (miles)	minimum	4.97	10.94	202.07
	maximum	6.25	13.56	275.54
	mean	5.46	12.47	260.24
	std	(0.69)	(0.95)	(28.59)

Table E6. Catch, sales and revenue (previous 12 months) per vessel, Hawaii island fulltime pelagic vessels by gear type

		Gear Type		
Catch, Sales and Revenue		**Palu ahi**	**Ika shibi**	**Seamount**
Total Pounds Caught	mean	37,667	31,563	183,583
	std	(37,099)	(21,084)	(116,842)
Total Pelagic Pounds Caught	mean	21,667	28,056	177,750
	std	(14,434)	(11,165)	(119,442)
Total Nonpelagic Pounds Caught	mean	16,000	3,333	5,833
	std	(27,713)	(10,000)	(9,704)
Total Pounds Sold	mean	35,533	31,150	178,188
	std	(35,575)	(21,229)	(114,149)
Total Pelagic Pounds Sold	mean	20,333	27,656	172,563
	std	(14,145)	(11,269)	(116,553)
Total Nonpelagic Pounds Sold	mean	15,200	3,333	5,625
	std	(26,327)	(10,000)	(9,211)
Total Sales Revenue	mean	46,667	70,813	236,979
	std	(30,139)	(57,266)	(158,374)

Table E7. Respondent characteristics (mean), Hawaii island fulltime pelagic vessels by gear type

		Gear Type		
Respondent Characteristic		**Palu ahi**	**Ika shibi**	**Seamount**
Percent of Personal Income From Fishing	mean	86.67	92.50	99.17
	std	(11.55)	(12.08)	(2.04)
Total Household Income	mean	28,333	46,111	80,833
	std	(15,275)	(42,040)	(54,168)
Age	mean	43.33	42.10	50.00
	std	(5.77)	(12.10)	(8.94)

Section F. Results by Island, Full and Parttime Pelagic Trollers

The remainder of this paper again excludes vessels which took multi-day trips. Section F investigates differences between troll vessels by island. Section F1 and Tables F1 to F7 examine fulltime trollers while section F2 and Tables F8 to F14 present information on parttimers. Because of the limited number of fulltime trollers (taking one day trips) intercepted, section F1 compares Oahu based vessels to those from all other islands combined.

1. Fulltime pelagic trollers by island.

As above, these vessels utilize multiple gears but reported that at least 80% of their trips in the previous 12 months were of their predominant gear type (trolling). Oahu vessels were slightly more active and did significantly more bottomfishing than those from other islands. Oahu based vessels managed to have lower fixed costs (with the exception of insurance costs), however their average trip costs were higher (despite lower fuel costs) because of higher bait and ice costs. Oahu vessels caught and sold 43% less pounds than did outer island boats, and their gross revenue was 68% lower. This may be due to localized competition due to both Oahu's higher population and its somewhat central location in the island chain. Thus Oahu based boats must at times compete with vessels from other islands for good fishing spots, a situation less common for Kauai or Hawaii island based fishermen. This fishing pressure may lead to local depletion of stocks available to Oahu fishermen.

Table F1. Number of trips (previous 12 months 1995-1996), fulltime pelagic trollers by island

		Island	
		Oahu	Other
Annual Trips Per Vessel		**(n=10)**	**(n=4)**
Total Fishing Trips	mean	169.85	162.50
	std	(63.56)	(43.30)
Total Commercial Fishing Trips	mean	163.16	140.69
	std	(61.99)	(61.36)
Total Recreational Fishing Trips	mean	6.69	21.81
	std	(8.88)	(35.72)
Commercial Troll Trips	mean	137.72	126.56
	std	(57.46)	(75.78)
Commercial Palu Ahi Trips	mean	0.30	3.75
	std	(0.95)	(7.50)
Commercial Ika Shibi Trips	mean	0.00	5.63
	std	(0.00)	(11.25)
Commercial Bottomfish Trips	mean	17.26	3.50
	std	(21.84)	(7.00)
Commercial Akule/Opelu Trips	mean	5.00	0.00
	std	(15.81)	(0.00)
Commercial Reef Fish Trips	mean	0.00	1.25
	std	(0.00)	(2.50)
Commercial Aquarium Fish Trips	mean	2.28	0.00
	std	(7.21)	(0.00)
Commercial Other Gear Trips	mean	0.60	0.00
	std	(1.90)	(0.00)
Recreational Troll Trips	mean	1.46	18.75
	std	(4.60)	(37.50)
Recreational Pelagic Handline Trips	mean	0.00	0.00
	std	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.36	0.00
	std	(1.15)	(0.00)
Recreational Akule/Opelu Trips	mean	0.00	0.00
	std	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	2.00	0.00
	std	(6.32)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00
	std	(0.00)	(0.00)
Recreational Other Gear Trips	mean	2.87	3.06
	std	(6.18)	(4.75)

Table F2. Vessel characteristics (mean), fulltime pelagic trollers by island

Vessel Characteristic		Island: Oahu	Island: Other
Vessel Length (feet)	mean	28.70	26.00
	std	(6.98)	(7.12)
Year Built	mean	84.13	81.75
	std	(10.99)	(8.14)
Year Bought	mean	91.56	89.75
	std	(3.28)	(4.99)
Purchase Price	mean	39,600	29,625
	std	(16,728)	(27,572)
Trailer Cost	mean	2,083	2,000
	std	(2,577)	(.)
Cost of Additional Electronics	mean	3,122	4,431
	std	(1,913)	(7,120)
Cost of Other Vessel Upgrades	mean	6,850	8,875
	std	(9,012)	(10,250)
Cost of Major Fishing Gear	mean	4,041	6,000
	std	(2,794)	(1,414)
Other Investment	mean	925	9,000
	std	(1,732)	(14,283)

Table F3. Fixed costs per vessel (annual mean), fulltime pelagic trollers by island

Cost Item		Island: Oahu	Island: Other
Insurance	mean	1,083	300
	std	(1,291)	(600)
Loan Payments	mean	1,675	2,190
	std	(3,157)	(2,533)
Maintenance and Repairs	mean	1,839	4,625
	std	(1,590)	(1,315)
Fishing Gear	mean	1,414	3,000
	std	(1,445)	(1,780)
Ramp, License, and Registration Fees	mean	92	150
	std	(81)	(.)
Miscellaneous	mean	440	0
	std	(647)	(0)
Total	sum	6,543	10,265

Table F4. Trip costs per vessel (mean of all fishing trips over previous 12 months), fulltime pelgaic trollers by island

		Island	
Cost Item		**Oahu**	**Other**
Ice	mean	41.81	27.58
	std	(4.16)	(2.18)
Boat Fuel	mean	41.83	69.68
	std	(1.10)	(6.52)
Bait	mean	92.83	16.64
	std	(12.44)	(1.93)
Food	mean	19.41	20.30
	std	(0.65)	(1.42)
Truck Fuel	mean	11.73	8.35
	std	(0.93)	(0.25)
Miscellaneous	mean	0.00	0.00
	std	(0.00)	(0.00)
Total	sum	207.61	142.55

Table F5. Vessel operating characteristics (mean), fulltime pelagic trollers by island

		Island	
Operating Characteristic		**Oahu**	**Other**
Number of Crew (includes captain)	mean	1.72	1.63
	std	(0.02)	(0.04)
Usual Fishing Distance From Shore (miles)	minimum	5.20	7.16
	maximum	6.40	8.66
	mean	5.96	7.92
	std	(0.41)	(0.73)
Maximum Fishing Distance From Shore (miles)	minimum	10.94	22.65
	maximum	13.56	28.71
	mean	12.47	25.91
	std	(0.95)	(2.85)

Table F6. Catch, sales and revenue (previous 12 months) per vessel, fulltime pelagic trollers by island

		Island	
Catch, Sales, and Revenue		**Oahu**	**Other**
Total Pounds Caught	mean	16,733	29,375
	std	(12,074)	(16,560)
Total Pelagic Pounds Caught	mean	15,843	28,750
	std	(11,530)	(16,008)
Total Non-Pelagic Pounds Caught	mean	2,071	625
	std	(3,514)	(946)
Total Pounds Sold	mean	14,008	24,600
	std	(11,389)	(15,476)
Total Pelagic Pounds Sold	mean	13,443	24,100
	std	(10,590)	(15,149)
Total Non-Pelagic Pounds Sold	mean	1,481	500
	std	(3,064)	(757)
Total Sales Revenue	mean	37,150	116,375
	std	(24,169)	(83,651)

Table F7. Respondent characteristics (mean), fulltime pelagic trollers by island

Respondent Characteristic		Island: Oahu	Island: Other
Percent of Personal Income From Fishing	mean	100.00	82.50
	std	(0.00)	(20.62)
Total Household Income	mean	42,500	72,500
	std	(21,547)	(52,678)
Age	mean	39.67	30.00
	std	(16.38)	(0.00)

2. Parttime pelagic trollers by island.

As seen throughout this report, these parttime vessels were less active than the fulltime vessels covered in the previous section. In addition, Kauai based vessels are the most active and Maui the least active when examined by island. Secondary gears also reflect differences seen in Section C, with Big Island boats taking ika shibi trips and Kauai and Oahu vessels focusing on bottomfishing. Maui vessels again appear to be the most specialized with only a little reef fishing. Trip costs reflect these differences as expected, although the distance from the home port to the fishing grounds also affects fuel costs.

Kauai boats had the greatest gross revenue, however Oahu based vessels caught and sold more total pounds. Obviously this means that Kauai vessels secured higher prices for their fish. This is probably because a greater percentage of their sales were non-pelagics and that these non-pelagics were probably bottomfish. However differences can also exist in prices received for pelagic species. For example, ahi are generally more valuable than mahimahi or marlin, and large ahi are more valuable than smaller ones.

Table F8. Number of trips (previous 12 months 1995-1996), parttime pelagic trollers by island

		Island			
		Hawaii	**Kauai**	**Maui**	**Oahu**
Annual Trips Per Vessel		**(n=8)**	**(n=7)**	**(n=6)**	**(n=31)**
Total Fishing Trips	mean	81.38	80.77	49.83	74.40
	std	(61.44)	(48.35)	(35.05)	(61.27)
Total Commercial Fishing Trips	mean	76.20	77.14	49.42	69.84
	std	(64.31)	(43.41)	(35.06)	(61.20)
Total Recreational Fishing Trips	mean	5.18	2.59	0.42	4.56
	std	(12.52)	(5.52)	(1.02)	(10.24)
Commercial Troll Trips	mean	63.64	72.11	45.88	62.76
	std	(49.93)	(44.94)	(32.73)	(58.96)
Commercial Palu Ahi Trips	mean	0.29	1.14	0.00	0.09
	std	(0.81)	(3.02)	(0.00)	(0.50)
Commercial Ika Shibi Trips	mean	9.74	3.92	0.00	0.16
	std	(17.37)	(5.30)	(0.00)	(0.88)
Commercial Bottomfish Trips	mean	1.26	8.97	0.00	4.67
	std	(3.53)	(7.74)	(0.00)	(7.13)
Commercial Akule/Opelu Trips	mean	0.00	0.00	0.00	0.47
	std	(0.00)	(0.00)	(0.00)	(2.64)
Commercial Reef Fish Trips	mean	0.00	2.83	3.53	0.00
	std	(0.00)	(7.48)	(5.03)	(0.00)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	1.28	2.61	0.00	1.69
	std	(2.49)	(3.42)	(0.00)	(7.16)
Recreational Troll Trips	mean	4.88	2.29	0.00	2.96
	std	(12.62)	(5.62)	(0.00)	(8.60)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.00	0.14	0.00	0.37
	std	(0.00)	(0.38)	(0.00)	(1.80)
Recreational Akule/Opelu Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	0.00	0.14	0.00	0.00
	std	(0.00)	(0.38)	(0.00)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.30	0.02	0.42	1.23
	std	(0.85)	(0.05)	(1.02)	(3.34)

Table F9. Vessel characteristics (mean), parttime pelagic trollers by island

		Island			
Vessel Characteristic		**Hawaii**	**Kauai**	**Maui**	**Oahu**
Vessel Length (feet)	mean	22.38	23.09	23.67	24.98
	std	(3.54)	(4.03)	(2.80)	(6.00)
Year Built	mean	83.88	83.83	83.50	83.40
	std	(10.01)	(6.55)	(10.27)	(6.64)
Year Bought	mean	90.75	89.71	93.67	88.71
	std	(6.41)	(5.25)	(1.37)	(5.96)
Purchase Price	mean	23,438	26,500	33,833	33,819
	std	(19,078)	(11,236)	(23,043)	(29,079)
Trailer Cost	mean	5,000	4,050	2,000	3,216
	std	(.)	(1,815)	(.)	(2,699)
Cost of Additional Electronics	mean	2,200	3,019	1,767	4,687
	std	(3,320)	(3,459)	(1,329)	(4,620)
Cost of Other Vessel Upgrades	mean	3,229	2,250	3,667	5,385
	std	(2,994)	(3,518)	(4,033)	(8,226)
Cost of Major Fishing Gear	mean	5,029	7,943	4,833	6,137
	std	(3,029)	(3,487)	(4,179)	(4,971)
Other Investment	mean	63	4,071	267	1,758
	std	(158)	(8,438)	(432)	(6,073)

Table F10. Fixed costs per vessel (annual mean), parttime pelagic trollers by island

		Island			
Cost Item		**Hawaii**	**Kauai**	**Maui**	**Oahu**
Insurance	mean	613	0	233	577
	std	(989)	(0)	(367)	(613)
Loan Payments	mean	434	1,029	2,236	1,258
	std	(812)	(2,721)	(4,108)	(2,604)
Maintenance and Mean Repairs	mean	1,581	3,083	3,017	1,978
	std	(1,294)	(3,401)	(3,672)	(2,787)
Fishing Gear	mean	1,547	1,703	637	1,475
	std	(1,144)	(748)	(875)	(2,208)
Ramp, License, and Registration Fees	mean	117	58	.	113
	std	(29)	(29)	(.)	(56)
Miscellaneous	mean	171	0	0	133
	std	(454)	(0)	(0)	(389)
Total	sum	4,463	5,873	6,123	5,534

Table F11. Trip costs per vessel (mean of all fishing trips over previous 12 months), parttime pelagic trollers by island

