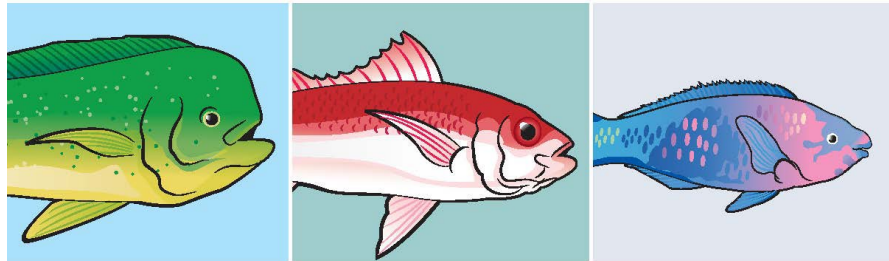


# Economic and Social Characteristics of the Hawaii Small Boat Fishery 2021

Hing Ling Chan



**U.S. DEPARTMENT OF COMMERCE**  
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# Economic and Social Characteristics of the Hawai'i Small Boat Fishery 2021

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## Table of Contents

List of Tables .....	iii
List of Figures .....	viii
Executive Summary .....	x
Introduction.....	1
Methods.....	2
Population .....	2
Methodology .....	2
Response Rates .....	3
Results.....	6
Respondents by Subgroup .....	6
Demographics .....	11
Vessel Characteristics .....	13
Fishing Activity Characteristics.....	16
Fishing Trips and Gear Used .....	16
Fishing Areas and Fish Aggregating Devices (FADs) .....	24
Fish Landings.....	29
Catch Disposition and Market Participation.....	38
Catch Distribution and Disposition.....	38
Market Participation.....	43
Revenue of Fish Sold .....	47
Total Catch and Revenue by Primary Fishing Motivation .....	57
Trip Costs.....	58
Annual Fishing Fixed Costs.....	65
Analysis by Fishery .....	70
Economic Performance of Full-time Commercial Fishermen.....	85
What Do You Think .....	86
Fishing Participation in Next Year.....	86
Top Three Species to Target.....	88
Importance of Fishing.....	88
Importance and Performance of Fisheries Management in Hawai‘i.....	89

Fishermen’s Comments and Suggestions for How Hawai‘i’s Fisheries should be Managed and Topics for Further Study .....	91
How have COVID-19 Changed Fishing Activities .....	92
The Main Reasons for Making the Changes .....	93
Discussion .....	95
Acknowledgments.....	96
Literature Cited .....	97
Appendix A. Survey Questionnaire .....	98
Appendix B. Summary Tables .....	102

## List of Tables

Table 1. Survey implementation schedule.....	2
Table 2. Survey population and response rates.....	4
Table 3. Demographics by mail and online respondents.....	5
Table 4. Distribution of survey responses by county and subgroup.....	9
Table 5. Distribution of survey responses by primary fishing motivation and subgroup.....	10
Table 6. Distribution of survey responses by most common gear and subgroup.....	10
Table 7. Survey responses: “How would you describe your race? (check all that apply).”.....	11
Table 8. Survey responses: “What is your age?”.....	12
Table 9. Survey responses: “What was your total household income, before taxes, in 2020, including fishing income?”.....	12
Table 10. Survey responses: “What is the highest level of education you have completed?”.....	13
Table 11. Vessel characteristics (mean, standard error, and median).....	15
Table 12. Vessel characteristics (mean), 2020 vs. 2013.....	15
Table 13. Number of boat fishing trips, 2020 vs. 2013.....	17
Table 14. Survey responses: “Approximately how many boat fishing trips did you take in 2020?” (percentage of responses and mean).....	17
Table 15. Gear usage in boat fishing trips in 2020 (percentage of responses).....	19
Table 16. Average number of boat fishing trips by gear type (exclude 0).....	21
Table 17. Survey responses: “In 2020, what percent of your fishing time occurred in state and/or federal jurisdiction?” (percentage of responses).....	24
Table 18. Survey responses: “In 2020, during what percent of your fishing trips did you fish at/visit fish aggregating devices (FADs)?” (percentage of responses and mean).....	26
Table 19. Survey responses: “In 2020, during the trips when you visited a fish aggregating devices (FADs), please estimate the percentage of your total fishing time that you fished at/around FADs?” (percentage of responses and mean).....	28
Table 20. Annual landings for the survey population from State of Hawai‘i DAR’s fishermen reporting system vs. survey respondents in 2020 (percentage of responses).....	30

Table 21. Annual landings for survey respondents: State of Hawai‘i DAR’s fishermen reporting system vs. survey responses in 2020 (percentage of responses).....	31
Table 22. Annual landings for survey respondents by species group: State of Hawai‘i DAR’s fishermen reporting system vs. survey responses in 2020.....	32
Table 23. Catch composition: “In 2020, approximately how many total pounds of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish did you catch?” (mean and median).....	32
Table 24. Estimated landings per trip (including pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish) (percentage of responses, mean, and median). ...	34
Table 25. Average annual landings and landings per trip, 2020 vs. 2013 (lb). ....	35
Table 26. Annual landings by species group (mean and media) (lb).....	36
Table 27. Distribution of annual landings by species group.....	37
Table 28. Estimated distribution of catch: consumed at home, caught and release, given away, and sold?” (percentage of catches). ....	40
Table 29. Market outlet usage in 2020 by county (percentage of respondents). ....	44
Table 30. Survey responses: “In 2020, where did you sell your fish: seafood dealer/wholesaler, auction, restaurants/stores, roadside/farmers’ market, friends/neighbors/coworkers, other?” (percentage of responses and mean percentage). ....	45
Table 31. Survey responses: “In 2020, where did you sell your fish: seafood dealer/ wholesaler, auction, restaurants/stores, roadside/farmers’ market, friends/ neighbors/coworkers, other?” <sup>a</sup> (mean percentage, exclude 0).....	46
Table 32. Revenue from fish sold for the survey population from State of Hawai‘i DAR’s Dealer Reporting System vs. survey respondents (percentage of responses).....	47
Table 33. Revenue from fish sold for survey respondents: State of Hawai‘i DAR’s Dealer Reporting System vs. survey responses (percentage of responses). ....	49
Table 34. Survey responses: “In 2020, what was the approximate value of all the fish you sold?” (percentage of responses, mean, and median). ....	50
Table 35. Average annual revenue of fish sold, 2020 vs. 2013 (inflation adjusted, 2020 dollars). ....	51
Table 36. Estimated revenue of fish sold per trip (percentage of responses, mean, and median). ..	52
Table 37. Estimated annual revenue of fish sold by species group (mean and media) (\$).....	53
Table 38. Estimated distribution of annual revenue of fish sold by species group. ....	54

Table 39. Survey responses: “In 2020, what percent of your personal income came from the sale of fish?” (percentage of responses and mean). .....	56
Table 40. Fishing trip costs for most common and second most common gear usage (total and itemized) (mean, standard error, and median). .....	59
Table 41. Average fishing trip costs for most common and second most common gear usage, 2020 vs. 2013 (inflation adjusted, 2020 dollars).....	59
Table 42. Fishing trip costs by county (mean, standard error, and median).....	60
Table 43. Fishing trip costs by gear type (based on fishermen using this gear as their most common and second most common gear types) (mean, standard error, and median). .....	61
Table 44. Fishing trip costs by primary fishing motivation (mean, standard error, and median). .....	63
Table 45. Survey responses: “On average per trip, how much did you spend on your first and second most common gear type trip?” .....	65
Table 46. Annual fishing fixed costs in 2020 (mean, standard error, median).....	65
Table 47. Average annual fishing fixed costs, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	66
Table 48. Annual fishing fixed costs in 2020 (non-zero expenditures on individual category) (mean, standard error, and median, and percentage of fleet with expenditure). .....	67
Table 49. Annual fishing fixed costs in 2020 for all respondents and by county (mean, standard error, and median). .....	67
Table 50. Annual fishing fixed costs in 2020 for all respondents and by primary fishing motivation (mean, standard error, and median). .....	68
Table 51. Annual fishing fixed costs in 2020 for all respondents and by most common gear (mean, standard error, and median). .....	69
Table 52. Fishermen demographics by fishery (percentage of responses). .....	71
Table 53. Vessel characteristics by fishery (mean, standard error, median, and percentage of responses).....	72
Table 54. Fishing activity characteristics by fishery (percentage of responses and mean). .....	73
Table 55. Landings by species group under each fishery (percentage of responses, mean, and median). .....	75
Table 56. Catch disposition and market participation by fishery (percentage of responses, mean, and median).....	76



Table 57. Fishing trip costs in 2020 by fishery (mean, standard error, median, and percentage of total trip cost). .....	78
Table 58. Average fishing trip costs for pelagic fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	79
Table 59. Average fishing trip costs for bottomfish fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	79
Table 60. Average fishing trip costs for coral reef fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	80
Table 61. Annual fishing fixed costs in 2020 by fishery (mean, standard error, median, and percentage of annual fixed costs). .....	80
Table 62. Average annual fishing fixed costs for pelagic fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	81
Table 63. Average annual fishing fixed costs for bottomfish fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	82
Table 64. Average annual fishing fixed costs for coral reef fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	82
Table 65. Annual fishing fixed costs in 2020 by fishery (non-zero expenditures on individual category) (mean, standard error, and median, and percentage of fleet with expenditure). .....	83
Table 66. Average annual fishing fixed costs for pelagic fishery (non-zero expenditures on individual category), 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	84
Table 67. Average annual fishing fixed costs for bottomfish fishery (non-zero expenditures on individual category), 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	84
Table 68. Average annual fishing fixed costs for coral reef fishery (non-zero expenditures on individual category), 2020 vs. 2013 (inflation adjusted, 2020 dollars). .....	85
Table 69. Economic performance of full-time commercial fishermen in 2020. ....	86
Table 70. Participation of different types of fishing in the next year. ....	86
Table 71. Summary of for reason of more/fewer fishing in the next year (number of mentions in parenthesis). .....	87
Table 72. Survey responses: “What are the top three (3) species you target... to sell/to keep for self-consumption/to give away?” (percentage of responses). .....	88
Table 73. Survey responses: “Please state how much you agree or disagree with the following statement:” (percentage of responses). .....	88

Table 74. Survey responses: “How important are the following for managing fisheries in Hawai‘i?” (percentage of responses). ..... 89

Table 75. Survey responses: “Please state how much you agree or disagree that following management is being done well?” (percentage of responses). ..... 90

## List of Figures

Figure 1. Survey respondents by county, 2020 and 2013.....	6
Figure 2. Primary fishing motivation in 2020 and fisherman type in 2013.....	7
Figure 3. Top three fishing motivations, 2020.....	8
Figure 4. The most common gear composition, 2020 and 2013.....	8
Figure 5. Percentage of fishermen who owned the boats on which they fished.....	14
Figure 6. Vessel size.....	14
Figure 7. Number of boat fishing trips in 2020 and 2013.....	16
Figure 8. Number of gears used in boat fishing trips in 2020.....	18
Figure 9. Types of boat fishing trips in 2020.....	19
Figure 10. Used green-stick for boat fishing trips in 2020.....	22
Figure 11. Number of non-boat fishing trips in 2020 and 2013.....	23
Figure 12. Gear usage in non-boat fishing trips in 2020.....	23
Figure 13. Average number of non-boat fishing trips by gear type (exclude those who did not take any non-boat trips with that gear type).....	24
Figure 14. Percent of fishing trips fished at/visited FADs in 2020.....	26
Figure 15. Number of people on board for an average fishing trip in 2020 and 2013.....	29
Figure 16. Annual landings distribution for the survey population (HDAR FRS statistics) vs. survey respondents.....	30
Figure 17. Average annual landings by species group and primary fishing motivation.....	37
Figure 18. Catch distribution among fishermen in fishing trips in 2020 and 2013.....	39
Figure 19. Catch disposition in 2020 and 2013.....	41
Figure 20. Catch disposition in percentage in 2020 vs. 2013 by primary fishing motivation (2020) and fisherman type (2013).....	41
Figure 21. Catch disposition in pound in 2020 vs. 2013 by primary fishing motivation (2020) and fisherman type (2013).....	42
Figure 22. Estimated catch disposition by primary fishing motivation.....	42

Figure 23. Market outlet usage in 2020 vs. 2013 by county.....	44
Figure 24. Market outlet usage in 2020 vs. 2013 by primary fishing motivation (2020) and fisherman type (2013).....	45
Figure 25. Revenue from fish sold for the survey population (HDAR DRS statistics) vs. survey respondents. ....	48
Figure 26. Estimated average annual value of fish sold by species and primary fishing motivation. ....	55
Figure 27. Percent of personal income obtained from fish sales. ....	56
Figure 28. Pounds of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish caught by primary fishing motivation (2020) and fisherman type (2013).....	58
Figure 29. Value of fish sold by primary fishing motivation (2020) and fisherman type (2013). ....	58
Figure 30. Need gap analysis. ....	91
Figure 31. Frequency distribution for fishermen’s comments on suggestions for how Hawai‘i’s fisheries should be managed or topics that they feel need further study. ....	92
Figure 32. Frequency distribution for fishermen’s comments on how fishing activities have changed due to COVID-19. ....	93
Figure 33. Frequency distribution for fishermen’s comments on the reasons for changing their fishing activities due to COVID-19. ....	94

## Executive Summary

This report presents an updated empirical description of the economic and social characteristics of the Hawai‘i small boat fishery using results from the cost-earnings survey of the fleet conducted in 2021. The population for the survey included 889 fishermen who held a State of Hawai‘i Commercial Marine License (CML) and fished using small vessels and landed at least one marine life during 2020. This is lower than the population of 1,796 fishermen in the 2014 survey. One possible reason for the lower participation in 2021 was the 100% increase in CML license fee in 2018 (from \$50 to \$100). A personalized letter to invite online survey participation was sent to 889 fishermen in spring 2021. It included the survey website address and a unique personalized password for survey login. For those who did not respond to the online survey, we followed up with a three-way mailing that included a survey booklet and reminder postcard. Seven undeliverable mail, 2 inactive fishermen, and 1 charter fishermen were identified during the fieldwork, and were excluded from the population as they did not meet the survey criteria. This made the effective population at 879 CML holders. We received 350 returns, including 228 via mail and 122 online, and achieved a 40% response rate, which is slightly lower than the 43% of response rate in the 2014 survey.

All of the survey results were presented in aggregate forms and individual results were not disclosed. With more than 300 responses, this study provides a robust update on the economic and social description of the Hawai‘i small boat fleet including demographics of small boat fishermen, vessel characteristics, fishing activity levels, social aspects of small boat fishing, market participation, fishing trip costs, and annual fishing fixed costs. The Hawai‘i small boat fishery is made up of fishermen from different islands who use different fishing gears and target different species. The fishing motivations among fishermen also vary. Based on the large number of responses, we are able to segment the responses and examine the characteristics and differences between subgroups of the fishery, including county of residence, primary fishing motivations, gear types most commonly used, and sub-fisheries within the Hawai‘i small boat fishery, which is defined by the types of fishing trip that fishermen had in 2020. This study, resulting from different self-identified fishing motivations, can be illustrated by full-time commercial fishermen, part-time commercial fishermen, cultural fishermen, recreational expenses fishermen, purely recreational fishermen, and subsistence fishermen.

The Hawai‘i small boat fishery was mostly owner-operated with 96% of respondents owning the vessel on which they fished, almost identical to the 95% in 2013. Of the respondents, 85% did not have other people use their vessels without them. This is lower than 91% of the respondents in 2013. The average vessel size was approximately 24 ft long with 250 hp engine. This was slightly larger than the average vessel size of 23 ft long with 216 hp in 2013. The average age of vessels was 26 years and the average duration of vessel ownership was 13 years, which was higher than the 23 years of age and 12 years of ownership in 2013 based on the passage of time. Vessel purchase price was close to \$53,000 on average and the estimated current market value was higher at \$62,000, which was higher than the \$45,000 inflation adjusted purchase price and \$48,000 in market value in 2013. On average, fishermen made major vessel improvements 3.6 years ago. Small boat fishermen on average took 40 boat fishing trips in 2020, which was almost the same as the average number of trips in 2013 (39 trips), but Maui was the only county that saw a lower number of trips in 2020. Trolling was most common type of fishing (95% of respondents), followed by dead bait/live bait for pelagic species (71%). Handline for Deep 7

bottomfish and handline/rod and reel for shallow bottomfish were both used by approximately 60% of respondents. One noticeable change in 2020 was smaller crew size, likely due to COVID-19 as some respondents reported they had smaller crew size or fish alone because of COVID-19 restrictions and health concerns.

Although the population we surveyed was made up of small boat fishermen who held a State of Hawai'i CML, they also had diverse motivations to fish. When including the top three motivations in 2020, recreational expense was most identified by all respondents (57%), closely followed by subsistence (51%), and part-time commercial (49%). While recreational expense was most identified as the primary motivation (35% of respondents), more respondents identified subsistence as the second (20% of respondents) and third motivations (11% of respondents). Fishing motivations/fisherman types have changed significantly when comparing the years 2020 and 2013. Note that the question has changed from "How do you define yourself as a fisherman?" in the 2014 survey to "what is your motivation for fishing?" in the 2021 survey. The impact from question change could be minimal as the same detailed descriptions of each type of fisherman/fishing motivation were included in both surveys. When comparing the primary motivation in 2020 with the self-identified fisherman type in 2013, part-time commercial decreased from 51% in 2013 to 30% in 2020, whereas subsistence increased from 3% to 16%, and recreational expense increased from 27% to 34%. This change could be in response to the COVID-19 pandemic, as the number one quoted response for the reason of changing fishing activities due to COVID-19 was low fish demand. The low fish demand caused the fish market and fish price to crash. The slowing fish market and economy caused some fishermen to become less active, sell less fish, give away more, sell more to community/friends, and keep more for self-consumption. Some also mentioned it became more difficult to sell to dealer/wholesaler/auction due to changing operating hours.

In 2020, the total landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish reported by the survey respondents were approximately 1.1 million lb, and the total fish sold were \$2.8 million. Among all the landings in different species groups, pelagic fish contributed 77% of the total landings across all respondents, followed by nearshore & reef fish (10%), Deep 7 bottomfish (8%), and shallow bottomfish (5%). Variation in annual landings among different fishing motivations was obvious. Full-time commercial fishermen reported considerably higher landings with nearly 15,000 lb of fish in 2020 when compared with cultural fishermen (9,688 lb), part-time commercial fishermen (2,809 lb), subsistence fishermen (1,352 lb), recreational expense fishermen (1,335 lb), and purely recreational fishermen (615 lb). Fish landings increased in 2020 for some types of fishermen. Full-time commercial and cultural fishermen saw a large increase in landings per trip and annual landings. Although subsistence fishermen was the only group that had a lower number of trips in 2020 (28 to 22 trips), they compensated this by increasing their per trip landings substantially and, therefore, higher landings per year. Full-time commercial fishermen had more fishing trips in 2020 (99 in 2013 to 110 trips in 2020), with higher landings per trips, total landings increased. Cultural fishermen had more than double their annual landings in 2020, due to both substantially higher number of trips (18 to 52 trips) and higher landings per trip (note for the small base for this type of fishermen). For the rest of the fishermen (recreational expense, part-time commercial, and purely recreational), their per-trip and annual landings remained similar to the 2013 levels.

Distributions of catch and value of fish sold varied substantially by primary fishing motivation. The 11% full-time commercial fishermen represented almost half of total fish caught (47%) and total value of fish sold by all respondents (43%). The second most represented group, part-time commercial fishermen (30%), caught about a quarter of the total fish caught (24%), and their fish sales represented 28% of total value. Recreational expense fishermen were the most represented group with 34% of respondents, but their catch represented only 13% of total catch and total value. The third most represented group, subsistence fishermen (16%), represented 6% of the total catch and total value. Purely recreational fishermen represented 8% of respondents, and their catch only represented 1% of total catch and 1% of total value.

The diversity of fishermen's motivations and how they relate to behavior echoes the findings in previous studies, which show a disconnect between fishermen's behavior relative to the definition of commercial and recreational fishing by the fisheries management agencies. For example, the Magnuson-Stevens Act defines commercial fishing as "fishing in which the fish harvested are intended to enter commerce"; however, the survey results show that while a majority of small boat fishermen (85%) reported selling at least a portion of their catch in 2020, not all of them considered their fishing motivation as commercial. Also, the disposition of catch among selling, keeping for home consumption, and giving away varied greatly by fisherman type. Compared to non-commercial fishermen, full-time and part-time commercial fishermen had more intensive fishing activities; however, they did not sell 100% of their catches. Full-time and part-time commercial fishermen sold 83% and 69% of their catch, respectively, with most of the balance distributed among home consumption and given away to friends and family. This supports previous research findings that showed the vital social role commercial small boat fishermen play in local communities (Chan and Pan, 2017; Hospital and Beavers, 2012; Hospital, Bruce, and Pan, 2011). However, "recreational" fishermen also sold a large portion of their catch to the market. Recreational expense fishermen and purely recreational fishermen sold 45% and 27% of their catch, respectively. This finding demonstrates that selling fish for supplemental income is common among self-identified recreational fishermen. Similar to recreational expense fishermen, subsistence fishermen sold 45% of their catch, but subsistence kept 28% for home consumption which is 5 percentage points higher than recreational expense fishermen. When compared with the catch disposition in 2013, both full-time commercial and cultural fishermen sold a higher portion of catch in 2020. Full-time commercial fishermen sold 10% point more of their catch (73% to 83%) and cultural fishermen sold 25% point more of their catch (37% to 62%). The higher portion of catch for sale could be related to the unfavorable economy and fish price in 2020. For the other four types of fishermen, their catch disposition in 2020 and 2013 was similar.

Small boat fishermen used different market outlets to sell their catch, with almost two-thirds (77%) selling to auction/seafood dealer/wholesaler, which was similar to 72% in 2013. Almost half (49%) sold to friends/neighbors/coworkers, which was almost doubled from 27% in 2013. Selling to restaurants/stores was 37%, which was a drop from 43% in 2013. Selling to roadside/farmers' market also increased to 14%, from 8% in 2013. These large variations in market outlet usage were very likely due to COVID impacts. With depressing fish price in auction/seafood dealer/wholesaler and changing operating hours in these outlets, direct marketing became more popular.

The average value of fish sold by all respondents was approximately \$10,000. Full-time commercial fishermen, as expected, reported the highest value of fish sold (\$35,709 annually and \$503 per trip), followed by cultural fishermen (\$19,250 annually and \$387 per trip), part-time commercial fishermen (\$8,983 annually and \$284 per trip), subsistence fishermen (\$6,382 annually and \$326 per trip), and recreational expenses fishermen (\$3,917 annually and \$166 per trip). Purely recreational fishermen also reported selling close to \$3,000 annually and \$143 per trip. Thus, to full-time commercial fishermen, income from fish selling served as an important source of personal income, since 44% of the full-time commercial fishermen reported almost all (90%–100%) of their personal income came from fish sale.

Annual revenues per respondent saw an increase of 5% in 2020 when compared to the inflation-adjusted revenues in 2013. This was lower than the 16% increase in annual landings, likely due to the COVID-19 impact on fish price. Across all fishing motivations, subsistence, purely recreational, and cultural fishermen had higher annual revenue in 2020 and opposite for full-time and part-time commercial fishermen. Although full-time commercial fishermen had higher annual landings per respondent in 2020 (+41%), they had lower annual revenues (-11%) and they were the group that was most impacted by COVID financially. Part-time commercial fishermen also had lower revenues, but to a lesser extent (-5%). Subsistence fishermen saw an almost 50% increase in annual landings, and their annual revenues increased by about \$4,200. Cultural fishermen had more than double of annual landings in 2020, and their annual revenues increased by around \$15,000. This could be due to the higher proportional of catch for sale in 2020 (increased from 37% in 2013 to 62% in 2020). For both purely recreational and recreational expense fishermen, their annual landings were relatively stable in 2020 and their annual revenue increased by around \$900–\$1,800. They were less impacted by COVID as they were more able to sell their fish through direct marketing given their low landings.

A small boat fishing trip averaged approximately \$302 in trip costs with a median of \$250. This was almost the same as the inflation adjusted trip costs in 2013 (\$303). But all the trip cost items were lower or remained the same in 2020, with noticeable decrease in fuel costs (-\$27.68 for boat fuel and -\$6.68 for truck fuel), likely due to the lower fuel price in 2020. It was the additional trip cost item that was added in the 2021 survey: gear lost that contributed to the comparable trip costs in 2020. If without this cost item, the trip costs in 2020 actually would be lower. Fuel was the major trip cost item that contributed 47% of trip costs. Ice was the next most important cost that contributed 12% of trip costs. Gear lost, food and beverage, daily maintenance and repair, and bait each contributed 9% of trip costs. Trip costs varied by different subgroups with Maui County fishermen spending more per trip (\$352) than fishermen on the other counties; full-time commercial fishermen (\$350) and cultural fishermen (\$863, caution for small base) reported higher spending than fishermen with other primary motivations; and trolling trips and handline for Deep 7 bottomfish trips costing more (\$304) than other types of trips.

Besides fishing trip costs, small boat fishermen incurred significant annual fishing fixed costs. Those were the costs incurred regardless of the number of trips taken in a year. On average, survey respondents reported annual fishing fixed costs of \$7,069, with a median spending of \$3,775. Relative to 2013, the average fixed costs was 13% higher in 2020. The majority of respondents reported spending on fees such as CML fees and registration fees for truck and trailer (97%), gear replacement and repair (93%), and boat and trailer repair, maintenance, and improvements (91%). More than half reported spending on boat insurance (60%), and lower



incidence for mooring fees (19%), loan payments (13%), and financial services (11%). The highest expenditure was loan payments for those with loans (\$5,709), followed by mooring fees (\$3,310), boat and trailer repair and maintenance (\$2,557), gear replacement and repair (\$2,126), boat insurance (\$1,169), fees (\$671), and financial services (\$461).

When fishermen were asked if they thought more or less number of people will be fishing next year, a large number thought more people will be fishing next year for subsistence and income supplement, and due to greater demand from post-COVID recovery and higher unemployment. Some also thought more people will be fishing next year due to more boats and more people moving to Hawai‘i. When analyzing the importance and performance of six management issues in Hawai‘i, “managers build or maintain fisheries infrastructures” was rated highly important but it was not well managed. This is an area of action to be taken by fisheries managers.

It is evident that the Hawai‘i small boat fishery is made up of fishermen with unique demographic profiles, various fishing motivations, gear usage, and target species; therefore, it is important for fishery managers to take into account the heterogeneity of the fishery as many potential regulatory changes will affect fishermen unequally. With the survey conducted during the pandemic, this adds another piece of information to fishery managers about how small boat fishermen changed their fishing activities, catch disposition, and market participation in response to pandemic and changes in the economic conditions. The information in this study provides an important update on the economic and social characteristics of the fishery and will allow fishery managers to make timely and better-informed decisions by having the best scientific information available.

## Introduction

This study updates the profiles of the current Hawai‘i small boat fleet and describes the 2020 fishing experiences, market participation, fishing trip costs, annual fishing fixed costs, and opinions about fisheries management and fishing conditions. Fishery management decisions are based, in part, on minimizing adverse economic and social impacts on fishing communities, so this research is vital to the assessment of future ocean management plans and actions.

The small boat fishery in Hawai‘i is important to local communities as it provides income and food for local families and communities, recreational services, and preserves cultural practices. The Hawai‘i small boat fishery includes various fishing gears that target different species. Multi-gear usage enables the Hawai‘i small boat fishery to encompass pelagic, bottomfish, and coral reef fisheries. Trolling is the most popular fishing method in the Hawai‘i small boat fishery and it targets pelagic species like tuna, marlin, and mahi-mahi. Other popular fishing methods include using dead bait/live bait for pelagic species, deep sea handline to target Deep 7 bottomfish, inshore handline and rod and reel to target shallow bottomfish and reef fish. In addition, the Hawai‘i small boat fishery includes fishers with various fishing motivations ranging from full-time commercial, to occasional recreational, to subsistence.

The last cost-earnings study for the Hawai‘i small boat fishery was conducted 7 years ago in 2014. To update the economic impact and social behavior of the small boat fishery, we conducted an updated survey in 2021. The definition of the survey population is the same as the 2014 survey, which includes CML holders that fit these criteria: fishermen who landed at least one marine life using small vessels in the past year and with valid mailing address; but excluded charter, longline, aquarium, and precious coral fishing. The number of fishers included in the survey has dropped from 1,796 in 2014 to 889 in 2021. One possible explanation of the lower participation in 2021 was due to the increase in CML license fee from \$50 to \$100 in 2018. Together, these 889 fishermen landed almost 3 million lb of fish in 2020, with a commercial value of more than \$9 million. These amounts are about half of the 2014 survey population that produced 6.2 million lb of fish in 2013 with a commercial value of \$16 million. The objectives of this study are to update baseline cost-earnings economic information for the Hawai‘i small boat fleet and to explore changes in the small boat fisheries in order to support current management actions. As the 2021 survey was conducted during the COVID pandemic, we added open-ended questions about whether fishing activities were impacted due to COVID and the reasons for making changes, and expectations about more or fewer people will be doing different types of small boat fishing in the next year. These questions shed some light on the importance of small boat fishing in Hawai‘i, and how people adopted their fishing behavior during difficult economic times.

When applicable, this study compares the 2021 survey results with the 2014 results. The 2021 survey was conducted in spring 2021 and asked about small boat fishing in 2020, whereas the 2014 survey that was conducted in summer 2014 and it asked about small boat fishing in the past 12 months, so it covered the period between 2013 and 2014. Figures and tables for the 2014 results are labeled as 2013 for abbreviation in this report.

# Methods

## Population

Fishermen who catch fish for commercial purpose are required to apply for a Hawai‘i Commercial Marine License (CML) from the State of Hawai‘i. The list of CML holders shows a population of commercial fishermen in the State of Hawai‘i. The population for this study was provided by the State of Hawai‘i Division of Aquatic Resources (HDAR) and it included 889 fishermen who held a State of Hawai‘i CML and the following criteria that we considered comprising the small boat fishery: fishermen who landed at least one marine life using small vessels during 2020 and with valid mailing address; but excluded charter, longline, aquarium, and precious coral fishing.

## Methodology

Adopted the methodology applied to the 2014 survey, this survey was developed with two options: via the internet and mail survey. A personalized letter with the survey website address and a unique personalized password for survey login was sent to all fishermen (n=889) in the sample. A month later, a three-way mailing was implemented using a modified Dillman’s Total Design Method (Dillman, Smyth, and Christian, 2009) that included the following: (a) first mailing of survey booklet with personalized cover letter and pre-addressed stamped return envelope to non-respondents to the online survey, (b) a reminder postcard of the mail survey was mailed a week after the first survey mailing, and (c) second mailing of survey booklet with a cover letter to non-respondents 4 weeks after the reminder postcard. The survey website and unique password were also printed on the cover letter in the first and third mailings of survey booklet to encourage survey completion online. An identification number was printed on each survey booklet and used for response tracking and response rate analysis. The timeline for the survey implementation is shown in Table 1. The survey implementation and online survey programming were conducted by the contractor ECS Federal. ECS Federal also worked on the data collection and data entry for the returned mail surveys. ECS Federal provided the data files for online survey responses and mail survey responses via secured email for further data processing and analysis by the economist at the Pacific Islands Fisheries Science Center.<sup>1</sup>

**Table 1. Survey implementation schedule.**

<b>Implementation activities</b>	<b>Date</b>
Sent personalized letter with survey website and unique password to all fishermen	February 22, 2021
Sent first survey booklet and cover letter to non-respondents	March 22, 2021
Sent a postcard reminder	March 29, 2021
Sent a second survey booklet and cover letter to non-respondents	April 26, 2021
Close off data collection	June 7, 2021

<sup>1</sup> The metadata for this report can be found in: <https://www.fisheries.noaa.gov/inport/item/66703>

The survey was divided into 7 sections: 1) fishing experiences, 2) market participation, 3) vessel characteristics, 4) fishing trip costs, 5) annual fishing fixed costs, 6) basic demographics, 7) opinions about future fishing participation, top three target species, importance of fishing, importance and performance of fisheries management, whether and how fishing activities were changed due to COVID, and comments/suggestions for how Hawai‘i’s fisheries should be managed and further studied. Fishermen were asked about fishing activities, market participation, and fishing costs only in 2020 to avoid recall bias. The online version of the survey was essentially the same as the mail version, with slight changes in wording and format to enhance online readability and the appropriate skipping patterns were implemented to make sure questions were answered in correct order.

The survey instrument was adapted from the last small boat cost-earnings surveys that was conducted in 2014 (Chan and Pan, 2017) with some modifications. The modifications included: 1) Changed fishers’ self-identification as a fisher to fishing motivation, and allowed up to three motivations to be selected. 2) Allowed answering the number of boat and non-boat fishing trips in numeric values instead of ranges. This improves the accuracy of the number of fishing trips in a year. 3) For questions with possibly 0% to 100% in the responses, the answer responses changed from 5 to 6 ranges. This is consistent with other small boat cost-earnings surveys in the Pacific Islands. 4) Revised the gear names to include dead bait/live bait for pelagic species, handline for Deep 7 bottomfish, handline/rod and reel for shallow bottomfish and excluded nets as it was used less often. 5) For pounds of fish caught and sale of fish, bottomfish was divided into Deep 7 bottomfish and shallow bottomfish to improve accuracy. 6) Added a new question for percentage of fishing time that fished at/around a Fish Aggregating Device. 7) Changed the market outlet question from yes/no to 6 ranges between 0% and 100%. This allows for capturing the intensity of market outlet usages. 8) Added a question for the most recent year when major vessel improvement was conducted. 9) Added gear lost as a new category in fishing trip costs question. 10) The amount of boat fuel, truck fuel, ice, and bait used in a trip were added to the trip costs questions to further understand the usage of resources in a trip. 11) Added questions in the last section to further understand fishers’ opinions about fishing, fisheries management, and impacts due to COVID. A copy of the survey questionnaire is shown in Appendix A.

## **Response Rates**

Table 2 presents the survey population and response rates by county. Among the 889 fishermen in the population, 10 were excluded in the response rate calculation (including 7 undeliverable, 2 inactive, and 1 charter). This makes the total effective small boat population at 879 participants. We received 350 returns, including 228 by mail and 122 online, resulting in an overall response rate of 40%, slightly lower than the 43% in the 2014 survey. Of the four counties, the response rate was highest in Kaua‘i, with a 43% response rate; the lowest response rate was found in Hawai‘i County, with a 38% response rate. The distribution of the survey respondents by county is representative of the effective population.

**Table 2. Survey population and response rates.**

	<b>No. of effective population (n)</b>	<b>Completed surveys (n)<sup>b</sup></b>	<b>Response rate (%)</b>	<b>% distribution of effective population</b>	<b>% distribution of completed surveys</b>
O‘ahu	296	123	41.6	33.7	35.1
Hawai‘i	352	132	37.5	40.1	37.7
Maui <sup>a</sup>	131	51	38.9	14.9	14.6
Kaua‘i	97	42	43.3	11.0	12.0
US mainland	3	2	66.7	0.3	0.6
<b>Total</b>	<b>879</b>	<b>350</b>	<b>39.8</b>	<b>100</b>	<b>100</b>

<sup>a</sup> The response rate was 60% for Moloka‘i (3 of 5) and 0% for Lāna‘i (0 of 4).

<sup>b</sup> We received 2 completed surveys from other states. These responses are not presented separately in this report, but the 2 respondents are included in the total responses.

Among the 350 total completed surveys, we excluded 5 cases from the analysis for various reasons. These included 4 cases that identified “charter” as their fishing motivation and 1 case that used shortline as the major fishing gear. Although the survey sample already excluded the CML who self-identified as charters, we still received 4 returns that were charter fishermen, probably due to the both commercial and private use of vessels in 2020. Shortline fishing in Hawai‘i is similar to the Hawai‘i longline fishery in terms of fishing gear, methods, areas fished, and target species, and it differs from a typical small boat fishing trip in that it does not involve paid crew members. Therefore, the charters and shortline fishing are not considered as small boat fishery and are excluded in the analysis of this study. The total responses for the analysis in this report is 345. With the effective population of 879, the sampling error at 95% confidence level is  $\pm 4\%$ . With almost 350 responses, this provides a robust description of Hawai‘i small boat fleet.

Among the 345 responses, two-thirds (66%) of the respondents responded by mail and one-third responded online. Table 3 shows the demographic distribution of the survey respondents by survey method. Comparing the two survey methods, subgroups that were more likely to respond online included O‘ahu fishermen, White, fishermen who are 64 or younger, higher income group (\$100 k or more), those with a bachelor’s degree or higher education, and those who selected purely recreational as their primary fishing motivation. Subgroups that were more likely to respond by mail included Big Island fishermen, Asians, 65 years of age and older, lower-income groups (\$25 k to less than \$100 k), high school graduates, and those who selected recreational expense and full-time commercial as their primary fishing motivations.

**Table 3. Demographics by mail and online respondents.**

Percentage of responses		All respondents (%)	Mail respondents (%)	Online respondents (%)
	Number of respondents (n)	345	227	118
County	O‘ahu	35.6	31.4	43.6
	Big Island	38.2	41.6	31.6
	Maui	14.9	15.0	14.5
	Kaua‘i	11.4	11.9	10.3
Race	Asian	38.6	40.5	35.0
	Native Hawai‘ian	12.4	12.6	12.0
	Other Pacific Islander	6.2	5.9	6.8
	White	26.5	24.8	29.9
	Mixed	15.9	15.8	16.2
	Hispanic or Latino	0.3	0.5	0
Age	Less than 25 years	1.5	1.3	1.7
	25 – 34 years	7.0	6.2	8.5
	35 – 44 years	11.1	9.3	14.5
	45 – 54 years	17.2	16.8	17.9
	55 – 64 years	25.1	22.1	30.8
	More than 64 years	38.2	44.2	26.5
Income	Less than \$10,000	1.5	2.4	0
	\$10,000 – \$24,999	4.6	4.3	5.2
	\$25,000 – \$49,999	17.9	21.1	12.2
	\$50,000 – \$99,999	36.1	37.8	33.0
	\$100,000 or more	39.9	34.4	49.6
Education	Less than high school	2.4	2.6	1.7
	High school graduate	21.7	26.0	13.6
	Some college or associate’s	43.1	43.1	43.2
	Bachelor's degree or higher	32.8	28.3	41.5
Primary fishing motivation <sup>a</sup>	Recreational expense	30.7	31.7	28.8
	Part-time commercial	27.2	26.4	28.8
	Subsistence	14.2	13.7	15.3
	Full-time commercial	9.9	11.0	7.6
	Purely recreational	7.5	4.8	12.7
	Cultural	1.2	0.9	1.7

<sup>a</sup> Not summing up to 100% due to respondents with multiple primary fishing motivations and therefore not able to identify a single primary fishing motivation.

## Results

In this report, survey responses are presented for total responses (labeled as all respondents in tables) and also segmented by different subgroups including counties, primary fishing motivation, most common gear used, and sub-fisheries. The most common gear is defined by fishermen’s self-reported “most common type of fishing trip in 2020.” The types of fishing trip listed in the survey included trolling, dead bait/live bait for pelagic species, handline for Deep 7 bottomfish, handline/rod and reel for shallow bottomfish, spearfishing, and others. This report provides analysis by sub-fishery since fishery management and regulations are often tied to specific sub-fisheries that used specific gear and target different species of fish. Sub-fisheries are defined by the types of fishing trip that fishermen reported in 2020 and include pelagic (if used trolling and dead bait/live bait for pelagic species), Deep 7 bottomfish, non-Deep 7 bottomfish, and coral reef fisheries. If fishermen conducted different types of fishing trips in 2020, they are included in different sub-fisheries. Thus, the sum from sub-fisheries groups are greater than the total number of respondents. For example, if fishermen reported they had trolling and handline for Deep 7 bottomfish trips in 2020, they are included in pelagic and Deep 7 bottomfish fisheries, respectively. Determining whether fishermen should be included in the coral reef fishery is more complicated because coral reef fishing trips involve different gear types such as spear and nets. Thus, the coral reef fishery is defined as any fishing trip that targeted reef-like fish such as spearfishing and netting, as well as reporting any landings of reef fish in 2020. The identification of primary fishing motivation was based on fishermen’s ranking up to three motivations. A few respondents (8%) did not rank their motivations and therefore the primary motivation was unknown. Tables with noticeable differences between subgroups are shown in the main text; otherwise, they are shown in Appendix B.

### Respondents by Subgroup

Figure 1 shows the distribution of respondents by county that had small boat fishing activities in 2020 and 2013. Among all respondents in 2020, 36% were from O‘ahu, 38% were from Hawai‘i County, 15% were from Maui County, and 11% were from Kaua‘i. Relative to 2013, Hawai‘i County respondents increased by 2 percentage points.

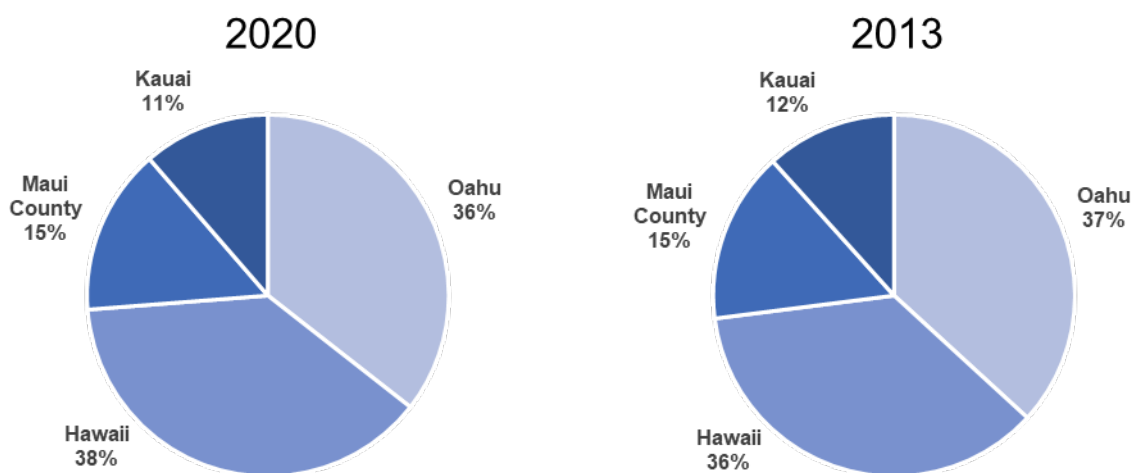
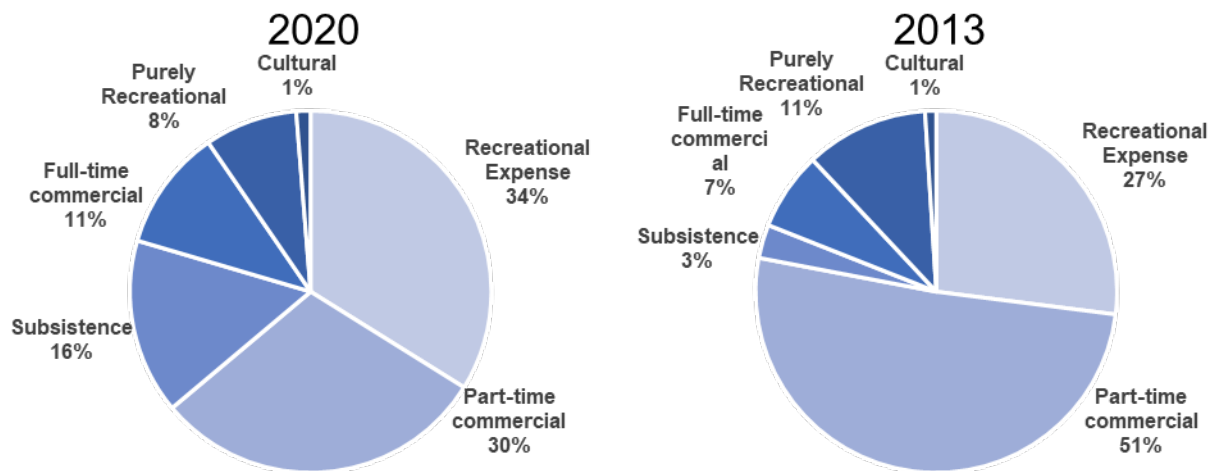


Figure 1. Survey respondents by county, 2020 and 2013.

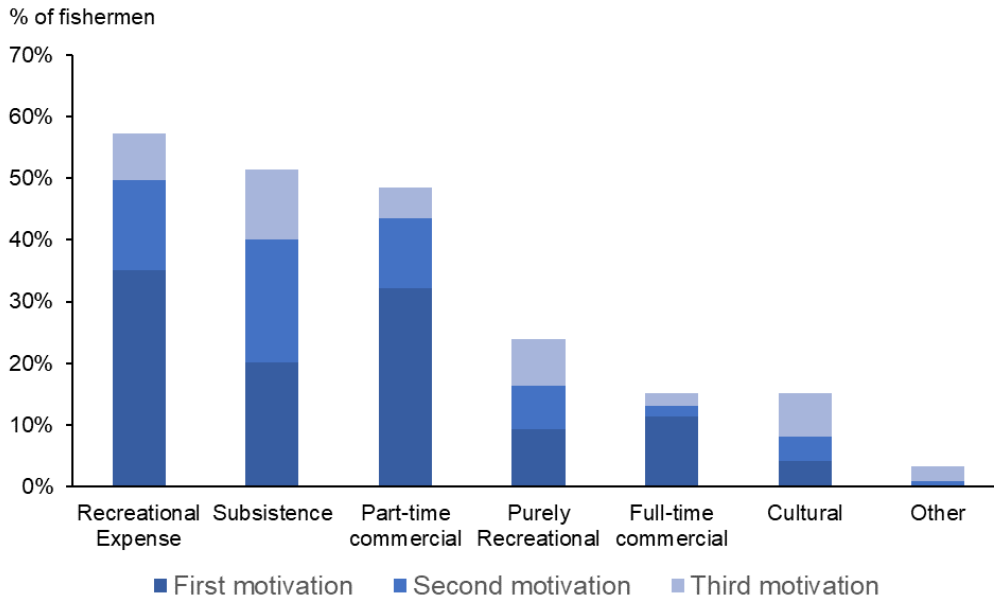
Figure 2 shows the distribution of respondents by fishermen’s self-identified motivations. This question has changed from “How do you define yourself as a fisherman?” in the 2014 survey to “What is your motivation for fishing?” in the 2021 survey and it allowed identification of primary, secondary, and tertiary motivations. This change would allow the question to be consistent with other cost-earnings surveys about small boat fisheries in the Pacific Islands region. When comparing the primary fishing motivation in 2020 with the self-identified fisherman type in 2013, there was a large drop (from 51% to 30%) of part-time commercial fishermen in 2020 and a large increase (from 3% to 16%) of subsistence fishermen, perhaps in response to the COVID pandemic. Recreational expense has increased from 27% to 34%. It is important to note that when interpreting this survey result between 2 years, caution needs to be taken as the differences could be due the COVID affecting fishermen’s motivations toward fishing and/or the question change, although the impact from question change could be minimal as the six fisherman types and fishing motivations had the same detailed descriptions in the answer choices in both years (e.g., purely recreational (I fish only for sport or pleasure), full-time commercial (Fishing brings in most or all of the money I make in a year).