		Island			
Cost Item		**Hawaii**	**Kauai**	**Maui**	**Oahu**
Ice	mean	10.69	24.42	28.64	16.81
	std	(1.44)	(4.30)	(0.70)	(0.02)
Boat Fuel	mean	48.69	66.78	146.24	59.10
	std	(2.47)	(13.44)	(3.52)	(2.89)
Bait	mean	6.68	12.45	14.48	9.28
	std	(6.56)	(8.27)	(1.06)	(2.27)
Food	mean	11.38	23.46	33.83	14.62
	std	(0.45)	(3.45)	(1.90)	(0.35)
Truck Fuel	mean	10.28	10.68	13.61	17.65
	std	(0.44)	(0.64)	(0.02)	(0.15)
Miscellaneous	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Total	sum	87.72	137.79	236.80	117.46

Table F12. Vessel operating characteristics (mean), parttime pelagic trollers by island

		Island			
Operating Characteristic		**Hawaii**	**Kauai**	**Maui**	**Oahu**
Number of Crew	mean	2.42	1.82	2.78	2.15
(includes captain)	std	(0.07)	(0.21)	(0.03)	(0.00)
Usual Fishing Distance	minimum	4.55	4.03	22.97	22.18
From Shore (miles)	maximum	5.04	6.68	32.67	29.76
	mean	4.90	5.88	28.79	27.83
	std	(0.20)	(1.08)	(4.22)	(2.40)
Maximum Fishing Distance	minimum	14.61	14.85	37.63	31.41
From Shore (miles)	maximum	16.13	23.13	53.50	44.60
	mean	15.44	20.28	47.15	41.25
	std	(0.59)	(3.17)	(6.90)	(4.18)

Table F13. Catch, sales and revenue (previous 12 months) per vessel, parttime pelagic trollers by island

		Island			
Catch, Sales, and Revenue		**Hawaii**	**Kauai**	**Maui**	**Oahu**
Total Pounds Caught	mean	5,341	7,950	3,833	8,051
	std	(4,118)	(6,007)	(5,285)	(9,267)
Total Pelagic Pounds Caught	mean	5,280	6,300	3,617	7,505
	std	(4,149)	(4,532)	(5,269)	(9,120)
Total Non-Pelagic Pounds Caught	mean	53	1,650	217	546
	std	(104)	(1,617)	(250)	(977)
Total Pounds Sold	mean	4,375	6,040	3,076	6,989
	std	(4,218)	(7,165)	(4,199)	(8,937)
Total Pelagic Pounds Sold	mean	4,343	4,616	2,970	6,529
	std	(4,237)	(5,561)	(4,268)	(8,819)
Total Non-Pelagic Pounds Sold	mean	28	1,424	106	460
	std	(56)	(1,656)	(175)	(895)
Total Sales Revenue	mean	8,139	17,021	6,333	14,535
	std	(8,477)	(24,236)	(8,565)	(19,641)

Table F14. Respondent characteristics (mean), parttime pelagic trollers by island

Respondent Characteristic		Island			
		Hawaii	Kauai	Maui	Oahu
Percent of Personal Income	mean	13.57	21.67	10.00	7.33
From Fishing	std	(18.42)	(21.37)	(19.75)	(12.23)
Total Household Income	mean	45,357	65,000	36,667	66,354
	std	(26,942)	(38,730)	(21,134)	(38,214)
Age	mean	40.63	37.14	41.67	44.50
	std	(15.68)	(7.56)	(9.83)	(14.74)

Section G. Results by Vessel Target and Operator Motivation, Expense and Recreational Vessels

Section G and Tables G1 to G7 focus on all (pelagic and non-pelagic) expense and recreational vessels. This section only includes vessels which took one day trips. When separated by vessel target and operator motivation it can be observed that non-pelagic vessels were slightly more active than pelagic vessels and that expense vessels were more active than recreational vessels. Expense non-pelagic boats primarily bottomfished while recreational boats reef fished on the majority of their trips. Both groups (expense and recreational) of pelagic vessels primarily trolled, followed by bottomfishing and reef fishing. Pelagic vessels were again slightly larger and more expensive than non-pelagic boats, and expense vessels were larger and more expensive than recreational vessels. Fixed and trip costs follow this same pattern, with non-pelagic vessel costs lower than those of pelagic vessels and expense vessel costs lower than those for recreational vessels. Pelagic expense vessels had the highest total catches and recreational pelagic vessels had the lowest. The effects of targeting (pelagic vs. non-pelagic) can be seen in catch compositions, with non-pelagic vessels averaging 53% non-pelagic species and pelagic vessels averaging 84% pelagic species. Pelagic expense vessels sold an average of 59% (2,173 pounds) of their catch while non-pelagic expense vessels averaged sales of 51% (1,886 pounds) of their catch. Both groups averaged very close to $4,000 in total sales and thus non-pelagic vessels again must have received higher unit prices for their fish than did pelagic vessels. Recreational vessels by definition did not sell any of their fish. Household incomes are again higher for recreational vessels, although all groups are above the Hawaii average.

Table G1. Number of trips (previous 12 months 1995-1996), by vessel target and operator motivation

Annual Trips Per Vessel		Vessel Target			
		Pelagic		Non-Pelagic	
Recreational		Expense	Recreational	Expense	
		(n=55)	(n=62)	(n=72)	(n=93)
Total Fishing Trips	mean	66.53	43.18	56.24	31.25
	std	(45.80)	(41.85)	(40.22)	(26.16)
Total Commercial Fishing Trips	mean	57.91	0.00	52.92	0.00
	std	(45.03)	(0.00)	(39.05)	(0.00)
Total Recreational Fishing Trips	mean	4.06	41.72	3.25	31.25
	std	(10.01)	(41.87)	(10.89)	(26.16)
Commercial Troll Trips	mean	8.10	0.00	38.28	0.00
	std	(16.60)	(0.00)	(29.56)	(0.00)
Commercial Palu Ahi Trips	mean	0.55	0.00	3.23	0.00
	std	(3.95)	(0.00)	(16.33)	(0.00)
Commercial Ika Shibi Trips	mean	2.02	0.00	1.25	0.00
	std	(10.48)	(0.00)	(5.73)	(0.00)
Commercial Bottomfish Trips	mean	21.03	0.00	5.43	0.00
	std	(33.22)	(0.00)	(12.29)	(0.00)
Commercial Akule/Opelu Trips	mean	5.53	0.00	1.30	0.00
	std	(16.01)	(0.00)	(6.69)	(0.00)
Commercial Reef Fish Trips	mean	8.53	0.00	2.69	0.00
	std	(18.78)	(0.00)	(8.16)	(0.00)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	6.00	0.00	0.62	0.00
	std	(17.01)	(0.00)	(2.73)	(0.00)
Recreational Troll Trips	mean	1.86	3.53	1.42	24.50
	std	(8.37)	(6.81)	(5.60)	(20.20)
Recreational Pelagic Handline Trips	mean	0.16	0.00	0.10	0.39
	std	(1.16)	(0.00)	(0.87)	(3.41)
Recreational Bottomfishing Trips	mean	0.88	4.64	0.72	3.29
	std	(3.26)	(10.75)	(7.71)	(9.47)
Recreational Akule/Opelu Trips	mean	0.00	1.65	0.01	0.26
	std	(0.00)	(7.11)	(0.09)	(1.66)
Recreational Reef Fishing Trips	mean	0.22	19.99	0.02	2.37
	std	(1.62)	(33.31)	(0.20)	(6.01)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.91	10.23	0.98	0.30
	std	(4.52)	(32.28)	(5.50)	(1.86)

Table G2. Vessel characteristics (mean) by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Vessel Characteristic		**Expense**	**Recreational**	**Expense**	**Recreational**
Vessel Length (feet)	mean	21.38	17.74	22.87	20.93
	std	(3.81)	(3.90)	(4.42)	(3.82)
Year Built	mean	81.29	83.21	84.31	83.43
	std	(9.85)	(8.16)	(8.34)	(8.65)
Year Bought	mean	88.85	88.05	89.40	90.46
	std	(5.73)	(6.72)	(6.44)	(5.20)
Purchase Price	mean	21,937	10,694	24,014	16,083
	std	(23,854)	(9,401)	(24,209)	(13,472)
Trailer Cost	mean	2,369	986	3,363	3,044
	std	(1,970)	(998)	(2,727)	(3,605)
Cost of Additional Electronics	mean	2,887	1,094	2,969	1,891
	std	(2,380)	(1,509)	(2,928)	(1,927)
Cost of Other Vessel Upgrades	mean	3,840	1,384	4,633	2,745
	std	(5,864)	(2,324)	(7,240)	(5,889)
Cost of Major Fishing Gear	mean	4,307	2,201	5,007	3,941
	std	(3,479)	(2,351)	(3,481)	(2,895)
Other Investment	mean	569	107	1,244	786
	std	(1,257)	(417)	(4,038)	(3,539)

Table G3. Fixed costs (annual mean) per vessel by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Cost Item		**Expense**	**Recreational**	**Expense**	**Recreational**
Insurance	mean	249	82	366	268
	std	(448)	(187)	(533)	(352)
Loan Payments	mean	773	391	520	325
	std	(2,008)	(1,296)	(1,372)	(1,145)
Maintenance and Repairs	mean	1,407	499	1,479	1,081
	std	(2,175)	(731)	(1,821)	(1,757)
Fishing Gear	mean	633	613	885	524
	std	(1,022)	(2,237)	(1,169)	(688)
Ramp, License, and Registration Fees	mean	101	62	88	77
	std	(110)	(24)	(63)	(52)
Miscellaneous	mean	94	31	128	24
	std	(349)	(143)	(521)	(120)
Total	sum	3,257	1,678	3,466	2,299

Table G4. Trip costs per vessel, (mean of all fishing trips over previous 12 months), by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Cost Item		**Expense**	**Recreational**	**Expense**	**Recreational**
Ice	mean	11.31	4.22	14.67	7.85
	std	(2.24)	(1.46)	(1.15)	(2.89)
Boat Fuel	mean	38.61	22.59	57.78	43.68
	std	(8.86)	(10.46)	(7.43)	(13.47)
Bait	mean	9.08	3.26	7.04	5.72
	std	(4.13)	(3.63)	(4.04)	(4.39)
Food	mean	11.35	12.12	16.55	14.24
	std	(1.69)	(3.38)	(0.73)	(2.07)
Truck Fuel	mean	9.94	9.74	10.37	9.91
	std	(2.59)	(5.25)	(0.88)	(3.08)
Miscellaneous	mean	0.14	1.64	0.31	0.16
	std	(0.07)	(1.23)	(0.47)	(0.11)
Total	sum	80.43	53.57	106.72	81.56

Table G5. Vessel operating characteristics (mean), by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Operating characteristic		**Expense**	**Recreational**	**Expense**	**Recreational**
Number of Crew (includes captain)	mean	2.15	2.44	2.27	2.62
	std	(0.36)	(0.39)	(0.05)	(0.18)
Usual Fishing Distance From	minimum	1.99	0.50	7.10	0.50
Shore (miles)	maximum	13.71	10.49	20.12	16.87
	mean	6.58	3.12	16.77	11.90
	std	(3.15)	(2.56)	(3.52)	(5.21)
Maximum Fishing Distance From	minimum	2.81	2.00	7.86	1.00
Shore (miles)	maximum	21.08	14.61	32.47	28.36
	mean	11.39	5.37	26.39	20.00
	std	(4.48)	(3.76)	(6.22)	(8.58)

Table G6. Catch, sales and revenue (previous 12 months), by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Catch, Sales and Revenue		**Expense**	**Recreational**	**Expense**	**Recreational**
Total Pounds Caught	mean	3,663	1,336	3,679	1,068
	std	(4,135)	(3,750)	(7,451)	(1,132)
Total Pelagic Pounds Caught	mean	2,316	409	3,143	870
	std	(2,843)	(1,538)	(6,350)	(940)
Total Non-Pelagic Pounds Caught	mean	1,284	918	520	173
	std	(2,128)	(2,310)	(1,417)	(386)
Total Pounds Sold	mean	1,866	0	2,173	0
	std	(2,014)	(0)	(5,706)	(0)
Total Pelagic Pounds Sold	mean	1,404	0	1,910	0
	std	(2,002)	(0)	(4,938)	(0)
Total Non-Pelagic Pounds Sold	mean	607	0	234	0
	std	(1,117)	(0)	(883)	(0)
Total Sales Revenue	mean	3,975	0	4,060	0
	std	(3,771)	(0)	(5,513)	(0)

Table G7. Respondent characteristics (mean) by vessel target and operator motivation

		Vessel Target			
		Non-Pelagic		Pelagic	
Respondent Characteristic		**Expense**	**Recreational**	**Expense**	**Recreational**
Percent of Personal Income From Fishing	mean	4.72	0.00	3.49	0.00
	std	(10.19)	(0.00)	(12.87)	(0.00)
Total Household Income	mean	52,143	64,741	58,733	71,203
	std	(39,038)	(37,838)	(41,131)	(40,511)
Age	mean	45.52	46.75	44.93	45.07
	std	(13.34)	(12.87)	(10.89)	(11.51)

Section H. Results by Operator Motivation and Island, Expense and Recreational Pelagic Vessels

Section H examines pelagic expense and recreational vessels by island. Section H1 and Tables H1 to H7 present information on expense vessels and section H2 and Tables H8 to H14 focus on recreational vessels.

1. Expense pelagic vessels by island.

Kauai based vessels were the most active, followed by Hawaii island boats. Maui vessels were the least active (Figure 21). Trolling was the most common gear type. Secondary gears largely follow those seen associated with various islands throughout this report. Molokai and Lanai vessels appear here for the first time (combined to allow pooling of limited observations). These vessels also primarily trolled, however one third of their total trips were reef fishing trips. This is the heaviest emphasis on reef fishing seen in pelagic vessels and it corresponds with the fact that Molokai and Lanai both have large and easily accessible reef areas. Oahu based vessels were slightly larger and significantly more expensive than those from other islands. Maui based vessels faced the highest trip costs (Figure 22), while Oahu boats had the highest total fixed costs (Figure 23). Oahu based vessels also caught the most total pounds, and sold two to three times as much fish as did vessels from other islands. However, Hawaii island boats realized slightly higher gross revenues perhaps due to the prevalence of ika shibi and bottomfishing by these vessels, both of which are known to yield higher valued fish.