**Figure 2. Primary fishing motivation in 2020 and fisherman type in 2013.**

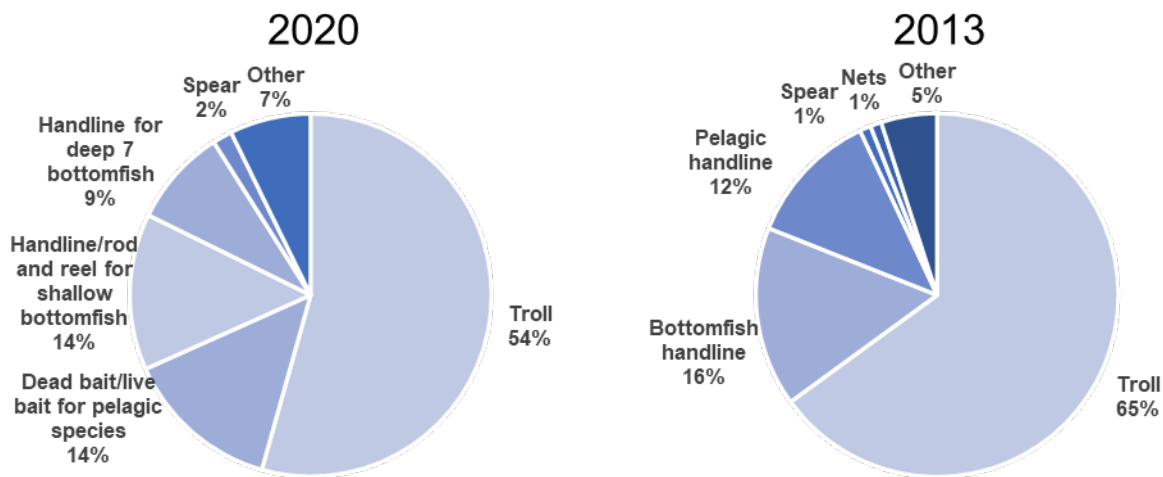
When including all three motivations, recreational expense was most identified by all respondents, closely followed by subsistence, and part-time commercial. While recreational expense was most identified as the primary motivation, subsistence was most identified as the second and third motivations (Figure 3).





**Figure 3. Top three fishing motivations, 2020.**

Figure 4 shows the distribution of respondents by most common gear. The answer choices in the 2021 survey were different from the 2014 survey by adding dead/live bait for pelagic species, handline for Deep 7 bottomfish, and handline/rod and reel for shallow bottomfish, and deleting bottomfish handline, pelagic handline, and nets. Regardless of the change, troll was the most common gear with more than half of the small boat fishermen used it, but the percent of respondents stated troll as their most common gear has dropped from 65% in 2013 to 54% in 2020. In 2020, 14% stated dead/live bait for pelagic and another 14% stated handline/rod and reel for shallow bottomfish as their most common gear. Another 9% stated handline for Deep 7 bottomfish was their most commonly used gears.



**Figure 4. The most common gear composition, 2020 and 2013.**

Table 4 shows the distribution of respondents by county for various subgroups. A larger percentage of full-time commercial and part-time commercial fishermen came from Hawai‘i County compared to other counties, while the greater percentage of recreational expense and subsistence fishermen were from O‘ahu. Across different gears, troll and handline/rod and reel for shallow bottomfish were more commonly used by O‘ahu fishermen; whereas bait for pelagic gear was more commonly used by Hawai‘i County fishermen. When compared across sub-fisheries, relatively more Hawai‘i County fishermen were in Deep 7 bottomfish fishery and coral reef fishery, whereas more O‘ahu fishermen were in non-Deep 7 bottomfish fishery.

**Table 4. Distribution of survey responses by county and subgroup.**

	<b>Number of respondents (n)</b>	<b>O‘ahu (%)</b>	<b>Big Island (%)</b>	<b>Maui (%)</b>	<b>Kaua‘i (%)</b>
All respondents	343	35.6	38.2	14.9	11.4
<b>By primary fishing motivation</b>					
Recreational expense	106	48.1	36.8	10.4	4.7
Part-time commercial	93	29.0	39.8	14.0	17.2
Subsistence	49	42.9	26.5	20.4	10.2
Full-time commercial	34	32.4	41.2	11.8	14.7
Purely recreational	25	36.0	40.0	12.0	12.0
Cultural	4	0.0	50.0	25.0	25.0
<b>By most common gear</b>					
Troll	186	40.3	35.5	11.8	12.4
Bait for pelagic	47	10.6	74.5	8.5	6.4
Handline for Deep 7 bottomfish	48	33.3	25.0	33.3	8.3
Handline/rod and reel for shallow bottomfish	30	50.0	13.3	16.7	20.0
Spear	6	100.0	0.0	0.0	0.0
<b>By sub-fishery</b>					
Pelagic	328	34.8	39.0	14.3	11.9
Deep 7 bottomfish	199	31.2	39.7	17.1	12.1
Non-deep 7 bottomfish	201	38.3	33.8	16.4	11.4
Coral reef	55	34.5	43.6	14.5	7.3

Table 5 shows the distribution of respondents by self-identified motivation for various subgroups. Across the counties, recreational expense was the top motivation for O‘ahu and Hawai‘i County fishermen, whereas part-time commercial was the top motivation for Maui and Kaua‘i fishermen. Trolling and handline/rod and reel for shallow bottomfish were more commonly used by recreational expense fishermen whereas bait for pelagic and handline for Deep 7 bottomfish were more commonly used by part-time commercial fishermen. When comparing across sub-fisheries, coral reef fishery had relatively more part-time commercial fishermen.

**Table 5. Distribution of survey responses by primary fishing motivation and subgroup.**

	Number of respondents (n)	Recreational expense (%)	Part-time commercial (%)	Subsistence (%)	Full-time commercial (%)	Purely recreational (%)	Cultural (%)
All respondents	313	33.9	30.0	15.7	10.9	8.3	1.3
<b>By county</b>							
O‘ahu	119	42.9	22.7	17.6	9.2	7.6	0.0
Hawai‘i	115	33.9	32.2	11.3	12.2	8.7	1.7
Maui	42	26.2	31.0	23.8	9.5	7.1	2.4
Kaua‘i	35	14.3	45.7	14.3	14.3	8.6	2.9
<b>By most common gear</b>							
Troll	173	39.3	25.4	16.8	6.9	9.8	1.7
Bait for pelagic	41	31.7	41.5	4.9	19.5	2.4	0.0
Handline for Deep 7 bottomfish	42	28.6	35.7	16.7	9.5	9.5	0.0
Handline/rod and reel for shallow bottomfish	29	37.9	24.1	17.2	6.9	10.3	3.4
Spears	6	16.7	33.3	33.3	16.7	0.0	0.0
<b>By sub-fishery</b>							
Pelagic	300	34.0	29.7	16.0	10.7	8.3	1.3
Deep 7 bottomfish	176	30.1	27.8	17.6	13.6	9.7	1.1
Non-deep 7 bottomfish	178	34.8	27.0	16.9	12.4	7.3	1.7
Coral reef	47	21.3	38.3	23.4	10.6	4.3	2.1

Table 6 shows the distribution of respondents by most common gear for various subgroups. Across the counties, troll was most commonly used. Bait for pelagic was the second-most commonly used gear in Hawai‘i County, handline for Deep 7 bottomfish was the second-most commonly used gear in Maui County, and handline/rod and reel for shallow bottomfish was the second-most commonly used gear in Kaua‘i. Trolling for most commonly used gear across different fishing motivations. In addition, bait for pelagic was the second-most commonly used gear for full-time and part-time commercial fishermen, and handline for Deep 7 bottomfish was the second-most commonly used gear for subsistence and purely recreational fishermen.

**Table 6. Distribution of survey responses by most common gear and subgroup.**

	Number of respondents (n)	Troll (%)	Bait for pelagic (%)	Handline for Deep 7 bottomfish (%)	Handline/rod and reel for shallow bottomfish (%)	Spears (%)
All respondents	344	54.4	14.0	14.0	8.7	1.7
<b>By county</b>						
O‘ahu	122	61.5	4.1	13.1	12.3	4.9
Hawai‘i	130	50.8	26.9	9.2	3.1	0.0
Maui	51	43.1	7.8	31.4	9.8	0.0

	Number of respondents (n)	Troll (%)	Bait for pelagic (%)	Handline for Deep 7 bottomfish (%)	Handline/rod and reel for shallow bottomfish (%)	Spear (%)
Kaua‘i	39	59.0	7.7	10.3	15.4	0.0
<b>By primary fishing motivation</b>						
Recreational expense	106	64.2	12.3	11.3	10.4	0.9
Part-time commercial	94	46.8	18.1	16.0	7.4	2.1
Subsistence	49	59.2	4.1	14.3	10.2	4.1
Full-time commercial	33	36.4	24.2	12.1	6.1	3.0
Purely recreational	26	65.4	3.8	15.4	11.5	0.0
Cultural	4	75.0	0.0	0.0	25.0	0.0
<b>By sub-fishery</b>						
Pelagic	329	56.8	14.6	13.7	7.3	1.5
Deep 7 bottomfish	198	45.5	14.6	24.2	8.1	1.5
Non-deep 7 bottomfish	200	44.0	17.0	17.0	15.0	2.5
Coral reef	54	38.9	14.8	13.0	5.6	9.3

## Demographics

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

Fishing is traditionally a male-dominated activity; our survey reflected such a tradition with 98% of male respondents. In terms of race, the composition of the small boat fishery community was in line with the state population, especially the top two races: Asian and White. Table 7 shows the race distribution of survey respondents vs. the State of Hawai‘i population as a whole based on the 2010 U.S. Census (State of Hawai‘i, 2020). The largest two races, Asian and White, made up 39% and 26% of the small boat fishermen, and 39% and 25% in the state population as a whole, respectively. There were proportionally more Native Hawai‘ians and Pacific Islanders in the survey respondents than the general population (19% vs. 10%).

**Table 7. Survey responses: “How would you describe your race? (check all that apply).”**

	All survey respondents (%)	State of Hawai‘i population <sup>a</sup> (%)
American Indian and Alaska Native	0	0.3
Asian	39	39
Black or African American	0	2
Native Hawai‘ian and Other Pacific Islander	19	10
White	26	25
Two or more races	16	24

<sup>a</sup> State of Hawai‘i (2020).

The distributions of race for subgroups of the survey respondents are presented in Table B1. When compared with all respondents, there were relatively more Asian small boat fishermen on O‘ahu, and more Hawai‘ian fishermen on the Hawai‘i County and Kaua‘i. Across different fishing motivations, recreational expense and purely recreational fishermen were more likely to be Asian, and part-time commercial fishermen were more likely to be White. Across different gear types, Asians were more likely to use handline gear for bottomfish, while White were more likely to troll and use bait for pelagic.

Table 8 shows the age distribution of the survey respondents and general adult-age population. Compared to the general population, the Hawai‘i small boat fishermen tended to skew toward older age groups, with almost two-thirds (63%) over 54 years old, vs. 41% in the general population. The age distribution in the State of Hawai‘i was based on 2020 State of Hawai‘i Data Book, 18 years and over (State of Hawai‘i, 2020). Only 9% of the Hawai‘i small boat fishermen were 34 years or under, vs. 28% in the state population.

**Table 8. Survey responses: “What is your age?”**

	<b>All survey respondents (%)</b>	<b>State of Hawai‘i population<sup>a</sup> (%)</b>
18 to 24 years	2	10
25 to 34 years	7	18
35 to 44 years	11	16
45 to 54 years	17	15
55 to 64 years	25	16
More than 64 years	38	25

<sup>a</sup> State of Hawai‘i (2020).

Distributions by subgroup are shown in Table B2. Fishermen tended to be older and included Kaua‘i fishermen, and those with recreational expense as their primary fishing motivation. Fishermen who participated in the coral reef fishery and who were subsistence fishing tended to be younger.

Table 9 shows the income distribution of survey respondents and general population. Small boat fishermen tended to have slightly higher income than the state population, 76% of them had \$50,000 or more household income vs. 71% in the general population.

**Table 9. Survey responses: “What was your total household income, before taxes, in 2020, including fishing income?”**

	<b>All survey respondents (%)</b>	<b>State of Hawai‘i population<sup>a</sup> (%)</b>
Less than \$10,000	1	5
\$10,000 to \$24,999	5	9
\$25,000 to \$49,999	18	15
\$50,000 to \$99,999	36	30
\$100,000 and more	40	41

<sup>a</sup> State of Hawai‘i (2020).

Table B3 shows the income distribution of survey respondents by different subgroups. Across counties, O‘ahu fishermen tended to have higher income with 51% having \$100,000 or more household income, vs. only 31% of Kaua‘i County fishermen with the same income level. Income also varied by fishing motivation and gear usage. Full-time commercial fishermen tended to have lower income with 43% having household income under \$50,000 whereas 48% of recreational expense and purely recreational fishermen had \$100,000 or more household income. Those who used a handline for Deep 7 bottomfish most often tended to have higher income with 47% with \$10,000 or more household income, vs. 33% of those who use handline/rod and reel for shallow bottomfish had the same income level. Fishermen who participated in the coral reef fishery tended to have lower income as they also tended to be younger.

Table 10 presents the education attainment of survey respondents and general population. Hawai‘i small boat fishermen tended to be better educated than the state average with 76% reporting to have some college, associate’s or bachelor’s degree or higher vs. 63% for the state. The education attainment in the State of Hawai‘i was based on 2020 State of Hawai‘i Data Book, 18 years and over (State of Hawai‘i, 2020).

**Table 10. Survey responses: “What is the highest level of education you have completed?”**

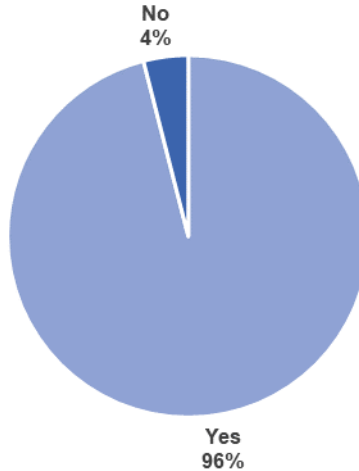
	All survey respondents (%)	State of Hawai‘i population <sup>a</sup> (%)
Less than high school	2	8
High school graduate	22	29
Some college or associate’s degree	43	32
Bachelor’s degree or higher	33	31

<sup>a</sup> State of Hawai‘i (2020).

Table B4 shows the education distribution of the survey respondents by different subgroups. Among different counties, O‘ahu fishermen tended to be better educated as 46% had bachelor’s or higher degree vs. 18% for Kaua‘i fishermen and 25% for Maui fishermen. Purely recreational fishermen tended to be better educated, compared to full-time and part-time commercial fishermen. In addition, fishermen who used handline for Deep 7 bottomfish most often had higher education attainment with 43% of them having bachelor’s or higher degree, a big contrast compared with those who used handline/rod and reel for shallow bottomfish most often (23%).

## Vessel Characteristics

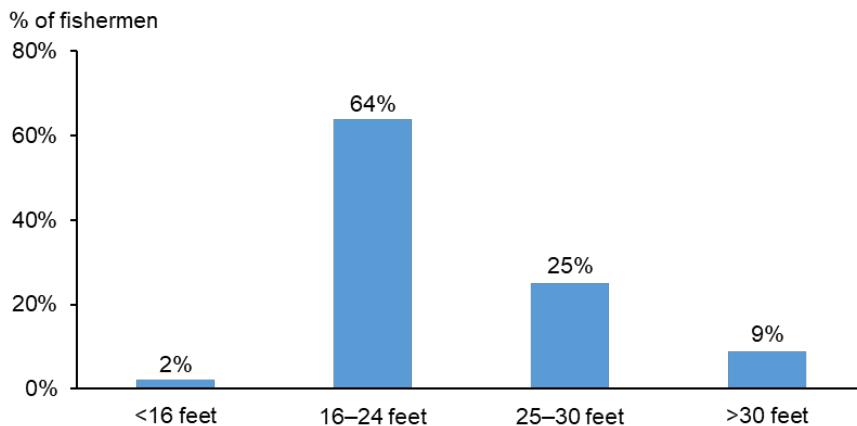
This section presents the characteristics of vessels used in the Hawai‘i small boat fishery. The majority of the small boat fishermen (96%) owned the boat on which they fished (Figure 5). This is almost the same in 2013 (95%). Across subgroups, 100% of fishermen in these groups owned the boats they fished on: Maui County and Kaua‘i fishermen, fishermen with subsistence and cultural as their primary motivations, and fishermen that used handline for Deep 7 bottomfish and spear most often (Table B5).



**Figure 5. Percentage of fishermen who owned the boats on which they fished.**

Fishermen seldom had other people (non-family members) use their boat without them; 15% of the respondents had non-family members use their boat without being present themselves, and they do so infrequently. Table B6 shows the percent of time non-family members used the boat without the owner by different subgroups. Across counties, O‘ahu fishermen (16%) were more likely to have non-family members use their boat. In a comparison across fishing motivations, almost all (91%) full-time commercial and all (100%) cultural fishermen did not share their boat with non-family members, whereas purely recreational fishermen were more likely to share (24%) their boat. Among gear types, fishermen who trolled most often were more likely to have non-family members use their boat (20%). Almost all (96%) who used bait for pelagic species and all (100%) who used spears most often did not share their boat.

Figure 6 shows the distribution of vessel sizes. The most common vessel size was 16 to 24 ft, with 64% of all vessels in this group, while the second most common vessel size, 25%, were 25 to 30 ft. Only 2% of small boat fishermen owned boats less than 16 ft, while 9% owned boats longer than 30 ft. Table B7 presents the distribution of vessel sizes by different subgroups.



**Figure 6. Vessel size.**

Table 11 shows the characteristics of vessels used in small boat fishery. The average vessel length was approximately 24 ft with a 250 hp engine. The average age of vessels was 26 years and the average duration of ownership was 13 years. The average purchase price and estimated market value of vessel were \$53,148 and \$62,222, respectively. The average years of the last vessel improvement was 3.6 years ago.

**Table 11. Vessel characteristics (mean, standard error, and median).**

	<b>Number of respondent (n)</b>	<b>Mean</b>	<b>Standard error</b>	<b>Median</b>
Boat length (ft)	330	23.5	0.3	22
Boat horsepower (hp)	329	249.5	14.6	200
Age of boat (years)	320	26.1	0.8	26
Current boat ownership (years)	325	12.8	0.6	9
Boat purchase price (\$)	307	53,148	6,824	35,000
Boat current market value (\$)	309	62,222	6,993	40,000
Last major vessel improvement (years ago)	257	3.6	0.3	2

When compared with the vessel characteristics in 2020 and 2013, vessels in 2020 were slightly longer and more powerful. The vessels were older in 2020 and with higher purchase price and market value (Table 12).

**Table 12. Vessel characteristics (mean), 2020 vs. 2013.**

	<b>2020 Mean</b>	<b>2013 Mean</b>	<b>Percentage change (%)</b>
Boat length (ft)	23.5	22.9	3
Boat horsepower (hp)	249.5	216.2	15
Age of boat (years)	26.1	22.8	14
Current boat ownership (years)	12.8	11.7	9
Boat purchase price (\$)	53,148	44,672 <sup>a</sup>	19
Boat current market value (\$)	62,222	48,477 <sup>a</sup>	28

<sup>a</sup> Inflation adjusted, 2020 dollars.

Table B8 shows vessel characteristics by county. O‘ahu and Kaua‘i fishermen tended to have slightly larger and more powerful vessels. Their vessels also tended to be older, which may be the reason for major vessel improvements occurring recently (2.6–2.7 years ago vs. more than 4 years ago for Hawai‘i and Maui County fishermen). The average estimated current market value was highest on Kaua‘i.

Table B9 shows vessel characteristics based on different fishing motivations. Not surprisingly, full-time commercial fishermen’s vessels were larger and higher value, but recreational expense fishermen’s vessels on average were more powerful and highest value. However, subsistence fishermen’s vessels were smaller and less powerful, and therefore of lower value. Their vessels tended to be older with longer ownership. Purely recreational fishermen’s vessels tended to be newer with a shorter ownership. Part-time commercial fishermen tended to make major vessel improvements in recent years (2.9 years ago).



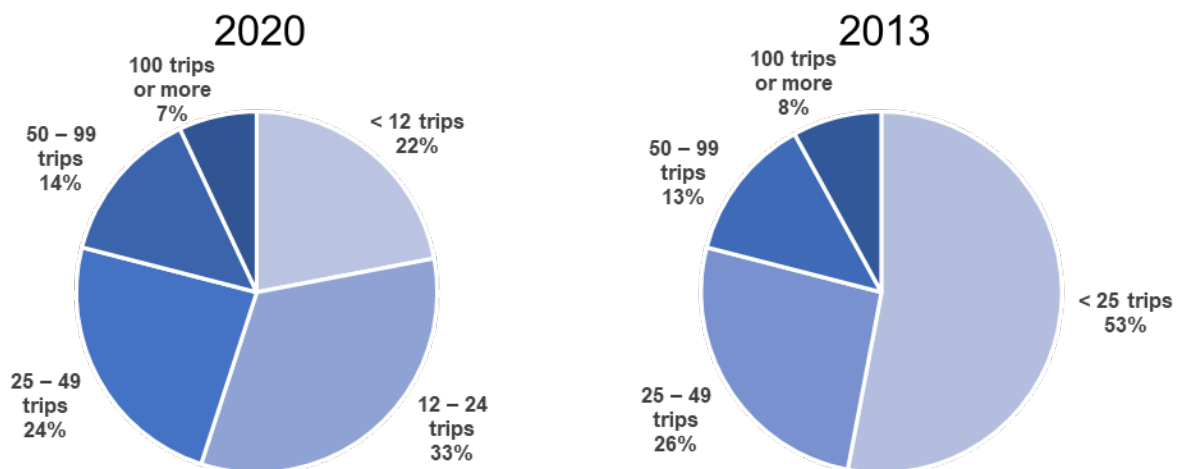
Table B10 shows the vessel characteristics based on gear most commonly used. Fishermen who trolled most often tended to have bigger, more powerful vessels with relatively brief ownership whereas those who used handline/rod and reel for shallow bottomfish and spear most often tended to have smaller, less powerful vessels with longer ownership. Vessel differences in value were also reflected by the following: vessels for fishermen who trolled most often were most valuable vs. vessels for fishermen who used handline/rod and reel for shallow bottomfish. In addition, fishermen who trolled most often tended to conduct major improvements to their vessels in recent years (3.3 years ago).

## Fishing Activity Characteristics

### Fishing Trips and Gear Used

This section presents small boat fishermen’s fishing experiences in 2020, including the number of boat and non-boat fishing trips, gear usage, spatial aspect of the trips, number of people on board, and pounds of fish caught. This information is essential in understanding their distribution of fishing effort and trip characteristics within a year and in gauging the degree of impact from any potential regulatory changes to the fishery.

Figure 7 shows the number of boat fishing trips survey respondents took in 2020 and 2013, in a percentage distribution by using the response bins in the survey. The average number of boat fishing trips reported by all respondents was 40 trips in 2020 and 39 trips in 2013. The distributions between 2 years were similar.



**Figure 7. Number of boat fishing trips in 2020 and 2013.**

Table 13 shows the average number of boat fishing trips in 2020 and 2013. All counties saw a slightly higher number of trips except for Maui County. Across fishing motivations (2020) and fisherman types (2013), all fishermen took more boat fishing trips except for subsistence fishermen. As Maui County had the highest proportion of subsistence fishermen (23.8%), the decreased number of trips by subsistence fishermen could be the reason for the lower number of trips in Maui. Cultural fishermen saw the highest increase in trips.

**Table 13. Number of boat fishing trips, 2020 vs. 2013.**

	<b>2020</b>	<b>2013</b>	<b>Percentage change (%)</b>
All respondents	40.3	38.5	5
<b>By county</b>			
O‘ahu	35.2	32.4	9
Hawai‘i	50.1	46.3	8
Maui	23.7	30.6	-23
Kaua‘i	45.6	43.9	4
<b>By primary fishing motivation (2020) and fisherman type (2013)</b>			
Recreational expense	32.0	27.9	15
Part-time commercial	42.5	41.1	3
Subsistence	21.8	27.6	-21
Full-time commercial	110.3	99.2	11
Purely recreational	22.3	20.3	10
Cultural	51.5	18.0	186

Table 14 shows the distribution of fishing trips in response bins and average number of trips per year by different subgroups. Across counties, Hawai‘i County fishermen reported more fishing trips per year (50 trips) whereas Maui County fishermen reported fewer trips on average (24 trips). As expected, full-time commercial fishermen conducted the most trips in 2020 (110 trips on average), followed by cultural fishermen (52 trips), part-time commercial fishermen (43 trips), and recreational expense fishermen (32 trips), whereas subsistence and purely recreational fishermen conducted only 22 trips. Fishermen who used bait for pelagic gear most often made 65 trips in 2020 vs. those who trolled, used handline for Deep 7 bottomfish, or used spear most often and on average took 32 trips.

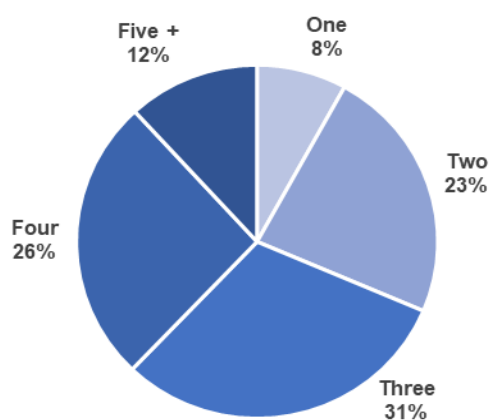
**Table 14. Survey responses: “Approximately how many boat fishing trips did you take in 2020?” (percentage of responses and mean).**

	<b>Number of respondents (n)</b>	<b>Fewer than 12 trips (%)</b>	<b>12–24 trips (%)</b>	<b>25–49 trips (%)</b>	<b>50–99 trips (%)</b>	<b>100 or more trips (%)</b>	<b>Mean<sup>a</sup> (trip)</b>	<b>Median<sup>a</sup> (trip)</b>
All respondents	343	22.4	32.9	23.6	14.3	6.7	40.3	18.0
<b>By county</b>								
O‘ahu	122	24.6	31.1	28.7	10.7	4.9	35.2	18.0
Hawai‘i	130	19.2	33.1	16.9	20.8	10.0	50.1	20.0
Maui	50	26.0	44.0	20.0	10.0	0.0	23.7	18.0
Kaua‘i	39	23.1	23.1	33.3	10.3	10.3	45.6	32.0
<b>By primary fishing motivation</b>								
Recreational expense	106	24.5	36.8	25.5	9.4	3.8	32.0	18.0
Part-time commercial	93	16.1	32.3	25.8	20.4	5.4	42.5	30.0
Subsistence	48	37.5	33.3	22.9	4.2	2.1	21.8	18.0
Full-time commercial	34	11.8	5.9	14.7	32.4	35.3	110.3	75.0
Purely recreational	26	26.9	46.2	19.2	7.7	0.0	22.3	18.0

	Number of respondents (n)	Fewer than 12 trips (%)	12–24 trips (%)	25–49 trips (%)	50–99 trips (%)	100 or more trips (%)	Mean <sup>a</sup> (trip)	Median <sup>a</sup> (trip)
Cultural	4	25.0	25.0	0.0	25.0	25.0	51.5	50.0
By most common gear								
Troll	187	25.1	35.8	24.6	11.2	3.2	31.8	18.0
Bait for pelagic	48	10.4	25.0	16.7	33.3	14.6	65.0	36.0
Handline for Deep 7 bottomfish	47	29.8	42.6	12.8	10.6	4.3	32.1	18.0
Handline/rod and reel for shallow bottomfish	30	16.7	36.7	23.3	10.0	13.3	45.8	21.0
Spear	6	33.3	0.0	50.0	16.7	0.0	31.8	34.0
By sub-fishery								
Pelagic	328	22.6	32.9	23.8	14.0	6.7	40.2	18.0
Deep 7 bottomfish	197	23.9	31.0	22.3	15.2	7.6	41.7	18.0
Non-deep 7 bottomfish	201	20.9	27.9	26.4	16.9	8.0	44.9	26.0
Coral reef	55	10.9	27.3	34.5	18.2	9.1	49.7	36.0

<sup>a</sup> Calculated using the medians of the response bins.

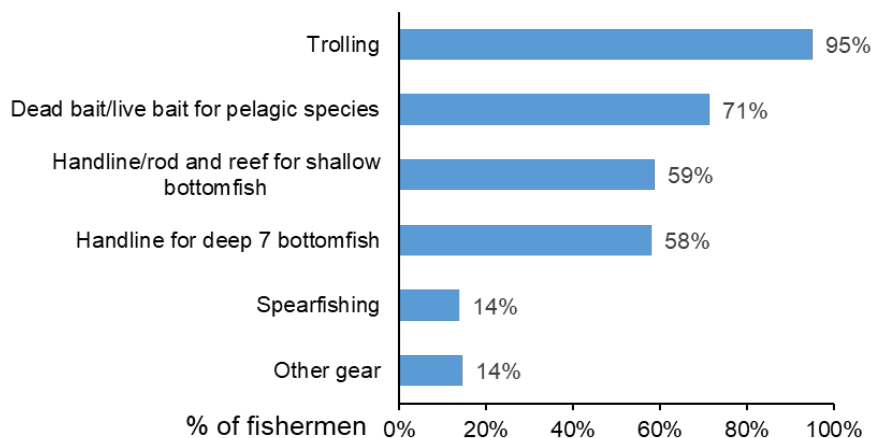
Figure 8 shows the number of gears used in boat fishing trips in 2020. Most of the survey respondents (92%) used more than one fishing gear in 2020. We do not know whether multiple gears were used in the same trip since the question merely asked which types of gears were used in their boat fishing trips in 2020.<sup>2</sup> Note that the result is not comparable with the 2014 survey as the gear type has changed in the 2021 survey.



**Figure 8. Number of gears used in boat fishing trips in 2020.**

<sup>2</sup> The number of gears was derived from this question: Please estimate in 2020, what percent of your boat fishing trip were: trolling, dead bait/live bait for pelagic species, handline for Deep 7 bottomfish, handline/rod and reel for shallow bottomfish, spearfishing, and other?

Figure 9 shows gear usage in boat fishing trips by all fishermen combined. Troll was the most commonly used gear by small boat fishermen as almost all (95%) survey respondents trolled in their fishing trips in 2020. Almost three-fourths (71%) used dead bait/live bait for pelagic species. Almost 60% used handline/rod and reel for shallow bottomfish and handline for Deep 7 bottomfish.



**Figure 9. Types of boat fishing trips in 2020.**

Table 15 shows the gear usage in boat fishing trips in 2020 by different subgroups. Trolling was the most commonly used gear across all subgroups. Relatively, more Hawai‘i County fishermen used bait for pelagic species gear (80%) and more Maui County fishermen used handline for Deep 7 bottomfish (67%) and handline/rod and reel for shallow bottomfish (65%). Across different fishing motivation, full-time commercial fishermen were more likely to use different gears, including bait for pelagic species (82%) and handline for Deep 7 bottomfish (71%). Tables B11–B15 show the percentage distribution of different gear type usage in boat fishing trips based on the survey response bins and average percentage calculated by the medians of response bins for all respondents and subgroups.

**Table 15. Gear usage in boat fishing trips in 2020 (percentage of responses).**

	Number of respondents (n)	Trolling (%)	Dead bait/live bait for pelagic species (%)	Handline for Deep 7 bottomfish (%)	Handline/rod and reel for shallow bottomfish (%)	Spearfishing (%)	Other (%)
All respondents	340	95.0	71.5	57.9	58.8	13.8	14.4
<b>By county</b>							
O‘ahu	121	93.4	64.5	51.2	62.8	14.0	13.2
Hawai‘i	128	96.9	79.7	60.2	53.1	17.2	17.2
Maui	51	90.2	68.6	66.7	64.7	11.8	7.8
Kaua‘i	39	100.0	69.2	61.5	59.0	5.1	17.9

	Number of respondents (n)	Trolling (%)	Dead bait/live bait for pelagic species (%)	Handline for Deep 7 bottomfish (%)	Handline/rod and reel for shallow bottomfish (%)	Spearfishing (%)	Other (%)
<b>By primary fishing motivation</b>							
Recreational expense	105	96.2	65.7	50.5	58.1	8.6	8.6
Part-time commercial	90	92.2	77.8	52.2	53.3	16.7	16.7
Subsistence	49	98.0	59.2	63.3	61.2	18.4	14.3
Full-time commercial	34	94.1	82.4	70.6	64.7	8.8	23.5
Purely recreational	26	96.2	65.4	65.4	50.0	11.5	11.5
Cultural	4	100.0	75.0	50.0	75.0	25.0	25.0
<b>By most common gear</b>							
Troll	187	100.0	73.3	48.1	47.1	12.3	9.6
Bait for pelagic	46	97.8	100.0	63.0	73.9	13.0	15.2
Handline for Deep 7 bottomfish	48	93.8	52.1	100.0	70.8	14.6	8.3
Handline/rod and reel for shallow bottomfish	29	75.9	62.1	55.2	100.0	6.9	17.2
Spear	6	83.3	50.0	50.0	83.3	100.0	16.7
<b>By sub-fishery</b>							
Pelagic	326	99.1	74.5	58.9	58.9	13.8	12.9
Deep 7 bottomfish	198	97.0	71.7	99.5	68.7	15.7	15.7
Non-deep 7 bottomfish	200	95.0	78.0	68.0	100.0	18.5	17.5
Coral reef	55	87.3	69.1	60.0	74.5	74.5	43.6

Table 16 shows the average annual number of fishing trips by gear type for all and for subgroups. This was calculated by using the medians of survey response bins based on the percentage of fishing trips by gear type and the number of boat fishing trips that occurred in 2020 and only included those with a fishing trip in that particular gear type (excluding those who didn't take a trip with that gear). On average in 2020, survey respondents had taken 17 trolling trips, 14 bait-for-pelagic-species trips, 9 handline-for-Deep-7 bottomfish trips, 9 handline/rod and reel for shallow bottomfish, and 6 spearfishing trips. Across different counties, Kaua'i fishermen had the most trolling trips in 2020, whereas Hawai'i County had the most bait for pelagic species trips, and Maui fishermen had the most Deep 7 bottomfish trips.

**Table 16. Average number of boat fishing trips by gear type (exclude 0).**

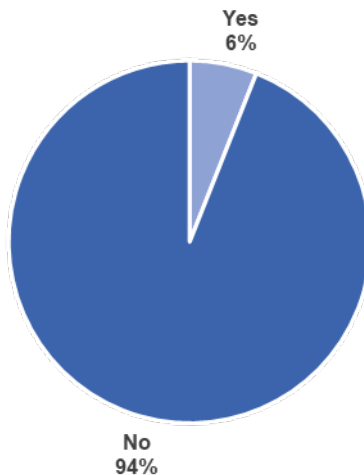
	Trolling (Mean)	Dead bait/live bait for pelagic species (Mean)	Handline for Deep 7 bottomfish (Mean)	Handline/rod and reel for shallow bottomfish (Mean)	Spearfishing (Mean)
All respondents	16.6	13.9	9.1	8.6	5.7
<b>By county</b>					
O'ahu	17.8	8.9	8.7	8.7	10.8
Hawai'i	16.0	21.1	9.4	9.1	3.3
Maui	7.6	6.6	10.1	7.1	1.2
Kaua'i	25.7	11.0	7.7	8.9	3.9
<b>By primary fishing motivation</b>					
Recreational expense	16.3	10.4	6.3	10.3	2.6
Part-time commercial	18.2	15.4	9.9	7.8	8.6
Subsistence	10.1	6.0	4.2	5.8	4.5
Full-time commercial	29.3	40.5	23.8	15.0	11.8
Purely recreational	13.7	3.9	5.4	4.7	3.2
Cultural	16.9	12.4	11.0	23.1	5.0
<b>By most common gear</b>					
Troll	21.4	7.2	5.3	3.9	2.8
Bait for pelagic	15.0	39.3	5.7	7.3	3.4
Handline for Deep 7 bottomfish	5.5	7.4	19.9	4.2	1.7
Handline/rod and reel for shallow bottomfish	6.7	11.1	4.0	29.9	3.1
Spear	2.9	2.4	1.8	3.0	24.8
<b>By sub-fishery</b>					
Pelagic	16.6	13.9	8.7	8.5	5.7
Deep 7 bottomfish	14.2	14.2	9.1	7.2	4.2
Non-deep 7 bottomfish	15.7	15.4	8.5	8.6	5.7
Coral reef	12.9	11.9	9.0	8.3	5.7

Besides the common gear types used in boat fishing trips, the survey also asked about the usage of gears that were less common, such as green-stick<sup>3</sup> and scuba gear, when fishermen went spearfishing.

<sup>3</sup> Green-stick fishing is a fishing technique that primarily targets tuna, it trolls artificial squids from a fiberglass pole (called green-stick) just above the water surface to attract tuna.

Figure 10 shows that 6% of the survey respondents used green-stick as one of the gear types for their boat-fishing trips in 2020. And for those who used green-stick in 2020, they used it 10 times on average. Table B16 shows the green-stick usage rate by subgroup.

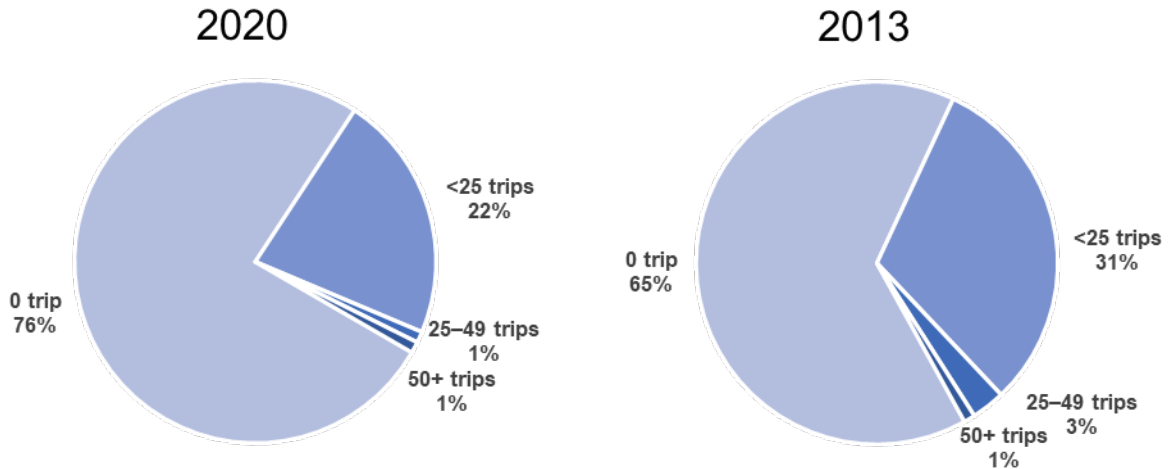
Across counties, Kaua'i fishermen were more likely to use green-stick (15% used it in 2020) vs. 3% for O'ahu fishermen. Green-stick was more likely to be used by full-time commercial fishermen (18%) and those who used handline for Deep 7 bottomfish most often (10%).



**Figure 10. Used green-stick for boat fishing trips in 2020.**

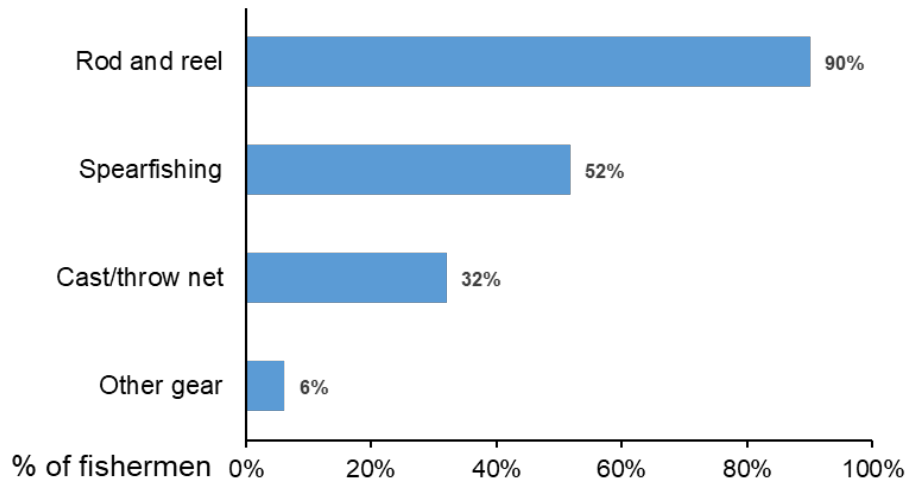
Among all respondents, 63 fishermen (18%) spearfished (by boat or non-boat) in 2020. Among those, 56 responded by selecting the use of scuba gear or free diving when they spearfished. Among the 56 respondents, 77% did not use any scuba gear. Almost all (98%) free dived, and more than half (52%) of them free dived in almost all (90%–100%) of their spearfishing trips. Tables B17 and B18 shows the scuba gear and free dive usage by subgroup, respectively.

Small boat fishermen were asked the number of non-boat fishing trips and types of gears used in 2020 (Figure 11). More than three-quarters of survey respondents did not take any non-boat fishing trips 2020 which was higher than the 65% in 2013. Table B19 shows the distribution and the average number of non-boat fishing trips by subgroup.



**Figure 11. Number of non-boat fishing trips in 2020 and 2013.**

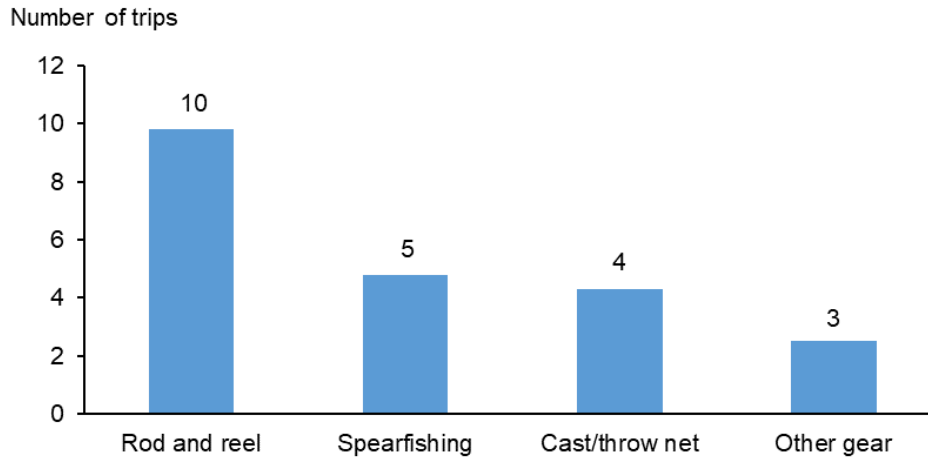
Figure 12 shows the gear usage for non-boat fishing trips in 2020. For fishermen who had non-boat fishing trips, most of them (90%) used rod and reel, 52% spear, 32% casted net, and 6% other gears. Table B20 shows the gear usage for non-boat fishing trips by subgroup.



**Figure 12. Gear usage in non-boat fishing trips in 2020.**

Figure 13 shows the average number of non-boat fishing trips by gear type. This was calculated by the percentage of non-boat fishing trips based on gear type (medians of survey response bins) times the number of non-boat fishing trips that occurred in 2020. On average, survey respondents took 10 rod and reel trips, 5 spearfishing trips, 4 nets trips, and 3 other non-boat fishing trips. Table B21 shows the average number of non-boat fishing trips by gear type by subgroup. Tables B22 to B24 show the percentage distribution of different type usage in non-boat fishing trips based on the survey response bins and average percentage calculated by the medians of response bins for all respondents and subgroups.





**Figure 13. Average number of non-boat fishing trips by gear type (exclude those who did not take any non-boat trips with that gear type).**

*Fishing Areas and Fish Aggregating Devices (FADs)*

Questions regarding the spatial aspect of small boat fishing trips included percentage of fishing trips in state and federal waters and percentage of trips around Fish Aggregating Devices (FADs). Table 17 shows the average percentage of fishing trips in state and federal waters. On average, slightly more than half (55%) of boat fishing trips occurred in state waters and 45% in federal waters. Fishing area differed by county, fishing motivation, and gear usage. Kaua‘i fishermen were more active within state waters (67% of fishing trips) while O‘ahu fishermen were more active within federal waters (58% of fishing time). Purely recreational fishermen were more active within state waters (63%) while recreational expense fishermen fished more than half of their fishing time (53%) in federal waters. Based on gear type, fishermen who trolled or baited for pelagic species were equally distributed in state and federal waters while fishermen who used handline/rod and reel for shallow bottomfish and spear most often were more active within state waters. Fishermen in the coral reef fishery were more likely to fish within state waters.

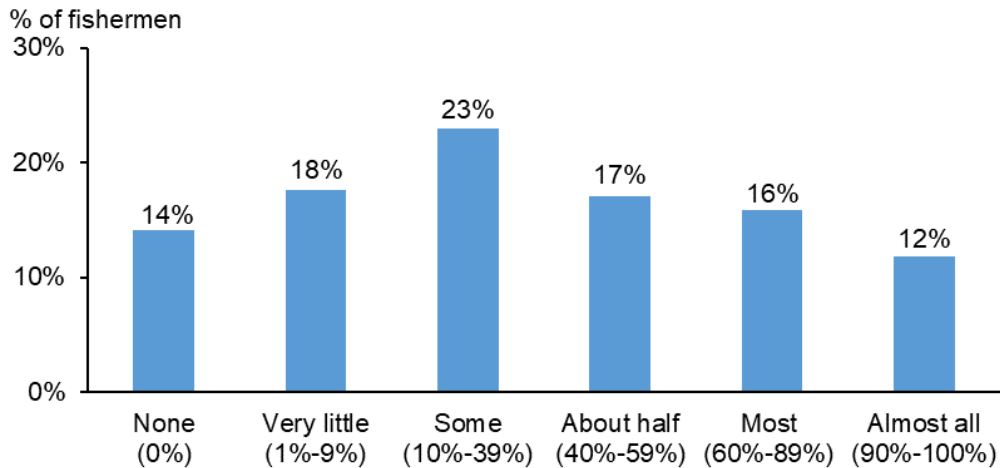
**Table 17. Survey responses: “In 2020, what percent of your fishing time occurred in state and/or federal jurisdiction?” (percentage of responses).**

	Number of respondents (n)	State waters <sup>a</sup> (%)	Federal waters <sup>a</sup> (%)
All respondents	333	54.6	45.4
<b>By county</b>			
O‘ahu	119	42.5	57.5
Hawai‘i	125	62.5	37.5
Maui	49	55.1	44.9
Kaua‘i	39	66.8	33.2
<b>By primary fishing motivation</b>			
Recreational expense	103	47.0	53.0
Part-time commercial	88	56.1	43.9

	<b>Number of respondents (n)</b>	<b>State waters<sup>a</sup> (%)</b>	<b>Federal waters<sup>a</sup> (%)</b>
Subsistence	48	56.1	43.9
Full-time commercial	32	58.1	41.9
Purely recreational	26	62.9	37.1
Cultural	4	57.5	42.5
<b>By most common gear</b>			
Troll	183	49.8	50.2
Bait for pelagic	44	50.3	49.8
Handline for Deep 7 bottomfish	47	58.1	41.9
Handline/rod and reel for shallow bottomfish	29	71.2	28.8
Spear	6	78.3	21.7
<b>By sub-fishery</b>			
Pelagic	318	53.5	46.5
Deep 7 bottomfish	194	54.3	45.7
Non-deep 7 bottomfish	194	53.4	46.6
Coral reef	54	62.5	37.5

<sup>a</sup> Calculated using the medians of the response bins.

Figure 14 shows the percent of fishing trips at FADs. One in 7 fishermen did not fish at FADs in 2020, and almost half of them (45%) fished at FADs for half of more of their trips. Table 18 shows the use of FADs by subgroup. Hawai‘i County fishermen (92%) were more likely to fish at FADs, whereas Kaua‘i County fishermen were less likely (79%). For those who fished at FADs, Maui fishermen fished at FADs more often, relative to Kaua‘i fishermen. FADs usage was tied to the fishing trip types. Fishermen who trolled or baited for pelagic species trips frequently were more reliant on FADs when compared with those who often conducted bottomfishing and spearfishing trips. Across fishing motivations, recreational expense and part-time commercial fishermen were more likely to fish at FADs, when compared with subsistence fishermen.



**Figure 14. Percent of fishing trips fished at/visited FADs in 2020.**

**Table 18. Survey responses: “In 2020, during what percent of your fishing trips did you fish at/visit fish aggregating devices (FADs)?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
All respondents	340	14.1	17.6	23.5	17.1	15.9	11.8	44.7
<b>By county</b>								
O‘ahu	122	16.4	18.9	18.9	15.6	17.2	13.1	46.4
Hawai‘i	127	7.9	18.9	26.0	21.3	14.2	11.8	43.3
Maui	51	19.6	13.7	21.6	11.8	19.6	13.7	49.4
Kaua‘i	38	21.1	13.2	34.2	13.2	13.2	5.3	38.8
<b>By primary fishing motivation</b>								
Recreational expense	105	12.4	23.8	21.9	15.2	16.2	10.5	41.5
Part-time commercial	94	12.8	12.8	30.9	17.0	13.8	12.8	45.1
Subsistence	49	20.4	22.4	16.3	12.2	12.2	16.3	45.3
Full-time commercial	34	17.6	8.8	29.4	26.5	8.8	8.8	43.8
Purely recreational	26	15.4	15.4	11.5	11.5	34.6	11.5	54.8
Cultural	4	25.0	25.0	0.0	25.0	25.0	.0	43.3
<b>By most common gear</b>								
Troll	186	5.9	10.2	24.2	18.8	23.1	17.7	53.3
Bait for pelagic	45	4.4	20.0	17.8	31.1	13.3	13.3	45.7
Handline for Deep 7 bottomfish	47	27.7	29.8	34.0	6.4	2.1	0.0	20.4
Handline/rod and reel for shallow bottomfish	30	40.0	40.0	13.3	3.3	3.3	0.0	15.8
Spear	6	33.3	33.3	16.7	0.0	16.7	0.0	27.5
<b>By sub-fishery</b>								

	Number of respondents (n)	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
Pelagic	325	12.0	17.8	23.7	17.8	16.3	12.3	45.1
Deep 7 bottomfish	195	15.4	21.5	25.6	14.9	14.9	7.7	39.5
Non-deep 7 bottomfish	196	14.8	19.4	22.4	17.3	15.8	10.2	43.2
Coral reef	53	20.8	20.8	20.8	15.1	15.1	7.5	40.7

<sup>a</sup> Calculated using the medians of the response bins.

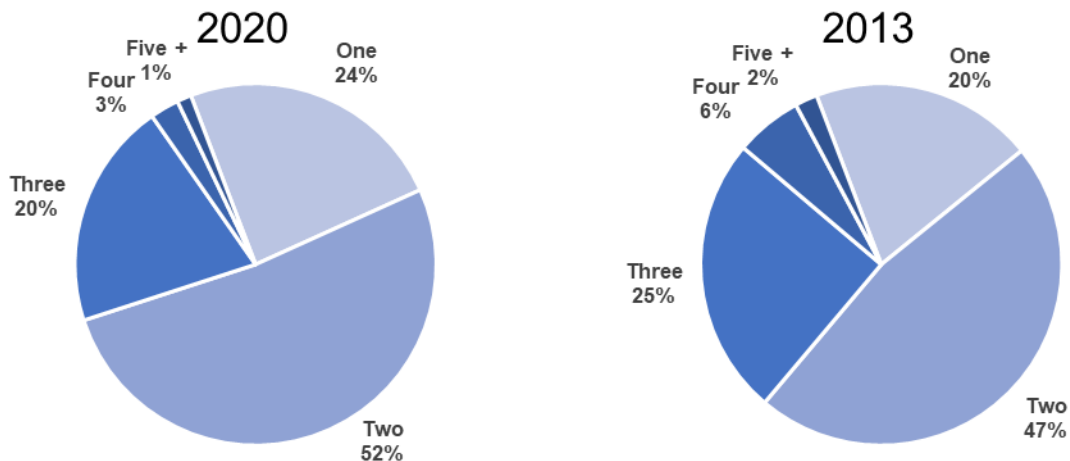
Those who fished at FADs were asked about the percentage of their fishing time there. On average, 37% of their fishing time were spent at/around FADs. Maui fishermen, full-time commercial fishermen, and those who used bait for pelagic species were more likely to spend more time at FADs, whereas O‘ahu fishermen, subsistence fishermen, and those who used handline/rod and reel for shallow bottomfish were less likely (Table 19).

**Table 19. Survey responses: “In 2020, during the trips when you visited a fish aggregating devices (FADs), please estimate the percentage of your total fishing time that you fished at/around FADs?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
All respondents	290	1.0	24.1	31.7	24.8	11.7	6.6	37.0
<b>By county</b>								
O‘ahu	100	1.0	29.0	38.0	23.0	7.0	2.0	29.9
Hawai‘i	117	0.9	21.4	29.1	26.5	12.0	10.3	40.6
Maui	41	2.4	17.1	22.0	29.3	17.1	12.2	46.5
Kaua‘i	30	0.0	26.7	33.3	20.0	20.0	0.0	34.7
<b>By primary fishing motivation</b>								
Recreational expense	91	0.0	25.3	36.3	23.1	7.7	7.7	34.9
Part-time commercial	82	2.4	22.0	31.7	25.6	11.0	7.3	37.9
Subsistence	39	2.6	30.8	25.6	25.6	15.4	0.0	33.2
Full-time commercial	28	0.0	14.3	35.7	21.4	21.4	7.1	43.2
Purely recreational	22	0.0	27.3	18.2	36.4	18.2	0.0	37.7
Cultural	3	0.0	0.0	33.3	0.0	0.0	66.7	71.7
<b>By most common gear</b>								
Troll	173	0.6	19.7	34.1	28.3	11.6	5.8	38.1
Bait for pelagic	44	0.0	13.6	31.8	22.7	20.5	11.4	46.1
Handline for Deep 7 bottomfish	34	2.9	41.2	32.4	17.6	2.9	2.9	24.7
Handline/rod and reel for shallow bottomfish	17	5.9	58.8	23.5	11.8	0.0	0.0	15.6
Spear	4	0.0	25.0	25.0	25.0	0.0	25.0	43.8
<b>By sub-fishery</b>								
Pelagic	285	0.7	24.6	31.2	25.3	11.6	6.7	36.9
Deep 7 bottomfish	165	0.6	27.3	30.3	23.6	10.3	7.9	36.2
Non-deep 7 bottomfish	166	0.6	24.7	30.7	24.1	12.7	7.2	37.5
Coral reef	42	2.4	23.8	16.7	33.3	16.7	7.1	42.3

<sup>a</sup> Calculated using the medians of the response bins.

In 2020, 76% of respondents reported one or two fishermen on board for an average fishing trip which was higher than 67% in 2013 (Figure 15). The smaller party size in 2020 was likely due to the COVID restrictions and health concerns. Subgroups of fishermen who were more likely to fish alone included Kaua‘i fishermen (39%), full-time commercial fishermen (47%), and fishermen who used handline/rod and reel for shallow bottomfish most often (41%). However, O‘ahu fishermen and purely recreational fishermen were more likely to have more people on board (Table B25).



**Figure 15. Number of people on board for an average fishing trip in 2020 and 2013.**

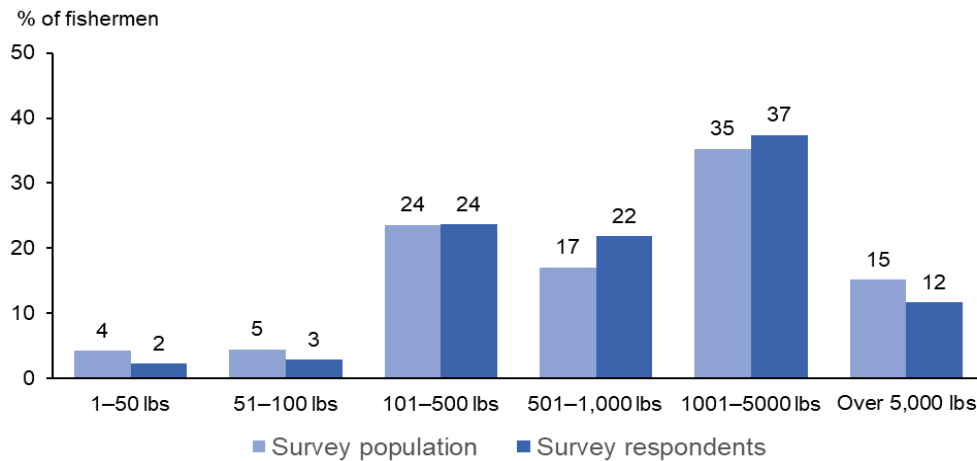
### *Fish Landings*

In the survey, fishermen were asked their total annual landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore and reef fish (in pounds) in response bins. To check whether the landings reported in the survey are representative of the entire Hawai‘i small boat fleet, this study compares fishermen’s landings reported to HDAR by the entire small boat population vs. the landings reported in this survey by all respondents. For the landings report to HDAR, only pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish were included to match the survey questions. The total landings reported by survey respondents were calculated using the medians of catch bins. Except for those who reported the highest category of landing bins (>1,000 lb), the actual reported landings were used. Almost all of the respondents who reported the highest category of landing bin (97%) answered the open-ended questions to report the actual landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish. For the 3% who did not report the actual landings, the missing values were replaced by the actual 2020 landings reported in the HDAR’s Fishermen Reporting System (FRS). Table 20 presents the landings from these two sources overall and by county, and Figure 16 shows the overall distribution of landings from these two sources. Overall survey respondents reported slightly higher landings in the survey when compared with the population, especially in the category of 501–1000 lb category, whereas slightly lower representation was observed in the highest landings categories (more than 5,000 lb). The average annual landings per fisherman reported in survey was slightly higher than the landings reported in the FRS (3,162 lb vs. 2,894 lb). Similar results are found at different counties, except in O‘ahu where lower average landings were reported in the survey, due to lower proportion of the respondents reported in the highest landing category.

**Table 20. Annual landings for the survey population from State of Hawai‘i DAR’s fishermen reporting system vs. survey respondents in 2020 (percentage of responses).**

Annual landings (lb)	All		O‘ahu		Hawai‘i		Maui		Kaua‘i	
	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)
1–50	4.3	2.3	6.2	4.1	2.8	1.5	3.0	0.0	5.3	2.6
51–100	4.5	2.9	6.2	4.1	3.7	1.5	5.2	3.9	1.1	2.6
101–500	23.6	23.7	24.7	24.8	21.5	23.8	34.3	23.5	13.8	17.9
501–1,000	17.1	21.9	17.8	18.2	16.7	24.6	17.9	25.5	16.0	20.5
1001–5000	35.3	37.4	31.5	41.3	39.1	33.8	28.4	37.3	41.5	38.5
More than 5,000	15.2	11.7	13.7	7.4	16.1	14.6	11.2	9.8	22.3	17.9
Number of fishermen (n)	876	342	292	121	353	130	134	51	94	39
Annual landings per fisherman										
Mean (lb)	2,894	3,162	2,586	2,170	3,056	3,858	2,260	2,500	4,183	4,855
Standard error (lb)	176	397	294	429	266	762	378	700	738	1,733
Median (lb)	1,023	925	849	925	1,325	862.5	635	900	1,696	1,625

Note: The survey population included four species group landings (pelagic, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish) reported in State of Hawai‘i DAR’s fishermen reporting system in 2020 (n=885) and excluded 4 seamount fishing, 5 cases that were excluded in this report (4 cases that identified “charter” as their fishing motivation and 1 case that used shortline as the major fishing gear). Survey responses only included landings for pelagic fish, Deep 7 bottomfish, shallow bottomfish and nearshore & reef fish and excluded 3 fishermen who did not answer fish landings questions.



**Figure 16. Annual landings distribution for the survey population (HDAR FRS statistics) vs. survey respondents.**

When compare the reported landings to HDAR in FRS with the reported landings in the survey for the survey respondents (Table 21), the reported landings to HDAR were lower. The average annual landings in 2020 per fisherman was 3,162 lb based on the survey responses and 2,456 lb based on the report to HDAR. There could be several reasons for the discrepancies between the two data sources. One is recall bias for the survey responses as the survey was conducted in spring 2021 whereas fishing activities occurred in 2020. The other reason is under-reporting.

**Table 21. Annual landings for survey respondents: State of Hawai‘i DAR’s fishermen reporting system vs. survey responses in 2020 (percentage of responses).**

Annual landings (lb)	All		O‘ahu		Hawai‘i		Maui		Kaua‘i	
	Fishing reports (%)	Survey responses (%)	Fishing reports (%)	Survey responses (%)	Fishing reports (%)	Survey responses (%)	Fishing reports (%)	Survey responses (%)	Fishing reports (%)	Survey responses (%)
1-50	5.3	2.3	6.6	4.1	3.8	1.5	2.0	0.0	7.7	2.6
51-100	5.0	2.9	8.3	4.1	3.8	1.5	3.9	3.9	0.0	2.6
101-500	24.6	23.7	27.3	24.8	22.3	23.8	35.3	23.5	10.3	17.9
501-1,000	19.0	21.9	15.7	18.2	21.5	24.6	25.5	25.5	12.8	20.5
1001-5000	35.1	37.4	34.7	41.3	35.4	33.8	27.5	37.3	46.2	38.5
More than 5,000	11.1	11.7	7.4	7.4	13.1	14.6	5.9	9.8	23.1	17.9
Number of fishermen (n)	342	342	121	121	130	130	51	51	39	39
Annual landings per fisherman										
Mean (lb)	2,456	3,162	1,654	2,170	3,053	3,858	1,704	2,500	3,998	4,855
Standard error (lb)	253	397	249	429	513	762	25	700	895	1,733
Median (lb)	880	925	651	925	954	862.5	599	900	2,425	1,625

Note: Excluded three fishermen who did not answer fish landings questions.

Further analysis was conducted to examine the differences between survey responses and reported landings to HDAR by species group. Table 22 shows a comparison of the two data sources. Most of the differences between survey responses and fishing reports came from pelagic fish. For Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish, the average landings matched very well.



**Table 22. Annual landings for survey respondents by species group: State of Hawai‘i DAR’s fishermen reporting system vs. survey responses in 2020.**

Annual landings per fisherman, mean (lb)	Fishing reports					Survey responses				
	Total	Pelagic fish	Deep 7 bottomfish	Shallow bottomfish	Near-shore and reef fish	Total	Pelagic fish	Deep 7 bottomfish	Shallow bottomfish	Near-shore and reef fish
State	2,456	1,797	218	149	292	3,162	2,429	259	155	319
O‘ahu	1,654	1,004	155	233	262	2,170	1,521	196	178	275
Big Island	3,053	2,632	122	50	249	3,858	3,245	187	104	322
Maui	1,704	840	629	78	157	2,500	1,511	670	147	173
Kaua‘i	3,998	2,772	199	312	714	4,855	3,776	165	265	648

Table 23 shows the distribution of the fishermen with different landing levels, and the average landings per respondent in 2020 for the sum of four species groups (pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish) based on the survey results. About half of the respondents reported less than 1,000 pounds of landings in 2020 and 37% reported 1,000–5,000 lb, and 12% reported more than 5,000 lb. The average landings per respondent was 3,162 lb. A comparison across different counties shows Kaua‘i fishermen on average landed more fish than other counties. Total landings as reported in the survey varied among fishermen with different motivations, and there were great differences between full-time commercial fishermen vs. other groups of fishermen. On average, full-time commercial fishermen landed almost 15,000 lb of fish a year, while part-time commercial fishermen landed 2,809 lb, recreational expense and subsistence landed approximately 1,350 lb, and purely recreational landed 615 lb. The small group of fishermen self-identified with cultural motivation landed 9,688 lb. Across different gear type, those who used bait for pelagic fish landed more than 6,000 lb per year, whereas those who used spear landed 667 lb. Tables B26 to B29 show the distribution of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish landings by subgroup, respectively.

**Table 23. Catch composition: “In 2020, approximately how many total pounds of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish did you catch?” (mean and median).**

	Number of respondents (n)	1–50 lb (%)	51–100 lb (%)	101–500 lb (%)	501–1,000 lb (%)	1,001–5,000 lb (%)	More than 5,000 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
All respondents	342	2.3	2.9	23.7	21.9	37.4	11.7	3,162	925
By county									
O‘ahu	121	4.1	4.1	24.8	18.2	41.3	7.4	2,170	925
Hawai‘i	130	1.5	1.5	23.8	24.6	33.8	14.6	3,858	862.5
Maui	51	0.0	3.9	23.5	25.5	37.3	9.8	2,500	900
Kaua‘i	39	2.6	2.6	17.9	20.5	38.5	17.9	4,855	1625

	Number of respondents (n)	1-50 lb (%)	51-100 lb (%)	101-500 lb (%)	501-1,000 lb (%)	1,001-5,000 lb (%)	More than 5,000 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
<b>By primary fishing motivation</b>									
Recreational expense	105	3.8	5.7	21.0	24.8	41.9	2.9	1,335	800
Part-time commercial	92	2.2	3.3	16.3	19.6	43.5	15.2	2,809	1350
Subsistence	49	0.0	2.0	36.7	36.7	20.4	4.1	1,352	750
Full-time commercial	34	2.9	0.0	8.8	5.9	26.5	55.9	14,986	8845
Purely recreational	26	0.0	0.0	69.2	11.5	19.2	0.0	615	350
Cultural	4	0.0	0.0	0.0	50.0	0.0	50.0	9,688	3662.5
<b>By most common gear</b>									
Troll	187	3.2	2.1	30.5	23.5	31.6	9.1	2,675	775
Bait for pelagic	46	4.3	0.0	8.7	17.4	43.5	26.1	6,313	2361
Handline for Deep 7 bottomfish	48	0.0	4.2	18.8	20.8	50.0	6.3	2,079	1112.5
Handline/rod and reel for shallow bottomfish	30	0.0	6.7	16.7	33.3	36.7	6.7	1,444	775
Spear	6	0.0	33.3	33.3	0.0	33.3	0.0	667	225
<b>By sub-fishery</b>									
Pelagic	327	2.4	2.8	24.5	22.3	36.7	11.3	3,076	875
Deep 7 bottomfish	198	1.5	2.5	22.7	18.2	42.4	12.6	3,491	1112.5
Non-deep 7 bottomfish	200	1.5	3.0	17.5	20.0	44.0	14.0	3,240	1175
Coral reef	55	1.8	3.6	16.4	7.3	49.1	21.8	3,571	1550

<sup>a</sup> Calculated using the medians of the response bins.

Table 24 shows the average landings per trip, which were calculated by the total landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish (by summing the medians of the catch bins for each type of fish if actual amounts were not provided) divided by the number of boat fishing trips in 2020 (using the median of survey response bins if actual amounts were not provided). For all respondents, the average landings per trip was approximately 83 lb. As expected, full-time commercial fishermen and part-time commercial fishermen reported higher landings per trip (196 lb and 87 lb, respectively). Fishermen who self-identified themselves with culture motivation for fishing also had high landings per trip (155 lb). In terms of landings per trip by gear type, fishermen who used bait for pelagic species gear most often caught more per trip (113 lb), followed by those who used handline for Deep 7 bottomfish (92 lb), and fishermen who used spear most often caught the least per trip (21 lb).

**Table 24. Estimated landings per trip (including pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish) (percentage of responses, mean, and median).**

	Number of respondents (n)	1-20 lb (%)	21-50 lb (%)	51-100 lb (%)	More than 100 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
All respondents	340	23.8	29.1	24.7	22.4	83.4	47.0
By county							
O‘ahu	121	28.9	25.6	26.4	19.0	71.3	46.6
Hawai‘i	129	24.8	31.8	24.0	19.4	79.3	43.1
Maui	50	12.0	36.0	18.0	34.0	97.3	58.0
Kaua‘i	39	17.9	23.1	30.8	28.2	118.0	65.3
By primary fishing motivation							
Recreational expense	105	23.8	35.2	25.7	15.2	58.1	41.7
Part-time commercial	91	23.1	25.3	29.7	22.0	87.3	53.6
Subsistence	48	20.8	33.3	25.0	20.8	66.2	47.9
Full-time commercial	34	26.5	8.8	11.8	52.9	195.8	106.1
Purely recreational	26	46.2	26.9	23.1	3.8	35.4	21.3
Cultural	4	0.0	25.0	25.0	50.0	154.9	99.3
By most common gear							
Troll	187	25.7	33.2	20.9	20.3	76.9	42.9
Bait for pelagic	46	21.7	21.7	26.1	30.4	112.8	60.0
Handline for Deep 7 bottomfish	47	17.0	21.3	31.9	29.8	91.5	66.7
Handline/rod and reel for shallow bottomfish	30	26.7	33.3	33.3	6.7	45.2	39.3
Spear	6	83.3	0.0	16.7	0.0	20.8	15.3
By sub-fishery							
Pelagic	325	24.3	30.2	23.4	22.2	83.1	45.2
Deep 7 bottomfish	196	19.4	25.5	28.6	26.5	89.4	54.2
Non-deep 7 bottomfish	200	21.5	27.0	28.5	23.0	91.2	53.1
Coral reef	55	18.2	36.4	25.5	20.0	81.4	46.6

<sup>a</sup> Calculated using the medians of the response bins.

A comparison of 2020 and 2013 shows the overall landings saw a 16% increase in 2020 (Table 25). Variations were observed in different counties and fishing motivations. Hawai‘i County and Kaua‘i fishermen saw a one-third increase in annual landings in 2020. The higher annual landings in Hawai‘i County could be due to the high and increasing number of fishing trips (from 46 to 50 trips). For Kaua‘i fishermen, fishing trip increased slightly (44 to 46 trips), and the higher annual landings could be based on higher landings by full-time commercial fishermen as they had the highest proportion of full-time commercial fishermen among four counties (14%).

Across fishing motivations/fisherman types, subsistence, full-time commercial, and cultural fishermen saw a large increase in annual landings and landings per trip in 2020. For full-time commercial fishermen, their higher total landings were associated with more fishing trips in 2020 (99 to 110 trips) and more landings per trip. Subsistence fishermen had slightly fewer trips in

2020 (28 to 22 trips), but they landed more per trip (+71%) in 2020. Cultural fishermen had more than double their annual landings in 2020 due to substantially higher number of trips (18 to 52 trips) (note the small base for this type of fishermen). For the rest of the fishermen (recreational expense, part-time commercial, and purely recreational), their annual landings remained similar to the 2013 levels.

**Table 25. Average annual landings and landings per trip, 2020 vs. 2013 (lb).**

	Average annual landings			Average landings per trip		
	2020 (lb)	2013 (lb)	Percentage change (%)	2020 (lb)	2013 (lb)	Percentage change (%)
All respondents	3,162	2,719	16	83.4	76.2	9
By county						
O‘ahu	2,170	2,383	-9	71.3	74.3	-4
Hawai‘i	3,858	2,888	34	79.3	79.4	0
Maui	2,500	2,395	4	97.3	74.9	30
Kaua‘i	4,855	3,686	32	118.0	75.0	57
By primary fishing motivation (2020) and fisherman type (2013)						
Recreational expense	1,335	1,485	-10	58.1	53.0	10
Part-time commercial	2,809	2,837	-1	87.3	89.2	-2
Subsistence	1,352	922	47	66.2	38.8	71
Full-time commercial	14,986	10,632	41	195.8	149.5	31
Purely recreational	615	624	-1	35.4	35.4	0
Cultural	9,688	3,581	171	154.9	125.5	23

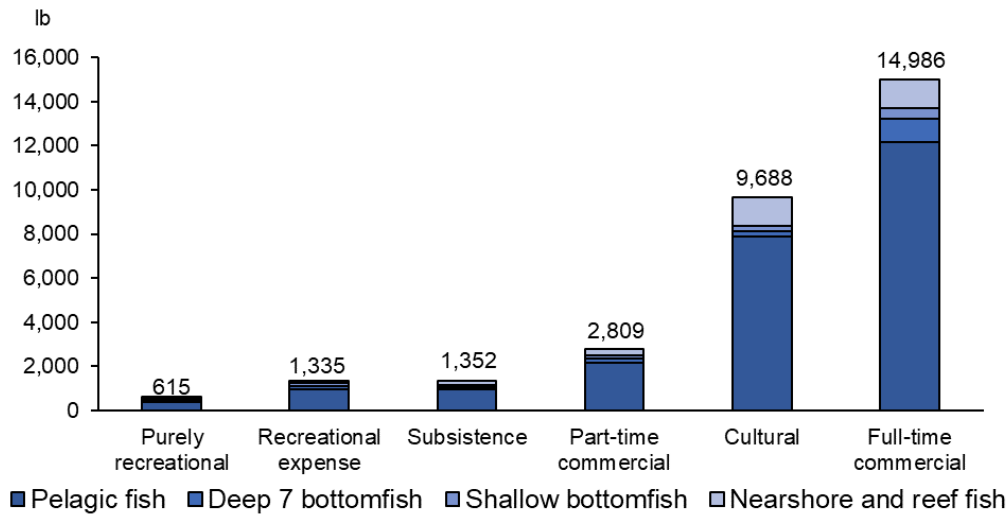
Table 26 shows the average annual landings and in four species groups for different subgroups. Overall, small boat fishermen landed pelagic fish the most (2,429 lb), followed by nearshore and reef fish (319 lb), Deep 7 bottomfish (259 lb), and shallow bottomfish (155 lb). Landings differed by county. Kaua‘i County had the highest average landings, followed by Hawai‘i County, with both counties had more than 3,000 lb of pelagic landings on average. Maui County fishermen had the highest Deep 7 bottomfish landings on average, and Kaua‘i fishermen had the highest landings of nearshore & reef fish and shallow bottomfish. Not surprisingly, gear usage that targeted specific species achieved the highest landings of that species, e.g. who used bait for pelagic gear most often caught the most pelagic fish (5,655 lb) across different gear types.

**Table 26. Annual landings by species group (mean and media) (lb).**

	Number of respondents (n)	Pelagic fish, Deep 7 bottomfish, shallow bottomfish, and reef fish (Mean)	Pelagic fish, Deep 7 bottomfish, shallow bottomfish, and reef fish (Median)	Pelagic fish (Mean)	Deep 7 bottomfish (Mean)	Shallow bottomfish (Mean)	Nearshore & reef fish (Mean)
All respondents	342	3,162	925	2,429	259	155	319
<b>By county</b>							
O‘ahu	121	2,170	925	1,521	196	178	275
Hawai‘i	130	3,858	862.5	3,245	187	104	322
Maui	51	2,500	900	1,511	670	147	173
Kaua‘i	39	4,855	1,625	3,776	165	265	648
<b>By primary fishing motivation</b>							
Recreational expense	105	1,335	800	940	169	141	85
Part-time commercial	92	2,809	1,350	2,187	175	138	309
Subsistence	49	1,352	750	947	117	81	208
Full-time commercial	34	14,986	8,845	12,149	1,087	482	1,267
Purely recreational	26	615	350	378	84	47	107
Cultural	4	9,688	3,662.5	7,881	263	213	1,331
<b>By most common gear</b>							
Troll	187	2,675	775	2,406	97	79	93
Bait for pelagic	46	6,313	2,361	5,655	234	217	208
Handline for Deep 7 bottomfish	48	2,079	1,112.5	665	1,094	230	90
Handline/rod and reel for shallow bottomfish	30	1,444	775	373	88	446	537
Spear	6	667	225	104	13	71	479
<b>By sub-fishery</b>							
Pelagic	327	3,076	875	2,516	213	147	201
Deep 7 bottomfish	198	3,491	1,112.5	2,656	438	164	234
Non-deep 7 bottomfish	200	3,240	1,175	2,456	237	226	321
Coral reef	55	3,571	1,550	1,699	240	176	1,456

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

Figure 17 shows the average landing by species across primary fishing motivations. The average landings varied from 600 lb per year for purely recreational fishermen, around 1,300 lb for recreational expense and subsistence fishermen, 2,800 lb for part-time commercial, and close to 15,000 lb for full-time commercial fishermen. Although landings varied largely across fishing motivations, the highest landings were pelagic fish across motivations with approximately 60% to 80% of their landings. Nearshore & reef fish were the second largest landings for all motivations except for recreational expense fishermen, where Deep 7 bottomfish was the second largest landings.



**Figure 17. Average annual landings by species group and primary fishing motivation.**

Among all the landings in different species groups, pelagic fish contributed 77% of total landings across all respondents, followed by nearshore & reef fish (10%), Deep 7 bottomfish (8%), and shallow bottomfish (5%). Correlated with the types of fishing trip by county, pelagic fish was the most likely caught species across counties as trolling was the most commonly used gear. Maui fishermen were more likely to catch Deep 7 bottomfish as handline for Deep 7 bottomfish was the second most commonly used gear in Maui County. O‘ahu and Kaua‘i fishermen were more likely to catch nearshore & reef fish as spear was more commonly used in O‘ahu, and handline/rod and reel for shallow bottomfish were more commonly used in these two counties. Table 27 shows the distribution of landings by species group for different subgroups.

**Table 27. Distribution of annual landings by species group.**

	Number of respondents (n)	Annual landings of pelagic fish (%)	Annual landings of Deep 7 bottomfish (%)	Annual landings of shallow bottomfish (%)	Annual landings of nearshore and reef fish (%)
All respondents	342	76.8	8.2	4.9	10.1
<b>By county</b>					
O‘ahu	121	70.1	9.0	8.2	12.7
Hawai‘i	130	84.1	4.9	2.7	8.3
Maui	51	60.4	26.8	5.9	6.9
Kaua‘i	39	77.8	3.4	5.5	13.4
<b>By primary fishing motivation</b>					
Recreational expense	105	70.4	12.7	10.5	6.3
Part-time commercial	92	77.9	6.2	4.9	11.0
Subsistence	49	70.0	8.6	6.0	15.4
Full-time commercial	34	81.1	7.3	3.2	8.5

	Number of respondents (n)	Annual landings of pelagic fish (%)	Annual landings of Deep 7 bottomfish (%)	Annual landings of shallow bottomfish	Annual landings of nearshore and reef fish (%)
Purely recreational	26	61.4	13.6	7.7	17.3
Cultural	4	81.4	2.7	2.2	13.7
<b>By most common gear</b>					
Troll	187	89.9	3.6	3.0	3.5
Bait for pelagic	46	89.6	3.7	3.4	3.3
Handline for Deep 7 bottomfish	48	32.0	52.6	11.1	4.3
Handline/rod and reel for shallow bottomfish	30	25.9	6.1	30.9	37.2
Spear	6	15.6	1.9	10.6	71.9
<b>By sub-fishery</b>					
Pelagic	327	81.8	6.9	4.8	6.5
Deep 7 bottomfish	198	76.1	12.5	4.7	6.7
Non-deep 7 bottomfish	200	75.8	7.3	7.0	9.9
Coral reef	55	47.6	6.7	4.9	40.8

## Catch Disposition and Market Participation

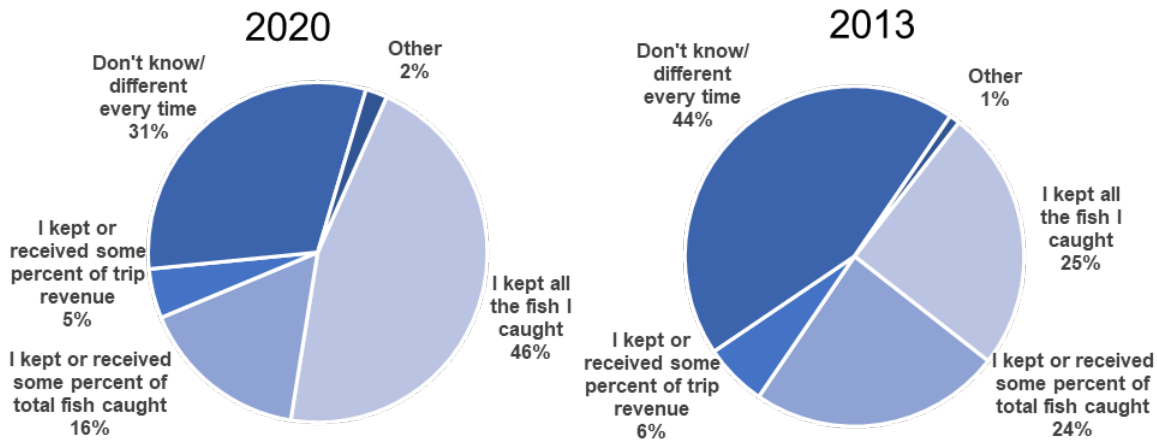
This section presents disposition of fish landed by the small boat fishermen and their market participation. Understanding the landing disposition among fish sale and other uses, such as home consumption and give away to friends and family, may shed light on the social and cultural importance of the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

### *Catch Distribution and Disposition*

Figure 18 shows the landing distribution among fishermen on board after a fishing trip in 2020 and 2013. In 2020, 46% of survey respondents kept all the fish they caught which was much higher than the 25% in 2013. This could be due to the impact of COVID which may have resulted in people fishing alone or with smaller crew size and the low fish price. In 2020, 16% of the fishermen kept/received a portion of the total fish caught, and 5% kept/received a portion of trip revenue, and the rest (31%) of the respondents stated that the distribution among fishermen on board may vary trip by trip or “don’t know.” Catch distribution by subgroup in 2020 is shown in Table B30. Across different fishing motivations, Kaua’i fishermen (63%), purely recreational fishermen (54%), and full-time commercial fishermen (53%) were more likely to keep all their catch for themselves. O’ahu fishermen (21%) and purely recreational fishermen (23%) were

more likely to keep/receive some percent of total fish caught, as they were more likely to have more people on board.

On average, respondents who shared fish caught among fishermen on board kept/received 61% of the total fish caught. On average, respondents who shared the trip revenue kept/received 61% of trip revenue. Average percentage of fish and revenue kept/received by subgroup are presented in Table B31.



**Figure 18. Catch distribution among fishermen in fishing trips in 2020 and 2013.**

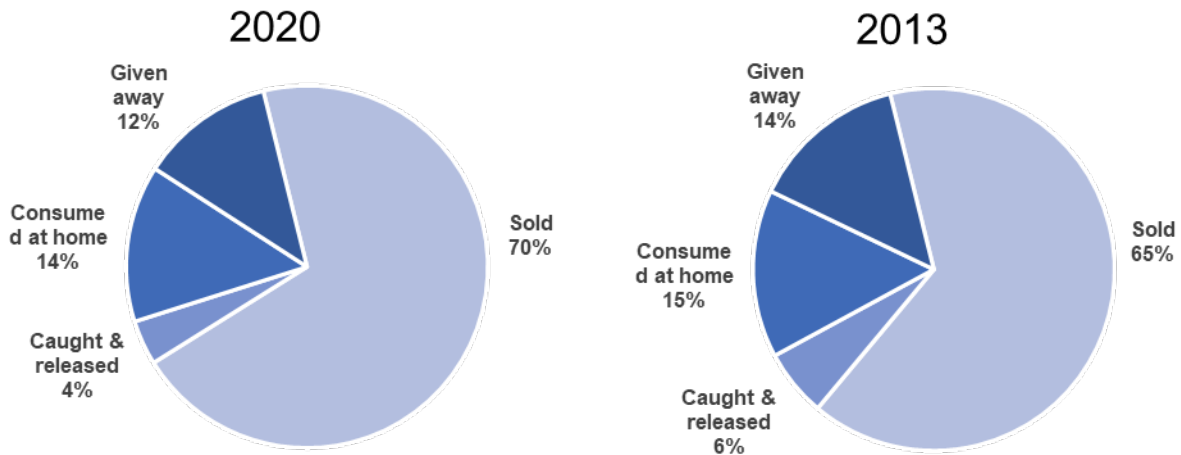
Fishermen were asked the percentage of catch consumed at home, given away, caught and released, and sold in 2020. Using the responses from this question and the responses of landings in 2020, the disposition of catch can be estimated. Table 28 shows the estimated fish disposition varied by primary fishing motivation in 2020. Full-time and part-time commercial fishermen sold 83% and 69% of their catch, respectively, with most of the balance distributed among home consumption and given away to friends and family. This supports previous research findings that showed the vital social role commercial small boat fishermen play in local community (Chan and Pan, 2017; Hospital and Beavers, 2012; Hospital, Bruce, and Pan, 2011). However, “recreational” fishermen also sold a large portion of their catch to the market. Recreational expense and purely recreational fishermen sold 45% and 27% of their catch, respectively. This finding demonstrates that selling fish for supplemental income is common among self-identified recreational fishermen. Purely recreational fishermen also gave away 37% of their catch. Similar to recreational expense fishermen, subsistence fishermen sold 45% of their catch but subsistence kept about 28% for home consumption, 5 percentage points higher than recreational expense fishermen.



**Table 28. Estimated distribution of catch: consumed at home, caught and release, given away, and sold?” (percentage of catches).**

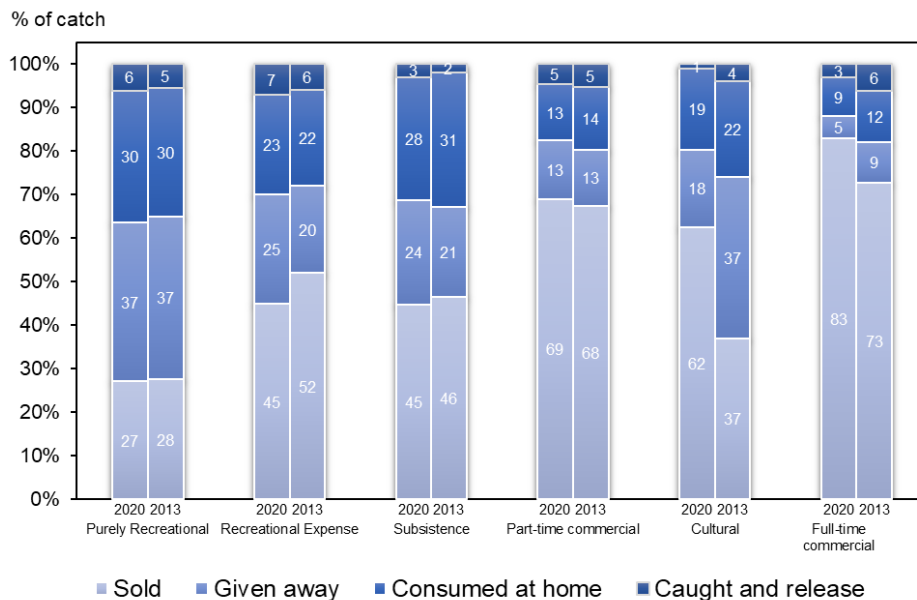
	Number of respondents (n)	Caught and released (%)	Given away (%)	Consumed at home (%)	Sold (%)
All respondents	328	3.7	12.4	14.3	69.6
<b>By county</b>					
O‘ahu	119	4.5	16.1	16.3	63.1
Hawai‘i	123	4.4	10.5	14.8	70.3
Maui	49	3.1	13.8	13.8	69.3
Kaua‘i	36	1.4	11.2	10.4	77.1
<b>By primary fishing motivation</b>					
Recreational expense	98	6.5	25.4	23.0	45.1
Part-time commercial	92	4.6	13.5	12.9	69.0
Subsistence	47	2.9	23.9	28.4	44.8
Full-time commercial	34	2.7	4.8	9.5	83.0
Purely recreational	25	6.0	36.5	30.3	27.1
Cultural	4	0.9	17.9	18.7	62.5
<b>By most common gear</b>					
Troll	178	4.0	14.1	19.0	63.0
Bait for pelagic	43	4.2	8.6	8.4	78.7
Handline for Deep 7 bottomfish	47	3.2	16.2	12.6	68.0
Handline/rod and reel for shallow bottomfish	30	7.3	26.0	26.6	40.1
Spear	6	0.4	15.5	10.2	73.9
<b>By sub-fishery</b>					
Pelagic	313	4.0	13.0	15.1	68.0
Deep 7 bottomfish	191	3.6	13.8	12.8	69.8
Non-deep 7 bottomfish	191	4.4	14.5	13.5	67.5
Coral reef	51	2.9	13.5	12.4	71.1

Figure 19 shows the catch disposition by all survey respondents in 2020 and 2013. Overall, higher portion of catches were sold in 2020 as a result of higher portion of catches that were sold by full-time commercial fishermen. Relatively fewer proportions of all catches were given away and released in 2020.

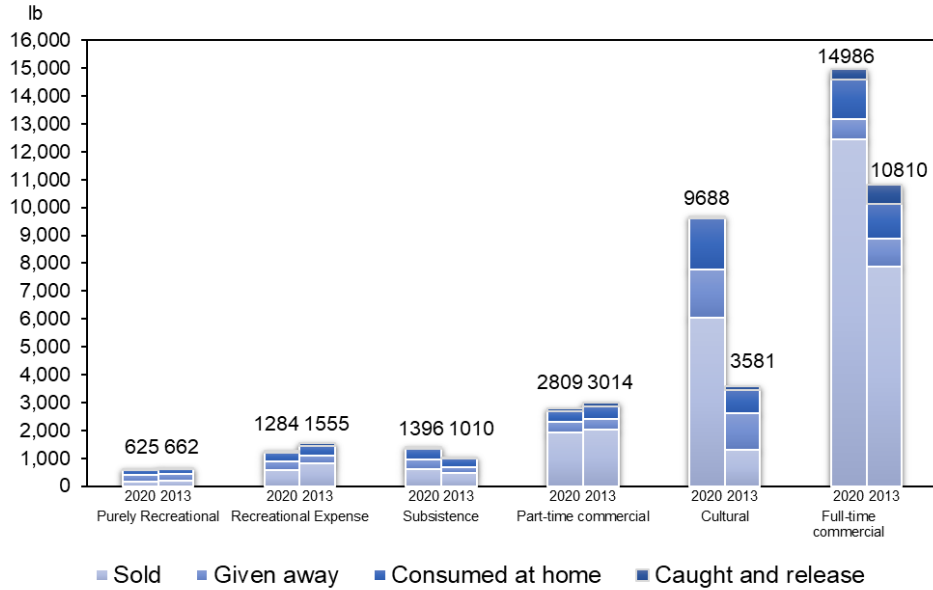


**Figure 19. Catch disposition in 2020 and 2013.**

Figure 20 shows the comparison of the disposition of the catch by self-identified primary fishing motivation in 2020 vs. self-identified fisherman type in 2013. The same categories were used in both years. Purely recreational and part-time commercial fishermen showed similar disposition patterns between the 2 years. Recreational expense fishermen sold fewer portion of their catch and given away more in 2020. Subsistence fishermen consumed fewer at home but gave away more in 2020. However, full-time commercial fishermen sold more of their catch, and they gave away and consumed fewer at home. Larger fluctuation was observed for cultural fishing due to small sample size. Figure 21 shows the similar information but in terms of pound caught.

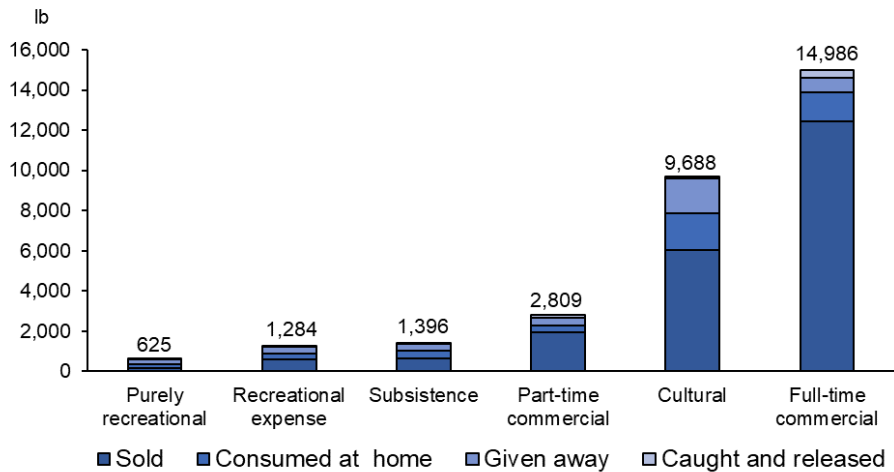


**Figure 20. Catch disposition in percentage in 2020 vs. 2013 by primary fishing motivation (2020) and fisherman type (2013).**



**Figure 21. Catch disposition in pound in 2020 vs. 2013 by primary fishing motivation (2020) and fisherman type (2013).**

Figure 22 shows the catch disposition by primary fishing motivation in terms of average amount of catch (lb). Selling fish was common for non-commercial fishermen, but the amounts were limited. For example, recreational expense fishermen sold approximately 580 lb and purely recreational fishermen only sold 170 lb in 2020. The catch distribution patterns were similar between recreational expense and subsistence fishermen. Cultural fishermen had a unique pattern of disposition. Their annual landings and the amount sold were between part-time and full-time commercial fishermen, and they consumed more at home and gave away more when compared with fishermen with other fishing motivations.



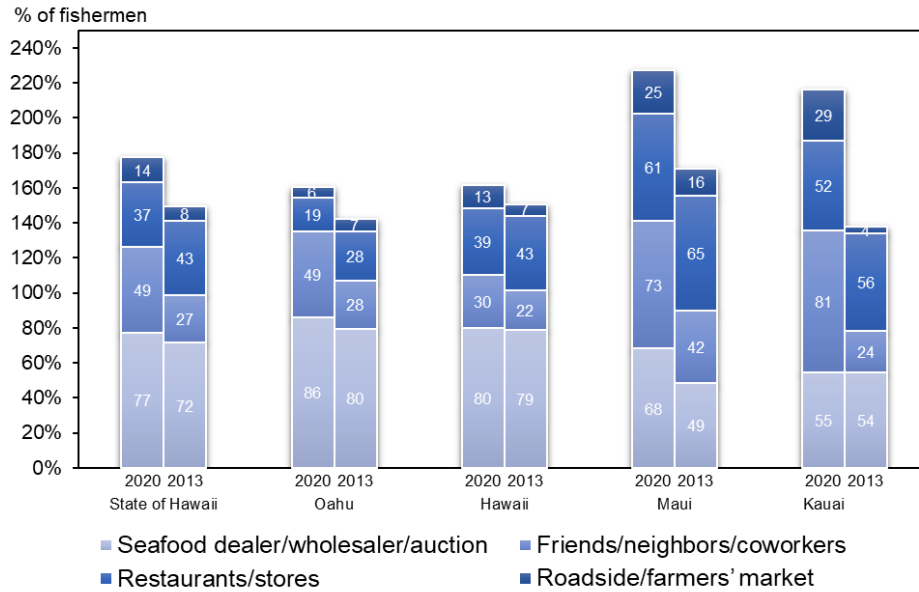
**Figure 22. Estimated catch disposition by primary fishing motivation.**

Note: the total pounds for some fishing motivations in Figure 21 are slightly different than the total pounds displayed in Figure 17 because not all respondents answered both landing and disposition questions.

## *Market Participation*

The survey results show that not all the fishermen sold fish even though they all had CMLs. The survey asked fishermen: “In 2020, did you ever sell any of the fish you caught?” Overall, 85% of the survey respondents stated that they sold at least some fish they caught in 2020, which was slightly higher than the 83% in 2013. Table B32 shows the market participation among subgroups.

Fishermen were asked about the market outlets for selling their catch in 2020. By comparison, the 2014 survey only asked whether they used a list of particular outlets for selling fish so it was a yes or no question. The 2021 survey asked the extent of the use of different outlets, ranging from 0% to 100%. Zero percent means a particular outlet was not used whereas 100% means a particular outlet was used all the time. The other change in the 2021 survey was the list of the outlets. In the 2021 survey, auction and seafood dealer/wholesaler were two separate outlet choices whereas in the 2014 survey wholesaler/auction was one answer choice. Figure 23 shows the usage of the four main market outlet categories in 2020 and 2013 by county, in terms of percentage of fishermen. Auction was combined with seafood dealer/wholesaler for 2020 to make this category comparable with 2013. Across all counties, all outlets except for restaurants/stores had more usage in 2020, and the usage of the three outlet categories increased in all counties, especially for Maui and Kaua‘i fishermen. In 2013, wholesaler/auction was the most commonly used outlet in O‘ahu and Hawai‘i Counties whereas restaurants/stores was most commonly used in Maui and Kaua‘i. In 2020, seafood dealer/wholesaler/auction was still the most commonly used outlets in O‘ahu and Hawai‘i counties, but selling to friends/neighbors/coworkers became more widely use in O‘ahu and it was used by half of the O‘ahu respondents who sold fish. And selling to friends/neighbors/coworkers became the most important outlet for Maui (73%) and Kaua‘i (81%) fishermen. The increase usage was likely due to restaurant closures during pandemic so fishermen switched to direct marketing to friends/neighbors/coworkers. Maui fishermen also increased their usage of seafood dealer/wholesaler and it was their second most commonly used outlet in 2020. Roadside/farmers’ market remained the least use outlets but they became more important for Maui and Kaua‘i fishermen in 2020. Table 29 shows the usage of five major market outlets identified in the 2021 survey for the state and by county.