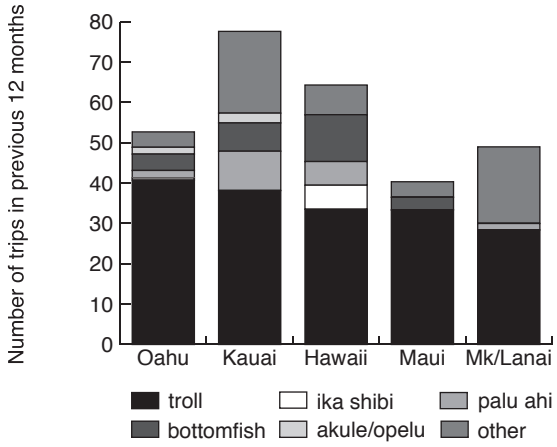

Figure 21. Annual trips per vessel by island—expense pelagic vessels

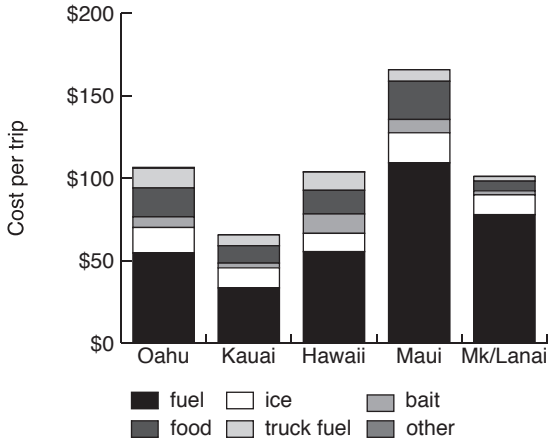

Figure 22. Cost per trip by island—expense pelagic vessels

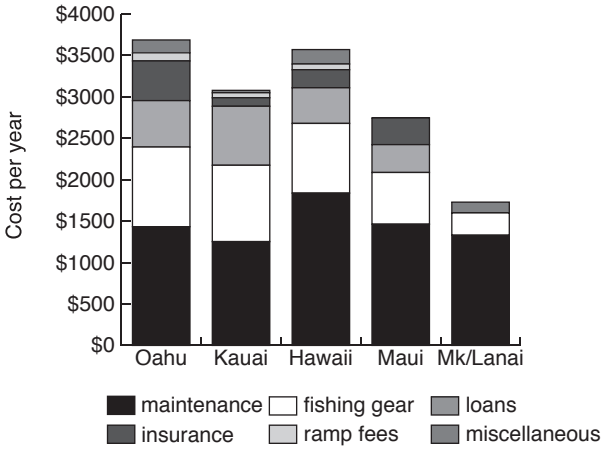

Figure 23. Annual fixed costs per vessel by island—expense pelagic vessels

Table H1. Number of trips (previous 12 months 1995-1996), expense pelagic vessels by island

Annual Trips Per Vessel		Island Kauai (n=20)	Hawaii (n=27)	Oahu (n=104)	Mk/Lanai (n=5)	Maui (n=16)
Total Fishing Trips	mean	77.63	64.33	52.71	49.00	40.35
	std	(56.56)	(52.25)	(33.99)	(35.72)	(13.82)
Total Commercial Fishing Trips	mean	67.49	58.74	50.52	49.00	40.15
	std	(47.95)	(52.54)	(35.00)	(35.72)	(14.03)
Total Recreational Fishing Trips	mean	9.75	5.59	2.09	0.00	0.19
	std	(25.11)	(11.84)	(6.12)	(0.00)	(0.75)
Commercial Troll Trips	mean	38.17	33.54	40.77	28.40	33.39
	std	(31.27)	(30.86)	(30.93)	(21.57)	(15.49)
Commercial Palu Ahi Trips	mean	9.75	5.87	1.86	1.60	0.00
	std	(29.22)	(13.16)	(15.07)	(3.58)	(0.00)
Commercial Ika Shibi Trips	mean	0.00	5.95	0.52	0.00	0.00
	std	(0.00)	(10.41)	(4.50)	(0.00)	(0.00)
Commercial Bottomfish Trips	mean	7.01	11.61	4.06	0.00	3.11
std	(12.88)	(22.36)	(8.42)	(0.00)	(5.49)	
Commercial Akule/Opelu Trips	mean	2.43	0.00	1.69	0.00	0.00
	std	(8.75)	(0.00)	(7.69)	(0.00)	(0.00)
Commercial Reef Fish Trips	mean	8.51	1.34	1.19	19.00	1.90
	std	(14.87)	(3.52)	(4.50)	(20.30)	(6.43)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	1.62	0.44	0.55	0.00	0.30
	std	(3.94)	(1.64)	(2.90)	(0.00)	(1.20)
Recreational Troll Trips	mean	4.11	1.41	1.22	0.00	0.00
	std	(12.50)	(3.31)	(4.46)	(0.00)	(0.00)
Recreational Pelagic Handline Trips	mean	0.00	0.66	0.00	0.00	0.00
	std	(0.00)	(2.15)	(0.00)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	5.26	0.06	0.20	0.00	0.00
	std	(22.94)	(0.24)	(1.37)	(0.00)	(0.00)
Recreational Akule/Opelu	mean	0.00	0.00	0.01	0.00	0.00
	std	(0.00)	(0.00)	(0.11)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	0.00	0.02	0.02	0.00	0.00
	std	(0.00)	(0.12)	(0.25)	(0.00)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.36	3.43	0.63	0.00	0.19
	std	(0.89)	(1.77)	(3.62)	(0.00)	(0.75)

Table H2. Vessel characteristics (mean), expense pelagic vessels by island

Vessel Characteristic		Island				
		Kauai	Hawaii	Oahu	Mk/Lanai	Maui
Vessel Length (Feet)	mean	20.64	21.13	23.92	20.32	22.55
	std	(4.42)	(2.85)	(4.56)	(3.55)	(4.02)
Year Built	mean	81.24	84.41	85.44	77.00	81.69
	std	(11.28)	(7.77)	(7.77)	(9.31)	(7.64)
Year Bought	mean	88.56	88.35	89.90	82.00	91.00
	std	(7.79)	(6.51)	(5.73)	(14.02)	(5.51)
Purchase Price	mean	12,526	15,944	30,066	12,500	15,944
	std	(11,82)	(10,924)	(28,160)	(8,583)	(13,201)
Trailer Cost	mean	1,388	2,482	4,107	1,000	3,833
	std	(1,355)	(1,872)	(2,946)	(1,000)	(2,438)
Cost of Additional Electronics	mean	2,431	2,429	3,389	1,060	2,475
	std	(1,805)	(1,723)	(3,428)	(1,954)	(1,901)
Cost of Other Vessel Upgrades	mean	5,725	3,346	4,535	7,214	5,500
	std	(6,823)	(5,398)	(7,466)	(7,659)	(9,059)
Cost of Major Fishing Gear	mean	3,442	4,144	5,860	2,230	3,853
	std	(2,061)	(2,245)	(3,839)	(2,380)	(2,863)
Other Investment	mean	140	1,169	1,661	1,040	131
	std	(394)	(4,436)	(4,630)	(1,350)	(298)

Table H3. Fixed costs per vessel (annual mean), expense pelagic vessels by island

Cost Item		Island				
		Kauai	Hawaii	Oahu	Mk/Lanai	Maui
Insurance	mean	103	218	479	0	322
	std	(247)	(315)	(601)	(0)	(485)
Loan Payments	mean	712	430	560	0	336
	std	(1,429)	(1,346)	(1,466)	(0)	(888)
Maintenance and Repairs	mean	1,253	1,838	1,433	1,330	1,463
	std	(1,934)	(2,316)	(1,742)	(2,080)	(1,104)
Fishing Gear	mean	921	841	961	269	624
	std	(774)	(976)	(1,367)	(157)	(478)
Ramp, License, and Registration Fees	mean	60	69	98	.	.
	std	(29)	(31)	(72)	(.)	(.)
Miscellaneous	mean	29	174	155	130	0
	std	(112)	(519)	(608)	(290)	(0)
Total	sum	3,078	3,570	3,686	1,729	2,745

Table H4. Trip costs per vessel (mean of all fishing trips over previous 12 months), expense pelagic vessels by island

Cost Item		Island				
		Kauai	Hawaii	Oahu	Mk/Lanai	Maui
Ice	mean	12.17	11.08	15.44	12.00	18.23
	std	(1.04)	(3.49)	(1.75)	(6.71)	(1.60)
Boat Fuel	mean	33.45	55.46	54.66	77.90	109.35
	std	(7.00)	(7.29)	(5.29)	(68.31)	(14.26)
Bait	mean	2.87	11.77	6.45	2.46	8.07
	std	(2.80)	(7.89)	(1.92)	(1.61)	(2.20)
Food	mean	10.54	14.35	17.53	5.87	23.17
	std	(2.11)	(0.72)	(1.17)	(3.32)	(1.44)
Truck Fuel	mean	6.54	11.05	11.94	2.82	6.97
	std	(0.70)	(2.10)	(1.98)	(1.62)	(0.29)
Miscellaneous	mean	0.00	0.17	0.56	0.00	0.00
	std	(0.00)	(0.08)	(1.58)	(0.00)	(0.00)
Total	sum	65.57	103.88	106.58	101.05	165.79

Table H5. Vessel operating characteristics (mean), expense pelagic vessels by island

Operating Characteristic		Island				
		Kauai	Hawaii	Oahu	Mk/Lanai	Maui
Number of Crew	mean	1.95	2.05	2.36	2.05	2.64
(includes captain)	std	(0.14)	(0.02)	(0.20)	(0.26)	(0.11)
Usual Fishing Distance from	minimum	2.47	4.50	8.49	3.81	11.96
Shore (miles)	maximum	10.29	9.31	35.13	20.00	23.55
	mean	5.69	7.67	21.39	7.74	19.95
	std	(2.07)	(1.49)	(4.47)	(6.97)	(3.52)
Maximum Fishing Distance from	minimum	4.99	7.45	13.12	6.00	15.84
Shore (miles)	maximum	17.78	18.19	39.68	50.00	29.60
	mean	10.69	14.34	33.79	15.89	26.36
	std	(3.60)	(3.50)	(7.11)	(19.17)	(4.55)

Table H6. Catch, sales and revenue (previous 12 months) per vessel, expense pelagic vessels by island

Catch, Sales and Revenue		Island				
		Kauai	Hawaii	Oahu	Mk/Lanai	Maui
Total Pounds Caught	mean	1,941	1,899	4,729	4,700	2,331
	std	(1,623)	(2,005)	(9,462)	(5,941)	(2,331)
Total Pelagic Pounds Caught	mean	1,539	1,769	4,139	2,670	2,124
	std	(1,483)	(1,744)	(8,179)	(2,915)	(2,073)
Total Non-Pelagic Pounds Caught	mean	402	282	575	2,030	206
	std	(301)	(455)	(1,655)	(3,163)	(372)
Total Pounds Sold	mean	826	1,450	2,921	1,440	1,186
	std	(1,010)	(1,819)	(7,372)	(1,316)	(1,394)
Total Pelagic Pounds Sold	mean	724	1,236	2,610	1,000	1,093
	std	(974)	(1,470)	(6,437)	(1,095)	(1,245)
Total Non-Pelagic Pounds Sold	mean	102	196	287	440	92
	std	(149)	(458)	(1,118)	(619)	(239)
Total Sales Revenue	mean	2,583	5,012	4,644	1,625	2,035
	std	(4,615)	(6,778)	(5,709)	(2,467)	(2,162)

Table H7. Respondent characteristics (mean), expense pelagic vessels by island

Respondent Characteristic		Island				
		Kauai	Hawaii	Oahu	Mk/Lanai	Maui
Percent of Personal Income from Fishing	mean	3.06	6.48	3.43	0.20	0.00
	std	(7.88)	(19.42)	(12.69)	(0.45)	(0.00)
Total Household Income	mean	47,375	66,087	61,951	39,000	51,071
	std	(40,858)	(50,288)	(38,249)	(13,416)	(46,334)
Age	mean	44.05	46.67	44.46	42.00	46.88
	std	(11.77)	(9.20)	(10.62)	(8.37)	(14.82)

2. Recreational pelagic vessels by island.

The overall level of activity by these recreational pelagic vessels was lower than that for expense or income vessels. However Kauai based vessels remained the most active and Maui vessels the least. As expected, all groups primarily trolled, secondary gears are similar to those used by income and expense vessels with the exception that recreational vessels in general do less handlining (both for pelagics and bottomfish). This may be because successful handlining requires more specialized skills and because handlining is more likely than trolling to cause seasickness. Maui vessels again encountered the highest trip costs, and Kauai boats the lowest. This is primarily due to a large difference in fuel costs which in turn is likely related to the distance from shore which these vessels normally fish (13 miles for Maui boats, 5 miles for Kauai boats). However, Kauai vessels had the highest fixed costs, primarily due to higher maintenance charges. These costs may be higher for Kauai based vessels because they are more active. Kauai boats also caught the most pounds, both of pelagics and non-pelagics, while Maui vessels caught the least.