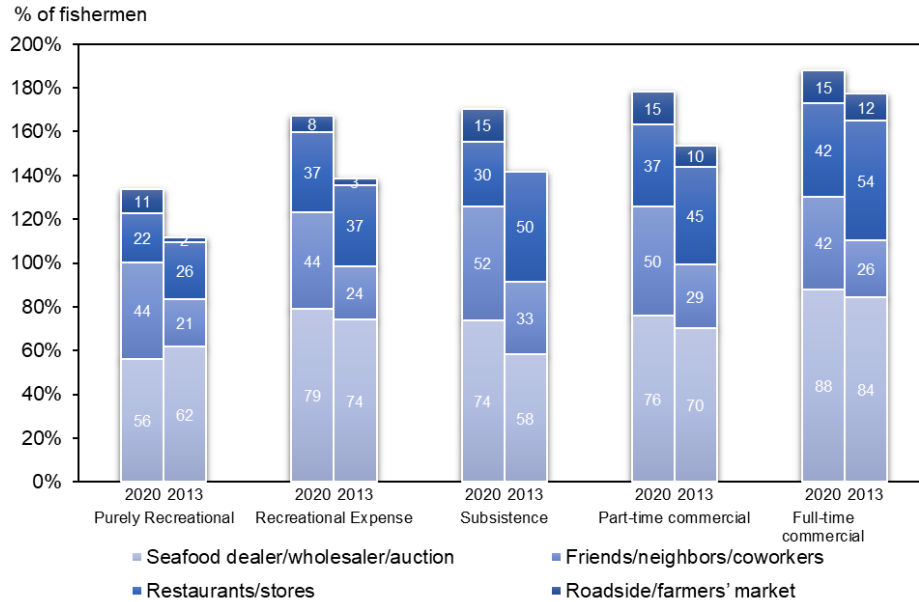


**Figure 23. Market outlet usage in 2020 vs. 2013 by county.**

**Table 29. Market outlet usage in 2020 by county (percentage of respondents).**

	State of Hawai'i (%)	O'ahu (%)	Hawai'i (%)	Maui (%)	Kaua'i (%)
Seafood dealer/wholesaler	62	43	80	68	52
Friends/neighbors/coworkers	49	49	30	73	81
Restaurants/stores	37	19	39	61	52
Auction (United Fishing Agency)	26	76	0	0	6
Roadside/farmers' market	14	6	13	25	29
Other	1	1	2	2	0
Number of respondents (n)	279	94	109	44	31

Market outlet usage also changed by primary fishing motivation in 2020 vs. fisherman type in 2013 (Figure 24). Seafood dealer/wholesaler/auction, friends/neighbors/coworkers, and roadside/farmers' market all become more important, except for seafood dealer/wholesaler/auction usage by purely recreational fishermen. Restaurants/stores showed lower usage in 2020, especially for full-time and subsistence fishermen. Friends/coworkers became more important across fishermen, from full-time commercial (+16 percentage points) to purely recreational (+23 percentage points). Subsistence fishermen also increased seafood dealer/wholesaler/auction usage (+16 percentage points) and roadside/farmers' market (+15 percentage points). Note: cultural fishermen were excluded in the analysis as the base was small and created large fluctuations.



**Figure 24. Market outlet usage in 2020 vs. 2013 by primary fishing motivation (2020) and fisherman type (2013).**

Table 30 shows the percentage of usage for different market outlets for all respondents in 2020, ranging from 0% (not used) to 100% (used all the time). The table also shows the average usage (calculated using the medians of the response bins) when excluding those who did not use the particular outlet. This provides a sense of the usage intensity by different outlets. Overall, auction and seafood dealer/wholesaler were used more intensively, followed by restaurants/stores, friends/neighbors/coworkers, and roadside/farmers' market. Note: only four respondents used "other" market outlets, so details are not shown in the table.

**Table 30. Survey responses: "In 2020, where did you sell your fish: seafood dealer/wholesaler, auction, restaurants/stores, roadside/farmers' market, friends/neighbors/coworkers, other?" (percentage of responses and mean percentage).**

	Number of respondents (n)	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
Auction	279	73.8	1.8	4.3	5.0	2.5	12.5	66.5
Seafood dealer/wholesaler	279	37.6	3.2	13.6	9.3	8.6	27.6	65.3
Restaurants/stores	279	63.1	7.2	9.7	9.7	2.5	7.9	43.9
Friends/neighbors/coworkers	279	51.3	9.7	16.5	9.0	5.7	7.9	41.4
Roadside/farmers' market	279	85.7	2.9	6.5	3.2	1.1	0.7	31.7

<sup>a</sup> Calculated using the medians of the response bins.

Table 31 show the average usage intensity of individual market outlets by different subgroups. Across counties, auction was most commonly used by O‘ahu fishermen whereas seafood dealer/wholesaler was most commonly used by Hawai‘i County fishermen. Not surprisingly, auction and seafood dealer/wholesaler were more likely to be used by full-time and part-time commercial fishermen. In addition, subsistence fishermen were more likely to sell at auction. With fewer catches, purely recreational, recreational expense, and subsistence fishermen were more likely to sell to their friends/neighbors/coworkers. Note that purely recreational and cultural fishermen only had a few respondents and the mean percentages showed large variations. Tables B33–B37 show the frequency distribution of the individual market outlets usage by different subgroups.

**Table 31. Survey responses: “In 2020, where did you sell your fish: seafood dealer/ wholesaler, auction, restaurants/stores, roadside/farmers’ market, friends/ neighbors/coworkers, other?”<sup>a</sup> (mean percentage, exclude 0).**

	Number of respondents (n)	Auction (%)	Seafood dealer/ wholesaler (%)	Restaurants/ stores (%)	Friends/ neighbors/ coworkers (%)	Roadside/ farmers market (%)
All respondents	279	66.5	65.3	43.9	41.4	31.7
<b>By county</b>						
O‘ahu	94	67.8	41.7	35.2	43.9	27.7
Hawai‘i	109	0.0	84.3	48.4	28.1	31.8
Maui	44	0.0	49.8	42.6	44.7	29.3
Kaua‘i	31	22.5	48.1	44.1	49.9	37.0
<b>By primary fishing motivation</b>						
Recreational expense	93	61.3	62.0	48.3	44.8	38.0
Part-time commercial	86	70.7	67.2	48.1	36.6	26.6
Subsistence	27	83.3	60.1	46.9	60.5	19.2
Full-time commercial	33	67.2	66.3	31.7	27.4	23.0
Purely recreational	9	17.0	87.5	97.5	63.8	83.0
Cultural	4	0.0	65.0	16.7	16.7	40.0
<b>By most common gear</b>						
Troll	145	63.4	63.9	42.1	46.0	32.9
Bait for pelagic	43	51.3	71.0	40.2	26.0	31.9
Handline for Deep 7 bottomfish	39	76.0	56.9	46.2	37.1	10.0
Handline/rod and reel for shallow bottomfish	22	78.6	54.2	65.0	35.0	100.0
Spear	5	61.1	73.3	33.3	21.1	0.0
<b>By sub-fishery</b>						
Pelagic	268	66.1	64.4	44.4	41.1	31.7
Deep 7 bottomfish	162	66.4	63.5	40.4	37.2	34.3
Non-deep 7 bottomfish	167	63.7	61.0	41.9	36.4	33.2
Coral reef	49	75.0	70.0	30.5	43.1	20.3

<sup>a</sup> Calculated using the medians of the response bins.

## Revenue of Fish Sold

In addition to fish landings in 2020, fishermen were also asked the value of the fish they sold in 2020. To check whether the sold values reported in the survey are representative of the entire Hawai‘i small boat fleet, the sold values reported in the survey are compared with the sold values reported by dealers and fishers to HDAR. Marine fish dealers (which includes any business that purchases fish directly from fishermen, i.e., wholesalers and auction, restaurants and retail stores) are required to report data on seafood purchased from fishermen, and these reports indicate the fisherman from whom the dealer purchased the fish. The dealer data are compiled in HDAR’s Dealer Reporting System (DRS). Cash sales of fish reported by fishers are also stored in DRS.

Table 32 shows the distribution, mean, standard error, and median of the sold values in DRS for the survey population and the survey responses reported by survey respondents. Overall, the distribution and mean value are matching very well, with slight under-representation in the higher value range \$10,001–\$20,000 than the population (by 4 points) and therefore the average value of fish sold reported by the survey respondents was lower than the average value of the whole population (15% lower overall). At county level, all counties except O‘ahu show similar distributions between the population and survey respondents. The mean value of fish sold by O‘ahu respondents is lower than the population due to a lower proportion of respondents with high values of fish sold (more than \$10,000). Figure 25 shows the overall distribution of value of fish sold reported to HDAR for the survey population and the value reported in the survey by the survey respondents.

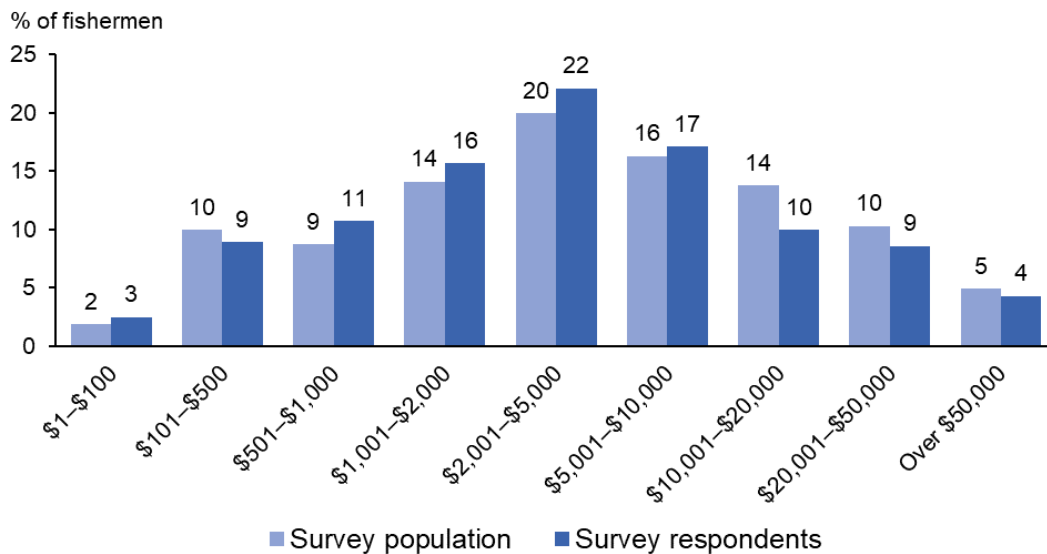
**Table 32. Revenue from fish sold for the survey population from State of Hawai‘i DAR’s Dealer Reporting System vs. survey respondents (percentage of responses).**

Revenue from fish sold (\$)	All		O‘ahu		Hawai‘i		Maui		Kaua‘i	
	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)
1–100	1.9	2.5	2.8	4.3	1.3	0.9	1.0	2.3	2.8	3.0
101–500	10.0	8.9	10.2	7.5	7.3	9.2	17.3	11.4	11.3	9.1
501–1,000	8.7	10.7	10.2	11.8	8.3	10.1	12.2	9.1	1.4	12.1
1,001–2,000	14.1	15.7	15.3	17.2	11.9	14.7	15.3	18.2	18.3	12.1
2,001–5,000	20.0	22.1	18.1	21.5	19.9	22.0	23.5	25.0	22.5	21.2
5,001–10,000	16.3	17.1	13.9	20.4	19.9	15.6	7.1	13.6	19.7	18.2
10,001–20,000	13.8	10.0	14.8	9.7	15.6	11.9	10.2	6.8	7.0	6.1
20,001–50,000	10.3	8.6	10.2	5.4	11.6	9.2	7.1	11.4	9.9	12.1
More than 50,000	4.9	4.3	4.6	2.2	4.3	6.4	6.1	2.3	7.0	6.1
Number of fishermen (n)	689	280	216	93	302	109	98	44	71	33



Revenue from fish sold (\$)	All		O'ahu		Hawai'i		Maui		Kaua'i	
	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)	Survey population (%)	Survey responses (%)
Revenue per fisherman										
Mean (\$)	11,913	10,116	11,666	7,173	12,049	12,705	10,992	9,047	13,350	11,135
Standard error (\$)	857	1,059	1,610	1,125	1,144	2,193	2,307	2,273	3,418	2,890
Median (\$)	4,111	3,500	3,768	3,500	5,234	3,500	2,241	3,500	4,062	3,500

Note: The survey population included those in the survey population (n=889) and excluded those without dealer records in 2020 (n=126), survey respondents reported no fish sale in 2020 in the survey (n=52), fishermen did not answer fish sale question (n=13), 4 seamount fishing, and 5 cases that were excluded in this report (4 cases that identified "charter" as their fishing motivation and 1 case that used shortline as the major fishing gear). Survey responses excluded respondents reported no fish sale in 2020 (n=52) and fishermen did not answer fish sale question (n=13).



**Figure 25. Revenue from fish sold for the survey population (HDAR DRS statistics) vs. survey respondents.**

To compare the results from survey and HDAR dealer reports, Table 33 lists the distribution of value of fish sold reported in the dealer reports to HDAR vs. the value reported in the survey. Distributions of sale value in the survey are matching very well with the dealer reports. Survey responses show slightly higher average sale values than the dealer reports.

**Table 33. Revenue from fish sold for survey respondents: State of Hawai‘i DAR’s Dealer Reporting System vs. survey responses (percentage of responses).**

Revenue from fish sold (\$)	All		O‘ahu		Hawai‘i		Maui		Kaua‘i	
	Dealer reports (%)	Survey responses (%)	Dealer reports (%)	Survey responses (%)	Dealer reports (%)	Survey responses (%)	Dealer reports (%)	Survey responses (%)	Dealer reports (%)	Survey responses (%)
1–100	4.0	2.5	6.0	4.3	2.9	0.9	0.0	2.3	7.1	3.0
101–500	9.9	8.9	9.5	7.5	10.7	9.2	11.1	11.4	7.1	9.1
501–1,000	9.9	10.7	13.1	11.8	4.9	10.1	22.2	9.1	3.6	12.1
1,001–2,000	16.3	15.7	15.5	17.2	15.5	14.7	16.7	18.2	21.4	12.1
2,001–5,000	19.4	22.1	20.2	21.5	21.4	22.0	19.4	25.0	10.7	21.2
5,001–10,000	18.7	17.1	16.7	20.4	21.4	15.6	11.1	13.6	25.0	18.2
10,001–20,000	11.1	10.0	11.9	9.7	8.7	11.9	13.9	6.8	10.7	6.1
20,001–50,000	6.7	8.6	6.0	5.4	8.7	9.2	0.0	11.4	10.7	12.1
More than 50,000	4.0	4.3	1.2	2.2	5.8	6.4	5.6	2.3	3.6	6.1
Number of fishermen (n)	252	280	84	93	103	109	36	44	28	33
Revenue per fisherman										
Mean (\$)	9,338	10,116	6,267	7,173	11,509	12,705	9,857	9,047	9,666	11,135
Standard error (\$)	1,178	1,059	975	1,125	2,203	2,193	4,329	2,273	2,636	2,890
Median (\$)	3,242	3,500	2,772	3,500	3,946	3,500	1,994	3,500	4,973	3,500

Note: Dealer reports and survey responses excluded those reported no fish sales in 2020 in the survey (n=52) and fishermen did not answer fish sale question (n=13). In addition, dealer reports excluded 28 cases without dealer records in 2020 but reported fish sales in the survey.

Table 34 shows the distribution, average, and median of revenue from fish sold reported by survey respondents. The average revenue from fish sale was calculated using the medians of response bins, except for those who reported the highest category of sale value bin (>\$50,000), the actual reported values were used. Among the 12 respondents who reported the highest category of value, 9 of them reported the actual sale values. The missing values from the other 3 fishermen were compared with the dealer records. One record was more than \$50,000 and was used to replace the missing value and 2 records were below \$50,000 and the lower end value of the category \$50,001 was used to replace the missing values. The average revenue from fish sold by all respondents was \$10,116. Hawai‘i County fishermen reported the highest value of fish sold (\$12,705), whereas O‘ahu fishermen reported lowest value (\$7,173). Full-time commercial fishermen, as expected, reported highest value of fish sold (\$35,709), followed by cultural fishermen (\$19,250, note for the small base), part-time commercial fishermen (\$8,983), subsistence fishermen (\$6,382), and recreational expenses fishermen (\$3,917). Purely recreational fishermen reported selling close to \$3,000 of their catch. Fishermen who used bait for pelagic species most often reported highest value of fish sold (\$18,702), whereas those who trolled and used handline for Deep 7 bottomfish most often sold approximately \$8,000. Those who used spear most often reported the lowest revenue (\$2,400).

**Table 34. Survey responses: “In 2020, what was the approximate value of all the fish you sold?” (percentage of responses, mean, and median).**

	Number of respondents (n)	\$1-\$100 (%)	\$101-\$500 (%)	\$501-\$1,000 (%)	\$1,001-\$2,000 (%)	\$2,001-\$5,000 (%)	\$5,001-\$10,000 (%)	\$10,001-\$20,000 (%)	\$20,001-\$50,000 (%)	More than \$50k (%)	Mean <sup>a</sup> (\$)	Median <sup>a</sup> (\$)
All respondents	280	2.5	8.9	10.7	15.7	22.1	17.1	10.0	8.6	4.3	10,116	3,500
By county												
O‘ahu	93	4.3	7.5	11.8	17.2	21.5	20.4	9.7	5.4	2.2	7,173	3,500
Hawai‘i	109	0.9	9.2	10.1	14.7	22.0	15.6	11.9	9.2	6.4	12,705	3,500
Maui	44	2.3	11.4	9.1	18.2	25.0	13.6	6.8	11.4	2.3	9,047	3,500
Kaua‘i	33	3.0	9.1	12.1	12.1	21.2	18.2	6.1	12.1	6.1	11,135	3,500
By primary fishing motivation												
Recreational expense	92	2.2	12.0	15.2	20.7	25.0	18.5	5.4	1.1	0.0	3,917	2,500
Part-time commercial	87	1.1	4.6	5.7	12.6	28.7	21.8	13.8	11.5	0.0	8,983	3,500
Subsistence	27	7.4	14.8	14.8	14.8	25.9	3.7	11.1	3.7	3.7	6,382	1,500
Full-time commercial	34	2.9	2.9	2.9	5.9	2.9	14.7	14.7	20.6	32.4	35,709	35,000
Purely recreational	9	11.1	33.3	22.2	11.1	0.0	11.1	11.1	0.0	0.0	2,939	750
Cultural	4	0.0	0.0	0.0	0.0	50.0	0.0	0.0	50.0	0.0	19,250	19,250
By most common gear												
Troll	144	3.5	10.4	12.5	18.1	25.0	13.2	7.6	6.3	3.5	7,985	3,500
Bait for pelagic	43	0.0	9.3	4.7	7.0	16.3	16.3	18.6	20.9	7.0	18,702	7,500
Handline for Deep 7 bottomfish	40	2.5	5.0	15.0	17.5	17.5	20.0	15.0	5.0	2.5	7,904	3,500
Handline/rod and reel for shallow bottomfish	22	4.5	9.1	0.0	22.7	27.3	27.3	0.0	9.1	0.0	6,552	3,500
Spear	5	0.0	0.0	40.0	40.0	0.0	20.0	0.0	0.0	0.0	2,400	1,500
By sub-fishery												
Pelagic Deep 7 bottomfish	268	2.6	9.3	11.2	16.0	22.8	15.7	9.7	8.6	4.1	9,860	3,500
Non-deep 7 bottomfish	162	1.9	8.6	9.9	14.2	23.5	14.8	11.1	11.1	4.9	11,474	3,500
Coral reef	167	2.4	8.4	9.0	18.0	19.8	20.4	6.6	10.2	5.4	11,121	3,500
	50	0.0	8.0	6.0	18.0	24.0	14.0	10.0	16.0	4.0	12,209	3,500

<sup>a</sup> Calculated using the medians of the response bins.

Annual revenues saw an increase of 5% in 2020 when compared to the inflation-adjusted revenues in 2013. This was lower than the 16% increase in annual landings, likely due to the COVID impact on fish prices. Although Hawai‘i County saw a large increase in annual landing (34% increase), the increase in annual revenue was less (28%). For Maui fishermen, landings were almost unchanged in 2020, and revenue dropped with lower prices. For Kaua‘i fishermen, landings increased but revenue decreased. This could be because Kaua‘i had the highest proportion of full-time and part-time commercial fishermen (60%) across counties, and the price impact could be more severe with larger buyers like dealers, wholesalers, and auction. For O‘ahu fishermen, with slightly lower landings in 2020, their revenue remained almost unchanged. This could be because O‘ahu had the lowest proportion of full-time and part-time commercial fishermen (32%), and the price impact was less severe to non-commercial fishermen as they were able to sell the catch to friends/neighbors/coworkers and roadside/farmers’ markets.

All fishermen, except full-time and part-time commercial fishermen, had higher annual revenue in 2020. Although full-time commercial fishermen had higher annual landings in 2020, they had lower annual revenues and they were the group that was most impacted by COVID financially. Part-time commercial fishermen also had lower revenues, but to a lesser extent. Subsistence fishermen saw an almost 50% increase in annual landings, so their annual revenues increased substantially. Cultural fishermen had more than double of the annual landings in 2020 and their annual revenues increased almost four times. This could be due to the higher proportion of catch for sale in 2020 (increased from 37% in 2013 to 62% in 2020). For both purely recreational and recreational expense fishermen, their annual landings were relatively stable in 2020 and their annual revenue increased by around \$900–\$1,800. They were less impacted by COVID as they were more able to sell their fish to friends/neighbors/coworkers than commercial fishers given their low landings (Table 35).

**Table 35. Average annual revenue of fish sold, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	2020	2013	Percentage change (%)
All respondents	10,116	9,626	5
<b>By county</b>			
O‘ahu	7,173	7,013	2
Hawai‘i	12,705	9,892	28
Maui	9,047	12,784	-29
Kaua‘i	11,135	12,153	-8
<b>By primary fishing motivation (2020) and fisherman type (2013)</b>			
Recreational expense	3,917	3,030	29
Part-time commercial	8,983	9,451	-5
Subsistence	6,382	2,146	197
Full-time commercial	35,709	40,017	-11
Purely recreational	2,939	1,121	162
Cultural	19,250	4,393	338

Table 36 presents the distribution, average, and median value of fish sold per trip. Average value of fish sold per trip was calculated based on the value of fish sold divided by the number of boat fishing trips in 2020 (using the median of survey response bins if actual values were not provided). The average value of fish sold per trip for all respondents was \$306, and it varied greatly by fishing motivation with full-time commercial fishermen selling more than \$500 per trip. Subsistence fishermen sold \$326, and part-time commercial fishermen sold \$284, whereas recreational expense fishermen sold around half of the subsistence fishermen (\$166), and purely recreational fishermen sold around half of part-time commercial fishermen (\$143). Across different gears, fishermen who used bait for pelagic species gear most often sold the most at \$519 per trip.

**Table 36. Estimated revenue of fish sold per trip (percentage of responses, mean, and median).**

	Number of respondents (n)	≤ \$50 (%)	\$51–\$100 (%)	\$101–\$500 (%)	More than \$500 (%)	Mean <sup>a</sup> (\$)	Median <sup>a</sup> (\$)
All respondents	278	27.0	15.1	43.9	14.0	305.8	151.2
<b>By county</b>							
O‘ahu	93	29.0	14.0	45.2	11.8	268.2	125.0
Hawai‘i	108	26.9	17.6	43.5	12.0	310.5	150.1
Maui	43	20.9	16.3	41.9	20.9	376.7	194.4
Kaua‘i	33	30.3	9.1	42.4	18.2	300.7	129.6
<b>By primary fishing motivation</b>							
Recreational expense	92	32.6	14.1	50.0	3.3	165.5	120.8
Part-time commercial	86	19.8	15.1	48.8	16.3	283.7	194.4
Subsistence	26	38.5	19.2	23.1	19.2	325.7	97.2
Full-time commercial	34	17.6	8.8	44.1	29.4	502.6	268.2
Purely recreational	9	66.7	11.1	11.1	11.1	143.3	50.0
Cultural	4	0.0	0.0	75.0	25.0	386.5	393.8
<b>By most common gear</b>							
Troll	144	31.3	14.6	41.0	13.2	257.4	127.3
Bait for pelagic	43	18.6	16.3	46.5	18.6	519.4	194.4
Handline for Deep 7 bottomfish	39	17.9	7.7	53.8	20.5	384.3	200.0
Handline/rod and reel for shallow bottomfish	22	31.8	27.3	40.9	0.0	156.5	97.2
Spear	5	60.0	0.0	40.0	0.0	84.2	46.9
<b>By sub-fishery</b>							
Pelagic	266	28.2	15.0	42.5	14.3	304.8	150.1
Deep 7 bottomfish	160	25.6	14.4	43.8	16.3	351.4	194.4
Non-deep 7 bottomfish	167	28.1	19.2	38.3	14.4	342.1	125.0
Coral reef	50	24.0	20.0	48.0	8.0	257.8	170.1

<sup>a</sup> Calculated using the medians of the response bins.

Fishermen were asked the percent of the value of fish sold came from the sale of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish. The revenue in species groups can be estimated by using the responses from this question and the responses of value of fish sold in 2020. Respondents who reported that less than 100% of value of fish sold were from the four species groups most likely received revenue from other species, such as crab and tako. Table 37 shows the estimated average revenue in four species groups. For all respondents, small boat fishermen on average sold approximately \$6,100 of pelagic fish, \$1,500 of Deep 7 bottomfish, \$870 of shallow bottomfish, and \$650 of reef fish. By county, Hawai‘i County fishermen sold the most of pelagic fish (\$8,746), whereas Maui fishermen had the highest sold value of Deep 7 bottomfish (\$3,026), Kaua‘i fishermen had the highest sold value of reef fish (\$1,799), and O‘ahu fishermen had the highest sold value of shallow bottomfish (\$1,161). Among different fishing motivation, full-time commercial fishermen sold the most of pelagic fish (\$20,914) and shallow bottomfish (\$3,014), whereas cultural fishermen sold the most of Deep 7 bottomfish (\$5,250) and reef fish (\$4,813).

**Table 37. Estimated annual revenue of fish sold by species group (mean and media) (\$).**

	Number of Respondents (n)	Annual value of fish sold (Mean)	Annual value of fish sold (Median)	Annual value of fish sold of pelagic fish (Mean)	Annual value of fish sold of Deep 7 bottomfish (Mean)	Annual value of fish sold of shallow bottomfish (Mean)	Annual value of fish sold of reef fish (Mean)
All respondents	280	10,116	3,500	6,098	1,540	871	653
<b>By county</b>							
O‘ahu	93	7,173	3,500	3,187	1,517	1,161	633
Hawai‘i	109	12,705	3,500	8,746	1,155	622	336
Maui	44	9,047	3,500	4,916	3,026	674	589
Kaua‘i	33	11,135	3,500	7,180	959	1,117	1,799
<b>By primary fishing motivation</b>							
Recreational expense	102	3,917	2,500	2,162	1,087	368	217
Part-time commercial	87	8,983	3,500	5,955	1,241	716	618
Subsistence	27	6,382	1,500	4,266	370	1,255	445
Full-time commercial	34	35,709	35,000	20,914	4,068	3,014	1,474
Purely recreational	9	2,939	750	2,009	502	143	190
Cultural	4	19,250	19,250	8,313	5,250	875	4,813
<b>By most common gear</b>							
Troll	144	7,985	3,500	6,062	874	569	248
Bait for pelagic	43	18,702	7,500	13,114	663	1,129	256
Handline for Deep 7 bottomfish	40	7,904	3,500	1,246	5,607	890	43
Handline/rod and reel for shallow bottomfish	22	6,552	3,500	642	1,102	2,389	1,549
Spear	5	2,400	1,500	239	38	452	1,673
<b>By sub-fishery</b>							
Pelagic	268	9,860	3,500	6,316	1,454	801	523
Deep 7 bottomfish	162	11,474	3,500	6,356	2,557	950	671

	Number of Respondents (n)	Annual value of fish sold (Mean)	Annual value of fish sold (Median)	Annual value of fish sold of pelagic fish (Mean)	Annual value of fish sold of Deep 7 bottomfish (Mean)	Annual value of fish sold of shallow bottomfish (Mean)	Annual value of fish sold of reef fish (Mean)
Non-deep 7 bottomfish	167	11,121	3,500	6,418	1,646	1,252	744
Coral reef	50	12,209	3,500	5,063	1,607	752	2,797

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

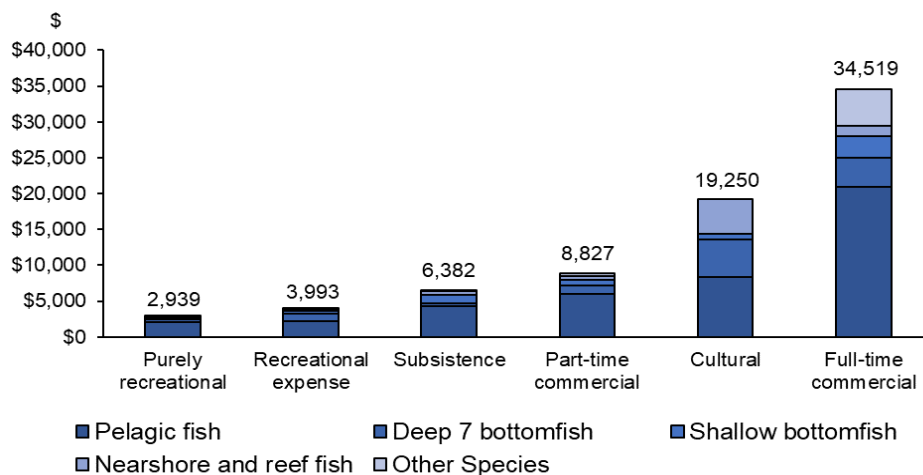
Table 38 shows the estimated percent of revenue by species group. The sold value of pelagic fish represents 61% of total value of fish sold across respondents, followed by Deep 7 bottomfish (15%), shallow bottomfish (9%), reef fish (7%), and other species (8%). Across counties and primary fishing motivations, value of fish sold predominantly came from pelagic fish as it was the highest landing species group, but the importance of the second species group varied across counties and motivations. These include Maui fishermen who reported higher percent of fish sold from Deep 7 bottomfish, O‘ahu fishermen who reported higher percent of fish sold from shallow bottomfish, and Kaua‘i fishermen who reported higher value of fish sold from reef fish. Across fishing motivations, recreational expense fishermen reported higher value of fish sold from Deep 7 bottomfish and subsistence fishermen reported higher value of fish sold from shallow bottomfish.

**Table 38. Estimated distribution of annual revenue of fish sold by species group.**

	Number of respondents (n)	Annual value of fish sold of pelagic fish (%)	Annual value of fish sold of Deep 7 bottomfish (%)	Annual value of fish sold of shallow bottomfish (%)	Annual value of fish sold of reef fish (%)	Other (%)
All respondents	271	61.0	15.4	8.7	6.5	8.4
<b>By county</b>						
O‘ahu	92	46.4	22.1	16.9	9.2	5.4
Hawai‘i	103	69.2	9.1	4.9	2.7	14.1
Maui	42	52.4	32.3	7.2	6.3	1.8
Kaua‘i	33	64.5	8.6	10.0	16.2	0.7
<b>By primary fishing motivation</b>						
Recreational expense	89	54.1	27.2	9.2	5.4	4.0
Part-time commercial	84	67.5	14.1	8.1	7.0	3.4
Subsistence	27	66.9	5.8	19.7	7.0	0.7
Full-time commercial	33	60.6	11.8	8.7	4.3	14.6
Purely recreational	9	68.3	17.1	4.9	6.5	3.2
Cultural	4	43.2	27.3	4.5	25.0	0.0
<b>By most common gear</b>						

	Number of respondents (n)	Annual value of fish sold of pelagic fish (%)	Annual value of fish sold of Deep 7 bottomfish (%)	Annual value of fish sold of shallow bottomfish (%)	Annual value of fish sold of reef fish (%)	Other (%)
Troll	137	75.2	10.8	7.1	3.1	3.8
Bait for pelagic	43	70.1	3.5	6.0	1.4	18.9
Handline for Deep 7 bottomfish	40	15.8	70.9	11.3	0.5	1.5
Handline/rod and reel for shallow bottomfish	21	9.4	16.2	35.2	22.8	16.4
Spear	5	9.9	1.6	18.8	69.7	0.0
<b>By sub-fishery</b>						
Pelagic	261	63.5	14.6	8.1	5.3	8.6
Deep 7 bottomfish	159	54.5	21.9	8.2	5.8	9.6
Non-deep 7 bottomfish	165	57.1	14.6	11.1	6.6	10.5
Coral reef	48	48.6	15.4	7.2	26.8	2.0

Similar to landings by fishing motivations, revenue and revenue by species varied largely across fishing motivations. Figure 26 displays the value of fish sold by species group for different fishing motivations. For all fishermen (except for cultural and recreational expense), pelagic fish represented about 60% to 70% of total revenue. For recreational expense fishermen, Deep 7 bottomfish represented 27% of their total revenue. For subsistence fishermen, shallow bottomfish represented 20% of their total revenue.

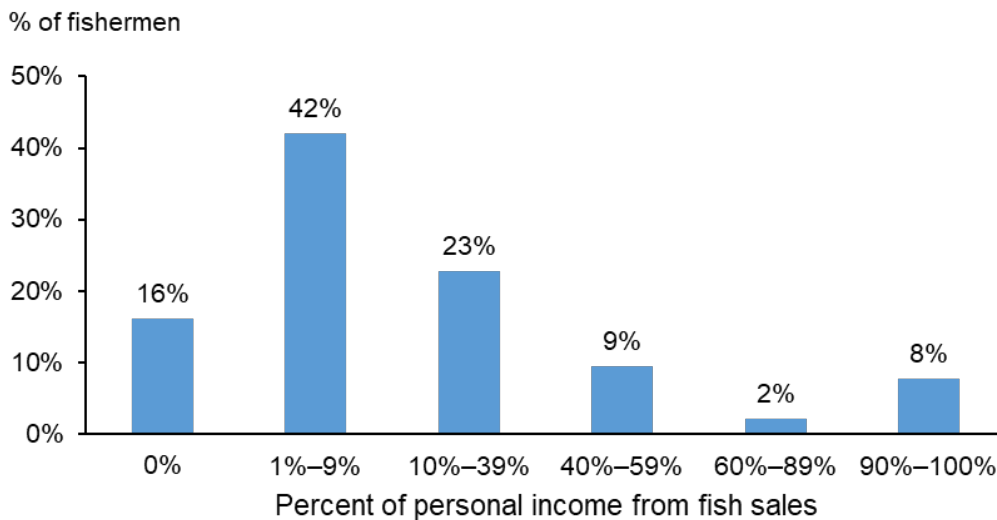


**Figure 26. Estimated average annual value of fish sold by species and primary fishing motivation.**

Note: the value of fish sold for some fishing motivations in Figure 25 are slightly different than the total value of fish sold displayed earlier because not all respondents answered both value of fish sold and percent of the value of fish sold from the four species groups' questions.



Income from fishing plays different roles among fisherman types. Figure 27 shows the contribution of fishing income to total personal income. About 2 in 5 fishermen (42%) reported fishing income contributed only 1% to 9% of their personal income and 1 in 4 fishermen (23%) reported fishing income contributed 10% to 39% of their personal income. However, 8% of survey respondents reported fishing income contributed 90% to 100% of their personal income. The latter is not surprising since about 11% of fishermen self-identified as full-time commercial fishermen. On average, fishing income contributed about 21% of their total personal income (calculated using medians of response bins), which is quite a substantial contribution.



**Figure 27. Percent of personal income obtained from fish sales.**

Table 39 shows that the percentage of personal income obtained from fish sales by subgroup. Fishermen on Maui County were more reliant on fishing income with an average 24% of their income coming from fish sales compared with fishermen on other counties. As expected, full-time commercial fishermen were heavily reliant on fish sale as a source of income with 44% reported that almost all (90%–100%) of their personal income came from fish sales. In addition, fishermen who used bait for pelagic species most often had higher percentage of personal income derived from fish sale than fishermen who used other gears.

**Table 39. Survey responses: “In 2020, what percent of your personal income came from the sale of fish?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	286	16.1	42.0	22.7	9.4	2.1	7.7	21.4
By county								
O‘ahu	95	21.1	42.1	21.1	7.4	3.2	5.3	18.4
Hawai‘i	112	10.7	42.0	25.9	12.5	1.8	7.1	22.9

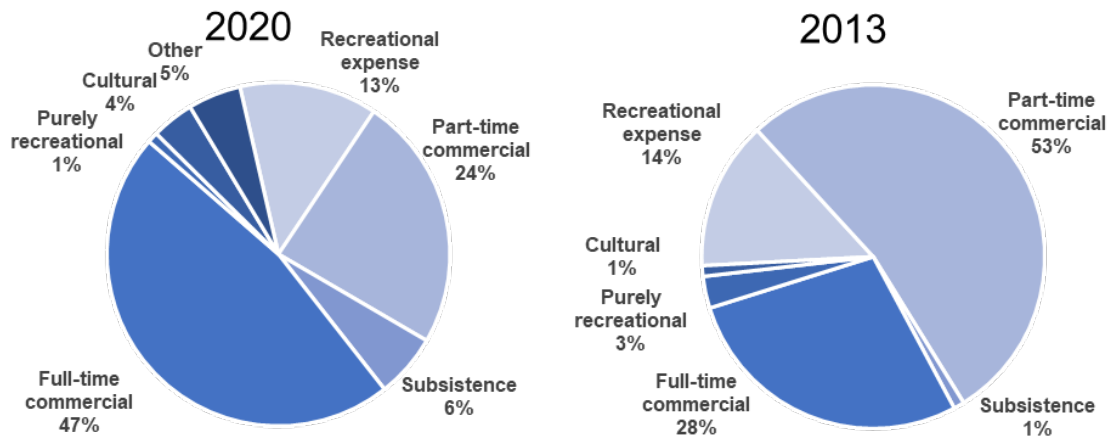
	Number of respondents (n)	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)	Mean <sup>a</sup> percentage (%)
Maui	44	11.4	45.5	22.7	6.8	2.3	11.4	23.9
Kaua'i	34	23.5	38.2	17.6	8.8	0.0	11.8	21.9
<b>By primary fishing motivation</b>								
Recreational expense	93	30.1	52.7	11.8	4.3	0.0	1.1	8.8
Part-time commercial	88	9.1	36.4	37.5	12.5	2.3	2.3	21.3
Subsistence	27	22.2	40.7	29.6	3.7	3.7	0.0	14.1
Full-time commercial	34	0.0	8.8	11.8	26.5	8.8	44.1	65.1
Purely recreational	9	33.3	55.6	11.1	0.0	0.0	0.0	5.6
Cultural	4	0.0	75.0	25.0	0.0	0.0	0.0	10.0
<b>By most common gear</b>								
Troll	146	19.9	50.7	15.8	6.2	1.4	6.2	16.4
Bait for pelagic	46	15.2	23.9	32.6	19.6	2.2	6.5	27.0
Handline for Deep 7 bottomfish	41	14.6	43.9	26.8	4.9	0.0	9.8	20.6
Handline/rod and reel for shallow bottomfish	22	9.1	45.5	27.3	4.5	4.5	9.1	23.4
Spear	5	20.0	20.0	60.0	0.0	0.0	0.0	16.0
<b>By sub-fishery</b>								
Pelagic	274	16.8	42.7	22.6	8.8	1.8	7.3	20.5
Deep 7 bottomfish	166	15.7	38.0	25.9	10.8	2.4	7.2	22.5
Non-deep 7 bottomfish	173	15.6	39.3	26.6	10.4	1.2	6.9	21.3
Coral reef	52	15.4	28.8	30.8	15.4	3.8	5.8	25.2

<sup>a</sup> Calculated using the medians of the response bins.

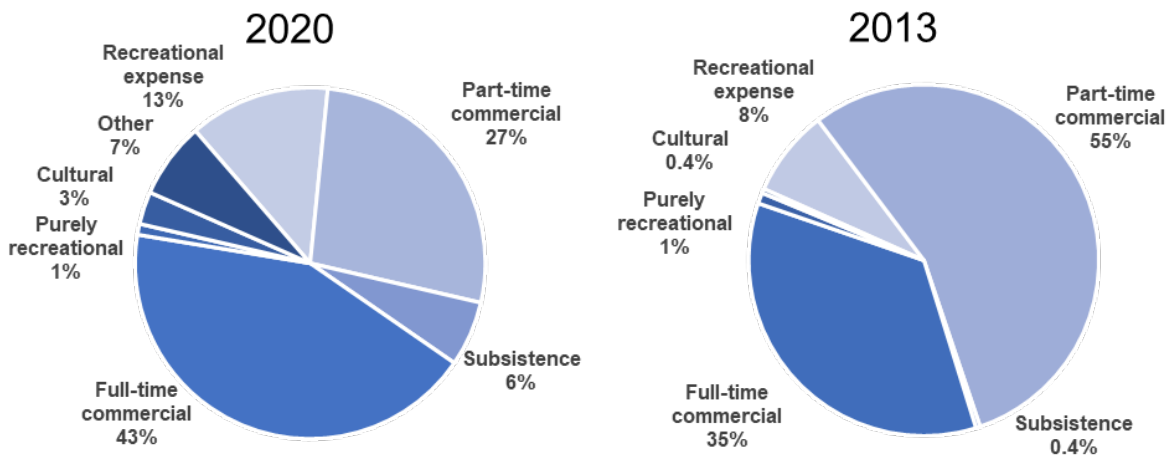
## Total Catch and Revenue by Primary Fishing Motivation

The previous section shows the distribution of landing and value of fish sold for all respondents and within individual subgroups. The diversity of fishermen can also be shown by comparing the contribution of catch and revenue to total by primary fishing motivation. Figure 28 and Figure 29 represent the corresponding percentage of catch and revenue in both years, respectively. In 2020, full-time commercial fishermen represented 11% of survey respondents; together they caught 47% of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish (Figure 28), and 43% of the total value of fish sold (Figure 29), which was higher than the percentages in 2013. With fewer part-time commercial fishermen in 2020 (a drop from 51% to 30%), their catch represented 24% of total fish caught and 27% of total value, which was about half of the proportion in 2013. With the largest increase in subsistence fishermen in 2020, their catch and revenue also saw a large increase. However, as their landings and sold values were relatively low when compared with commercial fishermen, they only represented 6% of the total landings and values. Recreational expense fishermen were the most represented group (34%) in 2020, but their catch only represented 13% of total catch and total value, due to the low landings and sold values (second lowest group). Purely recreational fishermen represented 8% of respondents, but

their catch represented only 1% of total catch and value as their landings and sold values were the lowest. Note: the category “other” in Figure 28 and Figure 29 refers to those who did not rank their fishing motivations and therefore primary fishing motivation was unknown.



**Figure 28. Pounds of pelagic fish, Deep 7 bottomfish, shallow bottomfish, and nearshore & reef fish caught by primary fishing motivation (2020) and fisherman type (2013).**



**Figure 29. Value of fish sold by primary fishing motivation (2020) and fisherman type (2013).**

### Trip Costs

One of the primary goals of this study is to update our understanding on the costs of fishing and to detail current levels of investment in the fishery. Fishermen were asked their trip costs for the most common and second most common gear types they had used in 2020. This information provides us with the variable costs for the operation of vessel including boat fuel, truck fuel, oil, ice, bait, food and beverage, daily maintenance and repair, gear lost, and other. Table 40 shows the average fishing trip costs for all respondents and the itemized costs. A typical small boat fishing trip costed \$302 on average with a median cost of \$250. The highest cost category were fuel costs (\$141 including \$120 for boat fuel and \$21 for truck fuel), and it contributed 47% of

the trip costs. The second most important cost item was ice (\$36), which contributed 12% of trip costs; followed by gear lost, food and beverage, daily maintenance & repair (each \$28), and bait (\$27); and each contributed 9% of trip costs. Other costs included oil (\$5) and other trip cost (\$8).

**Table 40. Fishing trip costs for most common and second most common gear usage (total and itemized) (mean, standard error, and median).**

<b>Category</b>	<b>Number of responses (n)</b>	<b>Mean (\$)</b>	<b>Standard error (\$)</b>	<b>Median (\$)</b>	<b>Percentage of total trip cost (%)</b>
Boat fuel	553	119.72	4.80	100	39.7
Truck fuel	553	21.51	0.83	20	7.1
Oil	553	5.34	0.48	0	1.8
Ice	553	35.56	1.64	26	11.8
Bait	553	27.10	1.44	20	9.0
Food and beverage	553	28.06	1.24	20	9.3
Daily maintenance & repair	553	28.13	2.20	15	9.3
Gear lost	553	28.42	2.14	15	9.4
Other trip cost	553	7.81	1.75	0	2.6
Total trip cost	553	301.65	10.48	250	100.0

When compared with the inflation adjusted trip costs in 2013, the average trip costs in 2020 was almost the same but one thing to note is gear lost was not asked in the 2014 survey. If excluding the cost of gear lost, the average trip cost was lower in 2020. Almost all categories were lower in 2020, especially in boat fuel and truck fuel (Table 41).

**Table 41. Average fishing trip costs for most common and second most common gear usage, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

<b>Category</b>	<b>2020 (\$)</b>	<b>2013 (\$)</b>	<b>\$ amount change</b>
Boat fuel	119.72	147.39	-27.68
Truck fuel	21.51	28.19	-6.68
Oil	5.34	8.32	-2.99
Ice	35.56	36.48	-0.93
Bait	27.10	26.28	0.83
Food and beverage	28.06	28.51	-0.45
Daily maintenance & repair	28.13	26.91	1.22
Gear lost	28.42	-	-
Other trip cost	7.81	0.78	7.03
Total trip cost	301.65	302.57	-0.93
Number of responses (n)	553	1193	

Table 42 shows the fishing trip costs by county. Across the four counties, Maui County fishermen reported highest average trip cost (\$352), followed by Kaua‘i fishermen (\$311), Hawai‘i County fishermen (\$299), and O‘ahu fishermen (\$281). The higher trip cost for Maui County fishermen was mainly due to relatively higher costs on boat fuel (\$144).

**Table 42. Fishing trip costs by county (mean, standard error, and median).**

<b>Category</b>	<b>County</b>	<b>Number of responses (n)</b>	<b>Mean (\$)</b>	<b>Standard error (\$)</b>	<b>Median (\$)</b>	<b>Percentage of total trip cost (%)</b>
Boat fuel	O'ahu	203	115.35	6.87	100	41.0
	Big Island	206	111.26	8.17	100	37.2
	Maui	82	144.49	12.69	120	41.1
	Kaua'i	60	128.93	17.90	83.5	41.5
Truck fuel	O'ahu	203	18.40	1.05	15	6.5
	Big Island	206	23.05	1.45	20	7.7
	Maui	82	28.53	2.94	20	8.1
	Kaua'i	60	17.70	1.75	15.5	5.7
Oil	O'ahu	203	5.23	0.73	0	1.9
	Big Island	206	4.69	0.69	0	1.6
	Maui	82	7.88	1.88	0	2.2
	Kaua'i	60	4.62	1.00	0	1.5
Ice	O'ahu	203	31.33	1.72	25	11.1
	Big Island	206	34.24	2.95	25	11.5
	Maui	82	37.13	3.21	30	10.6
	Kaua'i	60	52.58	8.26	31	16.9
Bait	O'ahu	203	22.49	1.96	15	8.0
	Big Island	206	32.89	2.72	25	11.0
	Maui	82	30.38	3.86	20	8.6
	Kaua'i	60	19.05	3.70	0	6.1
Food and beverage	O'ahu	203	28.03	1.48	20	10.0
	Big Island	206	23.76	1.93	20	7.9
	Maui	82	33.78	3.31	25	9.6
	Kaua'i	60	35.30	6.25	25	11.3
Daily maintenance & repair	O'ahu	203	29.81	2.87	20	10.6
	Big Island	206	28.46	4.74	10	9.5
	Maui	82	27.07	3.34	20	7.7
	Kaua'i	60	21.65	5.54	10	7.0
Gear lost	O'ahu	203	21.52	1.97	15	7.7
	Big Island	206	34.08	4.58	10	11.4
	Maui	82	29.35	4.57	20	8.3
	Kaua'i	60	29.95	7.52	10	9.6
Other trip cost	O'ahu	203	8.88	3.18	0	3.2
	Big Island	206	6.53	2.39	0	2.2
	Maui	82	13.29	6.39	0	3.8
	Kaua'i	60	1.25	0.71	0	0.4
Total trip cost	O'ahu	203	281.03	12.17	265	
	Big Island	206	298.96	20.14	225	
	Maui	82	351.91	26.29	280	
	Kaua'i	60	311.04	39.02	222	

Table 43 shows the fishing trip costs by gear type based on fishermen’s most common and second most common gear types in 2020. Higher trip costs were reported for trolling trips and handline for Deep 7 bottomfish trips (\$304), followed by dead bait/live bait for pelagic trips (\$300). Lower trip costs were reported for handline/rod and reel for shallow bottomfish trips (\$258) and spearfishing trips (\$222). Boat fuel cost contributed almost half of the trip costs for trolling trip (\$139), and about 30% to 37% for the other trip types. Bait was a higher contributor for handline for Deep 7 bottomfish trips (\$46), ice and gear lost were higher contributors for dead bait/live bait for pelagic trips (\$38 and \$31, respectively), and daily maintenance & repair was a higher contributor for handline/rod and reel for shallow bottomfish trips (\$37).