Table H8. Number of trips pelagic (previous 12 months 1995-1996), recreational pelagic vessels by island

Annual Trips Per Vessel		Island			
		Kauai (n=5)	Oahu (n=75)	Hawaii (n=5)	Maui (n=7)
Total Recreational Fishing Trips	mean	34.98	32.69	23.40	21.57
	std	(35.31)	(27.15)	(10.57)	(10.39)
Recreational Troll Trips	mean	18.78	26.27	19.38	17.29
	std	(19.65)	(21.62)	(5.45)	(7.49)
Recreational Pelagic Handline Trips	mean	5.55	0.06	0.00	0.00
	std	(13.59)	(0.36)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	1.57	3.87	0.48	1.03
	std	(2.16)	(10.48)	(1.07)	(2.72)
Recreational Akule/Opelu Trips	mean	0.42	0.28	0.17	0.00
	std	(1.02)	(1.84)	(0.38)	(0.00)
Recreational Reef Fishing Trips	mean	8.25	2.13	0.17	1.86
	std	(13.88)	(5.29)	(0.38)	(3.48)
Recreational Aquarium Fish	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.42	0.14	3.20	0.00
	std	(1.02)	(0.99)	(7.16)	(0.00)

Table H9. Vessel characteristics (mean), recreational pelagic vessels by island

Vessel Characteristic		Island			
		Kauai	Oahu	Hawaii	Maui
Vessel Length (Feet)	mean	20.23	21.03	18.54	20.83
	std	(4.71)	(3.74)	(1.60)	(3.37)
Year Built	mean	83.60	83.50	84.00	84.33
	std	(4.88)	(9.02)	(7.38)	(7.63)
Year Bought	mean	88.83	90.89	87.80	89.25
	std	(4.54)	(4.96)	(7.40)	(6.65)
Purchase Price	mean	10,900	16,413	13,700	17,900
	std	(8,532)	(13,877)	(7,678)	(15,990)
Trailer Cost	mean	750	3,380	300	2,000
	std	(354)	(3,812)	(.)	(.)
Cost of Additional Electronics	mean	2,400	1,887	870	2,050
	std	(2,380)	(1,778)	(678)	(3,324)
Cost of Other Vessel Upgrades	mean	3,450	2,920	3,340	569
	std	(3,753)	(6,480)	(2,649)	(1,106)
Cost of Major Fishing Gear	mean	4,708	4,080	2,000	3,188
	std	(3,586)	(2,901)	(1,225)	(2,999)
Other Investment	mean	917	893	100	206
	std	(2,245)	(3,927)	(224)	(365)

Table H10. Fixed costs per vessel (annual mean), recreational pelagic vessels by island

Cost Item		Island			
		Kauai	Oahu	Hawaii	Maui
Insurance	mean	0	279	130	459
	std	(0)	(357)	(264)	(383)
Loan Payments	mean	0	376	0	343
	std	(0)	(1,252)	(0)	(907)
Maintenance and Repairs	mean	2,558	920	940	1,486
	std	(4,673)	(1,439)	(984)	(674)
Fishing Gear	mean	496	518	742	526
	std	(511)	(730)	(765)	(322)
Ramp, License, and Registration Fees	mean	100	77	60	.
	std	(.)	(54)	(.)	(.)
Miscellaneous	mean	0	11	180	0
	std	(0)	(73)	(360)	(0)
Total	sum	3,154	2,181	2,052	2,814

Table H11. Trip costs per vessel, (mean of all fishing trips over previous 12 months), recreational pelagic vessels by island

		Island			
Cost Item		**Kauai**	**Maui**	**Hawaii**	**Oahu**
Ice	mean	1.87	14.40	5.61	9.67
	std	(0.81)	(1.80)	(0.33)	(1.00)
Boat Fuel	mean	33.11	88.27	54.57	48.46
	std	(9.57)	(5.76)	(2.71)	(5.86)
Bait	mean	1.17	3.35	1.67	4.32
	std	(1.01)	(0.58)	(2.89)	(1.33)
Food	mean	7.13	18.90	12.27	15.19
	std	(3.09)	(1.15)	(0.46)	(0.65)
Truck Fuel	mean	3.05	13.61	21.94	10.52
	std	(1.32)	(0.88)	(0.48)	(0.33)
Miscellaneous	mean	0.00	0.00	0.00	0.31
	std	(0.00)	(0.00)	(0.00)	(0.15)
Total	sum	46.33	138.53	96.06	88.47

Table H12. Vessel operating characteristics (mean), recreational pelagic vessels by island

		Island			
Operating Characteristic		**Kauai**	**Oahu**	**Hawaii**	**Maui**
Number of Crew (includes captain)	mean	1.89	2.56	2.32	2.76
	std	(0.17)	(0.04)	(0.14)	(0.07)
Usual Fishing Distance From Shore (miles)	minimum	4.17	9.44	8.69	10.73
	maximum	8.08	18.22	9.10	14.19
	mean	5.47	15.79	8.96	12.98
	std	(2.26)	(2.76)	(0.24)	(1.55)
Maximum Fishing Distance From Shore (miles)	minimum	7.67	15.79	15.35	16.12
	maximum	14.83	30.44	16.50	21.38
	mean	10.06	26.22	16.12	19.61
	std	(4.14)	(4.77)	(10.06)	(2.30)

Table H13. Catch, sales and revenue (previous 12 months) per vessel, recreational pelagic vessels by island

		Island			
Catch, Sales and Revenue		**Kauai**	**Oahu**	**Hawaii**	**Maui**
Total Pounds Caught	mean	1,855	986	1,585	914
	std	(1,821)	(1,061)	(994)	(1,297)
Total Pelagic Pounds Caught	mean	1,059	842	1,200	662
	std	(1,187)	(965)	(543)	(789)
Total Non-Pelagic Pounds Caught	mean	595	129	260	252
	std	(1,071)	(252)	(494)	(517)

Table H14. Respondent characteristics (mean), recreational pelagic vessels by island

		Island			
Respondent Characteristic		**Kauai**	**Oahu**	**Hawaii**	**Maui**
Total Household Income	mean	78,750	69,087	86,000	62,917
	std	(48,023)	(37,479)	(59,309)	(48,384)
Age	mean	43.33	44.80	42.00	46.88
	std	(10.33)	(11.13)	(8.37)	(14.38)

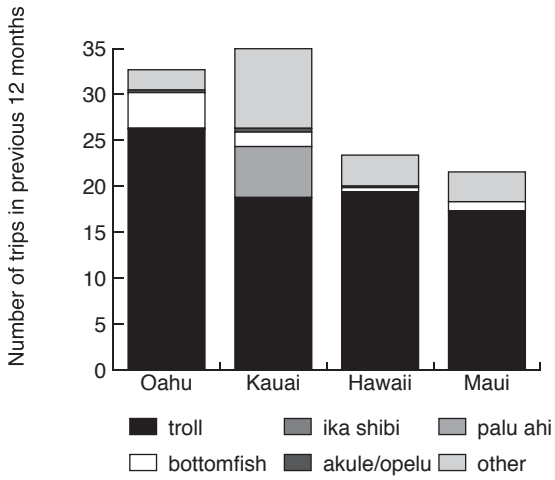

Figure 24. Annual trips by island—recreational pelagic vessels

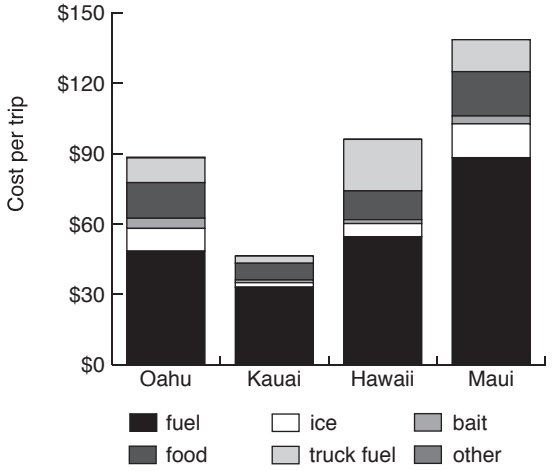

Figure 25. Cost per trip by island—recreational pelagic vessels

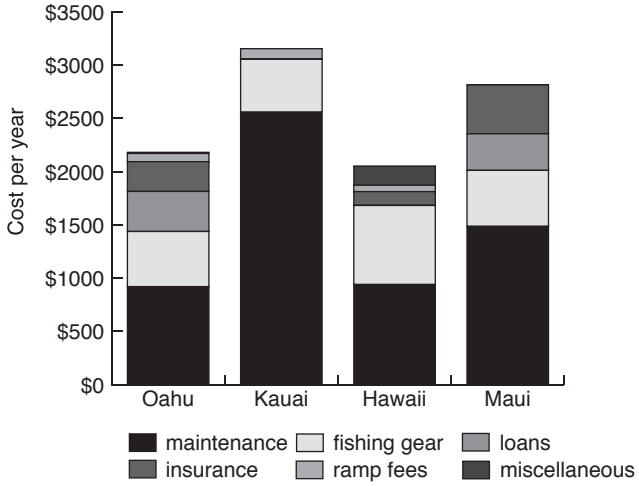

Figure 26. Annual fixed costs by island—recreational pelagic vessels

Section I. Results by vessel size, expense and recreational pelagic vessels

Section I examines expense and recreational vessels by size classes. These size classes are defined as follows:

Size 1 less than 16 feet;

Size 2 16 to 24 feet;

Size 3 greater than 24 feet to less than 30 feet; and

Size 4 30 feet or longer.

Section I1 and Tables I1 to I7 present information on expense pelagic vessels while section I2 and Tables I8 to I14 examine recreational pelagic vessels.

1. Expense pelagic vessels by size.

Although expense vessels are generally less active than full or parttime boats, all pelagic expense sizes averaged approximately one trip per week. Size 2 vessels were the most active group, although Size 1 vessels were used for more recreational trips. Again, all sizes used multiple gears but trolling remains the most common trip type. Size 1 vessels did not report any pelagic handlining (palu ahi or ika shibi) trips, however they were used for both bottomfishing and reef fishing trips, as were all other sizes.

Fixed and trip costs generally rise with vessel size, with Size 1 costs substantially lower than those of other sizes. Crew sizes (and food costs) also increase with vessel size. Interestingly, Size 1 vessels (with an average length of 14 feet) were found to be fishing almost as far offshore (13-20 miles) as were Size 2 vessels which average 21 feet in length.

Because of their emphasis on recreational fishing (which is generally less intensive than trips intended to lead to fish sales), Size 1 vessels had considerably lower annual catches, sales and revenue than did other sized vessels. Compared to Size 2 boats, these vessels sold 55% less total pounds of fish yet their annual revenue was 79% lower. This may be due in part to the difference in gear types and resultant fish prices between these two groups because Size 2 vessels engaged in pelagic handlining while Size 1 boats did not. Despite having the highest annual catches Size 4 vessels received lower gross revenues than did Size 3 vessels, perhaps because Size 3 vessels sold relatively more non-pelagics.

Table I1. Number of trips (previous 12 months 1995-1996), expense pelagic vessels by size (small to large)

		Vessel Size			
		1	2	3	4
Annual Trips Per Vessel		**(n=4)**	**(n=117)**	**(n=39)**	**(n=12)**
Total Fishing Trips	mean	55.50	57.76	54.35	46.95
	std	(32.47)	(42.20)	(35.40)	(39.63)
Total Commercial Fishing Trips	mean	43.00	54.54	52.57	40.92
	std	(14.00)	(40.48)	(35.28)	(43.36)
Total Recreational Fishing Trips	mean	12.50	3.15	1.88	5.53
	std	(25.00)	(11.58)	(4.33)	(11.83)
Commercial Troll Trips	mean	33.38	38.85	35.75	42.58
	std	(18.68)	(29.91)	(23.25)	(46.23)
Commercial Palu Ahi Trips	mean	0.00	3.09	4.09	2.85
	std	(0.00)	(13.93)	(24.03)	(9.87)
Commercial Ika Shibi Trips	mean	0.00	1.42	0.10	3.75
	std	(0.00)	(5.58)	(0.60)	(12.99)
Commercial Bottomfish Trips	mean	6.25	5.50	6.64	0.26
	std	(12.50)	(12.85)	(12.31)	(0.75)
Commercial Akule/Opelu Trips	mean	0.00	1.61	0.92	0.01
	std	(0.00)	(7.69)	(4.52)	(0.03)
Commercial Reef Fish Trips	mean	3.38	2.49	3.93	0.23
	std	(5.22)	(7.31)	(11.37)	(0.75)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	0.00	0.78	0.39	0.00
	std	(0.00)	(3.17)	(1.62)	(0.00)
Recreational Troll Trips	mean	12.50	0.76	1.27	4.67
	std	(25.00)	(3.10)	(3.93)	(10.00)
Recreational Pelagic Handline Trips	mean	0.00	0.15	0.00	0.00
	std	(0.00)	(1.05)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.00	0.87	0.34	0.62
	std	(0.00)	(9.24)	(1.93)	(2.14)
Recreational Akule/Opelu Trips	mean	0.00	0.00	0.00	0.09
	std	(0.00)	(0.00)	(0.00)	(0.32)
Recreational Reef Fishing Trips	mean	0.00	0.01	0.06	0.00
	std	(0.00)	(0.06)	(0.40)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.00	1.36	0.19	0.15
	std	(0.00)	(6.63)	(0.68)	(0.52)

Table I2. Vessel characteristics (mean), expense pelagic vessels by size (small to large)

		Vessel Size			
Vessel Characteristic		**1**	**2**	**3**	**4**
Vessel Length (feet)	mean	14.10	20.81	26.85	32.17
	std	(0.85)	(2.52)	(1.48)	(3.33)
Year Built	mean	84.00	83.32	85.94	88.91
	std	(11.27)	(8.63)	(7.44)	(5.65)
Year Bought	mean	86.33	88.93	90.75	91.00
	std	(12.42)	(7.00)	(4.04)	(4.24)
Purchase Price	mean	12,825	16,659	36,111	67,100
	std	(15,448)	(12,189)	(17,912)	(64,048)
Trailer Cost	mean	900	2,554	4,310	6,417
	std	(849)	(2,163)	(2,739)	(3,470)
Cost of Additional Electronics	mean	1,125	2,267	4,495	5,538
	std	(1,315)	(2,116)	(3,208)	(5,309)
Cost of Other Vessel Upgrades	mean	1,625	4,157	6,879	3,973
	std	(2,926)	(6,667)	(9,327)	(6,181)
Cost of Major Fishing Gear	mean	2,900	4,301	6,411	8,083
	std	(2,928)	(3,033)	(3,870)	(3,644)
Other Investment	mean	50	1,006	1,837	2,083
	std	(100)	(3,622)	(4,926)	(5,378)

Table I3. Fixed costs per vessel (annual mean), expense pelagic vessels by size (small to large)

		Vessel Size			
Cost Item		**1**	**2**	**3**	**4**
Insurance	mean	150	225	563	1,218
	std	(300)	(303)	(504)	(1,211)
Loan Payments	mean	0	559	568	175
	std	(0)	(1,294)	(1,800)	(606)
Maintenance and Repairs	mean	178	1,173	2,487	1,820
	std	(166)	(1,352)	(2,671)	(1,761)
Fishing Gear	mean	887	891	732	1,347
	std	(537)	(1,216)	(776)	(1,791)
Ramp, License, and Registration Fees	mean	.	86	88	105
	std	(.)	(63)	(67)	(79)
Miscellaneous	mean	0	44	169	874
	std	(0)	(183)	(508)	(1,509)
Total	sum	1,215	2,978	4,607	5,539

Table I4. Trip costs per vessel (mean of all fishing trips over previous 12 months), expense pelagic vessels by size (small to large)