**Table 43. Fishing trip costs by gear type (based on fishermen using this gear as their most common and second most common gear types) (mean, standard error, and median).**

Category	Gear type	Number of responses (n)	Mean (\$)	Standard error (\$)	Median (\$)	Percentage of total trip cost (%)
Boat fuel	Troll	231	138.97	8.09	120	45.7
	Bait for pelagic	98	111.94	9.56	97.5	37.3
	Handline for Deep 7 bottomfish	82	109.59	9.34	100	36.1
	Handline/rod and reel for shallow bottomfish	74	76.96	10.19	50	29.9
	Spear	11	70.00	18.95	50	31.6
Truck fuel	Troll	231	21.37	1.19	20	7.0
	Bait for pelagic	98	21.49	2.16	17.5	7.2
	Handline for Deep 7 bottomfish	82	19.47	1.54	20	6.4
	Handline/rod and reel for shallow bottomfish	74	20.20	2.97	15	7.8
	Spear	11	18.82	4.29	16	8.5
Oil	Troll	231	5.65	0.74	0	1.9
	Bait for pelagic	98	5.11	0.74	1	1.7
	Handline for Deep 7 bottomfish	82	4.07	0.77	0	1.3
	Handline/rod and reel for shallow bottomfish	74	5.36	1.77	0	2.1
	Spear	11	2.36	1.34	0	1.1
Ice	Troll	231	35.13	2.46	30	11.6
	Bait for pelagic	98	38.11	3.75	30	12.7
	Handline for Deep 7 bottomfish	82	30.59	3.01	24.5	10.1
	Handline/rod and reel for shallow bottomfish	74	30.24	4.77	20	11.7
	Spear	11	28.00	13.91	10	12.6
Bait	Troll	231	16.74	1.61	9	5.5
	Bait for pelagic	98	31.68	2.79	30	10.6

<b>Category</b>	<b>Gear type</b>	<b>Number of responses (n)</b>	<b>Mean (\$)</b>	<b>Standard error (\$)</b>	<b>Median (\$)</b>	<b>Percentage of total trip cost (%)</b>
	Handline for Deep 7 bottomfish	82	45.57	3.97	40	15.0
	Handline/rod and reel for shallow bottomfish	74	24.32	4.02	12.5	9.4
	Spear	11	26.73	23.88	0	12.0
Food and beverage	Troll	231	28.12	1.92	20	9.3
	Bait for pelagic	98	25.26	2.34	20	8.4
	Handline for Deep 7 bottomfish	82	30.20	2.82	25	9.9
	Handline/rod and reel for shallow bottomfish	74	29.63	5.17	20	11.5
	Spear	11	18.18	1.69	20	8.2
Daily maintenance & repair	Troll	231	27.10	3.79	20	8.9
	Bait for pelagic	98	27.11	4.36	17.5	9.0
	Handline for Deep 7 bottomfish	82	26.83	4.91	17.5	8.8
	Handline/rod and reel for shallow bottomfish	74	36.58	7.24	17.5	14.2
	Spear	11	15.00	6.40	10	6.8
Gear lost	Troll	231	26.07	2.56	15	8.6
	Bait for pelagic	98	31.23	5.12	20	10.4
	Handline for Deep 7 bottomfish	82	26.00	3.62	20	8.6
	Handline/rod and reel for shallow bottomfish	74	24.07	5.08	10	9.3
	Spear	11	14.55	13.58	0	6.6
Other trip cost	Troll	231	4.71	1.55	0	1.6
	Bait for pelagic	98	7.96	4.83	0	2.7
	Handline for Deep 7 bottomfish	82	11.65	6.40	0	3.8
	Handline/rod and reel for shallow bottomfish	74	10.20	4.93	0	4.0
	Spear	11	28.18	27.20	0	12.7
Total trip cost	Troll	231	303.87	16.21	260	
	Bait for pelagic	98	299.90	23.38	245.5	
	Handline for Deep 7 bottomfish	82	303.96	22.06	267	
	Handline/rod and reel for shallow bottomfish	74	257.57	33.35	166.75	
	Spear	11	221.82	100.23	97	

Table 44 shows the fishing trip costs by primary fishing motivation. Full-time commercial fishermen spent more per fishing trip (\$349), followed by part-time commercial fishermen (\$279), and recreational expense fishermen (\$275). Subsistence fishermen (\$262) and purely recreational fishermen (\$235) tended to be more cautious on cost and reported lower trip costs. Be caution for the high trip costs (\$863) reported by cultural fishermen, due to a small base (n=6). Excluding cultural fishermen, full-time commercial fishermen spent more on boat fuel (\$132), ice (\$55), gear lost (\$41), bait (\$33), daily maintenance & repair (\$31), and oil (\$7). Subsistence fishermen spent more on food and beverage (\$29).

**Table 44. Fishing trip costs by primary fishing motivation (mean, standard error, and median).**

Category	Primary motivation	Number	Mean	Standard	Median	Percentage
		of responses (n)		error (\$)		of total trip cost (%)
Boat fuel	Recreational expense	173	114.45	6.74	100	41.6
	Part-time commercial	142	113.84	6.94	100	40.7
	Subsistence	80	104.61	9.02	86	39.9
	Full-time commercial	57	132.42	16.26	100	37.9
	Purely recreational	43	96.14	20.27	50	40.9
	Cultural	6	340.00	92.56	275	39.4
Truck fuel	Recreational expense	173	19.12	1.24	18.5	7.0
	Part-time commercial	142	23.17	1.53	20	8.3
	Subsistence	80	19.83	1.82	18.5	7.6
	Full-time commercial	57	21.63	2.32	20	6.2
	Purely recreational	43	15.02	3.04	10	6.4
	Cultural	6	53.33	29.85	20	6.2
Oil	Recreational expense	173	4.83	0.80	0	1.8
	Part-time commercial	142	4.50	0.65	0	1.6
	Subsistence	80	3.95	0.75	0	1.5
	Full-time commercial	57	6.79	1.69	2	1.9
	Purely recreational	43	4.86	1.24	0	2.1
	Cultural	6	40.83	18.99	17.5	4.7
Ice	Recreational expense	173	30.17	2.01	25	11.0
	Part-time commercial	142	33.38	2.57	25	11.9
	Subsistence	80	31.11	2.83	21	11.9
	Full-time commercial	57	54.96	7.53	40	15.7
	Purely recreational	43	24.02	3.80	20	10.2
	Cultural	6	81.67	43.70	40	9.5
Bait	Recreational expense	173	24.55	2.34	20	8.9
	Part-time commercial	142	24.80	2.22	20	8.9
	Subsistence	80	22.50	3.55	20	8.6
	Full-time commercial	57	32.65	4.34	26	9.3
	Purely recreational	43	14.51	3.96	5	6.2
	Cultural	6	56.67	19.61	60	6.6
Food and	Recreational expense	173	27.62	1.81	20	10.0



Category	Primary motivation	Number	Mean	Standard	Median	Percentage
		of responses (n)		error (\$)		of total trip cost (%)
beverage	Part-time commercial	142	24.67	1.64	20	8.8
	Subsistence	80	28.88	2.90	20	11.0
	Full-time commercial	57	26.54	2.93	24	7.6
	Purely recreational	43	21.47	2.10	20	9.1
	Cultural	6	115.00	54.45	85	13.3
Daily maintenance & repair	Recreational expense	173	26.28	3.16	20	9.6
	Part-time commercial	142	24.15	2.88	20	8.6
	Subsistence	80	23.30	4.99	10	8.9
	Full-time commercial	57	31.25	6.00	20	8.9
	Purely recreational	43	16.21	2.75	10	6.9
Gear lost	Cultural	6	73.33	46.02	35	8.5
	Recreational expense	173	24.28	3.03	15	8.8
	Part-time commercial	142	23.32	2.98	12	8.3
	Subsistence	80	18.78	2.64	10	7.2
	Full-time commercial	57	40.70	10.73	20	11.6
Other trip cost	Purely recreational	43	25.63	6.32	10	10.9
	Cultural	6	85.00	45.37	50	9.9
	Recreational expense	173	3.70	1.73	0	1.3
	Part-time commercial	142	7.57	3.01	0	2.7
	Subsistence	80	9.13	4.53	0	3.5
Total trip cost	Full-time commercial	57	2.54	1.79	0	0.7
	Purely recreational	43	16.98	11.36	0	7.2
	Cultural	6	16.67	10.54	0	1.9
	Recreational expense	173	275.01	14.55	243	
	Part-time commercial	142	279.42	15.22	242	
	Subsistence	80	262.08	18.96	224	
	Full-time commercial	57	349.49	31.55	280	
	Purely recreational	43	234.84	30.98	203	
	Cultural	6	862.50	242.07	800	

Fishermen were asked how their trip costs were shared among fishermen on board. Almost all of the respondents (95%) paid all trip costs by themselves. For those who shared some percentage of total trip costs, on average they paid 67% of total trip costs.

New questions in the 2021 survey included the amount of boat fuel, truck fuel, ice, and bait used in a fishing trip. On average, respondents used 33 gallons of boat fuel in a trip, 6 gallons of truck fuel, 262 lb of ice, and 1.6 cases of bait. Across counties, Maui fishermen tended to use more bait and fuel for boat and truck, whereas Kaua‘i fishermen tended to use more ice. Excluding the small sample of cultural fishermen, full-time commercial fishermen tended to use more fuel and ice whereas purely recreational fishermen tended to use the least of everything. Across different gear types, trolling trips tended to use more boat fuel and ice whereas spearfishing trips tended to use the least (Table 45).

**Table 45. Survey responses: “On average per trip, how much did you spend on your first and second most common gear type trip?”**

	<b>Number of responses (n)</b>	<b>Boat fuel in gallon (Mean)</b>	<b>Truck fuel in gallon (Mean)</b>	<b>Ice used in pound (Mean)</b>	<b>Bait used in case (Mean)</b>
All respondents	553	32.5	6.2	261.6	1.6
<b>By county</b>					
O‘ahu	124	32.9	5.7	255.1	1.2
Hawai‘i	133	28.8	6.3	247.5	2.0
Maui	53	39.6	8.2	235.9	2.2
Kaua‘i	41	34.2	4.8	371.8	0.9
<b>By primary fishing motivation</b>					
Recreational expense	108	30.8	5.6	216.0	1.5
Part-time commercial	96	33.2	6.7	282.5	1.4
Subsistence	51	27.7	5.4	205.6	1.6
Full-time commercial	36	37.0	6.8	464.5	1.6
Purely recreational	28	25.3	4.8	128.6	0.5
Cultural	6	82.8	14.5	466.7	1.8
<b>Gear type</b>					
Troll	219	37.9	6.3	273.3	1.1
Bait for pelagic	82	31.2	6.3	272.7	1.7
Handline for Deep 7 bottomfish	88	30.1	5.9	264.0	1.8
Handline/rod and reel for shallow bottomfish	70	20.3	6.0	153.9	2.3
Spear	19	17.6	5.5	98.9	1.8

### **Annual Fishing Fixed Costs**

Besides fishing trip costs, small boat fishing in Hawai‘i incurred considerable annual fishing fixed costs regardless of the number of trips taken in a year such as insurance, loan payments, mooring fees, gear replacement and repair, boat and trailer repair, maintenance, and improvement, fees, and financial services, etc. Table 46 shows the annual fixed costs in 2020 for all respondents. On average, survey respondents reported an annual fixed cost of \$7,069, with a median spending of \$3,775. One-third of annual fixed costs were spent on boat and trailer repair, maintenance, and improvement (\$2,337), and another 28% on gear replacement and repair (\$1,969). About 10% were spent on each of the four categories: loan payments, boat insurance, fee, and mooring fees.

**Table 46. Annual fishing fixed costs in 2020 (mean, standard error, median).**

	<b>Number of respondents (n)</b>	<b>Mean (\$)</b>	<b>Standard error (\$)</b>	<b>Median (\$)</b>
Boat and trailer repair/maintenance/improvement	326	2,337	302	973
Gear replacement/repair from wear and tear	326	1,969	188	800
Loan payments	326	718	124	0

	<b>Number of respondents (n)</b>	<b>Mean (\$)</b>	<b>Standard error (\$)</b>	<b>Median (\$)</b>
Boat insurance	326	699	68	300
Fees	326	648	78	300
Mooring fees	326	629	105	0
Financial services	326	49	11	0
Other	326	18	9	0
Annual fixed costs	326	7,069	515	3,775

The inflation adjusted fixed costs increased from \$6,259 in 2013 to \$7,069 in 2020 (13%). Almost all categories (except for loan payments and other) increased in 2020, with the highest percentage increases in boat insurance (48%), financial services (45%), and fees (44%). The high expenditure category, boat and trailer repair, maintenance, and improvement, increased by 27%. Table 47 shows the fixed costs by category in 2020 and 2013, and the percentage changes.

**Table 47. Average annual fishing fixed costs, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	<b>2020 (\$)</b>	<b>2013 (\$)</b>	<b>Percentage change (%)</b>
Boat and trailer repair/maintenance/improvement	2,337	1,842	27
Gear replacement/repair from wear and tear	1,969	1,882	5
Loan payments	718	1,093	-34
Boat insurance	699	473	48
Fees	648	449	44
Mooring fees	629	466	35
Financial services	49	34	45
Other	18	21	-16
Annual fixed costs	7,069	6,259	13
Number of respondents	326	749	

Not all respondents spent on all categories of the fixed costs. Only 19% incurred mooring fees which shows most small boat fishermen used trailers rather than mooring their boats. Slightly more than 10% reported spending on loan payments and financial services. However, almost all (97%) reported spending on fees (e.g. CML, registration for truck and trailer, safety, dry dock, etc., not including mooring fees), gear replacement and repair (93%), and boat and trailer repair, maintenance, and improvements (91%). Sixty percent of respondents reported spending on boat insurance. The actual out-of-pocket expenditures for low incidence categories could be quite different from the averages including all respondents with zero expenditure. Table 48 shows the out-of-pocket expenditures for respondents who had non-zero spending in that category. Loan payments were the highest spending category (\$5,709), followed by mooring fees (\$3,310), boat and trailer repair, maintenance, and improvement (\$2,557), and gear replacement and repair (\$2,126). Tables B38–B40 show the non-zero annual fixed costs by county, primary fishing motivation, and most common gear type used, respectively.

**Table 48. Annual fishing fixed costs in 2020 (non-zero expenditures on individual category) (mean, standard error, and median, and percentage of fleet with expenditure).**

	Number of respondents (n)	Mean (\$)	Standard error (\$)	Median (\$)	Percentage of fleet with expenditure (%)
Boat and trailer repair/maintenance/improvement	298	2,557	328	1,000	91
Gear replacement/repair from wear and tear	302	2,126	201	1,000	93
Loan payments	41	5,709	534	4,800	13
Boat insurance	195	1,169	101	800	60
Fees	315	671	81	300	97
Mooring fees	62	3,310	407	2,880	19
Financial services	35	461	71	300	11
Other	5	1,180	242	1,200	2
Annual fixed costs	326	7,069	515	3,775	

Table 49 shows the annual fishing fixed costs by county. O‘ahu fishermen reported highest fixed costs on average (\$7,697) whereas Maui County fishermen reported lowest (\$6,036). For individual category, O‘ahu fishermen reported higher spending on boat and trailer repair, maintenance, and improvement (\$2,509) and mooring fees (\$1,110), while Hawai‘i County fishermen reported higher spending on gear replacement and repair (\$2,069) and loan payments (\$844). Kaua‘i fishermen reported higher spending on boat insurance (\$942), and Maui fishermen reported higher spending on fees (\$857).

**Table 49. Annual fishing fixed costs in 2020 for all respondents and by county (mean, standard error, and median).**

Category		All respondents	O‘ahu	Hawai‘i	Maui	Kaua‘i
	Number of respondents (n)	326	118	121	48	37
Boat and trailer repair/maintenance/ improvements	Mean	2,337	2,509	2,451	1,838	2,058
	Standard error	302	514	597	355	638
	Median	973	1,000	700	1,100	500
Gear replacement/ repair	Mean	1,969	1,776	2,069	1,770	1,920
	Standard error	188	311	290	469	405
	Median	800	800	800	708	1,000
Loan payments	Mean	718	696	844	529	661
	Standard error	124	231	217	232	257
	Median	-	-	-	-	-
Boat insurance	Mean	699	748	533	737	942
	Standard error	68	103	99	132	340
	Median	300	479	-	502	350
Fees	Mean	648	810	487	857	409
	Standard error	78	120	58	412	65
	Median	300	500	300	300	300

Category		All respondents				
		O'ahu	Hawai'i	Maui	Kaua'i	
Mooring fees	Mean	629	1,110	331	191	538
	Standard error	105	247	93	111	310
	Median	-	-	-	-	-
Financial services	Mean	49	39	55	79	28
	Standard error	11	13	19	44	17
	Median	-	-	-	-	-
Other	Mean	18	10	17	35	27
	Standard error	9	10	17	27	27
	Median	-	-	-	-	-
Annual fixed costs	Mean	7,069	7,697	6,787	6,036	6,582
	Standard error	515	966	868	879	1,203
	Median	3,775	4,562	3,376	4,500	3,300

Table 50 shows the annual fixed costs in 2020 by fishing motivation. As expected, full-time commercial fishermen reported high annual fixed costs (\$11,903), but cultural fishermen reported the highest fixed costs across motivations (\$14,563) due to the high costs on gear replacement and repair, loan payments, and boat insurance. Full-time commercial fishermen reported highest spending on boat and trailer repair, maintenance, and improvement when compared with other types of fishermen. For the rest of the fishing motivations, the fixed costs were around \$5,700 to \$6,800.

**Table 50. Annual fishing fixed costs in 2020 for all respondents and by primary fishing motivation (mean, standard error, and median).**

Category		All respondents	Recreational expense	Part-time commercial	Subsistence	Full-time commercial	Purely recreational	Cultural
		Number of respondents(n)	326	102	90	43	32	24
Boat and trailer repair/maintenance/improvements	Mean	2,337	2,509	2,177	1,860	3,805	1,247	3,550
	Standard error	302	763	456	545	875	427	2,191
	Median	973	850	1,000	500	2,000	350	2,000
Gear replacement/repair	Mean	1,969	1,458	1,898	1,415	4,745	1,760	6,450
	Standard error	188	198	352	306	986	991	4,609
	Median	800	775	675	500	2,500	500	2,750
Loan payments	Mean	718	470	1,143	1,183	300	0	1,500
	Standard error	124	143	303	498	170	0	1,500
	Median	0	0	0	0	0	0	0
Boat insurance	Mean	699	680	642	434	1,214	678	1,250
	Standard error	68	139	86	93	392	164	629
	Median	300	148	400	100	479	452	1,000
Fees	Mean	648	583	550	434	885	884	825

Category		All respondents	Recreational expense	Part-time commercial	Subsistence	Full-time commercial	Purely recreational	Cultural
	Standard error	78	88	62	57	307	291	269
	Median	300	250	400	300	450	300	750
Mooring fees	Mean	629	868	303	451	867	1,088	600
	Standard error	105	253	133	213	341	415	600
	Median	0	0	0	0	0	0	0
Financial services	Mean	49	21	88	58	48	0	388
	Standard error	11	11	32	21	27	0	226
	Median	0	0	0	0	0	0	275
Other	Mean	18	10	28	28	38	0	0
	Standard error	9	10	23	28	38	0	0
	Median	0	0	0	0	0	0	0
Annual fixed costs	Mean	7,069	6,598	6,830	5,862	11,903	5,656	14,563
	Standard error	515	1,138	846	1,086	1,666	1,450	8,007
	Median	3,775	3,550	3,650	2,900	9,450	2,300	9,225

Table 51 shows the annual fishing fixed costs in 2020 by gear most commonly used. Fishermen who used bait for pelagic most often reported highest fixed costs (\$8,245), closely followed by those who trolled (\$7,967). Those who used bait for pelagic most often reported higher spending on boat and trailer repair, maintenance, and improvements, gear replacement and repair, and loan payments; whereas those who trolled most often spent more on boat insurance, mooring fees, and other fees.

**Table 51. Annual fishing fixed costs in 2020 for all respondents and by most common gear (mean, standard error, and median).**

Category		All respondents	Troll	Bait for pelagic	Handline for Deep 7 bottomfish	Handline/rod and reel for shallow bottomfish	Spear
	Number of respondents (n)	326	176	44	46	29	6
Boat and trailer repair/maintenance/improvements	Mean	2,337	2,762	2,983	1,269	885	841
	Standard error	302	497	690	274	171	452
	Median	973	1,000	1,350	500	500	200
Gear replacement/repair	Mean	1,969	2,130	2,228	1,512	1,718	558
	Standard error	188	282	413	539	505	390
	Median	800	1,000	1,245	500	500	188
Loan payments	Mean	718	731	1,169	325	496	0

Category		All respondents	Troll	Bait for pelagic	Handline for Deep 7 bottomfish	Handline/rod and reel for shallow bottomfish	Spear
	Standard error	124	186	381	193	284	0
	Median	0	0	0	0	0	0
Boat insurance	Mean	699	808	652	487	247	535
	Standard error	68	96	130	93	77	271
	Median	300	400	200	350	0	355
Fees	Mean	648	621	615	559	459	478
	Standard error	78	84	129	87	64	207
	Median	300	300	339	323	300	305
Mooring fees	Mean	629	858	521	397	149	3
	Standard error	105	174	184	194	95	3
	Median	0	0	0	0	0	0
Financial services	Mean	49	48	77	74	19	0
	Standard error	11	16	40	25	16	0
	Median	0	0	0	0	0	0
Other	Mean	18	9	0	96	0	0
	Standard error	9	6	0	56	0	0
	Median	0	0	0	0	0	0
Annual fixed costs	Mean	7,069	7,967	8,245	4,718	3,972	2,416
	Standard error	515	829	1,113	838	764	836
	Median	3,775	4,898	6,634	2,995	2,650	1,740

## Analysis by Fishery

This section provides the analysis by fishery since fishery management and regulations are often tied to the fishery and the fishermen who are involved with fishery instead of gear usage. It presents the survey results by three major sub-fisheries within the Hawai‘i small boat fishery: pelagic, bottomfish, and coral reef fisheries. The three fisheries are classified based on the types of fishing trips fishermen had in 2020. Any fishermen who trolled or used bait for pelagic species are included in the pelagic fishery; any fishermen who used handline for Deep 7 bottomfish or handline/rod and reel for shallow bottomfish are included in the bottomfish fishery; and any fishermen who had fishing trip that targeted reef-like fish, such as spearfishing and netting, and reported reef fish landings, are included in the coral reef fishery. Hawai‘i small boat fishermen are likely to be involved in different sub-fisheries due to mixed gear usage during a trip or over the course of a year so that the sum of the number of fishermen from the three sub-fisheries is greater than the number of surveys returned. Among all respondents, 330 (96%) were involved in the pelagic fishery, 264 (77%) were involved in the bottomfish fishery, and 55 (16%) were involved in the coral reef fishery. Of those in the bottomfish fishery, 96% were also in the pelagic fishery; and of those in the coral reef fishery, 89% were also in the pelagic fishery. Because of overlapping of fishermen in different sub-fisheries, fishing activities such as catch, revenue, and disposition from other sub-fisheries are included as part of the activities of the sub-

fishery because the survey questions were about the total fishing activities in 2020. Only fishing trip costs are gear specific and not overlapping with different sub-fisheries.

Table 52 shows the demographics of fishermen from the three fisheries. Fishermen in the pelagic fishery were more likely to be White; whereas fishermen in the bottomfish fishery were more likely to be Asian. Fishermen in the coral reef fishery were more likely to be Native Hawai‘ian, Pacific Islander, and younger. Of those who were involved in the pelagic fishery, 34% reported their primary fishing motivation was recreational expense, whereas those in coral reef fishery 38% reported part-time commercial and 23% reported subsistence as primary fishing motivation.

**Table 52. Fishermen demographics by fishery (percentage of responses).**

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Race	Number of respondents (n)	338	323	259	55
	Asian	38.8	37.5	43.6	36.4
	Native Hawai‘ian	12.4	12.7	13.5	23.6
	Other Pacific Islander	6.2	6.5	5.4	10.9
	White	26.6	27.6	19.7	5.5
	Mixed	16.0	15.8	17.8	23.6
Age	Number of respondents (n)	343	328	262	55
	Less than 25 years	1.5	1.5	1.9	3.6
	25–34 years	7.0	7.3	8.8	18.2
	35–44 years	11.1	11.0	11.8	12.7
	45–54 years	17.2	18.0	17.6	20.0
	55–64 years	25.1	25.0	22.5	18.2
	More than 64 years	38.2	37.2	37.4	27.3
Education	Number of respondents (n)	341	326	261	55
	Less than high school	2.3	2.5	1.5	0.0
	High school graduate	21.7	21.2	19.5	27.3
	Some college or associate's degree	43.1	42.9	43.7	40.0
	Bachelor's degree or higher	32.8	33.4	35.2	32.7
Income	Number of respondents (n)	324	309	248	53
	Less than \$10,000	1.5	1.3	1.2	0.0
	\$10,000–\$24,999	4.6	4.5	4.4	5.7
	\$25,000–\$49,999	17.9	17.8	19.0	17.0
	\$50,000–\$99,999	36.1	36.2	36.3	47.2
	\$100,000 or more	39.8	40.1	39.1	30.2
Primary fishing motivation	Number of respondents (n)	313	300	235	47
	Recreational expense	33.9	34.0	33.2	21.3
	Part-time commercial	30.0	29.7	26.8	38.3
	Subsistence	15.7	16.0	17.0	23.4
	Full-time commercial	10.9	10.7	12.8	10.6
	Purely recreational	8.3	8.3	8.9	4.3
	Cultural	1.3	1.3	1.3	2.1



Table 53 shows the vessel characteristics by fishery. Vessels used in coral reef fishery tended to be smaller, less powerful, newer, shorter ownership, less expensive, and had lower market value. Vessels used in the bottomfish fishery tended to have higher market value.

**Table 53. Vessel characteristics by fishery (mean, standard error, median, and percentage of responses).**

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Boat length (ft)	Number of respondents (n)	330	315	252	53
	Mean	23.5	23.6	23.3	22.1
	Standard error	0.3	0.3	0.4	0.6
	Median	22.0	22.0	22.0	22.0
Boat horsepower (hp)	Number of respondents (n)	329	314	252	53
	Mean	249.5	250.3	236.9	206.8
	Standard error	14.6	15.1	14.3	16.7
	Median	200.0	200.0	180.0	190.0
Age of boat (years)	Number of respondents (n)	320	305	243	52
	Mean	26.1	26.1	25.9	24.3
	Standard error	0.8	0.8	1.0	2.2
	Median	26.0	26.0	26.0	21.0
Current boat ownership (years)	Number of respondents (n)	325	311	247	52
	Mean	12.8	12.7	13.0	11.3
	Standard error	0.6	0.7	0.7	1.5
	Median	9.0	9.0	9.0	8.0
Boat purchase price (\$)	Number of respondents (n)	307	293	233	51
	Mean	53,148	53,577	52,985	45,422
	Standard error	6,824	7,124	8,541	6,069
	Median	35,000	35,000	35,000	34,000
Boat current market value (\$)	Number of respondents (n)	309	295	237	50
	Mean	62,222	62,483	63,099	53,570
	Standard error	6,993	7,282	8,684	6,518
	Median	40,000	40,000	40,000	40,000
Most recent year for major vessel improvements (years ago)	Number of respondents (n)	257	244	197	41
	Mean	3.6	3.5	3.7	2.7
	Standard error	0.3	0.3	0.3	0.5
	Median	2.0	2.0	2.0	1.0
Own boat that fish on	Number of respondents (n)	345	330	264	55
	% Yes	95.9	95.8	95.8	96.4
Others used boat without you	Number of respondents (n)	330	315	252	53
	None (0%)	85.2	84.4	84.9	84.9
	Very little (1%–9%)	7.6	7.9	8.3	5.7
	Some (10%–39%)	2.1	2.2	2.0	3.8
	About half (40%–59%)	1.5	1.6	1.6	1.9

	All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Most (60%–89%)	1.5	1.6	1.2	1.9
Almost all (90%–100%)	2.1	2.2	2.0	1.9
Mean percentage <sup>a</sup>	4.8	5.0	4.5	5.4

<sup>a</sup> Calculated using the medians of the response bins.

Table 54 shows the characteristics of fishing activity by fishery. When compared across three fisheries, fishermen in the coral reef fishery tended to make more trips in 2020, used more different types of gears, and were more likely to fish in the state waters. However, fishermen in the pelagic fishery were more likely to fish in the federal waters and at FADs.

**Table 54. Fishing activity characteristics by fishery (percentage of responses and mean).**

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Number of boat fishing trips in 2020 (%)	Number of respondents (n)	343	328	262	55
	< 12 trips	22.4	22.6	23.3	10.9
	12–24 trips	32.9	32.9	29.0	27.3
	25–49 trips	23.6	23.8	23.7	34.5
	50–99 trips	14.3	14.0	16.4	18.2
	More than 100 trips	6.7	6.7	7.6	9.1
	Mean <sup>a</sup>	40.3	40.2	42.9	49.7
Number of gears used in boat fishing trips in 2020 (%)	Number of respondents (n)	340	326	262	55
	One	8.5	6.4	1.5	7.3
	Two	23.2	23.0	11.8	7.3
	Three	30.6	31.3	37.8	14.5
	Four	25.9	27.0	33.6	23.6
	Five or more	11.8	12.3	15.3	47.3
Mean	3.1	3.2	3.5	4.1	
Percent of your fishing trips occurred in state jurisdiction (%)	Number of respondents (n)	333	318	256	54
	None (0%)	2.7	2.8	2.3	0.0
	Very little (1%–9%)	14.4	14.5	11.7	7.4
	Some (10%–39%)	13.5	13.8	14.8	16.7
	About half (40%–59%)	28.8	29.9	31.3	29.6
	Most (60%–89%)	12.3	12.9	12.9	7.4
	Almost all (90%–100%)	28.2	26.1	27.0	38.9
Mean percentage <sup>a</sup>	54.6	53.5	54.8	62.5	
Percent of your fishing trips	Number of respondents (n)	333	318	256	54
	None (0%)	20.4	18.9	17.2	27.8

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
occurred in federal jurisdiction (%)	Very little (1%–9%)	6.3	5.7	7.8	11.1
	Some (10%–39%)	12.0	12.6	12.9	5.6
	About half (40%–59%)	27.6	28.6	29.3	29.6
	Most (60%–89%)	14.4	14.8	16.0	16.7
	Almost all (90%–100%)	19.2	19.5	16.8	9.3
	Mean percentage <sup>a</sup>	45.4	46.5	45.2	37.5
Percent of fishing trips fish at fish aggregating devices (%)	Number of respondents (n)	340	325	259	53
	None (0%)	14.1	12.0	15.4	20.8
	Very little (1%–9%)	17.6	17.8	19.3	20.8
	Some (10%–39%)	23.5	23.7	24.3	20.8
	About half (40%–59%)	17.1	17.8	16.2	15.1
	Most (60%–89%)	15.9	16.3	15.8	15.1
	Almost all (90%–100%)	11.8	12.3	8.9	7.5
	Mean percentage <sup>a</sup>	38.4	39.7	35.5	32.3
Percent of total fishing time at fish aggregating devices (%)	Number of respondents (n)	290	285	218	42
	None (0%)	1.0	0.7	0.9	2.4
	Very little (1%–9%)	24.1	24.6	25.7	23.8
	Some (10%–39%)	31.7	31.2	29.4	16.7
	About half (40%–59%)	24.8	25.3	25.2	33.3
	Most (60%–89%)	11.7	11.6	12.4	16.7
	Almost all (90%–100%)	6.6	6.7	6.4	7.1
	Mean percentage <sup>a</sup>	36.6	36.7	36.6	41.3
Number of people (including yourself) on board for an average trip (%)	Number of respondents (n)	311	296	240	50
	One	24.1	23.3	25.4	20.0
	Two	51.8	52.0	51.2	50.0
	Three	20.3	20.6	19.6	28.0
	Four	2.6	2.7	2.9	2.0
	Five or more	1.3	1.4	0.8	0.0
	Mean	2.1	2.1	2.0	2.1

<sup>a</sup> Calculated using the medians of the response bins.

Table 55 shows the landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish and nearshore & reef fish by fishery. Across three fisheries, the volume of pelagic fish landings were similar (more than 3,000 lb) because small boat fishermen overlapped in sub-fisheries. To understand species landed by fishery, we need to examine the landings by species group under each fishery. On average, fishermen in the pelagic fishery landed 2,516 lb pelagic fish, whereas fishermen in the bottomfish fishery landed 335 lb Deep 7 bottomfish and 195 shallow bottomfish, and fishermen in the coral reef fishery landed 1,456 lb reef fish. Landings per trip were similar across fishery (>80 lb).

**Table 55. Landings by species group under each fishery (percentage of responses, mean, and median).**

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Annual landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish, nearshore & reef fish (lb)	Number of respondents (n)	342	327	262	55
	Mean	3,162	3,076	3,234	3,571
	Standard error	397	404	425	723
	Median	925	875	1,100	1,550
Annual landings of pelagic fish (lb)	Number of respondents (n)	342	327	262	55
	Mean	2,429	2,516	2,440	1,699
	Standard error	371	387	391	431
	Median	750	750	750	300
Annual landings Deep 7 bottomfish (lb)	Number of respondents (n)	342	327	262	55
	Mean	259	213	335	240
	Standard error	57	28	74	66
	Median	25	25	25	25
Annual landings of shallow bottomfish (lb)	Number of respondents (n)	342	327	262	55
	Mean	155	147	195	176
	Standard error	19	19	24	34
	Median	25	25	25	25
Annual landings of nearshore & reef fish (lb)	Number of respondents (n)	342	327	262	55
	Mean	319	201	263	1,456
	Standard error	88	45	61	522
	Median	25	25	25	300
Average per trip landings of pelagic fish, Deep 7 bottomfish, shallow bottomfish, nearshore & reef fish (lb)	Number of respondents (n)	340	325	260	55
	Mean	83.4	83.1	86.2	81.4
	Standard error	6.6	6.8	7.3	15.2
	Median	47.0	45.2	53.1	46.6
Distribution of catch by species group	Number of respondents (n)	342	327	262	55
	Pelagic fish (%)	76.8	81.8	75.5	47.6
	Deep 7 bottomfish (%)	8.2	6.9	10.4	6.7
	Shallow bottomfish (%)	4.9	4.8	6.0	4.9
	Nearshore & reef fish (%)	10.1	6.5	8.1	40.8

Note: All the means, standard errors, and medians were calculated using the medians of the response bins.

Table 56 shows the catch disposition and market participation by fishery. Almost half of the fishermen in the coral reef fishery reported the distribution among fishermen on board varying trip by trip or don't know as higher than 31% of fishermen in the other two fisheries reported likewise. Catch disposition was similar across fisheries, with a slightly higher percentage of catch for sale by fishermen in the coral reef fishery. A majority of fishermen sold fish, particularly fishermen in the coral reef fishery (96%). Value of fish sold was higher in the coral

reef fishery with an average of \$12,209 in 2020 vs. \$9,860 in the pelagic fishery. Corresponding to that, a higher percentage of personal income came from fish sale for fishermen in the coral reef fishery (25%). Across three fisheries, pelagic fish represented the highest percentage of value of fish sold, and nearshore and reef fish represented more than a quarter (27%) of value of fish sold for fishermen in coral reef fishery. Seafood dealers/wholesalers and friends/neighbors/coworkers were the top two most commonly used channels to sell fish across fisheries, especially by fishermen in coral reef fishery. Proportionally, more fishermen in the pelagic and bottomfish fisheries sold to auction and restaurants/stores.

**Table 56. Catch disposition and market participation by fishery (percentage of responses, mean, and median).**

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
Catch distribution	Number of respondents (n)	340	325	259	53
	I kept all the fish I caught (%)	45.9	45.2	45.2	39.6
	I kept/received some % of total fish caught (%)	16.2	16.6	16.2	9.4
	I kept/ received some % of trip revenue (%)	4.7	4.9	5.0	3.8
	Don't know/different every time (%)	31.2	31.4	31.3	47.2
	Other (%)	2.1	1.8	2.3	0.0
Catch disposition	Number of respondents (n)	328	313	251	51
	Caught and released (%)	3.7	4.0	3.9	2.9
	Given away (%)	12.4	13.0	13.6	13.5
	Consumed at home (%)	14.3	15.1	13.1	12.4
	Sold (%)	69.6	68.0	69.4	71.1
Sold fish	Number of respondents (n)	344	329	263	55
	Yes (%)	85.2	85.1	85.2	96.4
Value of fish sold (\$)	Number of respondents (n)	280	268	215	50
	Mean <sup>a</sup>	10,116	9,860	10,718	12,209
	Standard error <sup>a</sup>	1,059	1,075	1,251	2,426
	Median <sup>a</sup>	3,500	3,500	3,500	3,500
Distribution of estimated revenue from fish sold by species group	Number of respondents (n)	271	261	211	48
	Pelagic fish (%)	61.0	63.5	57.2	48.6
	Deep 7 bottomfish (%)	15.4	14.6	18.0	15.4
	Shallow bottomfish (%)	8.7	8.1	9.7	7.2
	Nearshore & reef fish (%)	6.5	5.3	6.0	26.8
	Other (%)	8.4	8.6	9.1	2.0
Percentage of personal income came from the sale of fish	Number of respondents (n)	286	274	221	52
	None (0%)	16.1	16.8	15.8	15.4
	Very little (1%–9%)	42.0	42.7	39.4	28.8
	Some (10%–39%)	22.7	22.6	26.2	30.8
	About half (40%–59%)	9.4	8.8	9.5	15.4
	Most (60%–89%)	2.1	1.8	1.8	3.8
Almost all (90%–100%)	7.7	7.3	7.2	5.8	

		All respondents	Fishermen in pelagic fishery	Fishermen in bottomfish fishery	Fishermen in coral reef fishery
	Mean percentage <sup>a</sup>	21.4	20.5	21.5	25.2
Market outlet:	Number of respondents (n)	279	268	214	49
Seafood dealer/ wholesaler	None (0%)	37.6	37.7	35.0	32.7
	Very little (1%–9%)	3.2	3.4	4.2	4.1
	Some (10%–39%)	13.6	13.8	14.5	8.2
	About half (40%–59%)	9.3	9.7	11.2	6.1
	Most (60%–89%)	8.6	9.0	10.3	20.4
	Almost all (90%–100%)	27.6	26.5	24.8	28.6
	Mean percentage (exclude 0) <sup>a</sup>	65.3	64.4	62.4	70.0
Market outlet:	Number of respondents (n)	279	268	214	49
Auction (UFA)	None (0%)	73.8	73.1	72.0	85.7
	Very little (1%–9%)	1.8	1.9	2.3	0.0
	Some (10%–39%)	4.3	4.5	4.2	2.0
	About half (40%–59%)	5.0	5.2	6.1	2.0
	Most (60%–89%)	2.5	2.6	2.3	2.0
	Almost all (90%–100%)	12.5	12.7	13.1	8.2
	Mean percentage (exclude 0) <sup>a</sup>	66.5	66.1	65.1	75.0
Market outlet:	Number of respondents (n)	279	268	214	49
Restaurants/ stores	None (0%)	63.1	62.7	60.7	65.3
	Very little (1%–9%)	7.2	7.1	7.5	10.2
	Some (10%–39%)	9.7	9.7	9.8	14.3
	About half (40%–59%)	9.7	10.1	11.7	4.1
	Most (60%–89%)	2.5	2.2	3.3	2.0
	Almost all (90%–100%)	7.9	8.2	7.0	4.1
	Mean percentage (exclude 0) <sup>a</sup>	43.9	44.4	42.9	30.5
Market outlet:	Number of respondents (n)	279	268	214	49
Roadside/ farmers' market	None (0%)	85.7	85.1	84.6	77.6
	Very little (1%–9%)	2.9	3.0	3.7	6.1
	Some (10%–39%)	6.5	6.7	6.1	14.3
	About half (40%–59%)	3.2	3.4	3.7	2.0
	Most (60%–89%)	1.1	1.1	1.4	0.0
	Almost all (90%–100%)	0.7	0.7	0.5	0.0
	Mean percentage (exclude 0) <sup>a</sup>	31.7	31.7	31.8	20.3
Market outlet:	Number of respondents (n)	279	268	214	49
Friends/ neighbors/ coworkers	None (0%)	51.3	50.7	48.6	44.9
	Very little (1%–9%)	9.7	9.7	11.7	8.2
	Some (10%–39%)	16.5	17.2	17.8	20.4
	About half (40%–59%)	9.0	9.0	10.7	10.2
	Most (60%–89%)	5.7	5.6	4.2	8.2
	Almost all (90%–100%)	7.9	7.8	7.0	8.2
	Mean percentage (exclude 0) <sup>a</sup>	41.4	41.4	37.4	43.1

<sup>a</sup> Calculated using the medians of the response bins.

Table 57 shows the fishing trip costs by fishery. The pelagic fishery incurred the highest trip cost due to higher fuel costs (\$132), which was almost twice as high as the fuel cost for coral reef fishery. The cost of ice was also higher in the pelagic fishery. Bottomfish fishery incurred higher bait cost (\$35) than other fisheries, whereas coral reef fishery incurred lower costs in food and beverage, daily maintenance & repair, and gear lost.

**Table 57. Fishing trip costs in 2020 by fishery (mean, standard error, median, and percentage of total trip cost).**

		Pelagic fishery		Bottomfish fishery		Coral Reef fishery	
		\$ per trip	% of total trip cost	\$ per trip	% of total trip cost	\$ per trip	% of total trip cost
	Number of responses (n)	352		156		17	
Boat fuel	Mean	132.15	43.0	94.11	33.4	68.76	31.1
	Standard error	6.37		6.99		13.50	
	Median	100.00		75.00		50.00	
Truck fuel	Mean	21.47	7.0	19.82	7.0	22.82	10.3
	Standard error	1.00		1.62		4.48	
	Median	20.00		18.00		17.00	
Oil	Mean	5.36	1.7	4.69	1.7	4.53	2.1
	Standard error	0.54		0.93		1.66	
	Median	0.00		0.00		0.00	
Ice	Mean	36.20	11.8	30.42	10.8	30.53	13.8
	Standard error	1.97		2.75		9.21	
	Median	30.00		20.00		16.00	
Bait	Mean	22.72	7.4	35.49	12.6	22.82	10.3
	Standard error	1.47		2.94		15.48	
	Median	15.50		25.00		0.00	
Food and beverage	Mean	27.20	8.9	29.93	10.6	21.53	9.7
	Standard error	1.43		2.85		3.59	
	Median	20.00		20.00		20.00	
Daily maintenance & repair	Mean	26.64	8.7	31.46	11.2	21.47	9.7
	Standard error	2.78		4.30		6.83	
	Median	17.50		17.50		10.00	
Gear lost	Mean	28.80	9.4	25.08	8.9	10.24	4.6
	Standard error	2.61		3.06		8.77	
	Median	15.00		15.00		0.00	
Other trip cost	Mean	6.53	2.1	10.96	3.9	18.24	8.3
	Standard error	1.89		4.08		17.62	
	Median	0.00		0.00		0.00	
Total trip cost	Mean	307.07		281.96		220.94	
	Standard error	12.81		19.64		64.99	
	Median	259.50		221.00		131.00	

When compared with the 2013 trip costs for the pelagic fishery, trip costs in 2020 were lower on average (Table 58). Boat and truck fuel saw the largest decrease, likely due to the lower fuel price in 2020. The average monthly fuel price was \$4.08 in 2020 vs. \$5.52 (inflation adjusted) in 2013, a 26% decrease. Other trip cost items also saw slightly decrease in 2020.

**Table 58. Average fishing trip costs for pelagic fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	2020 (\$)	2013 (\$)	\$ amount change
Boat fuel	132.15	164.57	-32.43
Truck fuel	21.47	29.15	-7.68
Oil	5.36	8.99	-3.63
Ice	36.20	39.52	-3.33
Bait	22.72	26.45	-3.73
Food and beverage	27.20	29.54	-2.35
Daily maintenance & repair	26.64	27.83	-1.19
Gear lost	28.80	-	-
Other trip cost	6.53	0.44	6.09
Total trip cost	307.07	326.24	-19.17
Number of responses	352	806	

Trip costs in 2020 for bottomfish fishery on average was similar to the trip costs in 2013 (Table 59). If excluding the gear lost in 2020 (which was not asked in 2013), the average trip costs in 2020 was lower than 2013. Boat and truck fuel showed the largest decrease. Cost of oil and ice also slightly decreased. The rest of the items showed a slightly increase.

**Table 59. Average fishing trip costs for bottomfish fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	2020 (\$)	2013 (\$)	\$ amount change
Boat fuel	94.11	123.10	-28.99
Truck fuel	19.82	26.04	-6.23
Oil	4.69	7.92	-3.23
Ice	30.42	32.97	-2.55
Bait	35.49	33.51	1.98
Food and beverage	29.93	28.07	1.86
Daily maintenance & repair	31.46	28.51	2.95
Gear lost	25.08	-	-
Other trip cost	10.96	1.42	9.54
Total trip cost	281.96	281.53	0.43
Number of responses	156	257	

Trip costs in 2020 for coral reef fishery on average was higher than the trip costs in 2013. Fuel cost for reel fish fishery was almost the same in 2020, probably due to the lower fuel usage per trip when compared with the pelagic and bottomfish fisheries. Cost of bait and ice were higher in 2020 (Table 60).



**Table 60. Average fishing trip costs for coral reef fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	2020 (\$)	2013 (\$)	\$ amount change
Boat fuel	68.76	69.02	-0.26
Truck fuel	22.82	26.68	-3.86
Oil	4.53	5.42	-0.89
Ice	30.53	23.46	7.07
Bait	22.82	8.75	14.07
Food and beverage	21.53	24.28	-2.75
Daily maintenance & repair	21.47	21.33	0.14
Gear lost	10.24	-	-
Other trip cost	18.24	1.90	16.33
Total trip cost	220.94	180.86	40.08
Number of responses	17	71	

Table 61 shows the annual fixed costs in 2020 by fishery. On average, the pelagic fishery showed higher fixed costs than the other two fisheries (\$7,138 vs. \$6,711 in the bottomfish fishery and \$5,893 in the coral reef fishery). The higher expenditures were mainly due to the higher spending on boat and trailer repair/maintenance/improvement and mooring fees. This was correlated with the larger, more powerful, and older vessels in the pelagic fishery. Fishermen in coral reef fishery incurred higher spending in gear replacement/repair and loan payments, and lower cost in boat insurance. The higher cost in loan payments was likely due to newer vessel ownership and the lower boat insurance was due to the smaller and less valuable vessels in coral reef fishery. Other fixed costs items including fees and financial services were similar across fisheries.

**Table 61. Annual fishing fixed costs in 2020 by fishery (mean, standard error, median, and percentage of annual fixed costs).**

		Pelagic fishery		Bottomfish fishery		Coral reef fishery	
		Annual fixed costs (\$)	% of annual fixed costs (%)	Annual fixed costs (\$)	% of annual fixed costs (%)	Annual fixed costs (\$)	% of annual fixed costs (%)
	Number of respondents (n)	312		250		53	
Boat and trailer repair/maintenance/improvements	Mean	2,372	33	2,198	33	1,711	29
	Standard error	314		316		433	
	Median	1,000		973		800	
Gear replacement/repair from wear and tear	Mean	1,935	27	1,891	28	2,087	35
	Standard error	186		213		392	
	Median	850		800		1,000	
Loan payments	Mean	746	10	666	10	831	14
	Standard error	130		133		387	
	Median	0		0		0	
Boat insurance	Mean	704	10	695	10	479	8
	Standard error	71		83		94	

		Pelagic fishery		Bottomfish fishery		Coral reef fishery	
		Annual fixed costs (\$)	% of annual fixed costs (%)	Annual fixed costs (\$)	% of annual fixed costs (%)	Annual fixed costs (\$)	% of annual fixed costs (%)
Fees	Median	313		227		34	
	Mean	653	9	704	10	648	11
	Standard error	82		98		124	
Mooring fees	Median	300		300		360	
	Mean	657	9	488	7	90	2
	Standard error	110		89		62	
Financial services	Median	0		0		0	
	Mean	50	1	50	1	47	1
	Standard error	11		11		23	
Other	Median	0		0		0	
	Mean	19	0	20	0	0	0
	Standard error	9		11		0	
Annual fixed costs	Median	0		0		0	
	Mean	7,138		6,711		5,893	
	Standard error	529		534		874	
	Median	3,925		3,625		3,000	

When compared with the 2013 fixed costs in the pelagic fishery, fixed costs were higher (12%) in 2020 mainly due to higher spending in boat and trailer repair/maintenance/improvements, boat insurance, fees, and mooring fees (Table 62).

**Table 62. Average annual fishing fixed costs for pelagic fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	2020 (\$)	2013 (\$)	Percentage change (%)
Boat and trailer repair/maintenance/improvements	2,372	1,871	27
Gear replacement/repair from wear and tear	1,935	1,914	1
Loan payments	746	1,124	-34
Boat insurance	704	492	43
Fees	653	447	46
Mooring fees	657	479	37
Financial services	50	34	48
Other	19	23	-16
Annual fixed costs	7,138	6,384	12
Number of responses	312	709	

Average fixed costs for bottomfish fishery were similar in 2020 and 2013 but with variation in individual items. Higher spending in boat insurance and fees, and lower spending in loan payments and gear replacement/repair were observed (Table 63).

**Table 63. Average annual fishing fixed costs for bottomfish fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	<b>2020</b>	<b>2013</b>	<b>Percentage</b>
	<b>(\$)</b>	<b>(\$)</b>	<b>change (%)</b>
Boat and trailer			
repair/maintenance/improvements	2,198	2,184	1
Gear replacement/repair from wear and tear	1,891	1,993	-5
Loan payments	666	1,073	-38
Boat insurance	695	408	71
Fees	704	478	47
Mooring fees	488	405	20
Financial services	50	51	-1
Other	20	12	58
Annual fixed costs	6,711	6,605	2
Number of responses	250	362	

Annual fixed costs for coral reef fishery were lower in 2020 (-21%), with the largest decreases in mooring fees, loan payments, boat and trailer repair/maintenance/improvement, and gear replacement/repair (Table 64).

**Table 64. Average annual fishing fixed costs for coral reef fishery, 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	<b>2020</b>	<b>2013</b>	<b>Percentage</b>
	<b>(\$)</b>	<b>(\$)</b>	<b>change (%)</b>
Boat and trailer			
repair/maintenance/improvements	1,711	2,130	-20
Gear replacement/repair from wear and tear	2,087	2,194	-5
Loan payments	831	1,781	-53
Boat insurance	479	407	18
Fees	648	466	39
Mooring fees	90	411	-78
Financial services	47	52	-9
Other	0	27	-100
Annual fixed costs	5,893	7,468	-21
Number of responses	53	145	

Table 65 shows the itemized expenditures for fishermen who reported non-zero fixed costs for a particular item by fishery. Mooring fees showed the largest differences across fisheries, ranging from \$3,362 for pelagic fishery, \$2,836 for bottomfish fishery, to \$685 for coral reef fishery. Other differences include higher expenditures on boat and trailer repair/maintenance/improvement for pelagic fishery relative to coral reef fishery, and higher loan payments for coral reef fishery relative to the other two fisheries. Other categories were comparable across the fisheries.

**Table 65. Annual fishing fixed costs in 2020 by fishery (non-zero expenditures on individual category) (mean, standard error, and median, and percentage of fleet with expenditure).**

		Pelagic fishery		Bottomfish fishery		Coral reef fishery	
		Annual fixed costs(\$)	% of fleet with this expenditure (%)	Annual fixed costs (\$)	% of fleet with this expenditure (%)	Annual fixed costs (\$)	% of fleet with this expenditure (%)
	Number of respondents (n)	312		250		53	
Boat and trailer repair/maintenance/improvements	Mean	2,579	92	2,400	92	1,778	96
	Standard error	339		342		448	
	Median	1,000		1,000		800	
Gear replacement/repair from wear and tear	Mean	2,068	94	2,055	92	2,169	96
	Standard error	197		228		403	
	Median	1,000		1,000		1,000	
Loan payments	Mean	5,822	13	5,740	12	6,291	13
	Standard error	535		558		2,026	
	Median	4,800		4,800		4,200	
Boat insurance	Mean	1,175	60	1,207	58	939	51
	Standard error	105		128		133	
	Median	800		800		870	
Fees	Mean	677	96	721	98	648	100
	Standard error	84		100		124	
	Median	300		313		360	
Mooring fees	Mean	3,362	20	2,836	17	685	13
	Standard error	410		339		428	
	Median	3,000		2,300		100	
Financial services	Mean	474	11	406	12	417	11
	Standard error	75		58		130	
	Median	350		300		375	
Other	Mean	1,180	2	1,225	2	-	0
	Standard error	242		307		-	
	Median	1,200		1,200		-	
Annual fixed costs	Mean	7,138		6,711		5,893	
	Standard error	529		534		874	
	Median	3,925		3,625		3,000	

When comparing reported non-zero fixed costs in 2020 and in 2013 in the pelagic fishery, the largest decrease was observed in the loan payments. The rest of the categories (except for financial services and other) showed higher expenditures (Table 66).

**Table 66. Average annual fishing fixed costs for pelagic fishery (non-zero expenditures on individual category), 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	<b>2020</b>	<b>2013</b>	<b>Percentage</b>
	(\$)	(\$)	change (%)
Boat and trailer			
repair/maintenance/improvements	2,579	2,053	26
Gear replacement/repair from wear and tear	2,068	2,034	2
Loan payments	5,822	7,449	-22
Boat insurance	1,175	1,009	16
Fees	677	473	43
Mooring fees	3,362	2,650	27
Financial services	474	571	-17
Other	1,180	1,327	-11
Annual fixed costs	7,138	6,384	12
Number of responses	312	709	

A comparison of those who reported non-zero fixed costs in the bottomfish fishery in 2020 and 2013 showed the largest decrease in loan payments and financial services. Boat and trailer repair/maintenance/improvements and gear replacement/repair were comparable. The rest of the cost items showed higher expenditures (Table 67).

**Table 67. Average annual fishing fixed costs for bottomfish fishery (non-zero expenditures on individual category), 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	<b>2020</b>	<b>2013</b>	<b>Percentage</b>
	(\$)	(\$)	change (%)
Boat and trailer			
repair/maintenance/improvements	2,400	2,360	2
Gear replacement/repair from wear and tear	2,055	2,097	-2
Loan payments	5,740	7,193	-20
Boat insurance	1,207	868	39
Fees	721	500	44
Mooring fees	2,836	2,489	14
Financial services	406	713	-43
Other	1,225	919	33
Annual fixed costs	6,711	6,605	2
Number of responses	250	362	

A comparison of those who reported non-zero fixed costs in the coral reef fishery in 2020 and 2013 showed large fluctuations in various categories, especially in loan payments and mooring fees. The large fluctuations could be due to the smaller sample size in 2020 (Table 68).

**Table 68. Average annual fishing fixed costs for coral reef fishery (non-zero expenditures on individual category), 2020 vs. 2013 (inflation adjusted, 2020 dollars).**

	2020 (\$)	2013 (\$)	Percentage change (%)
Boat and trailer			
repair/maintenance/improvements	1,778	2,190	-19
Gear replacement/repair from wear and tear	2,169	2,225	-2
Loan payments	6,291	9,565	-34
Boat insurance	939	921	2
Fees	648	483	34
Mooring fees	685	2,593	-74
Financial services	417	577	-28
Other	-	1,295	-
Annual fixed costs	5,893	7,468	-21
Number of responses	53	145	

### **Economic Performance of Full-time Commercial Fishermen**

The Hawai'i small boat fishery includes fishermen with different fishing motivations and a small fraction of them identified themselves as full-time commercial fishermen. It is valuable to evaluate the economic performance of commercial fishermen in 2020 that includes returns above operating costs and profit. Returns above operating costs is calculated as the difference between the annual value of fish sold and annual trip costs. Profit is calculated as the difference between the returns above operating costs and annual fixed costs. Because trip costs were recorded at trip level, the annual trip costs for individual fisherman is estimated based on the trip costs of the two most common gear types (as the survey only asked the trip costs for the two most common gear types) and the corresponding number of boat fishing trips that used the gears. For fishermen with more than two gear types, the average trip costs of the two most common gear types were used. Table 69 shows the estimated returns above operating costs in 2020 for full-time commercial fishermen is estimated at \$15,899 and the estimated profit is estimated at \$2,036. Note that not all the fish landed by full-time commercial fishermen was sold in the market (83%), and a portion (14%) was given away or consumed at home (Table 28), the value of fish sold does not truly represent the total value of the fish landed. Using the same approach in Chan and Pan (2019) to estimate the value of unsold catch, the estimated value of unsold catch is \$9,278. When including the value of unsold catch, the estimated returns above operating costs becomes \$25,177 and the estimated profits becomes \$11,314.

**Table 69. Economic performance of full-time commercial fishermen in 2020.**

	<b>Full-time commercial fishermen</b>
Number of respondents (n)	21
Annual value of fish sold <sup>a</sup> (\$)	45,715
Estimated annual trip costs (\$)	29,816
Annual fixed costs (\$)	13,863
Estimated returns above operating costs (\$)	15,899
Estimated profit (\$)	2,036
Estimated value of unsold catch (\$)	9,278
Estimated annual value of fish when including estimated value of unsold catch (\$)	54,993
Estimated returns above operating costs in 2020 when including estimated value of unsold catch (\$)	25,177
Estimated profit in 2020 when including estimated value of unsold catch (\$)	11,314

<sup>a</sup> Calculated using the medians of the response bins.

## What Do You Think

This section of the survey asked fishers' opinion about fishing participation in next year, the top three species they targeted, the importance of fishing, and the importance and performance of fisheries management in Hawai'i. These questions are new in the 2021 survey. The section also include three open-ended questions: 1) suggestions for how Hawai'i's fisheries should be managed or topics that you feel need further study; 2) how have COVID-19 changed their fishing activities; and 3) the main reasons for making the changes.

### *Fishing Participation in Next Year*

Regarding the opinion about fishing participation in the next year, most respondents said more people will be going to different types of fishing, especially for shallow bottomfish and pelagic, less so for nearshore and reef fishing and Deep 7 bottomfish fishing (Table 70). Tables B41 to B44 show the responses by subgroup.

**Table 70. Participation of different types of fishing in the next year.**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
Pelagic fishing	327	85	15
Deep 7 bottomfish fishing	316	72	28
Shallow bottomfish fishing	242	99	1
Nearshore and reef fishing	311	77	23

When asked for the specific reason as to why fishermen think more or few people will conduct different types of fishing next year, about 1 in 4 fishermen thought there would be more fishing that is COVID related, particularly due to subsistence, higher demand from post-COVID recovery, high unemployment that would increase the number of people who will go fishing, and for income supplement. There were also a few who believed less will go fishing because of COVID. The second most-mentioned reason for more fishing next year was simply more fishermen and boats were out there, and more people were moving to Hawai'i. Fishing as a fun

recreational activity was another reason for more fishing. Fishing also gained popularity due to social media. Higher fishing costs and low fish price were the main reasons for less participation next year, followed by low fish stock. Detailed reasons are listed in Table 71.

**Table 71. Summary of for reason of more/fewer fishing in the next year (number of mentions in parenthesis).**

<b>Main reasons</b>	<b>Reasons for more fishing next year</b>	<b>Reasons for fewer fishing next year</b>
COVID-related (90)	<ul style="list-style-type: none"> <li>• For subsistence (22)</li> <li>• Post-COVID recovery (19)</li> <li>• More unemployment (16)</li> <li>• For income supplement (15)</li> <li>• More visitors (5)</li> <li>• Less COVID restrictions will encourage fishing (4)</li> <li>• More people taking less expansive fishing e.g. subsistence fishing, nearshore and reef fishing (3)</li> <li>• Better fish price (3)</li> <li>• Not much to do during pandemic except fishing (1)</li> <li>• More fish demand (1)</li> </ul>	<ul style="list-style-type: none"> <li>• Low fish price due to COVID (2)</li> <li>• When the economy recovery, fewer people will have time to go fishing (2)</li> <li>• COVID raises expenses (1)</li> <li>• Less fish demand (1)</li> </ul>
More people and boats (could be COVID-related) (85)	<ul style="list-style-type: none"> <li>• More fishermen (36)</li> <li>• More boats (21), a few mentioned more new and smaller boats</li> <li>• More people moving to Hawai‘i (15)</li> <li>• More young fishermen (5)</li> <li>• Fishing becomes more popular (4)</li> </ul>	
Fun and recreational (16)	<ul style="list-style-type: none"> <li>• Fishing is fun, outdoor, family activity (16)</li> </ul>	
Cost/fish price (15)	<ul style="list-style-type: none"> <li>• More affordable to do nearshore and reef fishing (2)</li> </ul>	<ul style="list-style-type: none"> <li>• Higher cost in general (11)</li> <li>• Low fish price (controlled price) (2)</li> </ul>
Social media (9)	<ul style="list-style-type: none"> <li>• More social media postings that attracted people fishing (7)</li> <li>• TV shows (2)</li> </ul>	
Fish stock (8)		<ul style="list-style-type: none"> <li>• Low stock in general (4)</li> <li>• Low pelagic and bottomfish stock, so less pelagic, Deep 7 bottomfish fishing (2)</li> <li>• Low shoreline fish stock, so more pelagic and bottomfish fishing (2)</li> </ul>
Technique (5)	<ul style="list-style-type: none"> <li>• Better technology (1)</li> </ul>	<ul style="list-style-type: none"> <li>• Fewer pelagic and bottomfish fishing because they are hard (4)</li> </ul>
Other (7)	<ul style="list-style-type: none"> <li>• Food prices are higher (1)</li> <li>• Pelagic fish and bottomfish in demand (1)</li> </ul>	<ul style="list-style-type: none"> <li>• Bad weather (2)</li> <li>• Poor infrastructure and FAD maintenance (1)</li> <li>• Older fishermen not fishing (1)</li> <li>• Bad economy (1)</li> </ul>



### *Top Three Species to Target*

Fishermen were asked about the top three species they target to sell, to keep for self-consumption, and to give away. ‘Ahi (bigeye and yellowfin tuna), mahi-mahi, and ono (wahoo) were the top three species mentioned. If counting the total Deep 7 bottomfish, they ranked as the fourth. Aku (skipjack tuna) was ranked as the fifth species (Table 72).

**Table 72. Survey responses: “What are the top three (3) species you target... to sell/to keep for self-consumption/to give away?” (percentage of responses).**

	Top species to sell (%)	Top species to keep for self-consumption (%)	Top species to give away (%)
‘Ahi (bigeye/yellowfin tuna)	65	56	54
Mahi-mahi	55	48	43
Ono (wahoo)	49	42	38
Deep 7 bottomfish	37	35	33
Aku (skipjack tuna)	15	20	24
Number of respondents (n)	302	302	284

### *Importance of Fishing*

Fishermen were asked about their agreement of several statements related to the importance of fishing. More than half of them strongly agreed that fishing is an important part of who they are, and fishing is an important part of their culture. Another 30% agreed with the two statements. Relatively, fishermen were less agreeable regarding whether they are respected by the community as someone who fishes; 24% were neutral, 46% agreed, and 26% strongly agreed about this statement (Table 73). Tables B45 to B47 show the responses by subgroup.

**Table 73. Survey responses: “Please state how much you agree or disagree with the following statement:” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
As someone who fishes I am respected by the community	342	2	2	24	46	26
Fishing is an important part of who I am	342	2	1	9	30	58
Fishing is an important part of my culture	340	2	2	15	30	51

## *Importance and Performance of Fisheries Management in Hawai‘i*

Fishermen were asked the importance of several areas of fisheries management in Hawai‘i. Among the six management areas, the most important area is about managers building or maintaining fisheries infrastructure with more than 2 in 3 (68%) fishermen rated this extremely important. The second most important area is about rules are followed and enforced, with more than half rated this extremely important. A total 90% fishermen rated these two areas as very or extremely important. The other two areas, whether managers know how many fish there are and how healthy the reef/other habitats are, were rated less important with 75% rated the former and 84% rated the latter as extremely or very important. Less important is a manager’s knowledge about the fisher and fishing community and if a fishers’ voice is included in the decision-making. Ten percent rated these two areas not at all important or slightly important, but still around 70% rated these two areas as either very or extremely important (Table 74). Tables B48 to B53 show the responses by subgroup.

Besides the six management areas listed in the survey, respondents could also report the specific fisheries management they deemed important. These open-ended responses covered management (n=24), maintenance (n=17), and rule enforcement (n=10). For management, responses were mainly related to better communication with fishermen. For maintenance, respondents focused mainly on ramps maintenance and FADs and buoys replacement.

**Table 74. Survey responses: “How important are the following for managing fisheries in Hawai‘i?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
Rules are followed and enforced	335	0	1	8	38	53
My voice is included in decision making	333	4	6	20	34	36
Managers know how many fish there are	332	3	5	17	36	39
Managers know how healthy the reef/other habitats are	333	2	4	10	37	47
Managers know about the fisher(men) and fishing community	332	4	6	18	30	42
Managers build or maintain fisheries infrastructure	332	2	2	6	22	68

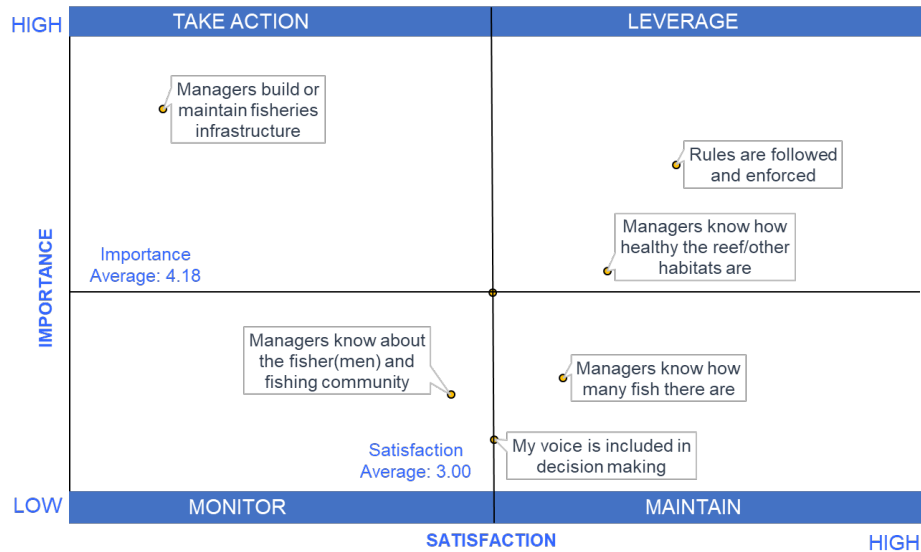
When fishermen were asked about the performance of the fisheries management, more fishermen disagreed that managers build or maintain fisheries infrastructure (Table 75). Almost half of them (49%) strongly disagreed or disagreed on the performance while about one-third of them (32%) strongly agreed or agreed that managers were doing their job. The disapproval ratings (strongly disagree and disagree) were higher for O‘ahu fishermen with 63% of them strongly disagreed or disagreed that managers build or maintain fisheries infrastructure. The disapproval

ratings for the other five management ratings were similar at 29% to 32% but the approval ratings (strongly agree and agree) varied. More fishermen strongly agreed or agreed that rules are followed and enforced (39%), and managers know how healthy the reef/other habitats are (37%), while fewer fishermen strongly agreed or agreed (29%) that fishermen’s voice is included in decision-making and managers know about the fisher(men) and fishing community. For O’ahu fishermen, in particular, only 20% of them strongly agreed or agreed that their voice is included in decision-making and only 19% of them strongly agreed or agreed that managers know about the fisher (men) and fishing community. The disapproval, approval, and neutral ratings were divided almost equally by managers’ knowledge on the quantity of fish. Among the open-ended responses that fishermen disagreed that management is being done well, they were all related to bad maintenance of FADs, ramps, and buoys (n=8), and management (n=9). Tables B54 to B59 show the responses by subgroup.

**Table 75. Survey responses: “Please state how much you agree or disagree that following management is being done well?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
Rules are followed and enforced	330	11	19	31	25	14
My voice is included in decision making	330	9	21	41	18	11
Managers know how many fish there are	310	5	27	36	21	11
Managers know how healthy the reef/other habitats are	329	9	23	31	27	10
Managers know about the fisher(men) and fishing community	329	12	18	41	20	9
Managers build or maintain fisheries infrastructure	328	23	26	19	16	16

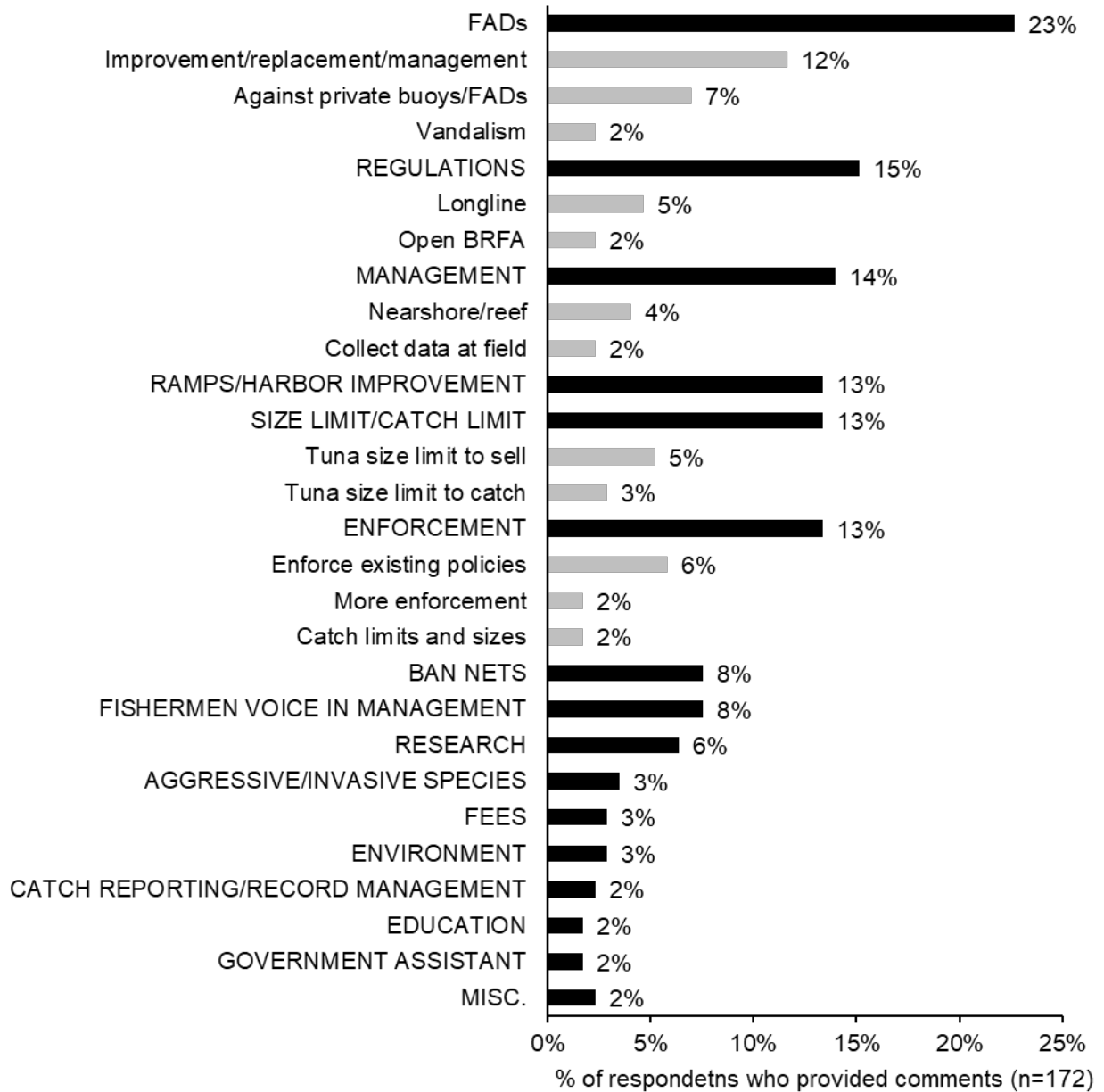
An analysis was conducted to determine the necessity of any “Need Gap” in fisheries management when ratings of satisfaction lags perceived importance, implying a need to bring satisfaction up to par with fishermen expectations. Among the six areas of fisheries management, “managers build or maintain fisheries infrastructure” is the vital area to take action on as it was rated as highly important but lowest in satisfaction. For “rules are followed and enforced” and “managers know how healthy the reef/other habitats are,” these positive areas can be leveraged and promoted as they are important and satisfied. Areas to maintain include “managers know how many fish there are” and “fishermen voice is included in decision-making” as they are satisfied and low importance. “Managers know about the fisher(men) and fishing community” is an area to monitor with low satisfaction and importance (Figure 30).



**Figure 30. Need gap analysis.**

*Fishermen’s Comments and Suggestions for How Hawai‘i’s Fisheries should be Managed and Topics for Further Study*

The last section of the survey included an open-ended question to ask fishermen for suggestions on how Hawai‘i’s fisheries should be managed or on topics that they feel need further study. The results are grouped into major subjects. Among the 345 respondents, 172 of them (50%) provided comments. Figure 31 shows the frequency distribution of the comments among the 172 respondents. The dark color bars in the figure represent the sum of a subject, while the light color bars represent the detailed comments about the subject. The most mentioned subject was related to FADs (23%). Among those, about half of the comments were about improvement of the quality, faster replacement, and management of FADs. Fishermen were also concerned about private buoys and FADs vandalism. The second most mentioned subject was related to regulations (15%). Some mentioned more regulations on longline fishery and some mentioned opening up Bottomfish Restricted Fishing Areas (BRFA). Others had opinions about regulations on different types of fishing, fisheries, and species. The third most mentioned subject was related to fisheries management. Some mentioned more management of nearshore and reef, a few mentioned the importance to collect data at field, and others mentioned the need to better manage fisheries and habitat. The fourth most-mentioned subjects were ramps/harbor improvement, the need to implement size limit and catch limit (especially tuna size limit to sell and catch), and enforcement (especially on existing policies, more enforcement, and enforcement on catch limits and sizes). Other important subjects included banning the use of nets and also included fishermen’s voice in management.

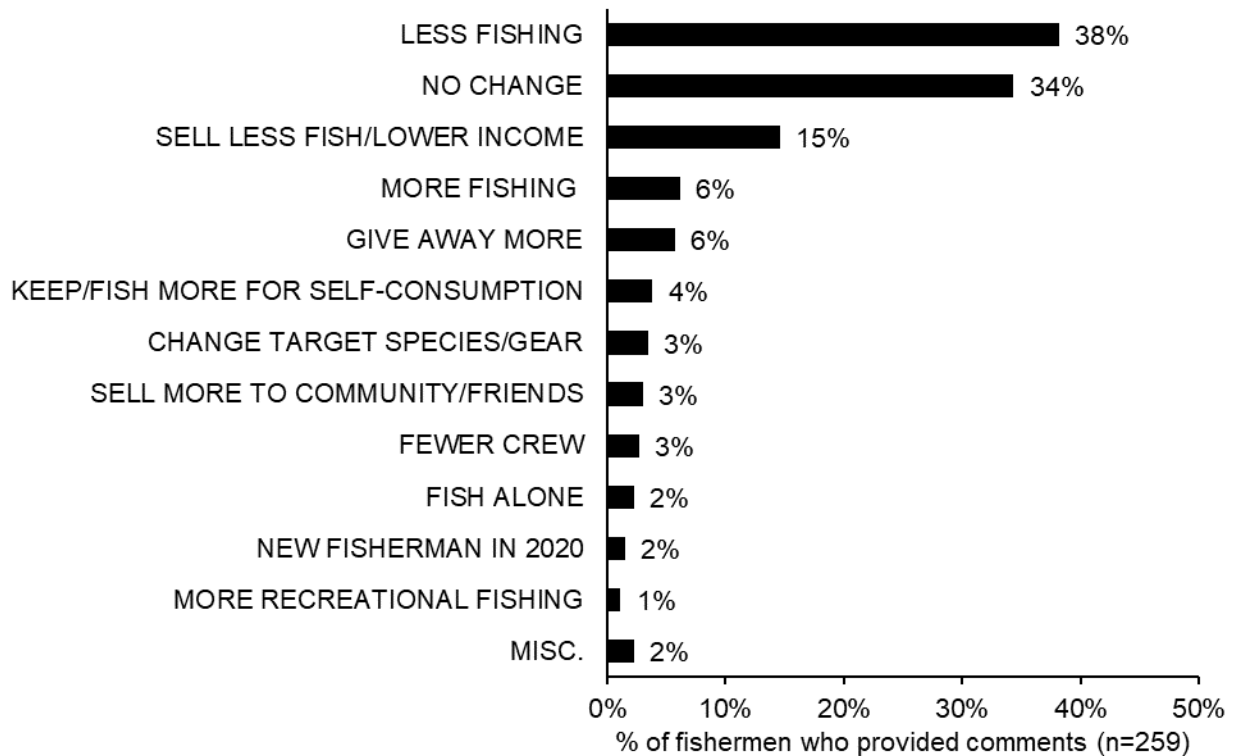


**Figure 31. Frequency distribution for fishermen’s comments on suggestions for how Hawai’i’s fisheries should be managed or topics that they feel need further study.**

*How have COVID-19 Changed Fishing Activities*

When asked whether fishermen have changed their fishing activities due to COVID, 259 (75%) of respondents provided responses. Figure 32 shows the frequency distribution of the comments among the 259 respondents. Almost 2 in 5 reported they fished less in 2020 due to COVID, another one-third of them reported no change, while 6% reported they fished more. COVID also affected small boat fishermen financially, with 15% reported selling less fish or lower income. The disposition of catches also changed due to COVID. Some gave away more fish to friends/family (6%), some kept/fished more for self-consumption (4%), and some sold more to

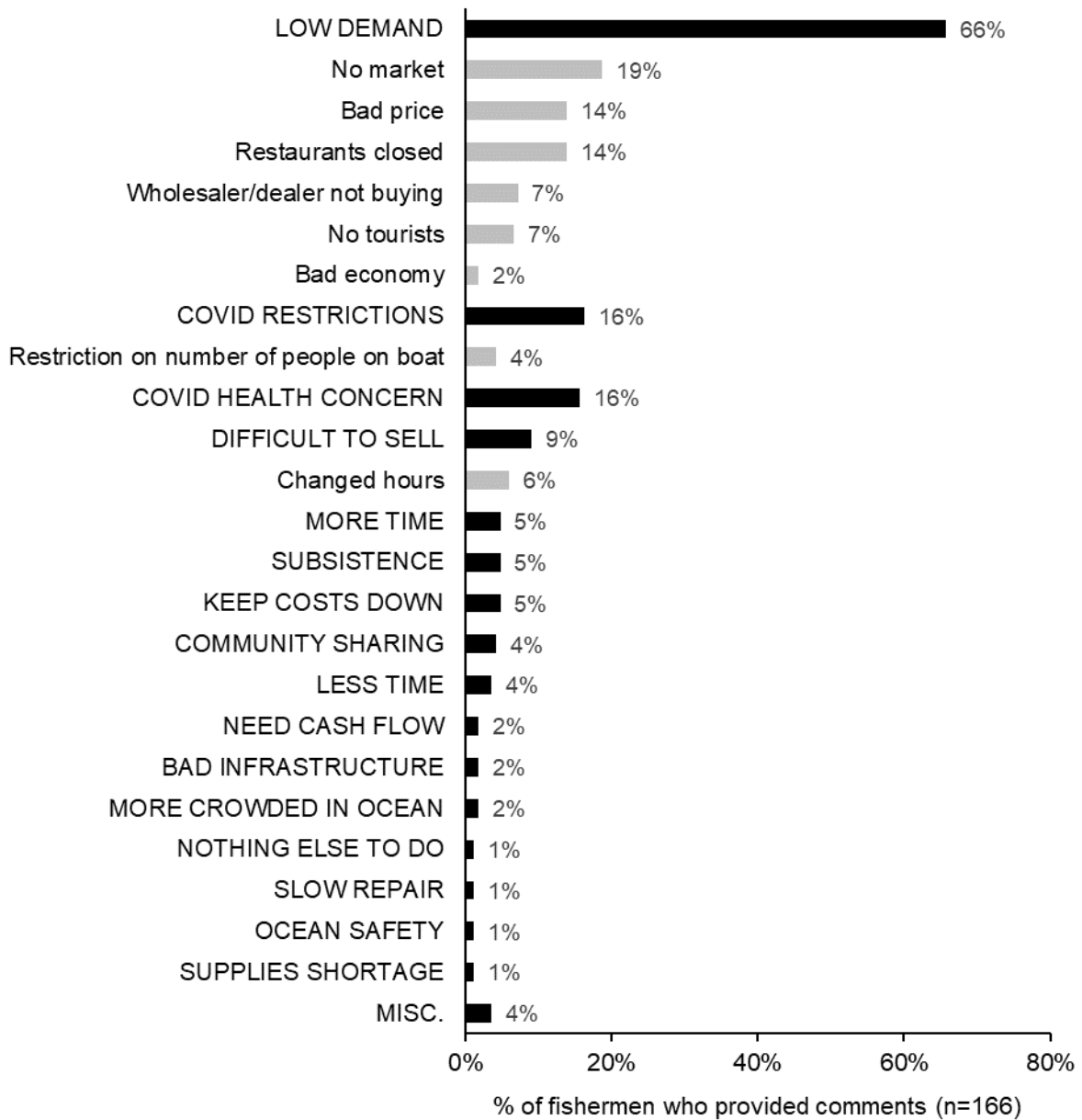
community/friends (3%). Some reported they changed their fishing behavior due to COVID. These included changing target species/fishing gear (3%), fishing with fewer crew (3%), or fished alone (2%), and some did more recreational fishing (1%).



**Figure 32. Frequency distribution for fishermen’s comments on how fishing activities have changed due to COVID-19.**

*The Main Reasons for Making the Changes*

Those who made changes in their fishing activities due to COVID (n=166) specified the reasons for making the changes. Figure 33 shows the frequency distribution of all responses among the 166 respondents who changed their fishing activities due to COVID. The most-mentioned reason was low fish demand as a result of restaurant closures and the drop in tourism which caused fish markets and fish price to crash. Changes in fishing activities were caused by COVID restrictions and health concerns. A few of the respondents pointed out that the restriction on the number of people on board caused them to fish less often or reduce their crew size. Some mentioned the difficulty of selling fish at auction, through dealers and wholesalers, particularly due to changes in operating hours. Some mentioned they fished more or continued to fish because they had more time, fishing for subsistence and community sharing, and the need of cash flow. Others mentioned they fished less trying to keep costs down, due to less time, bad infrastructure, and more crowding in the ocean.



**Figure 33. Frequency distribution for fishermen’s comments on the reasons for changing their fishing activities due to COVID-19.**

## Discussion

This report summarizes the results of the Hawai‘i small boat survey fielded in 2021. With the last study of Hawai‘i’s small boat fishery conducted 7 years ago, this report provides an important update on the economic and social characteristics of the fishery. Although approximately half of the active small boat participants responded to the survey, this report provides a representative description of the economic and social aspects of Hawai‘i small boat fishery overall and within subgroups of the fishery. Study areas include fishermen’s demographic profiles, vessel characteristics, current fishing activity, social aspects of fishing, market participation, and economic costs of fishing trips and annual fixed costs. In comparison to the 2013 survey results, we further understand how the fishery has changed over the years and during the pandemic period.

The changes in survey responses between 2020 and 2013 in different segments and the open-ended responses about how fishermen changed their fishing activities as a result of COVID and their reasons for making those changes, validates fishing as an important activity in Hawai‘i, ranging from fully commercial to purely recreational and for subsistence and maintaining cultural practices. During the pandemic period, some fishermen reduced fishing activity because of the crashing fish market and fish price, COVID restrictions, and health concerns, while others did not change their fishing activity. For some, fishing became more important or a new outdoor activity as it was considered one of the safer activities that could be done alone or with two people. Fish landings also became more important for subsistence, food sharing, and selling to friends and community directly. The survey results demonstrate how small boat fishermen in Hawai‘i adapted their fishing activities, catch disposition, and market participation in response to the pandemic, changes in the economic conditions and government regulations, and showed their resilience during the challenging times. It is interesting to see the changes were not unanimous but rather diverse. This report provides some perspectives about how Hawai‘i small boat fishermen responded to external changes and any potential external changes, such as economic downturn, and how regulatory changes will have various impacts across fisherman types and islands. This information is crucial for fishery managers when they evaluate the impacts from external changes and regulatory alternatives to the fishery as a whole and to various subgroups in the fishery.




## Acknowledgments

We want to thank many people who contributed to the success of this study. First, and the most important, we would like to thank all fishermen who participated in this study and shared valuable information regarding their fishing activities and fishing costs. We particularly appreciate their willingness to provide written comments on fisheries management and COVID's impact on their fishing behaviors. Without their participation we would not have been able to provide an accurate description of the Hawai'i small boat fishery. Moreover, we wish to thank Jason Helyer from the Division of Aquatic Resources who provided the mailing list of the fishermen; Justin Hospital and SEES team members for reviewing and providing feedback on the survey instrument, online survey, and outreach materials; Kathleen Uno who designed the beautiful survey cover and outreach materials; Sarah Medoff who developed R program to tabulate the tables in this report, and Huthaifah Khatatbeh from ECS Federal for programming the online survey; and Daemian Schreiber from ECS Federal for overseeing the survey implementation.


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# Appendix A. Survey Questionnaire



**NOAA  
FISHERIES**




Questions? Contact us at  
1-844-234-7444 (toll-free) or  
[pifsc.socioeconomics@noaa.gov](mailto:pifsc.socioeconomics@noaa.gov)  
Pacific Islands Fisheries Science Center

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

CMB Control No. 0648-0773

Expiration Date 12/31/2023

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

*We appreciate the confidential nature of the data being collected by this survey. NOAA's National Marine Fisheries Service (NMFS) will handle individual survey data as confidential business information and a form of protected personal information and will maintain the confidentiality of the information consistent with legal authorities available to it, including but not limited to the Privacy Act (5 U.S.C. Section 552a) and the Trade Secrets Act (18 U.S.C. Section 1905). NMFS will protect individual survey data from public disclosure to the extent permitted by law and it has instituted procedures to provide that protection.*

## SECTION A. YOUR FISHING EXPERIENCES

*Different fishermen in Hawaii had different fishing experiences over 2020.  
Please tell us about yours.*

1. What type of **fishing trips** did you take in 2020?

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

2. Approximately how many **BOAT** fishing trips did you take in 2020? \_\_\_\_\_ trips  
*(If not sure, please provide answer below):*

- Fewer than 12 trips (once every month or less)
- 12 – 24 trips (once every other week)
- 25 – 49 trips (once a week)
- 50 – 99 trips (once or twice a week)
- 100 – 200 trips (two or three times a week) or more

3. We understand you may use multiple gears in a trip, please estimate in 2020, what percent of your **BOAT** fishing trips were: (please check one for each gear type)

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
Trotling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dead bait/live bait for pelagic species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handline for deep 7 bottomfish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Handline/rod and reel for shallow bottomfish (uku, ulua, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spearfishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other gear (nets, etc.), please specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. In 2020, did you use a green-stick as one of the gear types?

- YES → 4a) In 2020, how many times in total did you use green-stick? \_\_\_\_\_ times  
 NO

5. Approximately how many **NON-BOAT** fishing (shoreline) trips did you take in 2020? \_\_\_\_\_ trips (if not sure, please provide answer below):

- 0  
 Fewer than 12 trips (once every month or less)  
 12 – 24 trips (once every other week)  
 25 – 49 trips (once a week)  
 50 – 99 trips (once or twice a week)  
 100 – 200 trips (two or three times a week) or more

6. In 2020, what percent of your **NON-BOAT** fishing (shoreline) trips were: (please check one for each gear type)

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
Rod and reel (pole)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spearfishing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cast/throw net	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other gear, please specify: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. In 2020, during what percent of your fishing trips did you fish at/visit Fish Aggregating Devices (FADs):

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14a. In 2020, during the trips when you visited a Fish Aggregating Devices (FADs), please estimate the percentage of your **total fishing time** that you fished at/around FADs:

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SECTION B. MARKET PARTICIPATION**

15. What is your motivation for fishing? (if multiple applies to you, put 1 as first, 2 as second, and 3 as third)

- Purely Recreational** (I fish only for sport or pleasure)  
 **Recreational Expense** (I fish primarily for sport or pleasure, but I also sell a few fish to cover trip expenses)  
 **Subsistence** (I fish primarily to catch fish to feed myself/my family/my community)  
 **Cultural** (I enjoy fishing, but I am even more concerned about keeping traditional practices alive, such as using traditional fishing gear)  
 **Part-time Commercial** (Fishing pays some of my bills, but I still have to work at another job)  
 **Full-time Commercial** (Fishing brings in most or all of the money I make in a year)  
 Other, please specify: \_\_\_\_\_

16. In 2020, how was the catch/revenue distributed among fishermen in a fishing trip?

- I kept all the fish I caught (for sale/given away/self-consumption)       Don't know/different every time  
 I kept/received \_\_\_\_\_% of total fish caught       Other, please describe: \_\_\_\_\_  
 I kept/received \_\_\_\_\_% of trip revenue

7. If you went spearfishing in 2020, what percent of the time did you use scuba gear and what percent of the time did you free dive?

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
Fishing trips with scuba gear	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing trips with free dive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. In 2020, what percent of your fishing time occurred in state and federal jurisdiction?

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
State waters (0-3nm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Federal waters (greater than 3nm)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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

10. In 2020, approximately how many total pounds of **pelagic fish** (tuna, marlin, mahihi, ono, etc., excluding akule and opelu) did you catch?

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

11. In 2020, approximately how many total pounds of **deep 7 bottomfish** (opakapaka, onaga, ehū, etc.) did you catch?

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

12. In 2020, approximately how many total pounds of **shallow bottomfish** (uku, ulua, etc.) did you catch?

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

13. In 2020, approximately how many total pounds of **nearshore and reef fish** (manini, uhu, weke ulu, etc., including akule and opelu) did you catch?

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

17. In 2020, what percent of your catch was:

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
Consumed at home	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Given away	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Caught and released	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. In 2020, did you ever sell any of the fish you caught?

- Yes → Q19  
 No → Q23

If you sold any of your fish...

19. In 2020, where did you sell your fish? (check all that apply)

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
Seafood dealer/wholesaler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Auction (United Fishing Agency)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Restaurants/stores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roadside/farmers' market	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Friends/neighbors/coworkers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other, please specify _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you sold any of your fish...

20. In 2020, what was the approximate value of all the fish you sold?

- \$1 – \$100       \$1,001 – \$2,000       \$10,001 – \$20,000  
 \$101 – \$500       \$2,001 – \$5,000       \$20,001 – \$50,000  
 \$501 – \$1,000       \$5,001 – \$10,000       More than \$50,000, specify \$ \_\_\_\_\_

If you sold any of your fish...

21. In 2020, what percent of the value of fish sold (question 20) came from the sale of pelagic fish, deep 7 bottomfish, shallow bottomfish, and nearshore and reef fish?

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
Pelagic fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Deep 7 bottomfish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shallow bottomfish (uku, ulua, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nearshore and reef fish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you sold any of your fish...

22. In 2020, after expenses, what percent of your personal income came from the sale of fish?

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### SECTION C. YOUR VESSEL

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

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

- Yes → Go to Q24  
 No → Go to Q32

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

24. In 2020, what percent of time did other people (other than family members) use the boat without you?

	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. What is the length of your boat? \_\_\_\_\_ feet

26. What is the total horsepower? \_\_\_\_\_ hp

27. In what year was the boat built? \_\_\_\_\_

28. In what year did you purchase the boat you fish on? \_\_\_\_\_  
*(if homebuilt - when did you complete it?)*

29. How much did you pay to purchase the boat you fish on? \$ \_\_\_\_\_  
*(if homebuilt - how much did it cost to build it?)*

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

31. Please enter the most recent year in which you made any major improvements to your vessel: \_\_\_\_\_

### SECTION D. YOUR FISHING TRIP COSTS

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

32. In 2020, what was the primary gear usage for your most common trip (please check one)?

- Trolling  Handline/rod and reel for shallow bottomfish (uku, ulua, etc.)  
 Dead bait/live bait for pelagic species  Spearfishing  
 Handline for deep 7 bottomfish  Other gear (net, etc.), specify: \_\_\_\_\_

32a. On average per trip, how much money did you spend on your most common (question 32) gear type trip?

Type of Expenditure	Trip Expenditure	Amount
Boat fuel (average for a trip)	\$ _____	_____ gallons
Truck fuel (round-trip)	\$ _____	_____ gallons
Oil (average for a trip)	\$ _____	_____
Ice	\$ _____	_____ lbs
Bait	\$ _____	_____ case(s)
Food and beverage	\$ _____	
Daily maintenance and repair	\$ _____	
Gear lost	\$ _____	
Other, please specify: _____	\$ _____	

32b. How were the trip costs distributed among your most common gear type (question 32)? (please check one and estimate percentage)

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

33. In 2020, what was your second most common gear usage (please check one)?

- Trolling  Handline/rod and reel for shallow bottomfish (uku, ulua, etc.)  
 Dead bait/live bait for pelagic species  Spearfishing  
 Handline for deep 7 bottomfish  Other gear (net, etc.), specify: \_\_\_\_\_

33a. On average per trip, how much money did you spend on your second most common (question 33) gear type trip?

Type of Expenditure	Trip Expenditure	Amount
Boat fuel (average for a trip)	\$ _____	_____ gallons
Truck fuel (round-trip)	\$ _____	_____ gallons
Oil (average for a trip)	\$ _____	
Ice	\$ _____	_____ lbs
Bait	\$ _____	_____ case(s)
Food and beverage	\$ _____	
Daily maintenance and repair	\$ _____	
Gear lost	\$ _____	
Other, please specify: _____	\$ _____	

33b. How were the trip costs distributed among your second most common gear type (question 33)? (please check one and estimate percentage)

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

### SECTION E. 2020 FISHING EXPENDITURES

In an effort to better understand your economic contribution to the State of Hawaii's economy, we would like to ask about your fishing-related expenditures in 2020. In the table below please indicate how much, if any, was spent on the following items during 2020.