		Vessel Size			
Cost Item		**1**	**2**	**3**	**4**
Ice	mean	13.16	12.19	19.79	22.88
	std	(1.30)	(1.86)	(2.72)	(1.54)
Boat Fuel	mean	18.23	53.68	66.51	75.37
	std	(1.94)	(6.65)	(13.17)	(2.30)
Bait	mean	0.64	6.77	8.38	3.06
	std	(1.13)	(4.64)	(2.07)	(2.08)
Food	mean	10.63	14.11	21.52	24.71
	std	(3.27)	(0.52)	(2.20)	(0.63)
Truck Fuel	mean	4.73	9.45	13.32	6.09
	std	(0.49)	(0.83)	(2.74)	(0.82)
Miscellaneous	mean	0.00	0.31	0.00	0.00
	std	(0.00)	(0.50)	(0.00)	(0.00)
Total	sum	47.39	96.51	129.52	132.11

Table I5. Vessel operating characteristics (mean), expense pelagic vessels by size (small to large)

		Vessel Size			
Operating Characteristic		**1**	**2**	**3**	**4**
Number of Crew (includes captain)	mean	1.62	2.13	2.66	2.82
	std	(0.20)	(0.05)	(0.25)	(0.02)
Usual Fishing Distance from Shore (miles)	minimum	8.91	6.19	10.00	25.05
	maximum	15.67	17.57	25.45	31.18
	mean	12.89	14.02	20.49	30.00
	std	(3.10)	(3.51)	(4.49)	(2.00)
Maximum Fishing Distance from Shore (miles)	minimum	13.63	7.28	15.00	55.34
	maximum	24.67	27.38	39.08	69.06
	mean	20.15	21.50	32.06	66.40
	std	(5.05)	(5.81)	(7.25)	(4.46)

Table I6. Catch, sales and revenue (previous 12 months) per vessel, expense pelagic vessels by size (small to large)

		Vessel Size			
Catch, Sales and Revenue		**1**	**2**	**3**	**4**
Total Pounds Caught	mean	1,530	2,808	5,439	7,941
	std	(945)	(2,538)	(13,564)	(11,320)
Total Pelagic Pounds Caught	mean	1,200	2,380	4,551	7,750
	std	(927)	(1,977)	(11,394)	(11,326)
Total Non-Pelagic Pounds Caught	mean	330	433	868	191
	std	(467)	(968)	(2,387)	(434)
Total Pounds Sold	mean	629	1,421	3,786	5,209
	std	(505)	(1,607)	(10,264)	(9,399)
Total Pelagic Pounds Sold	mean	516	1,246	3,268	5,207
	std	(528)	(1,426)	(8,704)	(9,400)
Total Non-Pelagic Pounds Sold	mean	113	164	503	1
	std	(144)	(406)	(1,667)	(4)
Total Sales Revenue	mean	650	3,142	6,524	5,975
	std	(522)	(4,407)	(7,502)	(4,882)

Table I7. Respondent characteristics (mean), expense pelagic vessels by size (small to large)

Respondent characteristic		Vessel Size			
		1	2	3	4
Percent of Personal Income from Fishing	mean	6.25	3.53	3.95	0.20
	std	(7.50)	(14.17)	(11.20)	(0.63)
Total Household Income	mean	25,000	57,216	69,485	47,000
	std	(20,000)	(39,612)	(47,847)	(25,815)
Age	mean	37.50	44.01	48.00	46.82
	std	(9.57)	(10.42)	(11.57)	(12.30)

2. Recreational pelagic vessels by size.

As seen in Table A1, fishing activity by recreational vessels is lower than for other groups. Among pelagic recreational boats, Size 4 vessels were relatively inactive with an average of only 10.5 trips per year, all of which were trolling trips. All other sizes took at least 25 trips, with the usual emphasis on trolling. Size 1 vessels were used for relatively more bottomfishing, both deep and shallow water (reef fishing) while only Size 3 boats did an appreciable amount of pelagic handlining (palu ahi and ika shibi combined).

Investment and fixed costs were quite similar for both Size 1 and Size 2 vessels but substantially higher for larger sizes. Reported trip costs rise with vessel size, especially fuel costs. This is likely related to vessel (and engine) size as well as the fact that smaller vessels stayed closer to shore than did larger boats.

All sizes had relatively low annual catches, with Size 1 boats catching only 20% more pounds than Size 4 vessels despite taking more than twice as many trips. This could be because fishing might not be the primary motivation for these trips.

Table I8. Number of trips (previous 12 months 1995-1996), recreational pelagic vessels by size (small to large)

		Vessel Size			
Annual Trips Per Vessel		1 (n=5)	2 (n=75)	3 (n=13)	4 (n=3)
Total Recreational Fishing Trips	mean	25.00	30.96	39.80	10.50
	std	(17.32)	(24.93)	(35.16)	(2.12)
Recreational Troll Trips	mean	19.44	24.37	30.66	10.50
	std	(9.87)	(20.38)	(22.97)	(2.12)
Recreational Pelagic Handline Trips	mean	0.00	0.06	2.56	0.00
	std	(0.00)	(0.37)	(9.24)	(0.00)
Recreational Bottomfishing Trips	mean	7.50	3.14	3.62	0.00
	std	(11.90)	(9.72)	(8.65)	(0.00)
Recreational Akule/Opelu Trips	mean	0.00	0.33	0.00	0.00
	std	(0.00)	(1.87)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	1.00	2.44	2.96	0.00
	std	(2.00)	(5.60)	(9.23)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	0.00	0.39	0.00	0.00
	std	(0.00)	(2.10)	(0.00)	(0.00)

Table I9. Vessel characteristics (mean), recreational pelagic vessels by size (small to large)

		Vessel Size			
Vessel Characteristic		**1**	**2**	**3**	**4**
Vessel Length (feet)	mean	13.75	20.01	26.23	30.50
	std	(0.96)	(2.42)	(1.09)	(0.71)
Year Built	mean	81.75	83.15	85.17	93.00
	std	(14.97)	(8.33)	(7.76)	(0.00)
Year Bought	mean	89.60	90.11	92.50	93.00
	std	(4.77)	(5.51)	(3.23)	(.)
Purchase Price	mean	13,700	13,099	30,891	52,500
	std	(17,908)	(9,874)	(15,256)	(10,607)
Trailer Cost	mean	7,750	2,207	3,317	7,250
	std	(10,253)	(2,295)	(3,418)	(6,718)
Cost of Additional Electronics	mean	1,330	1,571	3,546	4,000
	std	(2,368)	(1,342)	(3,442)	(0)
Cost of Other Vessel Upgrades	mean	1,300	2,112	7,346	950
	std	(2,168)	(3,855)	(12,267)	(1,344)
Cost of Major Fishing Gear	mean	2,885	3,618	5,853	10,000
	std	(4,128)	(2,673)	(2,728)	(.)
Other Investment	mean	70	483	2,915	500
	std	(110)	(1,964)	(8,339)	(707)

Table I10. Fixed costs per vessel (annual mean), recreational pelagic vessels by size (small to large)

		Vessel Size			
Cost item		**1**	**2**	**3**	**4**
Insurance	mean	100	256	376	650
	std	(224)	(332)	(398)	(919)
Loan Payments	mean	360	311	491	0
	std	(805)	(1,115)	(1,628)	(0)
Maintenance and Repairs	mean	425	896	2,045	3,200
	std	(358)	(1,383)	(3,289)	(1,131)
Fishing Gear	mean	900	524	501	240
	std	(1,386)	(706)	(398)	(0)
Ramp, License, and Registration Fees	mean	100	75	80	.
	std	(.)	(55)	(42)	(.)
Miscellaneous	mean	0	12	50	0
	std	(0)	(87)	(173)	(0)
Total	sum	1,885	2,074	3,543	4,090

Table I11. Trip costs per vessel (mean of all fishing trips over previous 12 months), recreational pelagic vessels by size (small to large)

		Vessel Size			
Cost Item		**1**	**2**	**3**	**4**
Ice	mean	6.61	9.43	8.67	21.25
	std	(1.60)	(1.01)	(0.75)	(0.00)
Boat Fuel	mean	23.38	51.01	63.26	135.00
	std	(1.09)	(5.72)	(7.43)	(0.00)
Bait	mean	0.96	3.76	6.46	5.00
	std	(0.34)	(0.91)	(6.68)	(0.00)
Food	mean	11.67	14.19	22.82	18.25
	std	(2.35)	(0.47)	(1.31)	(0.00)
Truck Fuel	mean	7.75	11.48	8.74	25.00
	std	(1.31)	(0.71)	(0.64)	(0.00)
Miscellaneous	mean	0.00	0.32	0.00	0.00
	std	(0.00)	(0.15)	(0.00)	(0.00)
Total	sum	50.37	90.19	109.95	204.50

Table I12. Vessel operating characteristics (mean), recreational pelagic vessels by size (small to large)

		Vessel Size			
Operating Characteristic		**1**	**2**	**3**	**4**
Number of Crew (includes captain)	mean	2.08	2.48	3.03	3.50
	std	(0.06)	(0.04)	(0.07)	(0.00)
Usual Fishing Distance from Shore (miles)	minimum	6.44	5.90	18.21	25.00
	maximum	11.51	16.61	20.19	25.00
	mean	9.34	14.08	19.73	25.00
	std	(2.58)	(2.84)	(0.69)	(0.00)
Maximum Fishing Distance from Shore (miles)	minimum	12.07	9.67	28.54	45.00
	maximum	15.03	27.01	37.08	45.00
	mean	14.23	22.90	35.18	45.00
	std	(1.45)	(4.61)	(2.69)	(0.00)

Table I13. Catch (previous 12 months) per vessel, recreational pelagic vessels by size (small to large)

		Vessel Size			
Catch		**1**	**2**	**3**	**4**
Total Pounds Caught	mean	425	1,095	1,146	350
	std	(456)	(1,165)	(1,161)	(.)
Total Pelagic Pounds Caught	mean	335	904	867	350
	std	(374)	(1,022)	(487)	(.)
Total Non-Pelagic Pounds Caught	mean	56	168	266	0
	std	(52)	(320)	(710)	(.)

Table I14. Respondent characteristics (mean), recreational pelagic vessels by size (small to large)

		Vessel Size			
Respondent Characteristic		**1**	**2**	**3**	**4**
Total Household Income	mean	60,833	65,500	115,313	56,250
	std	(26,260)	(37,464)	(38,159)	(44,194)
Age	mean	48.00	43.82	50.42	35.0
	std	(8.37)	(10.94)	(12.15)	(7.07)

Section J. Results by rank, fulltime pelagic vessels

In response to the wide variations seen between vessels (Figures 4-14), we have separated fulltime pelagic vessels into three groups based on total annual catch (Tables J1 to J7). Rank 1 vessels are defined as those fulltime pelagic vessels with total annual catches equal to or greater than 40,000 pounds. Rank 2 vessels reported catches from 20,000 to 39,999 pounds and Rank 3 vessels had total catches of less than 20,000 pounds. This stratification allows an examination of differences between more and less successful operations and allows greater consideration of the self-definition of fishermens' motivations. For example, Rank 3 includes 10 fishermen who told us that they consider themselves to be commercial fishermen (are fishing to earn income) and that more than 50% of their personal income is from fishing profits, yet their annual catch was less than 20,000 pounds and their gross sales of fish (before expenses) was only $18,000. Obviously when fixed and trip costs are subtracted these vessels encountered relatively low profits as compared to Rank 1 and 2 vessels. By ranking fishing operations we are able to get a clearer view of the differences that exist among fulltime pelagic fishermen. Vessels which take multi-day trips, including those which fish the seamounts (see Section E) are not included in this analysis because their operations are not comparable to those which take only one day trips.

Rank 1 vessels were more active than other vessels and emphasize handlining (especially palu ahi) rather than trolling. They also engaged in more bottomfishing and did no akule or opelu fishing. This was obviously a successful strategy because their annual catches were twice that of Rank 2 vessels despite taking only 1.3 times as many trips (Figure 30). These vessels sold 93% of their total catch while Rank 2 vessels sold 91% and Rank 3 vessels sold an average of 79% of their catch. Finally, Rank 1 vessels sold over five times as much non-pelagics (likely bottomfish) as did other vessels. All of these factors combined to yield an average annual gross revenue for Rank 1 vessels which was 41% greater than Rank 2 vessels and 78% greater than that of Rank 3 vessels.

Rank 1 vessels were larger and had considerably higher levels of investment and fixed costs as compared to other groups. A significant portion of this difference is attributed to the disparity in vessel purchase prices and resultant loan payments (despite the fact that the average Rank 1 vessel was purchased in 1986 versus 1992 for other vessels). Rank 1 vessels also had maintenance costs over twice those of other vessels, and purchased considerably more fishing gear each year.

The greatest differences in trip costs are in ice and bait. Rank 1 vessels spent more on ice but less on bait because many fishermen in this group reported catching their own baitfish rather than buying it. Despite doing less trolling and fishing quite close to shore (average 4.06 miles offshore) Rank 1 vessels had somewhat higher fuel costs than did other groups, this may be because of their larger size.

Finally, Rank 1 vessel operators were found to be completely dependent on fishing for their personal income. Operators of Rank 2 vessels realized 94% of their income from fishing profits and Rank 3 vessels realized 91%. Although we do not know the household compostions of each group, the average household income for the operators of Rank 1 vessels was from 35% to 73% higher than that of other groups.