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

Cost Category	2020 Expenditure (dollars)
Boat insurance	\$ _____ per month <input type="checkbox"/> per year
Loan payments	\$ _____ per month <input type="checkbox"/> per year
Mooring fees	\$ _____ per month <input type="checkbox"/> per year
Gear replacement/repair from wear and tear (lines, lures, gaffs, rods, electric/hydraulic reels, spears, wetsuits, coolers, safety equipment, etc.)	\$ _____
Annual boat and trailer repair, maintenance, and improvements (exclude daily expenses)	\$ _____
Fees (CML, non-commercial permit ramp, registration for truck and trailer, safety, dry dock fees, etc.)	\$ _____
Financial services	\$ _____
Other, please specify: _____	\$ _____

**SECTION F. ABOUT YOU**

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

35. What is your gender?  
 Male  
 Female
36. 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
37. What is the zip code where you live? \_\_\_\_\_
38. Are you Hispanic or Latino?  
 Yes, Hispanic or Latino  
 No, not Hispanic or Latino
39. How would you describe your race? (check all that apply)  
 American Indian or Alaska Native       Native Hawaiian  
 Asian       Other Pacific Islander (specify) \_\_\_\_\_  
 Black or African American       White
40. What is the highest level of education you have completed?  
 Less than 9<sup>th</sup> grade       Associates degree or technical school  
 Some high school (no diploma)       College graduate (bachelor degree)  
 High school graduate (including GED)       Advanced, professional, or doctoral degree  
 Some college (no degree)
41. What was your total household income, before taxes, in 2020, including fishing income?  
 Less than \$10,000       \$50,000 to \$99,999  
 \$10,000 to \$24,999       \$100,000 to \$249,999  
 \$25,000 to \$49,999       \$250,000 or more

47. Please state how much you agree or disagree that following management is being done well:
- |                                                                                   | Strongly Disagree        | Disagree                 | Neutral                  | Agree                    | Strongly Agree           |
|-----------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Rules are followed and enforced                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| My voice is included in decision making                                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers know how many fish there are                                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers know how healthy the reef / other habitats are                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers know about the fisher(men) and fishing community (income, culture, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers build or maintain fisheries infrastructure (boat ramps, harbors, etc.)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other, please specify: _____                                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

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

49. How have you changed your fishing activities due to COVID-19? For example, were any of your survey responses different than they would have been in a normal year?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

49a. What are the main reasons you made those changes?  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**SECTION G. WHAT DO YOU THINK?**

42. Given your experience, do you think in the next year (2021/2022) more people will be going ... (please check one for each)

- | Pelagic Fishing              | Deep 7 Bottomfish Fishing    | Shallow Bottomfish Fishing   | Nearshore and Reef Fishing   |
|------------------------------|------------------------------|------------------------------|------------------------------|
| <input type="checkbox"/> Yes | <input type="checkbox"/> Yes | <input type="checkbox"/> Yes | <input type="checkbox"/> Yes |
| <input type="checkbox"/> No  | <input type="checkbox"/> No  | <input type="checkbox"/> No  | <input type="checkbox"/> No  |

43. Why do you feel this way?  
 \_\_\_\_\_

44. What are the top three (3) species you target ...

	1	2	3
To sell?			
To keep for self-consumption?			
To give away?			

45. Please state how much you agree or disagree with the following statements:
- |                                                       | Strongly Disagree        | Disagree                 | Neutral                  | Agree                    | Strongly Agree           |
|-------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| As someone who fishes I am respected by the community | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fishing is an important part of who I am              | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Fishing is an important part of my culture            | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

46. How important are the following for managing fisheries in Hawaii?
- |                                                                                   | Not at all Important     | Slightly Important       | Moderately Important     | Very Important           | Extremely Important      |
|-----------------------------------------------------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Rules are followed and enforced                                                   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| My voice is included in decision making                                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers know how many fish there are                                             | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers know how healthy the reef / other habitats are                           | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers know about the fisher(men) and fishing community (income, culture, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Managers build or maintain fisheries infrastructure (boat ramps, harbors, etc.)   | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Other, please specify: _____                                                      | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

*Mahalo for participating in this survey.  
 Please use the enclosed postage paid return envelope to mail back your survey.  
 The information you have provided will improve our understanding of the importance of fishing in Hawaii.*

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

- a. YES  
 b. NO
- Name: \_\_\_\_\_  
 Address: \_\_\_\_\_  
 Email address: \_\_\_\_\_

- May we contact you if we have any questions about your survey responses?  
 YES Phone: \_\_\_\_\_ best time to contact you: \_\_\_\_\_  
 (your phone number will be kept strictly confidential)  
 NO

Paperwork Reduction Act Statement: NOAA's National Marine Fisheries Service (NMFS) is collecting this economic information to improve its ability to conduct the analyses required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and other applicable law. NMFS and the Regional Fishery Management Councils will use this information to monitor, explain and predict changes in the economic performance and impacts of commercial fisheries. Among other things, this will enable fisheries managers and the public to more fully consider the economic effects of proposed and existing regulations for federally managed fisheries.

A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995 unless the information collection has a currently valid OMB Control Number. The approved OMB Control Number for this information collection is 0604-0173 and its expiration date is 12/31/2023. Without this approval, we could not conduct this information collection. Public reporting for this information collection is estimated to be approximately 45 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. All responses to this information collection are voluntary. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the NOAA Fisheries at: 1545 Wasp Blvd., Building 175, Honolulu, HI 96818. Attn: Justin Hospital, and Justin.Hospital@noaa.gov if desired.

## Appendix B. Summary Tables

**Table B.1. Survey responses: “How would you describe your race? (check all that apply)” (percentage of responses).**

	Number of respondents (n)	Asian (%)	Native Hawaiian (%)	Other Pacific Islander (%)	White (%)	Mixed (%)
All respondents	338	38.8	12.4	6.2	26.6	16.0
<b>By county</b>						
O‘ahu	120	52.5	5.8	5.8	22.5	13.3
Hawai‘i	128	32.0	17.2	7.8	26.6	16.4
Maui	49	30.6	12.2	6.1	28.6	22.4
Kaua‘i	39	30.8	17.9	2.6	33.3	15.4
<b>By primary fishing motivation</b>						
Recreational expense	101	42.6	9.9	3.0	30.7	13.9
Part-time commercial	94	31.9	7.4	8.5	34.0	18.1
Subsistence	49	40.8	16.3	4.1	22.4	16.3
Full-time commercial	34	35.3	17.6	8.8	26.5	11.8
Purely recreational	26	57.7	3.8	11.5	15.4	11.5
Cultural	4	25.0	50.0	0.0	0.0	25.0
<b>By most common gear</b>						
Troll	183	31.1	10.9	5.5	34.4	18.0
Bait for pelagic	46	23.9	19.6	10.9	30.4	15.2
Handline for Deep 7 bottomfish	47	63.8	8.5	2.1	12.8	12.8
Handline/rod and reel for shallow bottomfish	30	60.0	10.0	6.7	13.3	10.0
Spear	6	66.7	0.0	16.7	0.0	16.7
<b>By sub-fishery</b>						
Pelagic	323	37.5	12.7	6.5	27.6	15.8
Deep 7 bottomfish	198	46.9	13.3	6.1	15.8	17.9
Non-deep 7 bottomfish	197	43.1	16.2	4.1	19.3	17.3
Coral reef	55	36.4	23.6	10.9	5.5	23.6

**Table B.2. Survey responses: “What is your age?” (percentage of responses).**

	Number of respondents (n)	Less than 35 years (%)	35–44 years (%)	45–54 years (%)	55–64 years (%)	More than 64 years (%)
All respondents	343	8.5	11.1	17.2	25.1	38.2
<b>By county</b>						
O‘ahu	122	7.4	13.1	18.9	28.7	32.0
Hawai‘i	131	9.2	10.7	18.3	20.6	41.2
Maui	49	10.2	14.3	8.2	26.5	40.8
Kaua‘i	39	7.7	2.6	20.5	25.6	43.6
<b>By primary fishing motivation</b>						
Recreational expense	105	4.8	10.5	18.1	24.8	41.9
Part-time commercial	94	8.5	10.6	16.0	26.6	38.3
Subsistence	49	10.2	14.3	16.3	32.7	26.5
Full-time commercial	34	5.9	14.7	17.6	29.4	32.4
Purely recreational	25	4.0	16.0	24.0	16.0	40.0
Cultural	4	75.0	0.0	0.0	25.0	0.0
<b>By most common gear</b>						
Troll	186	9.1	10.2	17.2	26.9	36.6
Bait for pelagic	48	6.3	20.8	14.6	22.9	35.4
Handline for Deep 7 bottomfish	47	8.5	8.5	23.4	21.3	38.3
Handline/rod and reel for shallow bottomfish	30	3.3	6.7	10.0	30.0	50.0
Spear	6	0.0	16.7	16.7	33.3	33.3
<b>By sub-fishery</b>						
Pelagic	328	8.8	11.0	18.0	25.0	37.2
Deep 7 bottomfish	197	9.6	12.2	17.8	21.8	38.6
Non-deep 7 bottomfish	200	11.0	10.0	20.0	24.0	35.0
Coral reef	55	21.8	12.7	20.0	18.2	27.3



**Table B.3. Survey responses: “What was your total household income, before taxes, in 2020, including fishing income?” (percentage of responses).**

	Number of respondents (n)	Less than \$25,000 (%)	\$25,000–\$49,999 (%)	\$50,000–\$99,999 (%)	\$100,000–\$249,999 (%)	\$250,000 or more (%)
All respondents	324	6.2	17.9	36.1	34.0	5.9
<b>By county</b>						
O‘ahu	117	1.7	18.8	28.2	40.2	11.1
Hawai‘i	122	10.7	14.8	41.8	31.1	1.6
Maui	48	10.4	16.7	37.5	33.3	2.1
Kaua‘i	36	0.0	27.8	41.7	25.0	5.6
<b>By primary fishing motivation</b>						
Recreational expense	102	4.9	19.6	27.5	38.2	9.8
Part-time commercial	88	5.7	11.4	42.0	36.4	4.5
Subsistence	49	2.2	10.9	50.0	30.4	6.5
Full-time commercial	33	15.2	27.3	33.3	21.2	3.0
Purely recreational	23	0.0	21.7	30.4	43.5	4.3
Cultural	4	0.0	0.0	75.0	25.0	0.0
<b>By most common gear</b>						
Troll	180	6.1	16.7	36.1	32.8	8.3
Bait for pelagic	41	12.2	17.1	29.3	39.0	2.4
Handline for Deep 7 bottomfish	45	2.2	11.1	40.0	40.0	6.7
Handline/rod and reel for shallow bottomfish	27	11.1	25.9	29.6	33.3	0.0
Spear	6	0.0	33.3	50.0	16.7	0.0
<b>By sub-fishery</b>						
Pelagic	309	5.8	17.8	36.2	34.3	5.8
Deep 7 bottomfish	189	6.3	15.9	37.0	37.6	3.2
Non-deep 7 bottomfish	190	5.8	18.9	36.8	35.8	2.6
Coral reef	53	5.7	17.0	47.2	26.4	3.8

**Table B.4. Survey responses: “What is the highest level of education you have completed?” (percentage of responses).**

	Number of respondents (n)	High school graduate or less (%)	Some college (%)	Associates degree or technical school (%)	College graduate (%)	Advanced, professional or doctoral degree (%)
All respondents	341	24.0	21.7	21.4	21.7	11.1
<b>By county</b>						
O‘ahu	121	17.4	22.3	14.9	28.1	17.4
Hawai‘i	130	26.9	20.8	24.6	20.8	6.9
Maui	49	28.6	28.6	18.4	20.4	4.1
Kaua‘i	39	30.8	15.4	35.9	5.1	12.8
<b>By primary fishing motivation</b>						
Recreational expense	105	17.1	22.9	23.8	22.9	13.3
Part-time commercial	93	23.7	25.8	23.7	19.4	7.5
Subsistence	49	22.4	20.4	12.2	26.5	18.4
Full-time commercial	33	45.5	18.2	21.2	12.1	3.0
Purely recreational	26	19.2	7.7	23.1	30.8	19.2
Cultural	4	0.0	50.0	25.0	25.0	0.0
<b>By most common gear</b>						
Troll	185	24.3	22.2	21.6	20.5	11.4
Bait for pelagic	47	21.3	19.1	21.3	29.8	8.5
Handline for Deep 7 bottomfish	47	21.3	23.4	12.8	29.8	12.8
Handline/rod and reel for shallow bottomfish	30	20.0	30.0	26.7	10.0	13.3
Spear	6	16.7	16.7	33.3	16.7	16.7
<b>By sub-fishery</b>						
Pelagic	326	23.6	21.8	21.2	22.1	11.3
Deep 7 bottomfish	196	20.9	19.9	23.5	24.0	11.7
Non-deep 7 bottomfish	198	20.2	24.2	21.2	23.2	11.1
Coral reef	55	27.3	20.0	20.0	25.5	7.3

**Table B.5. Survey responses: “Do you own the boat that you fish on?”(percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	345	95.9	4.1
<b>By county</b>			
O‘ahu	122	95.9	4.1
Hawai‘i	131	93.1	6.9
Maui	51	100.0	0.0
Kaua‘i	39	100.0	0.0
<b>By primary fishing motivation</b>			
Recreational expense	106	94.3	5.7
Part-time commercial	94	97.9	2.1
Subsistence	49	100.0	0.0
Full-time commercial	34	97.1	2.9
Purely recreational	26	96.2	3.8
Cultural	4	100.0	0.0
<b>By most common gear</b>			
Troll	187	95.7	4.3
Bait for pelagic	48	93.8	6.3
Handline for Deep 7 bottomfish	48	100.0	0.0
Handline/rod and reel for shallow bottomfish	30	93.3	6.7
Spear	6	100.0	0.0
<b>By sub-fishery</b>			
Pelagic	330	95.8	4.2
Deep 7 bottomfish	199	96.5	3.5
Non-deep 7 bottomfish	201	96.0	4.0
Coral reef	55	96.4	3.6

**Table B.6. Survey responses: “In 2020, what percent of time did other people (other than family members) used boat without you?” (percentage of responses).**

	Number of respondents (n)	None (0%)	Very little (1%-9%)	Some (10%-39%)	About half (40%-59%)	Most (60%-89%)	Almost all (90%-100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
All respondents	330	85.2	7.6	2.1	1.5	1.5	2.1	4.8
<b>By county</b>								
O‘ahu	116	83.6	7.8	.9	3.4	1.7	2.6	6.1
Hawai‘i	122	82.0	9.0	4.9	.8	.8	2.5	5.0
Maui	51	92.2	3.9	.0	.0	3.9	.0	3.1
Kaua‘i	39	92.3	5.1	.0	.0	.0	2.6	2.7
<b>By primary fishing motivation</b>								
Recreational expense	99	83.8	7.1	.0	3.0	3.0	3.0	7.0
Part-time commercial	92	82.6	8.7	6.5	.0	1.1	1.1	3.9
Subsistence	49	89.8	4.1	2.0	2.0	2.0	.0	3.3
Full-time commercial	33	90.9	9.1	.0	.0	.0	.0	0.5
Purely recreational	25	76.0	12.0	.0	.0	.0	12.0	12.0
Cultural	4	100.0	.0	.0	.0	.0	.0	0.0
<b>By most common gear</b>								
Troll	178	79.8	9.0	2.8	2.8	2.2	3.4	7.4
Bait for pelagic	45	95.6	2.2	2.2	.0	.0	.0	0.7
Handline for Deep 7 Bottomfish	48	89.6	8.3	2.1	.0	.0	.0	0.9
Handline/rod and reel for shallow bottomfish	28	92.9	3.6	.0	.0	3.6	.0	2.9
Spear	6	100.0	.0	.0	.0	.0	.0	0.0
<b>By sub-fishery</b>								
Pelagic	315	84.4	7.9	2.2	1.6	1.6	2.2	5.0
Deep 7 bottomfish	191	85.3	8.4	2.6	1.0	.0	2.6	4.1
Non-deep 7 bottomfish	193	83.9	9.8	2.1	1.6	1.6	1.0	3.9
Coral reef	53	84.9	5.7	3.8	1.9	1.9	1.9	5.4

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.7. Survey responses: “What is the length of your boat?” (percentage of responses and mean).**

	Number of respondents (n)	< 16 ft (%)	16–24 ft (%)	25–30 ft (%)	> 30 ft (%)
All respondents	330	2.1	63.9	25.2	8.8
<b>By county</b>					
O‘ahu	116	4.3	57.8	26.7	11.2
Hawai‘i	122	1.6	77.9	17.2	3.3
Maui	51	0.0	56.9	33.3	9.8
Kaua‘i	39	0.0	51.3	33.3	15.4
<b>By primary fishing motivation</b>					
Recreational expense	99	4.0	64.6	21.2	10.1
Part-time commercial	92	0.0	60.9	34.8	4.3
Subsistence	49	2.0	75.5	20.4	2.0
Full-time commercial	33	0.0	45.5	33.3	21.2
Purely recreational	25	8.0	68.0	12.0	12.0
Cultural	4	0.0	50.0	25.0	25.0
<b>By most common gear</b>					
Troll	178	2.8	59.6	26.4	11.2
Bait for pelagic	45	2.2	62.2	26.7	8.9
Handline for Deep 7 bottomfish	48	2.1	66.7	22.9	8.3
Handline/rod and reel for shallow bottomfish	28	0.0	78.6	21.4	0.0
Spear	6	0.0	66.7	33.3	0.0
<b>By sub-fishery</b>					
Pelagic	315	2.2	64.1	25.1	8.6
Deep 7 bottomfish	191	2.6	66.5	24.1	6.8
Non-deep 7 bottomfish	193	2.6	64.8	23.8	8.8
Coral reef	53	3.8	66.0	30.2	0.0

**Table B.8. Vessel characteristics by county (mean, standard error, and median).**

		All respondents	O'ahu	Hawai' i	Maui	Kaua'i
Boat length	Number of respondents (n)	330	116	122	51	39
	Mean	23.5	24.2	22.1	24.0	24.8
	Standard error	0.3	0.7	0.5	0.6	1.0
	Median	22.0	23.0	21.0	24.0	24.0
Boat horsepower	Number of respondents (n)	329	116	121	51	39
	Mean	249.5	273.4	214.2	256.5	262.2
	Standard error	14.6	32.7	20.3	22.5	23.8
	Median	200.0	200.0	180.0	225.0	240.0
Age of boat (years)	Number of respondents (n)	320	113	118	50	37
	Mean	26.1	27.6	25.2	24.8	26.6
	Standard error	0.8	1.3	1.4	2.0	2.5
	Median	26.0	27.0	24.5	24.5	29.0
Current boat ownership (years)	Number of respondents (n)	325	114	120	51	38
	Mean	12.8	12.8	13.4	11.8	13.2
	Standard error	0.6	1.1	1.0	1.4	2.1
	Median	9.0	9.0	10.5	9.0	8.5
Boat purchase price (\$)	Number of respondents (n)	307	109	111	49	36
	Mean	53,148	51,571	57,290	48,643	46,597
	Standard error	6,824	7,057	17,086	6,767	8,444
	Median	35,000	35,000	30,000	38,000	27,000
Boat current market value (\$)	Number of respondents (n)	309	113	111	48	35
	Mean	62,222	53,730	67,063	60,198	74,043
	Standard error	6,993	6,378	17,329	6,929	16,891
	Median	40,000	40,000	35,000	40,000	45,000
Most recent year for major vessel improvements (years ago)	Number of respondents (n)	257	95	89	45	26
	Mean	3.6	2.6	4.8	4.1	2.7
	Standard error	0.3	0.3	0.5	0.8	0.4
	Median	2.0	2.0	3.0	2.0	2.0

**Table B.9. Vessel characteristics by primary fishing motivation (mean, standard error, and median).**

		All respondents	Recreational expense	Part-time commercial	Subsistence	Full-time commercial	Purely recreational	Cultural
Boat length (ft)	Number of respondents (n)	330	99	92	49	33	25	4
	Mean	23.5	23.6	23.2	22.2	25.9	22.5	24.3
	Standard error	0.3	0.7	0.4	0.7	1.2	1.4	3.3
	Median	22.0	22.0	23.0	21.0	25.0	21.0	23.0
Boat horsepower (hp)	Number of respondents (n)	329	99	91	49	33	25	4
	Mean	249.5	284.9	242.9	192.3	265.6	217.8	372.5
	Standard error	14.6	42.8	14.7	17.5	25.3	36.9	173.2
	Median	200.0	180.0	220.0	150.0	230.0	155.0	245.0
Age of boat (years)	Number of respondents (n)	320	97	89	48	31	23	4
	Mean	26.1	26.9	27.4	28.0	24.6	20.3	21.8
	Standard error	0.8	1.6	1.6	2.2	2.6	2.5	6.1
	Median	26.0	28.0	29.0	26.5	23.0	20.0	16.0
Current boat ownership (year)	Number of respondents (n)	325	97	91	49	31	25	4
	Mean	12.8	13.6	12.3	13.8	13.4	10.5	14.5
	Standard error	0.6	1.2	1.2	1.7	2.3	1.8	8.0
	Median	9.0	10.0	8.0	11.0	9.0	8.0	8.0
Boat purchase price (\$)	Number of respondents (n)	307	90	87	46	31	22	4
	Mean	53,148	68,968	44,808	42,430	51,839	51,170	40,250
	Standard error	6,824	22,176	4,586	6,648	6,766	10,542	4,479
	Median	35,000	30,500	30,000	29,500	40,000	36,920	40,500
Boat current market value (\$)	Number of respondents (n)	309	92	86	47	31	23	4
	Mean	62,222	75,459	57,779	41,362	74,258	51,835	41,250
	Standard error	6,993	21,589	5,991	4,137	16,399	8,230	13,288
	Median	40,000	40,000	40,000	35,000	50,000	45,000	32,500
Most recent year for major vessel improvements (years ago)	Number of respondents (n)	257	78	71	38	26	20	3
	Mean	3.6	3.8	2.9	3.4	3.7	3.5	8.7
	Standard error	0.3	0.6	0.4	0.6	1.0	1.1	4.1
	Median	2.0	2.0	2.0	3.0	1.5	2.0	8.0

**Table B.10. Vessel characteristics by most common gear (mean, standard error, and median).**

		All respondents	Troll	Bait for pelagic	Handline for Deep 7 bottomfish	Handline/rod and reel for shallow bottomfish	Spear
Boat length (ft)	Number of respondents (n)	330	178	45	48	28	6
	Mean	23.5	24.2	23.6	23.1	20.8	21.8
	Standard error	0.3	0.5	0.9	0.7	0.6	1.8
	Median	22.0	23.0	22.0	22.5	20.0	21.0
Boat horsepower	Number of respondents (n)	329	178	45	48	28	6
	Mean	249.5	281.6	228.9	222.0	188.7	152.5
	Standard error	14.6	25.4	20.6	17.4	21.3	34.2
	Median	200.0	200.0	180.0	210.0	165.0	157.5
Age of boat (years)	Number of respondents (n)	320	174	45	48	26	5
	Mean	26.1	26.8	26.5	27.0	24.2	15.6
	Standard error	0.8	1.1	2.1	2.0	3.3	4.9
	Median	26.0	27.5	27.0	27.0	20.5	14.0
Current boat ownership (years)	Number of respondents (n)	325	177	45	48	26	5
	Mean	12.8	11.9	13.4	13.6	14.7	14.6
	Standard error	0.6	0.9	1.7	1.5	2.7	5.2
	Median	9.0	8.0	9.0	11.0	8.0	11.0
Boat purchase price (\$)	Number of respondents (n)	307	167	43	43	25	6
	Mean	53,148	62,346	52,488	40,298	31,576	60,833
	Standard error	6,824	12,194	7,503	5,301	4,023	25,707
	Median	35,000	35,000	36,000	30,000	37,000	32,000
Boat current market value (\$)	Number of respondents (n)	309	171	43	43	25	6
	Mean	62,222	70,884	56,750	49,151	37,260	44,833
	Standard error	6,993	12,029	7,187	6,746	4,214	12,397
	Median	40,000	40,000	42,000	35,000	37,500	42,000
Most recent year for major vessel improvements (years ago)	Number of respondents (n)	257	136	34	37	25	4
	Mean	3.6	3.3	4.4	4.1	4.3	4.0
	Standard error	0.3	0.3	0.9	0.7	1.0	1.8
	Median	2.0	2.0	2.0	2.0	2.0	4.0



**Table B.11. Survey responses: “Please estimate in 2020, what percent of your boat fishing trips were: Trolling?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%– 39%)	About half (40%–59%)	Most (60%– 89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	340	5.0	10.3	25.6	19.7	20.3	19.1	47.7
<b>By county</b>								
O‘ahu	121	6.6	9.1	19.8	19.8	24.8	19.8	50.3
Hawai‘i	128	3.1	9.4	27.3	23.4	15.6	21.1	48.2
Maui	51	9.8	11.8	33.3	21.6	13.7	9.8	35.9
Kaua‘i	39	.0	15.4	28.2	5.1	28.2	23.1	52.4
<b>By primary fishing motivation</b>								
Recreational expense	105	3.8	7.6	23.8	20.0	20.0	24.8	53.7
Part-time commercial	90	7.8	14.4	23.3	17.8	17.8	18.9	43.9
Subsistence	49	2.0	8.2	26.5	20.4	24.5	18.4	49.5
Full-time commercial	34	5.9	20.6	38.2	17.6	11.8	5.9	32.2
Purely recreational	26	3.8	0.0	23.1	15.4	26.9	30.8	57.2
Cultural	4	0.0	0.0	25.0	25.0	0.0	50.0	60.0
<b>By most common gear</b>								
Troll	187	0.0	0.0	5.9	22.5	36.9	34.8	71.7
Bait for pelagic	46	2.2	15.2	56.5	26.1	0.0	0.0	24.1
Handline for Deep 7 bottomfish	48	6.3	29.2	52.1	12.5	0.0	0.0	17.0
Handline/rod and reel for shallow bottomfish	29	24.1	27.6	48.3	0.0	0.0	0.0	10.4
Spear	6	16.7	50.0	33.3	0.0	0.0	0.0	5.8
<b>By sub-fishery</b>								
Pelagic	326	.9	10.7	26.7	20.6	21.2	19.9	49.7
Deep 7 bottomfish	198	3.0	14.1	34.3	22.2	19.7	6.6	37.7
Non-deep 7 bottomfish	200	5.0	15.0	33.5	20.0	19.0	7.5	37.3
Coral reef	55	12.7	14.5	34.5	21.8	14.5	1.8	27.9

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.12. Survey responses: “Please estimate in 2020, what percent of your boat fishing trips were: Dead bait/live bait for pelagic species?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	340	28.5	19.1	35.3	10.6	5.6	0.9	17.7
<b>By county</b>								
O‘ahu	121	35.5	21.5	35.5	6.6	.8	.0	11.7
Hawai‘i	128	20.3	14.8	34.4	16.4	11.7	2.3	26.1
Maui	51	31.4	23.5	33.3	7.8	3.9	0.0	14.2
Kaua‘i	39	30.8	20.5	38.5	7.7	2.6	0.0	13.2
<b>By primary fishing motivation</b>								
Recreational expense	105	34.3	18.1	32.4	8.6	4.8	1.9	16.5
Part-time commercial	90	22.2	21.1	35.6	12.2	8.9	0.0	20.6
Subsistence	49	40.8	24.5	24.5	8.2	2.0	0.0	11.6
Full-time commercial	34	17.6	14.7	44.1	11.8	8.8	2.9	25.5
Purely recreational	26	34.6	11.5	50.0	3.8	0.0	0.0	10.7
Cultural	4	25.0	50.0	0.0	25.0	0.0	0.0	12.5
<b>By most common gear</b>								
Troll	187	26.7	21.9	45.5	5.9	0.0	0.0	12.5
Bait for pelagic	46	0.0	0.0	10.9	41.3	41.3	6.5	57.4
Handline for Deep 7 bottomfish	48	47.9	25.0	27.1	0.0	0.0	0.0	6.6
Handline/rod and reel for shallow bottomfish	29	37.9	20.7	37.9	3.4	0.0	0.0	11.0
Spear	6	50.0	50.0	0.0	0.0	0.0	0.0	2.5
<b>By sub-fishery</b>								
Pelagic	326	25.5	19.9	36.8	11.0	5.8	0.9	18.5
Deep 7 bottomfish	198	28.3	18.2	37.9	9.1	6.1	0.5	17.7
Non-deep 7 bottomfish	200	22.0	20.0	40.0	10.5	7.0	0.5	19.1
Coral reef	55	30.9	14.5	45.5	1.8	7.3	0.0	16.3

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.13. Survey responses: “Please estimate in 2020, what percent of your boat fishing trips were: Handline for Deep 7 bottomfish?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	340	42.1	18.5	22.6	7.4	7.1	2.4	15.8
<b>By county</b>								
O‘ahu	121	48.8	14.9	19.0	11.6	3.3	2.5	14.5
Hawai‘i	128	39.8	27.3	22.7	3.1	7.0	.0	11.6
Maui	51	33.3	7.8	23.5	9.8	19.6	5.9	29.4
Kaua‘i	39	38.5	15.4	33.3	5.1	2.6	5.1	16.0
<b>By primary fishing motivation</b>								
Recreational expense	105	49.5	13.3	19.0	8.6	8.6	1.0	14.6
Part-time commercial	90	47.8	20.0	16.7	4.4	6.7	4.4	15.3
Subsistence	49	36.7	18.4	28.6	6.1	10.2	.0	17.1
Full-time commercial	34	29.4	32.4	23.5	2.9	2.9	8.8	18.4
Purely recreational	26	34.6	23.1	26.9	11.5	3.8	0.0	14.2
Cultural	4	50.0	0.0	50.0	0.0	0.0	0.0	6.3
<b>By most common gear</b>								
Troll	187	51.9	19.8	24.1	4.3	0.0	0.0	7.5
Bait for pelagic	46	37.0	32.6	28.3	2.2	0.0	0.0	6.3
Handline for Deep 7 bottomfish	48	0.0	0.0	6.3	27.1	50.0	16.7	66.3
Handline/rod and reel for shallow bottomfish	29	44.8	17.2	34.5	3.4	0.0	0.0	9.0
Spear	6	50.0	33.3	16.7	0.0	0.0	0.0	3.3
<b>By sub-fishery</b>								
Pelagic	326	41.1	19.3	23.3	7.4	7.4	1.5	15.3
Deep 7 bottomfish	198	.5	31.8	38.9	12.6	12.1	4.0	27.1
Non-deep 7 bottomfish	200	32.0	24.5	27.0	6.0	9.0	1.5	16.6
Coral reef	55	40.0	25.5	20.0	7.3	7.3	0.0	13.3

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.14. Survey responses: “Please estimate in 2020, what percent of your boat fishing trips were: Handline/rod and reel for shallow bottomfish?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	340	41.2	23.5	25.0	4.4	3.8	2.1	12.2
<b>By county</b>								
O‘ahu	121	37.2	21.5	28.1	5.0	5.0	3.3	15.3
Hawai‘i	128	46.9	25.8	22.7	3.1	1.6	0.0	7.5
Maui	51	35.3	21.6	27.5	5.9	7.8	2.0	16.0
Kaua‘i	39	41.0	25.6	20.5	5.1	2.6	5.1	13.6
<b>By primary fishing motivation</b>								
Recreational expense	105	41.9	22.9	23.8	4.8	5.7	1.0	12.6
Part-time commercial	90	46.7	18.9	24.4	5.6	0.0	4.4	11.7
Subsistence	49	38.8	22.4	26.5	8.2	2.0	2.0	13.6
Full-time commercial	34	35.3	35.3	20.6	2.9	5.9	0.0	10.3
Purely recreational	26	50.0	23.1	15.4	0.0	7.7	3.8	13.8
Cultural	4	25.0	50.0	0.0	0.0	25.0	0.0	18.8
<b>By most common gear</b>								
Troll	187	52.9	20.9	23.5	2.7	0.0	0.0	6.3
Bait for pelagic	46	26.1	34.8	34.8	4.3	0.0	0.0	9.1
Handline for Deep 7 bottomfish	48	29.2	39.6	27.1	4.2	0.0	0.0	8.6
Handline/rod and reel for shallow bottomfish	29	0.0	0.0	13.8	17.2	44.8	24.1	65.9
Spear	6	16.7	33.3	50.0	0.0	0.0	0.0	10.0
<b>By sub-fishery</b>								
Pelagic	326	41.1	24.5	25.2	4.0	3.7	1.5	11.4
Deep 7 bottomfish	198	31.3	30.3	29.3	3.5	4.5	1.0	12.1
Non-deep 7 bottomfish	200	0.0	40.0	42.5	7.5	6.5	3.5	20.8
Coral reef	55	25.5	29.1	38.2	3.6	1.8	1.8	12.3

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.15. Survey responses: “Please estimate in 2020, what percent of your boat fishing trips were: Spearfishing?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	340	86.2	7.4	4.4	0.3	1.5	0.3	2.4
<b>By county</b>								
O‘ahu	121	86.0	4.1	5.0	0.0	4.1	0.8	4.8
Hawai‘i	128	82.8	10.9	5.5	0.8	0.0	0.0	1.4
Maui	51	88.2	9.8	2.0	0.0	0.0	0.0	0.6
Kaua‘i	39	94.9	2.6	2.6	0.0	0.0	0.0	0.4
<b>By primary fishing motivation</b>								
Recreational expense	105	91.4	2.9	4.8	0.0	1.0	0.0	1.6
Part-time commercial	90	83.3	10.0	4.4	0.0	1.1	1.1	3.0
Subsistence	49	81.6	10.2	4.1	0.0	4.1	0.0	3.7
Full-time commercial	34	91.2	5.9	0.0	0.0	2.9	0.0	2.3
Purely recreational	26	88.5	3.8	3.8	3.8	0.0	0.0	2.1
Cultural	4	75.0	25.0	0.0	0.0	0.0	0.0	1.3
<b>By most common gear</b>								
Troll	187	87.7	6.4	5.3	0.5	0.0	0.0	1.2
Bait for pelagic	46	87.0	8.7	4.3	0.0	0.0	0.0	1.0
Handline for Deep 7 bottomfish	48	85.4	10.4	4.2	0.0	0.0	0.0	0.9
Handline/rod and reel for shallow bottomfish	29	93.1	6.9	0.0	0.0	0.0	0.0	0.3
Spear	6	0.0	0.0	0.0	0.0	83.3	16.7	77.5
<b>By sub-fishery</b>								
Pelagic	326	86.2	7.7	4.3	0.3	1.2	0.3	2.2
Deep 7 bottomfish	198	84.3	9.6	4.5	0.0	1.5	0.0	2.1
Non-deep 7 bottomfish	200	81.5	10.5	5.5	0.0	2.5	0.0	3.0
Coral reef	55	25.5	40.0	25.5	0.0	7.3	1.8	12.2

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.16. Survey responses: “In 2020, did you use a green-stick as one of the gear types?” (percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	340	6.5	93.5
<b>By county</b>			
O‘ahu	122	2.5	97.5
Hawai‘i	128	7.0	93.0
Maui	50	8.0	92.0
Kaua‘i	39	15.4	84.6
<b>By primary fishing motivation</b>			
Recreational expense	104	6.7	93.3
Part-time commercial	91	4.4	95.6
Subsistence	49	2.0	98.0
Full-time commercial	34	17.6	82.4
Purely recreational	26	3.8	96.2
Cultural	4	25.0	75.0
<b>By most common gear</b>			
Troll	186	5.9	94.1
Bait for pelagic	46	8.7	91.3
Handline for Deep 7 bottomfish	48	10.4	89.6
Handline/rod and reel for shallow bottomfish	29	0.0	100.0
Spear	6	0.0	100.0
<b>By sub-fishery</b>			
Pelagic	325	6.5	93.5
Deep 7 bottomfish	196	8.7	91.3
Non-deep 7 bottomfish	199	8.0	92.0
Coral reef	54	1.9	98.1

**Table B.17. Survey responses: “If you went spearfishing in 2020, what percent of the time did you use scuba gear?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)
All respondents	56	76.8	5.4	3.6	7.1	1.8	5.4
<b>By county</b>							
O‘ahu	20	70.0	10.0	0.0	10.0	.0	10.0
Hawai‘i	25	76.0	4.0	4.0	8.0	4.0	4.0
Maui	9	100.0	0.0	0.0	0.0	0.0	0.0
Kaua‘i	n.d	n.d	n.d	n.d	n.d	n.d	n.d
<b>By primary fishing motivation</b>							
Recreational expense	10	90.0	0.0	0.0	10.0	0.0	0.0
Part-time commercial	18	61.1	11.1	5.6	5.6	0.0	16.7
Subsistence	11	81.8	0.0	0.0	18.2	0.0	0.0
Full-time commercial	5	80.0	20.0	0.0	0.0	0.0	0.0
Purely recreational	3	100.0	0.0	0.0	0.0	0.0	0.0
Cultural	n.d	n.d	n.d	n.d	n.d	n.d	n.d
<b>By most common gear</b>							
Troll	26	84.6	3.8	3.8	7.7	0.0	0.0
Bait for pelagic	6	83.3	0.0	0.0	0.0	16.7	0.0
Handline for Deep 7 bottomfish	12	91.7	0.0	0.0	0.0	0.0	8.3
Handline/rod and reel for shallow bottomfish	n.d	n.d	n.d	n.d	n.d	n.d	n.d
Spear	6	66.7	0.0	0.0	16.7	.0	16.7
<b>By sub-fishery</b>							
Pelagic	53	79.2	5.7	3.8	5.7	1.9	3.8
Deep 7 bottomfish	38	78.9	2.6	5.3	7.9	2.6	2.6
Non-deep 7 bottomfish	42	73.8	4.8	4.8	9.5	2.4	4.8
Coral reef	39	71.8	5.1	5.1	10.3	2.6	5.1

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

**Table B.18. Survey responses: “If you went spearfishing in 2020, what percent of the time did you use free dive?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)
All respondents	56	1.8	21.4	10.7	10.7	3.6	51.8
<b>By county</b>							
O‘ahu	20	5.0	15.0	15.0	10.0	0.0	55.0
Hawai‘i	25	0.0	28.0	4.0	12.0	8.0	48.0
Maui	9	0.0	22.2	22.2	0.0	0.0	55.6
Kaua‘i	n.d	n.d	n.d	n.d	n.d	n.d	n.d
<b>By primary fishing motivation</b>							
Recreational expense	10	0.0	20.0	10.0	10.0	0.0	60.0
Part-time commercial	18	5.6	22.2	11.1	5.6	5.6	50.0
Subsistence	11	0.0	9.1	9.1	27.3	0.0	54.5
Full-time commercial	5	0.0	40.0	0.0	0.0	20.0	40.0
Purely recreational	3	0.0	0.0	0.0	0.0	0.0	100.0
Cultural	n.d	n.d	n.d	n.d	n.d	n.d	n.d
<b>By most common gear</b>							
Troll	26	0.0	23.1	15.4	11.5	3.8	46.2
Bait for pelagic	6	0.0	33.3	0.0	0.0	0.0	66.7
Handline for Deep 7 bottomfish	12	0.0	25.0	8.3	0.0	0.0	66.7
Handline/rod and reel for shallow bottomfish	n.d	n.d	n.d	n.d	n.d	n.d	n.d
Spear	6	0.0	16.7	0.0	16.7	0.0	66.7
<b>By sub-fishery</b>							
Pelagic	53	1.9	20.8	9.4	9.4	3.8	54.7
Deep 7 bottomfish	38	0.0	21.1	5.3	13.2	5.3	55.3
Non-deep 7 bottomfish	42	2.4	19.0	11.9	11.9	4.8	50.0
Coral reef	39	2.6	15.4	10.3	15.4	5.1	51.3

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



**Table B.19. Survey responses: “Approximately how many non-boat fishing trips did you take in 2020?” (percentage of responses and mean).**

	Number of respondents (n)	0 (%)	1-11 trips (%)	12-24 trips (%)	25-49 trips (%)	50-99 trips (%)	Mean <sup>a</sup> (trip) (exclude 0)
All respondents	344	75.9	17.4	4.7	0.9	1.2	12.7
<b>By county</b>							
O‘ahu	122	73.8	18.9	4.1	1.6	1.6	14.2
Hawai‘i	130	79.2	15.4	3.8	0.0	1.5	13.3
Maui	51	68.6	25.5	5.9	0.0	0.0	8.3
Kaua‘i	39	79.5	10.3	7.7	2.6	0.0	14.3
<b>By primary fishing motivation</b>							
Recreational expense	106	84.0	10.4	3.8	.9	.9	15.1
Part-time commercial	94	73.4	18.1	6.4	1.1	1.1	12.8
Subsistence Full-time commercial	49	71.4	18.4	8.2	2.0	.0	11.3
Purely recreational	34	76.5	17.6	2.9	0.0	2.9	16.1
Cultural	26	84.6	15.4	0.0	0.0	0.0	6.0
	4	25.0	75.0	0.0	0.0	0.0	6.0
<b>By most common gear</b>							
Troll	186	78.5	14.5	5.4	1.6	.0	11.4
Bait for pelagic	48	77.1	16.7	4.2	0.0	2.1	14.5
Handline for Deep 7 bottomfish	48	54.2	39.6	6.3	0.0	0.0	7.5
Handline/rod and reel for shallow bottomfish	30	86.7	6.7	3.3	0.0	3.3	26.3
Spear	6	100.0	0.0	0.0	0.0	0.0	0.0
<b>By sub-fishery</b>							
Pelagic	329	75.7	17.9	4.9	0.9	0.6	11.3
Deep 7 bottomfish	198	67.7	22.7	7.1	1.0	1.5	12.9
Non-deep 7 bottomfish	200	69.5	21.0	7.0	0.5	2.0	13.9
Coral reef	55	52.7	25.5	16.4	0.0	5.5	18.3

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.20. Gear usage in non-boat fishing trips in 2020 (percentage of responses).**

	Number of respondents (n)	Rod and reel (%)	Spearfishi ng (%)	Cast/thro w net (%)	Other (%)
All respondents	81	90.1	51.9	32.1	6.2
<b>By county</b>					
O‘ahu	30	93.3	40.0	20.0	6.7
Hawai‘i	28	85.7	67.9	35.7	0.0
Maui	16	93.8	50.0	43.8	18.8
Kaua‘i	7	85.7	42.9	42.9	0.0
<b>By primary fishing motivation</b>					
Recreational expense	16	93.8	50.0	18.8	0.0
Part-time commercial	24	91.7	58.3	29.2	4.2
Subsistence	14	100.0	64.3	35.7	14.3
Full-time commercial	7	57.1	28.6	42.9	0.0
Purely recreational	4	100.0	25.0	0.0	0.0
Cultural	3	100.0	33.3	66.7	0.0
<b>By most common gear</b>					
Troll	39	92.3	48.7	30.8	5.1
Bait for pelagic	11	90.9	63.6	54.5	0.0
Handline for Deep 7 bottomfish	22	81.8	59.1	22.7	13.6
Handline/rod and reel for shallow bottomfish	4	100.0	25.0	25.0	0.0
Spear	0	-	-	-	-
<b>By sub-fishery</b>					
Pelagic	78	89.7	51.3	30.8	6.4
Deep 7 bottomfish	63	87.3	55.6	31.7	6.3
Non-deep 7 bottomfish	61	95.1	55.7	34.4	6.6
Coral reef	26	88.5	96.2	53.8	3.8

**Table B.21. Average number of non-boat fishing trips by gear type (exclude 0).**

	Rod and reel (Mean)	Spearfishing (Mean)	Cast/throw net (Mean)	Other (Mean)
All respondents	9.8	4.8	4.3	2.5
<b>By county</b>				
O‘ahu	11.6	5.0	9.1	2.3
Hawai‘i	9.4	5.6	3.5	0.0
Maui	5.7	3.3	1.7	2.7
Kaua‘i	12.7	3.2	3.5	0.0
<b>By primary fishing motivation</b>				
Recreational expense	12.4	5.7	7.0	0.0
Part-time commercial	8.3	5.7	5.7	0.3
Subsistence	8.6	2.6	1.9	2.7
Full-time commercial	22.2	4.0	8.7	0.0
Purely recreational	5.9	0.6	0.0	0.0
Cultural	5.3	0.3	0.9	0.0
<b>By most common gear</b>				
Troll	8.8	3.9	3.9	2.7
Bait for pelagic	7.9	7.8	4.2	0.0
Handline for Deep 7 bottomfish	5.5	3.4	2.8	2.4
Handline/rod and reel for shallow bottomfish	26.1	0.3	0.3	0.0
Spear	0.0	-	-	-
<b>By sub-fishery</b>				
Pelagic	8.7	4.4	3.5	2.5
Deep 7 bottomfish	10.3	4.3	3.8	2.8
Non-deep 7 bottomfish	9.8	5.4	3.8	1.6
Coral reef	10.8	6.1	5.3	0.8

**Table B.22. Survey responses: “Please estimate in 2020, what percent of your non-boat fishing (shoreline) trips were: Rod and Reel?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	81	9.9	3.7	12.3	9.9	12.3	51.9	67.6
<b>By county</b>								
O‘ahu	30	6.7	0.0	13.3	6.7	6.7	66.7	76.1
Hawai‘i	28	14.3	7.1	10.7	14.3	17.9	35.7	58.5
Maui	16	6.3	6.3	18.8	12.5	12.5	43.8	62.0
Kaua‘i	7	14.3	0.0	0.0	0.0	14.3	71.4	80.7
<b>By primary fishing motivation</b>								
Recreational expense	16	6.3	6.3	12.5	12.5	6.3	56.3	70.0
Part-time commercial	24	8.3	4.2	16.7	4.2	20.8	45.8	66.3
Subsistence	14	0.0	0.0	21.4	21.4	7.1	50.0	68.6
Full-time commercial	7	42.9	0.0	14.3	0.0	0.0	42.9	47.6
Purely recreational	4	0.0	0.0	0.0	0.0	0.0	100.0	97.5
Cultural	3	0.0	0.0	0.0	0.0	33.3	66.7	88.3
<b>By most common gear</b>								
Troll	39	7.7	2.6	10.3	7.7	12.8	59.0	73.6
Bait for pelagic	11	9.1	9.1	27.3	9.1	9.1	36.4	52.5
Handline for Deep 7 bottomfish	22	18.2	4.5	9.1	13.6	18.2	36.4	56.8
Handline/rod and reel for shallow bottomfish	4	0.0	0.0	0.0	0.0	0.0	100.0	97.5
Spear	0	-	-	-	-	-	-	-
<b>By sub-fishery</b>								
Pelagic	78	10.3	3.8	10.3	10.3	12.8	52.6	68.1
Deep 7 bottomfish	63	12.7	4.8	7.9	11.1	14.3	49.2	66.3
Non-deep 7 bottomfish	61	4.9	4.9	14.8	11.5	13.1	50.8	68.1
Coral reef	26	11.5	11.5	19.2	19.2	19.2	19.2	46.4

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.23. Survey responses: “Please estimate in 2020, what percent of your non-boat fishing (shoreline) trips were: Spearfishing?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	81	48.1	8.6	19.8	11.1	8.6	3.7	20.3
<b>By county</b>								
O‘ahu	30	60.0	10.0	16.7	6.7	6.7	0.0	12.6
Hawai‘i	28	32.1	7.1	21.4	17.9	14.3	7.1	31.4
Maui	16	50.0	0.0	31.3	6.3	6.3	6.3	20.2
Kaua‘i	7	57.1	28.6	0.0	14.3	0.0	0.0	8.6
<b>By primary fishing motivation</b>								
Recreational expense	16	50.0	0.0	18.8	25.0	6.3	0.0	21.8
Part-time commercial	24	41.7	8.3	25.0	8.3	12.5	4.2	24.3
Subsistence	14	35.7	21.4	21.4	14.3	0.0	7.1	19.2
Full-time commercial	7	71.4	0.0	14.3	0.0	0.0	14.3	19.0
Purely recreational	4	75.0	0.0	25.0	0.0	0.0	0.0	2.5
Cultural	3	66.7	33.3	0.0	0.0	0.0	0.0	1.7
<b>By most common gear</b>								
Troll	39	51.3	12.8	17.9	10.3	7.7	0.0	15.6
Bait for pelagic	11	36.4	0.0	18.2	27.3	18.2	0.0	29.1
Handline for Deep 7 bottomfish	22	40.9	4.5	22.7	9.1	9.1	13.6	28.9
Handline/rod and reel for shallow bottomfish	4	75.0	25.0	0.0	0.0	0.0	0.0	1.3
Spear	0	-	-	-	-	-	-	-
<b>By sub-fishery</b>								
Pelagic	78	48.7	9.0	17.9	11.5	9.0	3.8	20.2
Deep 7 bottomfish	63	44.4	11.1	20.6	11.1	7.9	4.8	20.8
Non-deep 7 bottomfish	61	44.3	9.8	18.0	13.1	11.5	3.3	22.8
Coral reef	26	3.8	11.5	34.6	30.8	15.4	3.8	37.2

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.24. Survey responses: “Please estimate in 2020, what percent of your non-boat fishing (shoreline) trips were: Cast/throw net?” (percentage of responses and mean).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%)
All respondents	81	67.9	9.9	13.6	4.9	0.0	3.7	9.5
<b>By county</b>								
O‘ahu	30	80.0	6.7	6.7	0.0	0.0	6.7	8.8
Hawai‘i	28	64.3	10.7	14.3	7.1	0.0	3.6	10.1
Maui	16	56.3	12.5	25.0	6.3	0.0	0.0	9.5
Kaua‘i	7	57.1	14.3	14.3	14.3	0.0	0.0	10.7
<b>By primary fishing motivation</b>								
Recreational expense	16	81.3	0.0	6.3	12.5	0.0	0.0	8.2
Part-time commercial	24	70.8	8.3	12.5	4.2	0.0	4.2	9.1
Subsistence	14	64.3	21.4	7.1	7.1	0.0	0.0	5.7
Full-time commercial	7	57.1	0.0	14.3	0.0	0.0	28.6	33.3
Purely recreational	4	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Cultural	3	33.3	33.3	33.3	0.0	0.0	0.0	10.0
<b>By most common gear</b>								
Troll	39	69.2	10.3	12.8	5.1	0.0	2.6	8.5
Bait for pelagic	11	45.5	18.2	9.1	18.2	0.0	9.1	18.4
Handline for Deep 7 bottomfish	22	77.3	0.0	18.2	0.0	0.0	4.5	8.9
Handline/rod and reel for shallow bottomfish	4	75.0	25.0	0.0	0.0	0.0	0.0	1.3
Spear	0	-	-	-	-	-	-	-
<b>By sub-fishery</b>								
Pelagic	78	69.2	10.3	11.5	5.1	0.0	3.8	9.1
Deep 7 bottomfish	63	68.3	9.5	14.3	3.2	0.0	4.8	9.8
Non-deep 7 bottomfish	61	65.6	11.5	16.4	6.6	0.0	0.0	7.3
Coral reef	26	46.2	11.5	26.9	11.5	0.0	3.8	15.9

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.25. Survey responses: “How many people in total, including yourself, are on board for an average trip?” (percentage of responses and mean).**

	Number of respondents (n)	One (%)	Two (%)	Three (%)	Four or more (%)	Mean	Median
All respondents	311	24.1	51.8	20.3	3.9	2.1	2.0
<b>By county</b>							
O‘ahu	114	21.1	50.9	22.8	5.3	2.2	2.0
Hawai‘i	117	23.1	57.3	15.4	4.3	2.0	2.0
Maui	46	23.9	47.8	26.1	2.2	2.1	2.0
Kaua‘i	33	39.4	42.4	18.2	0.0	1.8	2.0
<b>By primary fishing motivation</b>							
Recreational expense	98	21.4	51.0	21.4	6.1	2.2	2.0
Part-time commercial	85	29.4	54.1	14.1	2.4	1.9	2.0
Subsistence	44	13.6	54.5	31.8	0.0	2.2	2.0
Full-time commercial	30	46.7	40.0	13.3	0.0	1.7	2.0
Purely recreational	24	12.5	50.0	29.2	8.3	2.3	2.0
Cultural	n.d	n.d	n.d	n.d	n.d	n.d	n.d
<b>By most common gear</b>							
Troll	168	19.0	50.6	25.0	5.4	2.2	2.0
Bait for pelagic	40	22.5	62.5	12.5	2.5	2.0	2.0
Handline for Deep 7 bottomfish	45	28.9	53.3	17.8	0.0	1.9	2.0
Handline/rod and reel for shallow bottomfish	27	40.7	51.9	3.7	3.7	1.8	2.0
Spear	6	16.7	33.3	33.3	16.7	2.5	2.5
<b>By sub-fishery</b>							
Pelagic	296	23.3	52.0	20.6	4.1	2.1	2.0
Deep 7 bottomfish	180	26.7	53.9	17.2	2.2	2.0	2.0
Non-deep 7 bottomfish	181	25.4	50.3	20.4	3.9	2.1	2.0
Coral reef	50	20.0	50.0	28.0	2.0	2.1	2.0

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

**Table B.26. Catch Composition: “In 2020, approximately how many total pounds of pelagic fish did you catch?” (mean and median).**

	Number of respondents (n)	0 lb (%)	1–50 lb (%)	51–100 lb (%)	101–500 lb (%)	501–1,000 lb (%)	1,001–5,000 lb (%)	More than 5,000 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
All respondents	342	6.7	7.3	6.4	26.9	23.4	20.5	8.8	2,429	750
<b>By county</b>										
O‘ahu	121	9.9	10.7	7.4	25.6	19.0	23.1	4.1	1,521	300
Hawai‘i	130	3.8	1.5	3.8	26.2	32.3	20.0	12.3	3,245	750
Maui	51	7.8	15.7	13.7	31.4	13.7	9.8	7.8	1,511	300
Kaua‘i	39	5.1	5.1	2.6	25.6	20.5	28.2	12.8	3,776	750
<b>By primary fishing motivation</b>										
Recreational expense	105	5.7	9.5	8.6	23.8	22.9	27.6	1.9	940	750
Part-time commercial	92	9.8	3.3	2.2	27.2	22.8	23.9	10.9	2,187	750
Subsistence	49	8.2	8.2	8.2	36.7	28.6	6.1	4.1	947	300
Full-time commercial	34	2.9	5.9	2.9	11.8	8.8	23.5	44.1	12,149	5,000
Purely recreational	26	3.8	7.7	19.2	50.0	15.4	3.8	0.0	378	300
Cultural	4	0.0	25.0	0.0	0.0	50.0	0.0	25.0	7,881	750
<b>By most common gear</b>										
Troll	187	1.1	3.7	8.0	27.8	29.9	20.9	8.6	2,406	750
Bait for pelagic	46	4.3	2.2	2.2	17.4	19.6	32.6	21.7	5,655	2,000
Handline for Deep 7 bottomfish	48	8.3	14.6	12.5	35.4	12.5	16.7	0.0	665	300
Handline/rod and reel for shallow bottomfish	30	23.3	26.7	0.0	33.3	6.7	10.0	0.0	373	162.5
Spear	6	50.0	16.7	0.0	33.3	0.0	0.0	0.0	104	12.5
<b>By sub-fishery</b>										
Pelagic	327	4.6	6.7	6.7	27.5	24.5	20.8	9.2	2,516	750
Deep 7 bottomfish	198	4.5	9.1	7.6	24.7	19.7	24.7	9.6	2,656	750
Non-deep 7 bottomfish	200	8.0	8.5	6.5	23.5	20.5	23.0	10.0	2,456	750
Coral reef	55	18.2	9.1	5.5	18.2	23.6	12.7	12.7	1,699	300

<sup>a</sup> Calculated using the medians of the response bins.