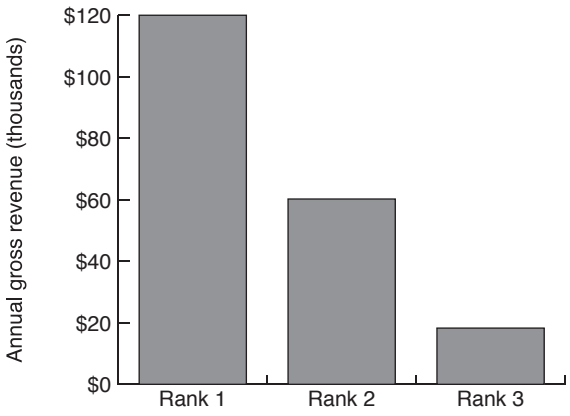

Figure 27. Annual gross revenue per vessel—fulltime pelagic vessels

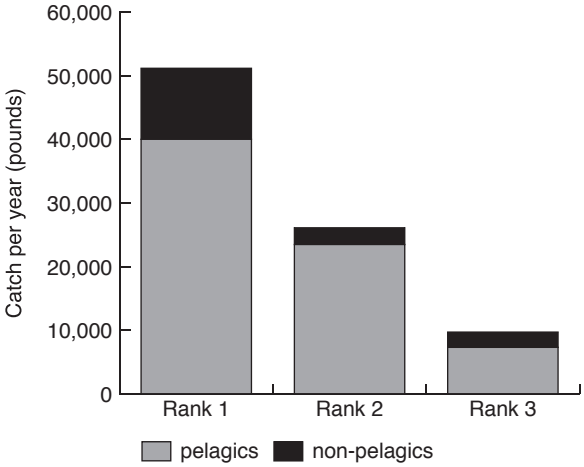

Figure 28. Total annual catch per vessel—fulltime pelagic vessels

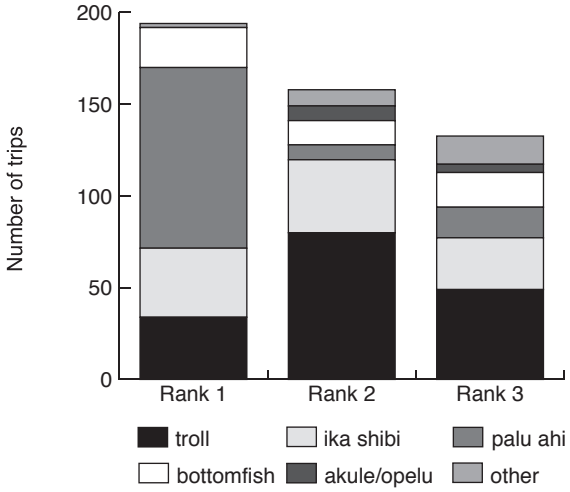

Figure 29. Annual trips per vessel—fulltime pelagic vessels

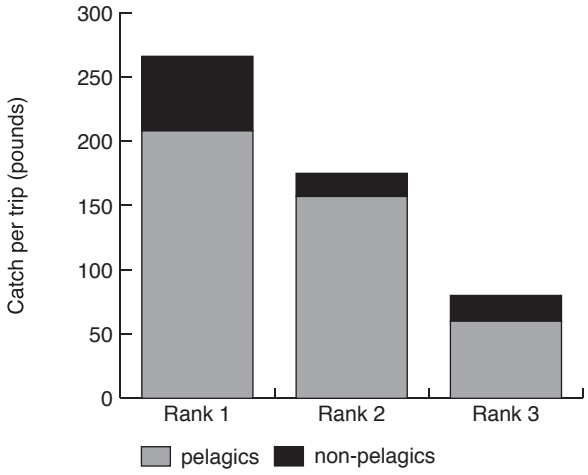

Figure 30. Catch per trip per vessel—fulltime pelagic vessels

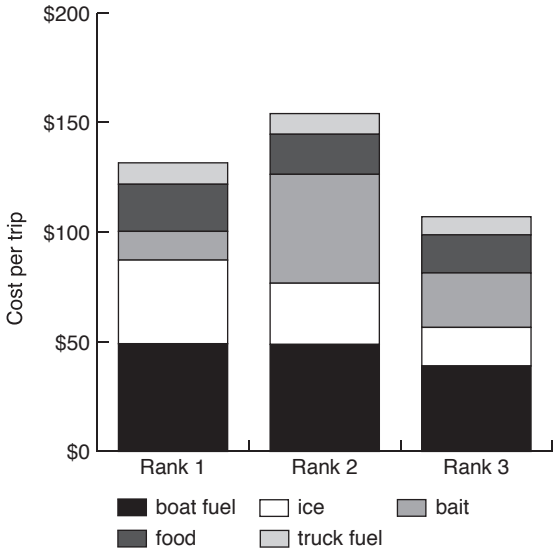

Figure 31. Cost per trip—fulltime pelagic vessels

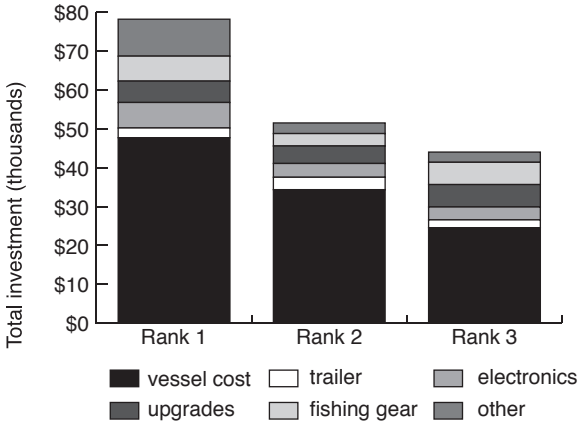

Figure 32. Total investment per vessel—fulltime pelagic vessels

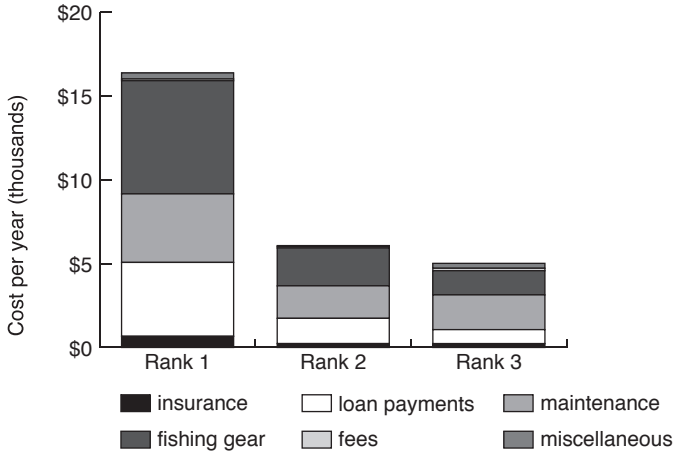

Figure 33. Annual fixed costs per vessel—fulltime pelagic vessels

Table J1. Number of trips (previous 12 months 1995-1996), fulltime pelagic vessels by rank (high to low)

Annual Trips Per Vessel		Rank 1 (n=6)	2 (n=12)	3 (n=10)
Total Fishing Trips	mean	193.79	157.71	132.51
	std	(66.40)	(64.37)	(46.46)
Total Commercial Fishing Trips	mean	191.55	149.82	122.35
	std	(67.32)	(59.40)	(51.10)
Total Recreational Fishing Trips	mean	2.23	7.89	10.16
	std	(3.92)	(12.55)	(23.69)
Commercial Troll Trips	mean	33.87	79.90	48.95
	std	(48.97)	(73.23l)	(54.42)
Commercial Palu Ahi Trips	mean	98.36	8.12	16.67
	std	(94.03)	(23.46)	(35.96)
Commercial Ika Shibi Trips	mean	37.58	39.68	28.15
	std	(41.78)	(44.45)	(48.53)
Commercial Bottomfish Trips	mean	21.75	13.20	18.88
	std	(25.30)	(21.70)	(24.42)
Commercial Akule/Opelu Trips	mean	0.00	8.00	4.51
	std	(0.00)	(27.71)	(14.26)
Commercial Reef Fish Trips	mean	0.00	0.42	0.00
	std	(0.00)	(1.44)	(0.00)
Commercial Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Commercial Other Gear Trips	mean	0.00	0.50	5.20
	std	(0.00)	(1.73)	(16.44)
Recreational Troll Trips	mean	0.00	4.55	7.90
	std	(0.00)	(11.92)	(23.61)
Recreational Pelagic Handline Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Bottomfishing Trips	mean	0.00	0.30	0.00
	std	(0.00)	(1.05)	(0.00)
Recreational Akule/Opelu Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Reef Fishing Trips	mean	0.00	1.67	0.00
	std	(0.00)	(5.77)	(0.00)
Recreational Aquarium Fish Trips	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Recreational Other Gear Trips	mean	2.23	1.37	2.26
	std	(3.92)	(3.38)	(6.60)

Table J2. Vessel characteristics (mean), fulltime pelagic vessels, by rank (high to low)

		Rank		
Vessel Characteristic		**1**	**2**	**3**
Vessel Length (feet)	mean	27.93	24.88	23.40
	std	(4.79)	(3.93)	(5.36)
Year Built	mean	85.83	88.00	81.11
	std	(7.05)	(9.18)	(8.72)
Year Bought	mean	86.67	92.30	90.75
	std	(7.02)	(3.95)	(3.58)
Purchase Price	mean	47,700	34,333	24,556
	std	(38,739)	(21,347)	(19,557)
Trailer Cost	mean	2,500	3,186	2,000
	std	(707)	(1,971)	(2,646)
Cost of Additional Electronics	mean	6,558	3,550	3,318
	std	(5,629)	(3,959)	(2,185)
Cost of Other Vessel Upgrades	mean	5,500	4,500	5,772
	std	(7,382)	(7,969)	(7,778)
Cost of Major Fishing Gear	mean	6,417	3,191	5,726
	std	(4,387)	(2,502)	(5,719)
Other Investment	mean	9,500	2733	2,625
	std	(12,078)	(8,598)	(5,514)

Table J3. Fixed costs per vessel (annual mean), fulltime pelagic vessels by rank (high to low)

		Rank		
Cost Item		**1**	**2**	**3**
Insurance	mean	667	232	230
	std	(1,211)	(421)	(411)
Loan Payments	mean	4,402	1,505	833
	std	(5,144)	(1,895)	(2,500)
Maintenance and Repairs	mean	4,083	1,935	2,070
	std	(3,383)	(2,278)	(2,308)
Fishing Gear	mean	6,745	2,257	1,441
	std	(6,793)	(1,849)	(1,861)
Ramp, License, and Registration Fees	mean	100	90	146
	std	(.)	(13)	(51)
Miscellaneous	mean	364	52	293
	std	(419)	(174)	(531)
Total	sum	16,361	6,071	5,013

Table J4. Trip costs per vessel (mean of all fishing trips over previous 12 months), fulltime pelagic vessels by rank (high to low)

		Rank		
Cost Item		**1**	**2**	**3**
Ice	mean	38.10	27.90	17.56
	std	(9.15)	(4.47)	(4.03)
Boat Fuel	mean	49.14	48.80	38.99
	std	(7.97)	(13.63)	(8.98)
Bait	mean	13.10	49.65	24.83
	std	(11.03)	(40.32)	(11.46)
Food	mean	21.48	18.27	17.37
	std	(3.75)	(2.06)	(2.52)
Truck Fuel	mean	9.77	9.42	8.27
	std	(3.37)	(3.32)	(2.00)
Miscellaneous	mean	0.00	0.00	0.00
	std	(0.00)	(0.00)	(0.00)
Total	sum	131.59	154.04	107.02

Table J5. Vessel operating characteristics (mean), fulltime pelagic vessels by rank (high to low)

		Rank		
Operating Characteristic		**1**	**2**	**3**
Number of Crew (includes captain)	mean	1.84	1.66	1.74
	std	(0.12)	(0.17)	(0.20)
Usual Fishing Distance from Shore (miles)	minimum	3.46	3.01	5.13
	maximum	4.60	13.93	19.00
	mean	4.06	8.15	11.79
	std	(0.37)	(3.68)	(5.52)
Maximum Fishing Distance from Shore (miles)	minimum	5.69	7.78	8.25
	maximum	11.00	35.66	30.00
	mean	8.50	20.60	19.85
	std	(2.08)	(9.40)	(8.59)

Table J6. Catch, sales and revenue (previous 12 months) per vessel, fulltime pelagic vessels by rank (high to low)

		Rank		
Catch, Sales and Revenue		**1**	**2**	**3**
Total Pounds Caught	mean	51,167	26,092	9,690
	std	(15,026)	(6,521)	(6,465)
Total Pelagic Pounds Caught	mean	40,000	23,458	7,290
	std	(10,954)	(9,857)	(5,428)
Total Non-Pelagic Pounds Caught	mean	11,167	2,633	2,400
	std	(18,915)	(5,907)	(4,770)
Total Pounds Sold	mean	47,617	23,768	7,687
	std	(15,230)	(6,163)	(6,050)
Total Pelagic Pounds Sold	mean	37,000	21,733	5,582
	std	(10,766)	(9,168)	(4,530)
Total Non-Pelagic Pounds Sold	mean	10,617	2,035	2,105
	std	(18,028)	(4,386)	(4,755)
Total Sales Revenue	mean	120,000	60,250	18,278
	std	(62,849)	(38,639)	(13,741)

Table J7. Respondent characteristics (mean), fulltime pelagic vessels by rank (high to low)

		Rank		
Respondent Characteristic		**1**	**2**	**3**
Percent of Personal Income From Fishing	mean	100.00	93.33	90.50
	std	(0.00)	(12.12)	(14.23)
Total Household Income	mean	78,333	51,136	20,556
	std	(64,485)	(19,019)	(14,240)
Age	mean	40.00	34.42	45.50
	std	(12.65)	(11.32)	(13.83)

Section K. Trip Costs and Characteristics by Trip Target, Size 2 Vessels

Trip costs presented so far have been the means of weighted averages of all trips taken by each vessel. This section examines trip costs and characteristics by trip target (i.e. a trolling trip). Included in this analysis are all Size 2 vessels (from 16 to 24 feet overall) which targeted pelagics as well as those that targeted non-pelagics.

Pelagic trips were consistently more expensive than non-pelagic trips. Ice, fuel, and bait costs were all lower for non-pelagic trips. The most significant difference was in fuel costs. An obvious explanation is that vessels typically fished from 8 to 17 miles offshore on pelagic trips while they stayed within 1 to 5 miles from shore on non-pelagic trips.

Table K1. Cost per trip by trip target—size 2 vessels: Pelagic targets

Cost Item		**Trolling**	**Palu ahi**	**Ika shibi**
Ice	mean	13.33	16.89	26.13
	std	(9.83)	(7.91)	(11.32)
Boat Fuel	mean	60.65	59.56	42.13
	std	(31.10)	(40.72)	(23.21)
Bait	mean	4.31	22.37	53.27
	std	(8.73)	(25.54)	(58.76)
Food	mean	13.91	11.75	13.21
	std	(10.67)	(6.46)	(8.01)
Truck Fuel	mean	10.92	9.79	10.52
	std	(7.32)	(6.11)	(7.99)
Miscellaneous	mean	0.25	0.49	0.00
	std	(2.27)	(2.57)	(0.00)
Total	sum	103.37	120.85	145.26

Table K2. Vessel operating characteristics by trip target—size 2 vessels: Pelagic targets

Operating Characteristic		**Trolling**	**Palu ahi**	**Ika shibi**
Number of Crew (includes captain)	mean	2.24	2.09	2.03
	std	(0.76)	(0.72)	(0.52)
Usual Fishing Distance from Shore (miles)	minimum	0.50	0.19	0.50
	maximum	80.00	30.00	60.00
	mean	17.37	8.73	8.12
	std	(10.81)	(9.05)	(10.45)
Maximum Fishing Distance from Shore (miles)	minimum	1.00	0.50	2.00
	maximum	100.00	60.00	25.00
	mean	27.52	16.42	12.33
	std	(15.30)	(15.59)	(6.60)

Table K3. Cost per trip by trip target—size 2 vessels: Non-pelagic targets

Cost Item		Akule/Opelu Fishing	Reef Fishing	Bottom Fishing
Ice	mean	9.92	9.35	10.65
	std	(13.78)	(9.58)	(16.88)
Boat Fuel	mean	22.67	27.84	33.56
	std	(16.79)	(21.36)	(24.99)
Bait	mean	5.70	4.02	14.73
	std	(12.20)	(10.57)	(17.53)
Food	mean	11.73	14.35	13.71
	std	(9.32)	(15.18)	(12.81)
Truck Fuel	mean	11.88	12.34	12.05
	std	(8.57)	(10.42)	(8.88)
Miscellaneous	mean	0.00	3.31	0.04
	std	(0.00)	(10.96)	(0.45)
Total	sum	61.90	71.03	84.74

Table K4. Vessel operating characteristics by trip target—size 2 vessels: Non-pelagic targets

Operating Characteristic		Akule/Opelu Fishing	Reef Fishing	Bottom Fishing
Number of Crew (includes captain)	mean	2.03	2.60	2.06
	std	(0.90)	(0.88)	(0.80)
Usual Fishing Distance From Shore (miles)	minimum	0.25	0.13	0.06
	maximum	12.50	5.00	35.00
	mean	1.85	0.98	5.52
	std	(2.34)	(1.00)	(6.98)
Maximum Fishing Distance From Shore (miles)	minimum	0.28	0.19	0.25
	maximum	20.00	5.00	60.00
	mean	2.96	3.15	8.90
	std	(4.69)	(3.45)	(10.97)

Section L. Fishermen's Comments and Suggestions

Following are responses to the question "Do you have any suggestions concerning how Hawaii's fisheries should be managed, or topics which need further study?" Responses are grouped by general topic and appear roughly according to the frequency of response within each category.

FADS

- Maintain FADS
- More FADS—good for attracting fish
- Put FADS where fishermen want them, right now they are not all in the best areas
- Use streamers on FADS
- Need some farther out
- Need some closer in
- Make underwater FADS
- Put some FADS at 1500'-2000'
- More FADS off Kawaihae
- More FADS off Waianae
- More FADS off Hilo, and closer in, too far out now
- Move Victor buoy to where Juliet was on the North Shore
- Aku boats wipe out FADS for 2-3 months
- Put/maintain lights on the FADS
- Less FADS—they attract fish and deplete stocks, especially the small fish

Enforcement

- More enforcement
- Enforce rules against selling without a CML. Monitor the so-called pleasure fishermen who sell without a license and don't pay taxes on sales
- Stop net fishing in bays
- Need more enforcement of current laws, otherwise don't have them
- Don't make unenforceable laws, be more logical
- Need more enforcement, check fish
- Need more enforcement, not more studies
- Stiffer penalties, more enforcement. Punish a few and others will be more careful
- Enforce crab laws
- More education to encourage self-monitoring
- Enforcement is hard because we have so many ramps and harbors to launch and land at
- Enforce collection of outstanding fees, especially dock fees
- Make sure longliners are US citizens
- Stop menpachi fishing with Clorox
- Need more enforcement officers

Regulations

- Eliminate longliners
- Ban gill nets
- Use kapu system, limits on seasons and area closures
- Not sure

- No whale sanctuary
- Establish minimum size for ahi, marlin, bottomfish, others
- Regulate recreational fishermen, leave commercial guys alone
- Keep big guys (longliners/netters) out so that the fishery can support more little guys
- It's already over regulated
- Leave it alone, it's fine
- Need bag limits for recreational fishermen
- Regulate aku boats
- Aku boats should stay out like longliners, stay at least 5-6 miles away from FADS, they are rude
- Regulations hurt older recreational guys
- Everyone should be required to have a license to fish
- Reef fishing is dead, regulate divers and netters
- Regulations are not stringent enough, have more management and enforcement like in Alaska
- Control use of spotter planes for netting
- Have minimum sale size limit for ahi and aku
- Minimum size for ahi should be 5 pounds
- Minimum size for ahi should be 50 pounds
- Ban all nets
- Stop all netting, they catch the baitfish
- No surround nets in bays
- Control surround nets, don't catch spawners
- Ban lay net fishing in harbors and rivers
- Regulate lay nets, all nets
- Ban surround nets
- Keep surround nets off shore, at least 100' depth
- No drift nets
- Stop driftnetters, they lose and leave nets out
- Eliminate near shore gill nets
- Stop all overnight netting
- Ban opelu netting
- Ban opelu and akule netting, or else set seasons
- Let nehu propagate for a while
- No small nets
- Rotate gill net areas (temporary reef closures)
- Regulate akule boats
- Make maximum length for longline trips, that way the fish will have better quality
- Things are pretty good now that longliners are kept outside
- Push longliners out to 100 miles all year
- Push longliners out to 150 miles all year
- Push longliners out to 200 miles all year
- Push longliners out to 1000 miles all year
- Reduce number of longliners, 25 longliners would be an acceptable amount for Hawaii
- Longliners take most of the flag/game fish, regulate them more
- Make bag limits for longliners
- Reduce bycatch by longliners

- Close bottomfishing for 2-3 years
- Use kapu seasonal or area closures for bottomfish
- Use closed areas, especially for bottomfish. Must be fair to all islands, maybe rotate areas
- Make seasons for opakapaka
- The state imported taape that eat opakapaka juveniles and now they blame the fishermen for overfishing
- Small boat fishermen can't cross the channels in the winter and if there are closed seasons in the summer we'll never be able to fish
- Closing Penguin Banks is wrong
- Pelagics need international management
- Create artificial reefs
- Area closures can be good but should be studied first
- Use closed seasons for all species
- Closing one species will put more pressure on others
- More international management, we are small compared to high seas fishing
- Look to Alaska for fishery management models
- Use seasonal, area closures for Kona crabs
- Minimum sizes for crabs and lobsters, don't take ones with eggs
- Kona crab season should open one month later and close one month earlier
- Kona crab season should open in October so that all the eggs will hatch
- Fuel crisis of 1970s depleted stocks inside, trollers became bottomfishers and crabbers. Crab stocks went down from there, should close crab fishing for 3-5 years
- Limit number of Kona crab nets per set
- Poorly managed, remove area closures, stop limited entry and quotas. Target individuals not gear types, avoid derby style fishing
- Need more management of inner reefs
- Should always have "grandfather" clauses to let the local way of fishing continue. No restrictions on bottomfishing for locals
- Charging more for CML will discourage week-end fishermen from selling and undercutting commercial fishermen
- Have bag limits on small fish
- Still lots of fish
- Less fish these days
- We don't need recreational licenses like on the Mainland
- If we have to have recreational licenses than use the money for research
- There are no problems—except not enough fish
- More marine patrols, especially check folks breaking coral
- Educate fishermen about conservation ethics
- Educate fishermen, some overfish for profit or subsistence but they don't realize that overfishing will permanently deplete the resource. We must have additional awareness or enforcement for things to improve
- Near shore overharvesting takes away much of the food that supports the food chain
- There are too many fishermen, limit entry—require 5 year Hawaii residency before being allowed to fish
- Use license fees to replenish stocks

- Stop fishing on seamounts
- Regulate tropical fish collectors, many fish die before reaching market
- Things are better than before
- Let economics and fishermen decide, regulations make things worse
- Control the number of fishermen, especially by island
- Shouldn't let industry be part of management
- Use rules like Alaska quotas, 2 ahi a day are plenty
- Have area restrictions for commercial fishermen, move the areas by season
- Expanding population has already exceeded the capacity of our nearshore waters. It is no longer reasonable to have unregulated, indiscriminate fishing practices like gillnetting. Take only what you can eat
- Papio size limit is dumb because small ones die from eating the hook anyway

Fishermen's Input
- Involve more fishermen in decision making process
- Involve fishermen in any studies or management proposals
- Regulations should benefit all, not just big business and commercial fishermen
- Small boat fishermen have little say or power right now
- DLNR needs to speak with experienced fishermen
- Continue getting input from fishermen, task forces are good
- Make license conditional on submitting catch reports. Need better input/participation by fishermen, better catch reports numbers and sizes of fish
- Need to speak with small time fishermen who don't report
- Keep government out of fisheries, have a fishermen's co-op for consensus decision making, involve fishermen
- Government needs to communicate with fishermen more
- Not enough communication between government and fishermen, they need to give out more information
- Local fisheries should be managed by local people, not the Federal government
- We need fishery management, but not by government
- Make voluntary catch reports for recreational fishermen
- Ask commercial fishermen about the resource

Fishing Community
- Fishermen need to work together
- Fishermen should release more fish, there are more fishermen than fish
- We need to fill out catch reports better, right now they don't represent reality or FAD productivity
- There is not enough reporting by fishermen
- We need more harmony
- Some people throw rubbish into the ocean, they are jerks

Research
- Study interactions between longliners, local fish populations, and our economy
- Study FADS, construction, placement, effect

- Base laws on science, not politics. Legislature is not competent to make rules
- Study bottomfish and their depletion
- Research ahi tumors, seeing increase
- Research bottomfish movement
- Study areas proposed for closures, will they help?
- Research most effective minimum sizes for fish
- Study interactions between fish
- Research pelagic migration
- Study effects of netting and longlining
- Study effect of commercial passenger boats, they are damaging the reef
- Study impact of small boat fishing
- More research into ahi burn
- Study fish before changing laws
- Study fish more than mammals
- Research fishing effects on tourist ocean industry. Conflicts with tropical fish collectors
- Research effect of tropical fish collectors on population
- Research food chain, ecology, and ecosystem
- Too much studies already
- Tagging fish kills them, poor use of research money
- Need creel census, understanding of how stocks are being impacted
- Need more hands on studies
- Study economic damage due to sharks taking bottomfish from fishermen
- Study economic damage due to porpoises taking fish from fishermen
- Research mahi and aku because they are disappearing

Various Issues
- We don't want or need a whale sanctuary
- Should use CML and ramp fees for fishery
- Need more and to maintain boat ramps. Scrub them because they get too slick
- Not fair for fishermen to have to pay road taxes on fuel, difficult to get refunded on taxes
- Have to go further out to find fish now
- Longliners catch too much fish, surround the islands with line, keep fish from coming in
- Open Kahoolawe like before
- Make more moorings so we can stay out overnight
- Charge more for CML, especially to tourists (like we pay in Alaska)
- Charge tourist charter patrons for license
- Porpoises compete for fish, eat from lines and nets
- Too much paperwork, GET and catch reports even when not fishing
- Tugboats keep fishing the buoys
- Should enforce safety checks, especially for navigational lights
- Stop shooting porpoises
- Raise and widen the bridge at Kapaa, and fix the navigational lights
- Need more and better ramps
- Carry through with Heeia Kea parking lot improvements
- Put floating gas stations in harbor for tax free fuel

- Too much pollution
- More aquaculture, tax fishermen to artificially spawn fish, develop hatcheries and make more fish available
- Raise fish like mahimahi
- Give tax breaks to fishermen
- Harder to find opaka these days
- Too much sewage in the water
- Ramp and trailer fees aren't fair to occasional fishermen
- It's good to stir up the bottom to bring up fish
- Waianae Harbor entrance is too dangerous, needs to be fixed
- State is taxing us to death
- Nonpoint source pollution is deteriorating fishery, too much freshwater runs off into the ocean
- Sugar Mill outflow killed the reef. Erosion from agriculture silts up the reef
- Too many turtles means more sharks
- Recreational fishermen should do more tag and release
- Concentrate management so that fish make the most money. For example it is more profitable to sell some types of fish for aquariums than to let them be used as food fish
- Too many people go out without safety equipment
- Longliners discard fish because of shelf life. We local fishermen who fish daily and return daily rely on this type of fish and bring it fresh to the market
- Be careful, avoid mistakes of the East Coast. Limit the big guys vs. recreational
- Keahou bathrooms are disgusting, why do we pay fees and taxes?

Fish Marketing

- Fishermen need to get fairer prices for fish
- Limit the amount of longline catch sold at auction so "local" fishermen can get reasonable prices for their fish. Low prices at the auction are not reflected in lower prices at restaurants and supermarkets
- Buyers need to insist on seeing CML before buying, weekend fishermen sell to markets and undercut prices for commercial fishermen
- Need an auction just for small boats
- Stop importing fish, everyone should buy local so that fishermen can get better prices
- Too many longliners, too much competition, especially at the auction. They flood the floor and drive down prices
- Need better marketing of fish, if fishermen got better prices they wouldn't have to catch as many fish
- Auctions don't give fair prices to fishermen, especially in Hilo
- Government should set up a co-op market for fishermen, eliminate the middle man
- Buyers shouldn't buy immature fish
- Longliners catch so much marlin that they drive the price down, they should have bag limits
- No one should sell or buy immature fish
- Recreational fishermen sell cheaply but don't have to worry about making a living from fishing. Hard on commercial fishermen
- Auctions shouldn't sell ahi and aku that weigh less than 10 pounds
- People who aren't fishermen buy fish wholesale at the auction and then sell to restaurants

VI. Conclusions

This project found great diversity in fishing operations and avidity, and examination of selected groups found that clear differences exist. Not surprisingly, fishing intensity and catch rates were highest for fulltime fishermen and lowest for expense fishermen. For those who sold fish, sales and gross revenues were highest for fulltime fishermen and lowest for expense fishermen. The percentage of total catch sold followed the same trend, with fulltime fishermen selling an average of 91% of their catch, parttime fishermen selling 85%, and expense fishermen selling 57%. These numbers are remarkably consistent between pelagic and non-pelagic fishermen.