**Table B.27. Catch Composition: “In 2020, approximately how many total pounds of Deep 7 bottomfish did you catch?” (mean and median).**

	Number of respondents (n)	0 lb (%)	1-50 lb (%)	51-100 lb (%)	101-500 lb (%)	501-1,000 lb (%)	1,001-5,000 lb (%)	More than 5,000 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
All respondents	342	43.9	19.9	9.1	13.7	8.5	4.7	0.3	259	25
<b>By county</b>										
O‘ahu	121	47.1	20.7	8.3	9.9	7.4	6.6	0.0	196	25
Hawai‘i	130	47.7	24.6	7.7	9.2	7.7	3.1	0.0	187	25
Maui	51	31.4	15.7	7.8	21.6	13.7	7.8	2.0	670	75
Kaua‘i	39	35.9	7.7	17.9	30.8	7.7	0.0	0.0	165	75
<b>By primary fishing motivation</b>										
Recreational expense	105	47.6	19.0	8.6	14.3	5.7	4.8	0.0	169	25
Part-time commercial	92	47.8	17.4	9.8	12.0	8.7	4.3	0.0	175	25
Subsistence	49	40.8	20.4	14.3	18.4	6.1	0.0	0.0	117	25
Full-time commercial	34	35.3	17.6	2.9	5.9	20.6	14.7	2.9	1,087	25
Purely recreational	26	46.2	34.6	7.7	3.8	7.7	0.0	0.0	84	25
Cultural	4	50.0	0.0	0.0	25.0	25.0	0.0	0.0	263	150
<b>By most common gear</b>										
Troll	187	54.0	22.5	7.0	11.2	3.7	1.6	0.0	97	0
Bait for pelagic	46	39.1	23.9	10.9	15.2	8.7	2.2	0.0	234	25
Handline for Deep 7 bottomfish	48	0.0	2.1	14.6	29.2	29.2	22.9	2.1	1,094	750
Handline/rod and reel for shallow bottomfish	30	46.7	23.3	16.7	6.7	6.7	0.0	0.0	88	25
Spear	6	50.0	50.0	0.0	0.0	0.0	0.0	0.0	13	12.5
<b>By sub-fishery</b>										
Pelagic	327	43.1	20.2	9.2	14.4	8.3	4.9	0.0	213	25
Deep 7 bottomfish	198	13.6	26.8	14.1	22.7	14.1	8.1	0.5	438	75
Non-deep 7 bottomfish	200	37.0	22.0	9.5	15.0	11.5	5.0	0.0	237	25
Coral reef	55	41.8	18.2	5.5	18.2	12.7	3.6	0.0	240	25

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.28. Catch Composition: “In 2020, approximately how many total pounds of shallow bottomfish did you catch?” (mean and median).**

	Number of respondents (n)	0 lb (%)	1-50 lb (%)	51-100 lb (%)	101-500 lb (%)	501-1,000 lb (%)	1,001-5,000 lb (%)	More than 5,000 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
All respondents	342	36.3	24.9	12.9	18.4	5.8	1.8	0.0	155	25
<b>By county</b>										
O‘ahu	121	30.6	24.0	14.0	21.5	8.3	1.7	0.0	178	25
Hawai‘i	130	45.4	25.4	9.2	16.2	3.1	0.8	0.0	104	25
Maui	51	31.4	35.3	13.7	9.8	7.8	2.0	0.0	147	25
Kaua‘i	39	28.2	12.8	20.5	28.2	5.1	5.1	0.0	265	75
<b>By primary fishing motivation</b>										
Recreational expense	105	36.2	28.6	12.4	15.2	6.7	1.0	0.0	141	25
Part-time commercial	92	37.0	19.6	12.0	25.0	6.5	0.0	0.0	138	25
Subsistence	49	32.7	32.7	22.4	10.2	0.0	2.0	0.0	81	25
Full-time commercial	34	29.4	14.7	2.9	23.5	17.6	11.8	0.0	482	300
Purely recreational	26	46.2	38.5	3.8	11.5	0.0	0.0	0.0	47	25
Cultural	4	25.0	25.0	25.0	0.0	25.0	0.0	0.0	213	50
<b>By most common gear</b>										
Troll	187	43.3	27.3	11.2	16.0	2.1	0.0	0.0	79	25
Bait for pelagic	46	34.8	21.7	13.0	21.7	4.3	4.3	0.0	217	25
Handline for Deep 7 bottomfish	48	20.8	27.1	18.8	22.9	6.3	4.2	0.0	230	75
Handline/rod and reel for shallow bottomfish	30	6.7	16.7	13.3	30.0	26.7	6.7	0.0	446	300
Spear	6	33.3	33.3	16.7	16.7	0.0	0.0	0.0	71	25
<b>By sub-fishery</b>										
Pelagic	327	37.0	25.1	12.8	18.0	5.5	1.5	0.0	147	25
Deep 7 bottomfish	198	26.8	28.3	16.7	20.2	6.6	1.5	0.0	164	25
Non-deep 7 bottomfish	200	14.0	29.0	19.0	26.5	9.0	2.5	0.0	226	75
Coral reef	55	21.8	29.1	12.7	27.3	7.3	1.8	0.0	176	25

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.29. Catch Composition: “In 2020, approximately how many total pounds of nearshore & reef fish did you catch?” (mean and median).**

	Number of respondents (n)	0 lb (%)	1–50 lb (%)	51–100 lb (%)	101–500 lb (%)	501–1,000 lb (%)	1,001–5,000 lb (%)	More than 5,000 lb (%)	Mean <sup>a</sup> (lb)	Median <sup>a</sup> (lb)
All respondents	342	39.8	24.9	9.1	17.3	4.7	3.5	0.9	319	25
<b>By county</b>										
O‘ahu	121	31.4	27.3	15.7	14.9	5.8	4.1	0.8	275	25
Hawai‘i	130	46.9	23.1	5.4	18.5	3.1	2.3	0.8	322	25
Maui	51	41.2	25.5	5.9	19.6	5.9	2.0	0.0	173	25
Kaua‘i	39	41.0	20.5	5.1	17.9	5.1	7.7	2.6	648	25
<b>By primary fishing motivation</b>										
Recreational expense	105	46.7	21.9	12.4	16.2	2.9	0.0	0.0	85	25
Part-time commercial	92	42.4	14.1	9.8	22.8	5.4	4.3	1.1	309	25
Subsistence	49	28.6	36.7	10.2	14.3	6.1	4.1	0.0	208	25
Full-time commercial	34	41.2	20.6	8.8	14.7	5.9	2.9	5.9	1,267	25
Purely recreational	26	38.5	34.6	0.0	23.1	3.8	0.0	0.0	107	25
Cultural	4	25.0	25.0	0.0	25.0	0.0	25.0	0.0	1,331	162.5
<b>By most common gear</b>										
Troll	187	47.6	27.3	9.1	11.2	3.7	1.1	0.0	93	25
Bait for pelagic	46	37.0	17.4	8.7	28.3	4.3	4.3	0.0	208	25
Handline for Deep 7 bottomfish	48	31.3	35.4	8.3	25.0	0.0	0.0	0.0	90	25
Handline/rod and reel for shallow bottomfish	30	20.0	13.3	13.3	30.0	13.3	10.0	0.0	537	300
Spear	6	16.7	33.3	16.7	0.0	16.7	16.7	0.0	479	50
<b>By sub-fishery</b>										
Pelagic	327	40.7	25.7	8.9	17.1	4.6	2.8	0.3	201	25
Deep 7 bottomfish	198	33.3	27.8	9.1	23.7	3.0	2.5	0.5	234	25
Non-deep 7 bottomfish	200	21.5	30.0	12.5	24.5	7.5	3.0	1.0	321	25
Coral reef	55	0.0	30.9	12.7	23.6	9.1	18.2	5.5	1,456	300

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.30. Survey responses: “In 2020, how was the catch/revenue distributed among fishermen in a fishing trip?” (percentage of responses).**

	Number of respondents (n)	I kept all the fish I caught (%)	I kept/received some % of total fish caught (%)	I kept/received some % of trip revenue (%)	Don't know/different every time (%)	Other (%)
All respondents	340	45.9	16.2	4.7	31.2	2.1
<b>By county</b>						
O‘ahu	121	35.5	20.7	6.6	33.1	4.1
Hawai‘i	128	51.6	15.6	3.1	28.1	1.6
Maui	51	43.1	13.7	5.9	37.3	0.0
Kaua‘i	38	63.2	7.9	2.6	26.3	0.0
<b>By primary fishing motivation</b>						
Recreational expense	105	44.8	19.0	3.8	28.6	3.8
Part-time commercial	94	45.7	13.8	9.6	29.8	1.1
Subsistence	49	46.9	14.3	2.0	34.7	2.0
Full-time commercial	34	52.9	14.7	0.0	29.4	2.9
Purely recreational	26	53.8	23.1	3.8	19.2	0.0
Cultural	4	25.0	25.0	0.0	50.0	0.0
<b>By most common gear</b>						
Troll	185	45.4	15.7	3.2	33.0	2.7
Bait for pelagic	46	50.0	10.9	13.0	26.1	0.0
Handline for Deep 7 bottomfish	47	44.7	17.0	4.3	34.0	0.0
Handline/rod and reel for shallow bottomfish	30	56.7	13.3	0.0	26.7	3.3
Spear	6	33.3	50.0	16.7	0.0	0.0
<b>By sub-fishery</b>						
Pelagic	325	45.2	16.6	4.9	31.4	1.8
Deep 7 bottomfish	195	46.7	16.9	5.1	29.2	2.1
Non-deep 7 bottomfish	196	43.9	14.8	5.1	34.7	1.5
Coral reef	53	39.6	9.4	3.8	47.2	0.0

**Table B.31. Survey responses: “In 2020, how were the catches distributed?” Responses for percentage of total fish caught kept/received and percentage of trip revenue kept/received.**

	Number of respondents (n)	I kept/received some % of total fish caught (Mean percentage)	Number of respondents (n)	I kept/received some % of trip revenue (Mean percentage)
All respondents	55	60.6	16	60.8
<b>By county</b>				
O‘ahu	25	59.6	8	59.0
Hawai‘i	20	60.9	4	69.0
Maui	7	60.0	3	72.0
Kaua‘i	3	68.3	n.d	n.d
<b>By primary fishing motivation</b>				
Recreational expense	20	54.2	4	72.8
Part-time commercial	13	66.5	9	56.8
Subsistence	7	67.3	n.d	n.d
Full-time commercial	5	63.0	0	-
Purely recreational	6	50.8	n.d	n.d
Cultural	n.d	n.d	0	-
<b>By most common gear</b>				
Troll	29	58.9	6	66.8
Bait for pelagic	5	58.0	6	62.8
Handline for Deep 7 bottomfish	8	63.8	n.d	n.d
Handline/rod and reel for shallow bottomfish	4	61.5	0	-
Spear	3	50.0	n.d	n.d
<b>By sub-fishery</b>				
Pelagic	54	60.6	16	60.8
Deep 7 bottomfish	33	63.2	10	56.2
Non-deep 7 bottomfish	29	55.9	10	63.4
Coral reef	5	55.0	n.d	n.d

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

**Table B.32. Survey responses: “In 2020, did you ever sell any of the fish you caught?” (percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	344	85.2	14.8
<b>By county</b>			
O‘ahu	122	79.5	20.5
Hawai‘i	131	88.5	11.5
Maui	51	88.2	11.8
Kaua‘i	38	89.5	10.5
<b>By primary fishing motivation</b>			
Recreational expense	106	89.6	10.4
Part-time commercial	94	97.9	2.1
Subsistence	49	57.1	42.9
Full-time commercial	34	100.0	0.0
Purely recreational	26	38.5	61.5
Cultural	4	100.0	0.0
<b>By most common gear</b>			
Troll	187	81.3	18.7
Bait for pelagic	47	95.7	4.3
Handline for Deep 7 bottomfish	48	85.4	14.6
Handline/rod and reel for shallow bottomfish	30	76.7	23.3
Spear	6	100.0	0.0
<b>By sub-fishery</b>			
Pelagic	329	85.1	14.9
Deep 7 bottomfish	198	83.8	16.2
Non-deep 7 bottomfish	200	88.0	12.0
Coral reef	55	96.4	3.6

**Table B.33. Survey responses: “In 2020, where did you sell your fish: seafood dealer/wholesaler?” (percentage of responses and mean percentage).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%) (exclude)
All respondents	279	37.6	3.2	13.6	9.3	8.6	27.6	65.3
<b>By county</b>								
O‘ahu	94	57.4	4.3	18.1	8.5	6.4	5.3	41.7
Hawai‘i	109	20.2	.9	5.5	6.4	11.0	56.0	84.3
Maui	44	31.8	6.8	20.5	18.2	6.8	15.9	49.8
Kaua‘i	31	48.4	3.2	19.4	9.7	9.7	9.7	48.1
<b>By primary fishing motivation</b>								
Recreational expense	93	41.9	1.1	17.2	10.8	4.3	24.7	62.0
Part-time commercial	86	34.9	4.7	10.5	8.1	12.8	29.1	67.2
Subsistence	27	44.4	7.4	11.1	7.4	11.1	18.5	60.1
Full-time commercial	33	30.3	6.1	15.2	6.1	9.1	33.3	66.3
Purely recreational	9	55.6	0.0	0.0	11.1	0.0	33.3	87.5
Cultural	4	.0	0.0	25.0	25.0	0.0	50.0	65.0
<b>By most common gear</b>								
Troll	145	45.5	2.8	14.5	6.2	6.2	24.8	63.9
Bait for pelagic	43	18.6	2.3	14.0	9.3	16.3	39.5	71.0
Handline for Deep 7 bottomfish	39	23.1	7.7	17.9	20.5	5.1	25.6	56.9
Handline/rod and reel for shallow bottomfish	22	45.5	4.5	18.2	4.5	9.1	18.2	54.2
Spear	5	40.0	0.0	0.0	20.0	20.0	20.0	73.3
<b>By sub-fishery</b>								
Pelagic	268	37.7	3.4	13.8	9.7	9.0	26.5	64.4
Deep 7 bottomfish	162	33.3	4.3	16.0	8.6	9.9	27.8	63.5
Non-deep 7 bottomfish	167	34.7	4.8	13.8	12.6	10.8	23.4	61.0
Coral reef	49	32.7	4.1	8.2	6.1	20.4	28.6	70.0

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.34. Survey responses: “In 2020, where did you sell your fish: auction” (percentage of responses and mean percentage).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%) (exclude 0%)
All respondents	279	73.8	1.8	4.3	5.0	2.5	12.5	66.5
<b>By county</b>								
O‘ahu	94	24.5	4.3	12.8	13.8	7.4	37.2	67.8
Hawai‘i	109	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Maui	44	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Kaua‘i	31	93.5	3.2	0.0	3.2	0.0	0.0	22.5
<b>By primary fishing motivation</b>								
Recreational expense	93	61.3	3.2	7.5	7.5	5.4	15.1	61.3
Part-time commercial	86	79.1	1.2	1.2	5.8	2.3	10.5	70.7
Subsistence	27	77.8	3.7	0.0	0.0	0.0	18.5	83.3
Full-time commercial	33	69.7	0.0	9.1	6.1	0.0	15.2	67.2
Purely recreational	9	88.9	0.0	11.1	0.0	0.0	0.0	17.0
Cultural	4	100.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>By most common gear</b>								
Troll	145	69.7	2.8	6.9	3.4	2.8	14.5	63.4
Bait for pelagic	43	90.7	0.0	2.3	4.7	0.0	2.3	51.3
Handline for Deep 7 bottomfish	39	66.7	2.6	0.0	7.7	5.1	17.9	76.0
Handline/rod and reel for shallow bottomfish	22	68.2	0.0	0.0	9.1	4.5	18.2	78.6
Spear	5	40.0	0.0	20.0	20.0	0.0	20.0	61.1
<b>By sub-fishery</b>								
Pelagic	268	73.1	1.9	4.5	5.2	2.6	12.7	66.1
Deep 7 bottomfish	162	72.8	2.5	4.3	4.3	3.1	13.0	66.4
Non-deep 7 bottomfish	167	70.7	3.0	4.2	6.6	1.8	13.8	63.7
Coral reef	49	85.7	0.0	2.0	2.0	2.0	8.2	75.0

<sup>a</sup> Calculated using the medians of the response bins.



**Table B.35. Survey responses: “In 2020, where did you sell your fish: restaurants/stores?” (percentage of responses and mean percentage).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
All respondents	279	63.1	7.2	9.7	9.7	2.5	7.9	43.9
<b>By county</b>								
O‘ahu	94	80.9	8.5	4.3	1.1	2.1	3.2	35.2
Hawai‘i	109	61.5	7.3	8.3	9.2	2.8	11.0	48.4
Maui	44	38.6	4.5	20.5	25.0	4.5	6.8	42.6
Kaua‘i	31	48.4	6.5	16.1	16.1	.0	12.9	44.1
<b>By primary fishing motivation</b>								
Recreational expense	93	63.4	8.6	5.4	9.7	3.2	9.7	48.3
Part-time commercial	86	62.8	5.8	9.3	10.5	1.2	10.5	48.1
Subsistence	27	70.4	7.4	3.7	11.1	0.0	7.4	46.9
Full-time commercial	33	57.6	9.1	15.2	12.1	6.1	0.0	31.7
Purely recreational	9	77.8	0.0	0.0	0.0	0.0	22.2	97.5
Cultural	4	25.0	25.0	50.0	0.0	0.0	0.0	16.7
<b>By most common gear</b>								
Troll	145	64.1	9.0	7.6	10.3	1.4	7.6	42.1
Bait for pelagic	43	48.8	7.0	18.6	14.0	4.7	7.0	40.2
Handline for Deep 7 bottomfish	39	71.8	0.0	12.8	7.7	2.6	5.1	46.2
Handline/rod and reel for shallow bottomfish	22	59.1	9.1	0.0	4.5	9.1	18.2	65.0
Spear	5	80.0	0.0	20.0	0.0	0.0	0.0	33.3
<b>By sub-fishery</b>								
Pelagic	268	62.7	7.1	9.7	10.1	2.2	8.2	44.4
Deep 7 bottomfish	162	59.3	7.4	11.7	13.0	2.5	6.2	40.4
Non-deep 7 bottomfish	167	59.9	8.4	10.8	10.2	3.0	7.8	41.9
Coral reef	49	65.3	10.2	14.3	4.1	2.0	4.1	30.5

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.36. Survey responses: “In 2020, where did you sell your fish: roadside/farmers’ market?” (percentage of responses and mean percentage).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
All respondents	279	85.7	2.9	6.5	3.2	1.1	0.7	31.7
<b>By county</b>								
O‘ahu	94	93.6	2.1	3.2	0.0	1.1	0.0	27.7
Hawai‘i	109	87.2	1.8	7.3	1.8	.9	0.9	31.8
Maui	44	75.0	6.8	6.8	9.1	2.3	0.0	29.3
Kaua‘i	31	71.0	3.2	12.9	9.7	0.0	3.2	37.0
<b>By primary fishing motivation</b>								
Recreational expense	93	92.5	2.2	3.2	0.0	1.1	1.1	38.0
Part-time commercial	86	84.9	4.7	5.8	3.5	0.0	1.2	26.6
Subsistence	27	85.2	0.0	14.8	0.0	0.0	0.0	19.2
Full-time commercial	33	84.8	3.0	9.1	3.0	0.0	0.0	23.0
Purely recreational	9	88.9	0.0	0.0	0.0	11.1	0.0	83.0
Cultural	4	75.0	0.0	0.0	25.0	0.0	0.0	40.0
<b>By most common gear</b>								
Troll	145	82.8	2.8	7.6	4.8	1.4	0.7	32.9
Bait for pelagic	43	83.7	2.3	9.3	2.3	2.3	0.0	31.9
Handline for Deep 7 bottomfish	39	92.3	5.1	2.6	0.0	0.0	0.0	10.0
Handline/rod and reel for shallow bottomfish	22	95.5	0.0	0.0	0.0	0.0	4.5	100.0
Spear	5	100.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>By sub-fishery</b>								
Pelagic	268	85.1	3.0	6.7	3.4	1.1	0.7	31.7
Deep 7 bottomfish	162	86.4	3.7	4.3	3.1	1.9	0.6	34.3
Non-deep 7 bottomfish	167	83.2	4.2	6.0	4.2	1.8	0.6	33.2
Coral reef	49	77.6	6.1	14.3	2.0	0.0	0.0	20.3

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.37. Survey responses: “In 2020, where did you sell your fish: friends/neighbors/coworkers?” (percentage of responses and mean percentage).**

	Number of respondents (n)	None (0%)	Very little (1%–9%)	Some (10%–39%)	About half (40%–59%)	Most (60%–89%)	Almost all (90%–100%)	Mean <sup>a</sup> percentage (%) (exclude 0)
All respondents	279	51.3	9.7	16.5	9.0	5.7	7.9	41.4
<b>By county</b>								
O‘ahu	94	51.1	8.5	16.0	8.5	7.4	8.5	43.9
Hawai‘i	109	69.7	9.2	14.7	2.8	.0	3.7	28.1
Maui	44	27.3	11.4	15.9	25.0	11.4	9.1	44.7
Kaua‘i	31	19.4	12.9	25.8	9.7	12.9	19.4	49.9
<b>By primary fishing motivation</b>								
Recreational expense	93	55.9	6.5	12.9	10.8	9.7	4.3	44.8
Part-time commercial	86	50.0	9.3	22.1	8.1	2.3	8.1	36.6
Subsistence	27	48.1	7.4	11.1	3.7	11.1	18.5	60.5
Full-time commercial	33	57.6	15.2	15.2	6.1	3.0	3.0	27.4
Purely recreational	9	55.6	11.1	0.0	11.1	0.0	22.2	63.8
Cultural	4	25.0	25.0	50.0	0.0	0.0	0.0	16.7
<b>By most common gear</b>								
Troll	145	46.9	8.3	16.6	10.3	8.3	9.7	46.0
Bait for pelagic	43	60.5	7.0	25.6	4.7	0.0	2.3	26.0
Handline for Deep 7 bottomfish	39	53.8	12.8	7.7	15.4	7.7	2.6	37.1
Handline/rod and reel for shallow bottomfish	22	59.1	13.6	13.6	4.5	0.0	9.1	35.0
Spear	5	40.0	20.0	40.0	0.0	0.0	0.0	21.1
<b>By sub-fishery</b>								
Pelagic	268	50.7	9.7	17.2	9.0	5.6	7.8	41.1
Deep 7 bottomfish	162	51.2	11.7	16.0	10.5	4.3	6.2	37.2
Non-deep 7 bottomfish	167	48.5	11.4	19.2	10.2	3.6	7.2	36.4
Coral reef	49	44.9	8.2	20.4	10.2	8.2	8.2	43.1

<sup>a</sup> Calculated using the medians of the response bins.

**Table B.38. Annual fishing fixed costs in 2020 for all respondents and by county (non-zero expenditures on individual category) (mean, standard error, median).**

Category		All respondents	O'ahu	Hawai'i	Maui	Kaua'i
Boat and trailer re- pair/maintenance/ improvements	Number of respondents (n)	298	111	108	45	33
	Mean	2,557	2,667	2,746	1,961	2,307
	Standard error	328	543	664	372	704
	Median	1,000	1,000	1,000	1,200	797
Gear replacement/ repair	Number of respondents (n)	302	109	110	47	34
	Mean	2,126	1,923	2,276	1,808	2,089
	Standard error	201	333	312	477	429
	Median	1,000	1,000	1,000	750	1,000
Loan payments	Number of respondents (n)	41	11	18	6	6
	Mean	5,709	7,462	5,675	4,230	4,075
	Standard error	534	1,285	789	966	381
	Median	4,800	6,960	4,800	3,870	4,426
Boat insurance	Number of respondents (n)	195	86	56	30	21
	Mean	1,169	1,026	1,151	1,180	1,660
	Standard error	101	129	182	166	555
	Median	800	700	890	1,053	800
Fees	Number of respondents (n)	315	116	114	48	36
	Mean	671	824	517	857	420
	Standard error	81	121	61	412	66
	Median	300	500	300	300	300
Mooring fees	Number of respondents (n)	62	35	17	5	3
	Mean	3,310	3,743	2,356	1,832	6,640
	Standard error	407	646	400	804	1,010
	Median	2,880	3,000	2,100	2,300	5,880
Financial services	Number of respondents (n)	35	12	13	7	3
	Mean	461	382	515	543	350
	Standard error	71	79	123	250	76
	Median	300	325	300	300	400
Other	Number of respondents (n)	5	n.d	n.d	n.d	n.d
	Mean	1,180	n.d	n.d	n.d	n.d
	Standard error	242	n.d	n.d	n.d	n.d

<b>Category</b>		<b>All respondents</b>	<b>O'ahu</b>	<b>Hawai'i</b>	<b>Maui</b>	<b>Kaua'i</b>
	Median	1,200	n.d	n.d	n.d	n.d
Annual fixed costs	Number of respondents (n)	326	118	121	48	37
	Mean	7,069	7,697	6,787	6,036	6,582
	Standard error	515	966	868	879	1,203
	Median	3,775	4,562	3,376	4,500	3,300

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

**Table B.39. Annual fishing fixed costs in 2020 for all respondents and by primary fishing motivation (non-zero expenditures on individual category) (mean, standard error, median).**

<b>Category</b>		<b>All respondents</b>	<b>Recreational expense</b>	<b>Part-time commercial</b>	<b>Subsistence</b>	<b>Full-time commercial</b>	<b>Purely recreational</b>	<b>Cultural</b>
Boat and trailer repair/maintenance/improvement	Number of respondents (n)	298	93	83	41	31	20	4
	Mean	2,557	2,752	2,361	1,950	3,928	1,496	3,550
	Standard error	328	832	489	568	895	496	2,192
	Median	1,000	1,000	1,000	600	2,000	500	2,000
Gear replacement/repair	Number of respondents (n)	302	92	81	43	32	22	4
	Mean	2,126	1,616	2,109	1,415	4,745	1,920	6,450
	Standard error	201	214	384	306	986	1,076	4,609
	Median	1,000	1,000	1,000	500	2,500	550	2,750
Loan payments	Number of respondents (n)	41	11	15	8	3	0	n.d
	Mean	5,709	4,357	6,859	6,356	3,200	-	n.d
	Standard error	534	458	842	1,819	400	-	n.d
	Median	4,800	4,344	6,240	4,426	3,600	-	n.d
Boat insurance	Number of respondents (n)	195	57	57	23	21	17	3
	Mean	1,169	1,216	1,014	812	1,850	958	1,667
	Standard error	101	224	109	131	551	195	667
	Median	800	800	850	700	1,200	650	1,000
Fees	Number of respondents (n)	315	98	87	42	31	23	4
	Mean	671	607	569	444	914	922	825
	Standard error	81	91	63	58	316	301	269
	Median	300	250	500	300	500	300	750

Category		All respondents	Recreational expense	Part-time commercial	Subsistence	Full-time commercial	Purely recreational	Cultural
Mooring fees	Number of respondents (n)	62	26	10	6	7	7	n.d
	Mean	3,310	3,403	2,731	3,232	3,965	3,729	n.d
	Standard error	407	819	912	963	837	790	n.d
	Median	2,880	2,502	1,520	3,420	3,132	4,176	n.d
Financial services	Number of respondents (n)	35	6	12	9	4	0	3
	Mean	461	355	662	278	388	-	517
	Standard error	71	135	170	55	120	-	262
	Median	300	300	475	300	325	-	450
Other	Number of respondents (n)	5	n.d	n.d	n.d	n.d	n.d	n.d
	Mean	1,180	n.d	n.d	n.d	n.d	n.d	n.d
	Standard error	242	n.d	n.d	n.d	n.d	n.d	n.d
	Median	1,200	n.d	n.d	n.d	n.d	n.d	n.d
Annual fixed costs	Number of respondents (n)	326	102	90	43	32	24	4
	Mean	7,069	6,598	6,830	5,862	11,903	5,656	14,563
	Standard error	515	1,138	846	1,087	1,666	1,450	8,007
	Median	3,775	3,550	3,650	2,900	9,450	2,300	9,225

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

**Table B.40. Annual fishing fixed costs in 2020 for all respondents and by most common gear (non-zero expenditures on individual category) (mean, standard error, median).**

Category		All respondents	Troll	Bait for pelagic	Handline for Deep 7 bottomfish	Handline/rod and reel for shallow bottomfish	Spear
Boat and trailer repair/maintenance/improvements	Number of respondents (n)	298	160	41	43	24	6
	Mean	2,557	3,039	3,201	1,357	1,069	841
	Standard error	328	541	730	288	185	452
	Median	1,000	1,000	1,600	650	973	200
Gear replacement/repair	Number of respondents (n)	302	166	43	41	22	6
	Mean	2,126	2,258	2,280	1,697	2,265	558
	Standard error	201	296	420	599	624	390
	Median	1,000	1,000	1,489	643	1,000	188

Category		All respondents	Troll	Bait for pelagic	Handline for Deep 7 bottomfish	Handline/rod and reel for shallow bottomfish	Spear
Loan payments	Number of respondents (n)	41	21	9	3	3	0
	Mean	5,709	6,130	5,715	4,980	4,790	-
	Standard error	534	933	748	1,121	773	-
	Median	4,800	4,800	5,760	4,140	4,531	-
Boat insurance	Number of respondents (n)	195	111	25	31	12	5
	Mean	1,169	1,281	1,147	722	596	642
	Standard error	101	134	171	116	132	305
	Median	800	900	1,000	550	456	375
Fees	Number of respondents (n)	315	167	42	46	29	6
	Mean	671	654	644	559	459	478
	Standard error	81	87	133	87	64	207
	Median	300	300	388	323	300	305
Mooring fees	Number of respondents (n)	62	41	10	5	3	n.d
	Mean	3,310	3,682	2,293	3,651	1,437	n.d
	Standard error	407	556	509	962	538	n.d
	Median	2,880	3,084	2,050	4,176	1,560	n.d
Financial services	Number of respondents (n)	35	16	6	9	n.d	0
	Mean	461	524	565	378	n.d	-
	Standard error	71	128	218	54	n.d	-
	Median	300	430	325	300	n.d	-
Other	Number of respondents (n)	5	n.d	0	3	0	0
	Mean	1,180	n.d	-	1,467	-	-
	Standard error	242	n.d	-	267	-	-
	Median	1,200	n.d	-	1,200	-	-
Annual fixed costs	Number of respondents (n)	326	176	44	46	29	6
	Mean	7,069	7,967	8,245	4,718	3,972	2,416
	Standard error	515	829	1,113	838	764	836
	Median	3,775	4,898	6,634	2,995	2,650	1,740

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

**Table B.41. Survey responses: “Given your experience, do you think in the next year (2021/2022) more people will be going pelagic fishing?” (percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	327	85.3	14.7
<b>By county</b>			
O‘ahu	114	78.1	21.9
Hawai‘i	127	89.8	10.2
Maui	48	91.7	8.3
Kaua‘i	37	83.8	16.2
<b>By primary fishing motivation</b>			
Recreational expense	99	80.8	19.2
Part-time commercial	88	87.5	12.5
Subsistence	48	91.7	8.3
Full-time commercial	34	76.5	23.5
Purely recreational	25	84.0	16.0
Cultural	4	100.0	0.0
<b>By most common gear</b>			
Troll	177	82.5	17.5
Bait for pelagic	46	89.1	10.9
Handline for Deep 7 bottomfish	45	88.9	11.1
Handline/rod and reel for shallow bottomfish	28	82.1	17.9
Spear	5	100.0	0.0
<b>By sub-fishery</b>			
Pelagic	312	85.3	14.7
Deep 7 bottomfish	193	86.0	14.0
Non-deep 7 bottomfish	193	86.5	13.5
Coral reef	53	92.5	7.5

**Table B.42. Survey responses: “Given your experience, do you think in the next year (2021/2022) more people will be going Deep 7 bottomfish fishing?” (percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	316	71.8	28.2
<b>By county</b>			
O‘ahu	111	70.3	29.7
Hawai‘i	121	70.2	29.8
Maui	48	75.0	25.0
Kaua‘i	35	77.1	22.9
<b>By primary fishing motivation</b>			
Recreational expense	94	72.3	27.7
Part-time commercial	84	76.2	23.8
Subsistence	48	77.1	22.9
Full-time commercial	33	51.5	48.5
Purely recreational	25	68.0	32.0



	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
Cultural	4	50.0	50.0
<b>By most common gear</b>			
Troll	170	67.1	32.9
Bait for pelagic	42	78.6	21.4
Handline for Deep 7 bottomfish	45	84.4	15.6
Handline/rod and reel for shallow bottomfish	28	67.9	32.1
Spear	5	100.0	0.0
<b>By sub-fishery</b>			
Pelagic	301	70.8	29.2
Deep 7 bottomfish	188	75.0	25.0
Non-deep 7 bottomfish	186	73.1	26.9
Coral reef	53	77.4	22.6

**Table B.43. Survey responses: “Given your experience, do you think in the next year (2021/2022) more people will be going shallow bottomfish fishing?” (percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	242	99.2	0.8
<b>By county</b>			
O‘ahu	94	98.9	1.1
Hawai‘i	82	98.8	1.2
Maui	41	100.0	0.0
Kaua‘i	24	100.0	0.0
<b>By primary fishing motivation</b>			
Recreational expense	70	98.6	1.4
Part-time commercial	66	98.5	1.5
Subsistence	41	100.0	0.0
Full-time commercial	21	100.0	0.0
Purely recreational	20	100.0	0.0
Cultural	n.d	n.d	n.d
<b>By most common gear</b>			
Troll	130	100.0	0.0
Bait for pelagic	27	100.0	0.0
Handline for Deep 7 bottomfish	35	100.0	0.0
Handline/rod and reel for shallow bottomfish	23	91.3	8.7
Spear	5	100.0	0.0
<b>By sub-fishery</b>			
Pelagic	229	99.6	0.4
Deep 7 bottomfish	143	100.0	0.0
Non-deep 7 bottomfish	148	98.6	1.4
Coral reef	44	100.0	0.0

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

**Table B.44. Survey responses: “Given your experience, do you think in the next year (2021/2022) more people will be going nearshore and reef fishing?” (percentage of responses).**

	<b>Number of respondents (n)</b>	<b>Yes (%)</b>	<b>No (%)</b>
All respondents	311	77.2	22.8
<b>By county</b>			
O‘ahu	110	80.0	20.0
Hawai‘i	118	72.0	28.0
Maui	49	85.7	14.3
Kaua‘i	33	72.7	27.3
<b>By primary fishing motivation</b>			
Recreational expense	95	73.7	26.3
Part-time commercial	80	75.0	25.0
Subsistence	47	89.4	10.6
Full-time commercial	32	75.0	25.0
Purely recreational	24	87.5	12.5
Cultural	4	50.0	50.0
<b>By most common gear</b>			
Troll	168	76.8	23.2
Bait for pelagic	40	62.5	37.5
Handline for Deep 7 bottomfish	45	82.2	17.8
Handline/rod and reel for shallow bottomfish	27	77.8	22.2
Spear	5	100.0	0.0
<b>By sub-fishery</b>			
Pelagic	297	76.8	23.2
Deep 7 bottomfish	184	76.6	23.4
Non-deep 7 bottomfish	186	78.0	22.0
Coral reef	52	86.5	13.5

**Table B.45. Survey responses: “Please state how much you agree or disagree with the following statements: As someone who fishes I am respected by the community?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	342	1.8	2.0	23.7	46.2	26.3
<b>By county</b>						
O‘ahu	122	1.6	4.1	24.6	46.7	23.0
Hawai‘i	130	0.8	1.5	24.6	47.7	25.4
Maui	50	6.0	0.0	20.0	42.0	32.0
Kaua‘i	38	0.0	0.0	21.1	47.4	31.6
<b>By primary fishing motivation</b>						
Recreational expense	105	1.0	1.9	28.6	44.8	23.8
Part-time commercial	93	1.1	3.2	23.7	49.5	22.6
Subsistence	49	6.1	2.0	26.5	49.0	16.3
Full-time commercial	34	0.0	0.0	17.6	41.2	41.2
Purely recreational	25	0.0	0.0	24.0	36.0	40.0
Cultural	4	0.0	0.0	0.0	75.0	25.0
<b>By most common gear</b>						
Troll	187	2.1	2.1	22.5	44.9	28.3
Bait for pelagic	48	0.0	2.1	18.8	54.2	25.0
Handline for Deep 7 bottomfish	46	4.3	0.0	28.3	47.8	19.6
Handline/rod and reel for shallow bottomfish	29	0.0	3.4	37.9	44.8	13.8
Spear	6	0.0	0.0	33.3	33.3	33.3
<b>By sub-fishery</b>						
Pelagic	327	1.8	1.8	24.5	45.9	26.0
Deep 7 bottomfish	197	1.5	1.5	21.8	47.2	27.9
Non-deep 7 bottomfish	199	1.5	2.5	22.6	49.2	24.1
Coral reef	55	1.8	5.5	9.1	49.1	34.5

**Table B.46. Survey responses: “Please state how much you agree or disagree with the following statements: Fishing is an important part of who I am?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	342	2.0	1.5	8.5	30.1	57.9
<b>By county</b>						
O‘ahu	122	1.6	0.8	8.2	28.7	60.7
Hawai‘i	130	0.8	0.8	10.0	32.3	56.2
Maui	50	6.0	0.0	8.0	30.0	56.0
Kaua‘i	38	2.6	5.3	5.3	28.9	57.9
<b>By primary fishing motivation</b>						
Recreational expense	105	1.0	1.9	11.4	32.4	53.3
Part-time commercial	93	1.1	2.2	9.7	31.2	55.9
Subsistence	49	6.1	0.0	8.2	18.4	67.3
Full-time commercial	34	0.0	0.0	0.0	32.4	67.6
Purely recreational	25	4.0	4.0	4.0	44.0	44.0
Cultural	4	0.0	0.0	0.0	25.0	75.0
<b>By most common gear</b>						
Troll	187	2.1	1.6	10.2	27.3	58.8
Bait for pelagic	48	0.0	0.0	6.3	29.2	64.6
Handline for Deep 7 bottomfish	46	6.5	2.2	6.5	32.6	52.2
Handline/rod and reel for shallow bottomfish	29	0.0	3.4	10.3	41.4	44.8
Spear	6	0.0	0.0	0.0	50.0	50.0
<b>By sub-fishery</b>						
Pelagic	327	2.1	1.5	8.6	30.0	57.8
Deep 7 bottomfish	197	2.0	0.5	5.6	28.9	62.9
Non-deep 7 bottomfish	199	2.0	0.5	5.5	32.2	59.8
Coral reef	55	1.8	0.0	5.5	18.2	74.5

**Table B.47. Survey responses: “Please state how much you agree or disagree with the following statements: Fishing is an important part of my culture?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	340	2.1	2.1	15.0	30.0	50.9
<b>By county</b>						
O‘ahu	122	1.6	1.6	13.9	31.1	51.6
Hawai‘i	129	0.8	2.3	17.1	30.2	49.6
Maui	49	6.1	0.0	14.3	26.5	53.1
Kaua‘i	38	2.6	2.6	13.2	31.6	50.0
<b>By primary fishing motivation</b>						
Recreational expense	104	1.0	2.9	23.1	34.6	38.5
Part-time commercial	93	1.1	2.2	12.9	30.1	53.8
Subsistence	49	6.1	2.0	12.2	18.4	61.2
Full-time commercial	34	0.0	0.0	8.8	26.5	64.7
Purely recreational	25	4.0	4.0	12.0	44.0	36.0
Cultural	4	0.0	0.0	0.0	50.0	50.0
<b>By most common gear</b>						
Troll	186	2.2	3.2	16.7	30.1	47.8
Bait for pelagic	47	0.0	2.1	12.8	25.5	59.6
Handline for Deep 7 bottomfish	46	6.5	0.0	10.9	32.6	50.0
Handline/rod and reel for shallow bottomfish	29	0.0	0.0	20.7	37.9	41.4
Spear	6	0.0	0.0	16.7	16.7	66.7
<b>By sub-fishery</b>						
Pelagic	325	2.2	2.2	14.8	30.2	50.8
Deep 7 bottomfish	196	2.0	1.0	10.2	28.6	58.2
Non-deep 7 bottomfish	198	2.0	1.5	11.1	26.8	58.6
Coral reef	55	1.8	0.0	5.5	18.2	74.5

**Table B.48. Survey responses: “How important are the following for managing fisheries in Hawai‘i: Rules are followed and enforced?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
All respondents	335	0.3	0.9	8.4	37.9	52.5
<b>By county</b>						
O‘ahu	120	0.8	1.7	10.0	33.3	54.2
Hawai‘i	127	0.0	0.8	6.3	38.6	54.3
Maui	49	0.0	0.0	12.2	42.9	44.9
Kaua‘i	37	0.0	0.0	5.4	43.2	51.4
<b>By primary fishing motivation</b>						
Recreational expense	104	0.0	1.0	8.7	34.6	55.8
Part-time commercial	90	0.0	1.1	6.7	44.4	47.8
Subsistence	47	0.0	0.0	12.8	38.3	48.9
Full-time commercial	33	0.0	3.0	6.1	30.3	60.6
Purely recreational	25	0.0	0.