The majority of fishermen used more than one gear type during the previous 12 months, with trolling by far the most common gear type used by pelagic fishermen. However, gear types were found to vary by island in accordance with what is known about fishing areas around each island (e.g. Oahu is known for ahi trolling, Kauai has good bottomfishing areas nearby etc.). Fulltime pelagic fishermen spent a greater percentage of their time handlining (both palu ahi and ika shibi) than parttime, expense, or recreational fishermen. This emphasis was even more pronounced among pelagic highliners.

Although the extent of the fishing population remains unknown, it is clear that they are making substantial contributions to our economy. Average overall investment in vessels, trailers, and related equipment totaled $48,000 for fulltime vessels, followed by $44,000 for parttime vessels, $40,000 for expense vessels, and $24,000 for recreational vessels. This ranking applies to both pelagic and non-pelagic vessels, however total investment was higher for pelagic vessels than for non-pelagic vessels at every level.

Mean annual fixed costs represent another substantial input into Hawaii's economy. These averaged $8,000 for fulltime vessels, $5,000 for parttime vessels, $3,000 for expense vessels, and $2,000 for recreational vessels. This ranking is not surprising because fixed costs are related to investment (e.g. insurance and loan payments) and avidity (e.g. maintenance and gear), both of which varied according to operator motivation. Fixed costs were higher for pelagic vessels as compared to non-pelagic vessels across all motivations.

Average trip costs were remarkably similar across groups, with only slight variations by operator motivations, vessel targets, sizes, and islands. The average trip cost was $116 for fulltime vessels, $124 for parttime vessels, $102 for expense vessels, and $76 for recreational vessels. Multiplying these figures by mean annual fishing trips gives annual purchases of $13,000, $11,000, $6,000, and $3,000 respectively. In general, boat fuel was the most significant cost and appeared to vary with vessel size, gear type, and how far from port vessels typically fished. Other important costs were ice and bait, with full and parttime vessels generally using more of both relative to expense and recreational boats. Again, this was expected because expense and recreational vessels did less handlining (thus requiring less bait) and had lower catch rates (thus requiring less ice).

Survey respondents were remarkably willing to participate in this project and quite open in their responses. Many management issues exist in Hawaii's small boat fishery—to the extent that this basic information helps tell their story and inform public policy it will have met its objectives. However, any public policy must invoke fishermen's direct input.

VII. References

Boggs, C.H., and R.Y. Ito, 1993. *Hawaii's Pelagic Fisheries*. "Marine Fisheries Review," 55(2).
Pooley, S.G., 1993a. *Economics and Hawaii's Marine Fisheries*. "Marine Fisheries Review," 55(2).
Pooley, S.G., 1993b. *Hawaii Marine Fisheries: Some History, Long-term Trends and Recent Developments*. "Marine Fisheries Review," 55(2).

VIII. Appendix

In-Person Survey Instrument

Date:

Harbor:

Time:

Interviewer(s):

1. Do you own this boat?

2. Do other people use this boat without you?

3. Is your boat trailered or moored?

4. How long is your boat overall?

5. In what year did you buy your boat? And do you know what year it was built?

6. How much did the boat cost when you bought it?

7. How much has been spent since then in each of the following categories:
   Electronics currently used
   Major upgrades and improvements to the boat
   Trailer and hitch
   Rods/reels/pullers and other major gear currently used
   Other (ice maker, freezer, etc.)

8. In the past 12 months, how much money was spent on your boat for:
   Boat insurance
   Loan payments on the boat
   Maintenance and repair of the boat and trailer
   Other (mooring fees, ramp fees etc.)

9. How many trips did your boat make in the past 12 months?

10. What did you usually do with the fish that you caught?
    All of the catch was sold
    Some of the catch was sold
    Some of the catch was taken home to eat
    Some of the catch was given away to the crew
    Some of the catch was given to friends/neighbors/coworkers, etc.
    Other (specify)

If any of the catch was sold:

11. When you sold your fish, did you consider yourself a commercial fisherman trying to make some income or were you just trying to cover trip costs?

If any of the catch was sold:

12. Did you also use your boat for purely recreational trips, for example taking your wife and kids out? If yes: How many (or what percent of total) trips did you take that were purely recreational?

If any of the catch was sold:

13. What percent of non-recreational trips were of each gear type?

Trolling	Handline for deepsea bottomfish
Palu ahi	Mixed gear (specify)
Ika shibi	Other gear (specify)

If any recreational trips were taken:

14. What percent of recreational trips were of each gear type?

Trolling	Handline for deepsea bottomfish
Palu ahi	Mixed gear (specify)
Ika shibi	Other gear (specify)
Non-fishing	

15. How many pounds of pelagic fish (ahi, aku, mahi, marlin, ono, or spearfish) were caught on all your boat's trips in the past 12 months?

16. How many pounds of non-pelagic fish were caught on all your boat's trips in the past 12 months?

If any of the catch was sold:

17. What percent of the pelagic fish caught were sold? And what percent of the non-pelagic fish caught were sold?

Note: Questions 18-23 refer to the most common and second most common trip types, these are based on the percentages given in response to Question 13 for respondents who sold fish, or Question 14 for purely recreational fishermen.

18. How far away from any land (straight line) did your boat fish on a typical fishing trip in the last 12 months? What was the maximum distance from land that you fished?
    Most common trip type
        Usual distance
        Maximum distance
    Second most common trip type
        Usual distance
        Maximum distance

19. Who normally ran the boat on these fishing trips?
    Most common trip type
    Second most common trip type

20. How many fishermen (total) were on board?
    Most common trip type
    Second most common trip type

21. How do you pay your crew? And what percentage does each receive?
    Most common trip type
    Second most common trip type

22. How much money was spent on a typical fishing trip in each category?

	Most common trip type	Second most common trip type
Ice		
Bait		
Fishing gear (lures, line, etc.)		
Boat fuel (gas or diesel?)		
Food		
Other (e.g. truck fuel)		

If any of the catch was sold:

23. Where did you usually sell your fish? What was the most common outlet?

	Most common trip type	Second most common trip type
Auction		
Markets/stores		
Restaurants/bars		
Roadside sales		
Friends/neighbors/coworkers		
Other (specify)		

If any of the catch was sold:

24. How much did your boat gross (before expenses) in the past 12 months from selling fish?

If any of the catch was sold:

25. After expenses, what percent of your personal income came from fishing?

26. What is the zip code where you normally live?

27. How would you describe your ethnicity? (observe gender M/F)

28. What is your age?

less than 25 years	45 to 54 years
25 to 34 years	55 to 64 years
35 to 44 years	more than 64 years

29. People define "commercial" fishermen in different ways. Which definitions would you use to define a fisherman as commercial? (Check all that apply).

Someone who:
sells at least one fish
sells fish just to cover expenses
sells fish to make a profit
sells fish to friends and neighbors
sells fish to stores or restaurants
sells fish at the auction
earns the majority of their income from fishing
relies solely on fishing to provide income
makes more than $_____ /year (fill in) from selling fish
other (specify)

30. How would you define yourself as a fisherman? (Check all that apply).

Subsistence	Part-time commercial
Recreational	Full-time commercial
Other (specify)	

31. What was your household's total income in the past year, including fishing income?

less than $10,000	$40,000 to $50,000
$10,000 to $20,000	$50,000 to $75,000
$20,000 to $30,000	$75,000 to $100,000
$30,000 to $40,000	more than $100,000

32. Do you have any suggestions concerning how Hawaii's fisheries should be managed or topics which need further study?

Special Economic Survey of Hawaii's Pelagic
Troll and Handline Fishing Vessels

Thank you for taking the time to complete this survey. This project is being conducted by the Joint Institute for Marine and Atmospheric Research (JIMAR) to better understand the economics of Hawaii's pelagic troll and handline fishing vessels. How well it portrays an accurate picture of this fishery depends on the information provided by you, the fishermen. Although exact answers are preferred, estimates are acceptable. This survey focuses on your boat's fishing operations over the past 12 months. Some questions are rather personal, however all answers are **voluntary** and **confidential.** You can remain **anonymous if you choose.** If you cannot or do not want to answer any specific questions, please skip them and go on. Feel free to write any comments you would like in the margins (e.g. can't remember, too personal). If you would like a copy of our report at the conclusion of this study, **please** be sure to include your name and address at the end of this form. Your name and address will be kept separate from the answers you provide. If you have any questions or would like more information, contact Marcia Hamilton or Steve Huffman at (808) 943-1278.

Joint Institute for Marine and Atmospheric Research
HIFIVE Project
1000 Pope Rd., MSB 312
Honolulu, HI 96822-2336
Attn: M. Hamilton

When completed, please refold this survey form with the mailing address and stamp facing out, tape or staple, and mail back (no postage necessary).

This survey focuses on the importance of troll and handline fishing to Hawaii's economy. Please use your best estimate or, if possible, refer to your fishing logs or records.

1. Is your boat trailered or moored? (circle one)

2. How long is your boat overall? (fill in the blank) _____ feet

3. In what year did you buy your boat? (fill in the blank) 19____

4. When was your boat built? (fill in the blank) 19 ____

5. How much did the boat cost when you bought it? (fill in the blank) $_____

In Hawaii, people go fishing for different reasons. They may want to make money, cover their trip expenses, catch fish to eat, enjoy the fishing experience, or a combination of these reasons. Please provide information on all trips your boat took not just the ones you were on.

6. How many fishing trips did your boat take in the past 12 months that fall into each of the following categories? (fill in the blanks)

Sold fish to make money	_____ trips
or	
Sold fish to cover trip expenses	_____ trips
or	
Caught fish but did not sell any fish	_____ trips
or	
Didn't catch any fish	_____ trips
Total number of trips	_____

The following questions separate pelagic and non-pelagic trips. Pelagic trips *target tuna, billfish, shark, mahi, or ono*. Non-pelagic *trips target bottomfish or other non-pelagics*.

7. How many fishermen (including the skipper) were on board the boat on a typical fishing trip? (fill in the blanks)

Typical pelagics trip	_____ fishermen
Typical non-pelagics trip	_____ fishermen

8. Who normally runs the boat on your fishing trips? (check the appropriate category/ categories)

	typical pelagics trip	typical non-pelagics trip
Boat owner	_____	_____
Other (please specify: family member, friend, hired captain, etc.)		
_____	_____	_____

9. In general, what type of fishing occurred on trips your boat made in the past 12 months? (please check all that apply, please double check the most common)

_____ Trolling for pelagics
_____ Handlining for pelagics
_____ Handlining for non-pelagics
_____ Other (please specify) _____

10. About how much time did you spend in each of the following activities on your typical fishing trip? (fill in the blanks)

	typical pelagics trip	typical non-pelagics trip
Preparing for a trip	_____ hours	_____ hours
Trailering boat to ramp	_____ hours	_____ hours
Traveling to and from the fishing grounds	_____ hours	_____ hours
Fishing	_____ hours	_____ hours
Non-fishing activities at sea	_____ hours	_____ hours
Cleaning up after a trip	_____ hours	_____ hours
Selling your fish	_____ hours	_____ hours
Other activities (please specify) _____	_____ hours	_____ hours

11. How many pelagic, non-pelagic, and mixed pelagic/non-pelagic trips did your boat make in the past 12 months? Please include all trips which you made, whether you caught any fish or not.

	total # pelagic trips	total # non-pelagic trips	total # mixed pelagic/ non-pelagic trips
Total	_____	_____	_____

12. How many pounds of *PELAGIC* fish caught on your boat's trips in the past 12 months were sold versus kept for home or shared with others? Please include the catch made by everyone aboard the boat, not just yourself.

	total # pelagic pounds pounds sold	total # pelagic pounds kept for home or shared with others
Total	_____	_____

13. How many pounds of *NON-PELAGIC* fish caught on your boat's trips in the past 12 months were sold versus kept for home or shared with others? Please include the catch made by everyone aboard the boat, not just yourself.

	total # non-pelagic pounds pounds sold	total # non-pelagic pounds kept for home or shared with others
Total	_____	_____

14. How much total gross revenue (before expenses) did your boat make from fishing in the past 12 months? (fill in the blank) $_____/12 months

15. How do you pay your crew? (e.g. 25% of fish, 25% of revenue, etc.)

16. What percentage of your personal income in the past 12 months came from any type of fishing? (fill in the blank)

_____ %

The following questions apply to you.

17. How do you describe your ethnic background? (please check all that apply)

_____ Hawaiian
_____ Korean
_____ Caucasian
_____ Chinese
_____ Filipino
_____ Vietnamese
_____ Japanese
_____ Other (please specify) _____

18. What is the zip code of the residence where you normally live? (please fill in the blanks)
_____

19. What was your household's total income in the past year, including income from fishing? (please check one)

_____ less than $10,000
_____ $10,000-$20,000
_____ $20,000-$30,000
_____ $30,000-$40,000
_____ $40,000-$50,000
_____ $50,000-$75,000
_____ $75,000-$100,000
_____ more than $100,000

20. What is your age? (please check one)
_____ less than 25
_____ 25-34 years
_____ 35-44 years
_____ 45-54 years
_____ 55-64 years
_____ more than 64

21. People define commercial fishermen in different ways. Which definitions would you use to define a fisherman as commercial? (please check all that apply)

_____ Someone who sells at least one fish
_____ Someone who sells fish just to cover expenses
_____ Someone who sells fish to make a profit
_____ Someone who sells fish to friends and neighbors
_____ Someone who sells fish to stores or restaurants
_____ Someone who sells fish at the auction
_____ Someone who earns the majority of their income from fishing
_____ Someone who makes more than $_____ /year (fill in) from selling fish
_____ Someone who relies solely on fishing to provide income
_____ Other (please fill in)_____
_____
_____

22. How do you define yourself as a fisherman? (please check all that apply)

_____ Subsistence
_____ Recreational
_____ Part-time commercial
_____ Full-time commercial
_____ Other (please fill in)_____

Optional Section

23. What is your boat's HA number or CG number? (fill in the blank)

    HA _____ CG _____

24. Are state catch reports filled out for this boat?

    Yes_____ No_____

25. Is there anything you would like us to know regarding your fishing experiences? Do you have any comments concerning how Hawaii's fisheries are managed?

Thank you for your help with this project.

If you would like to receive a copy of our report please fill in your name and address below. Please print clearly.

Name:

Address: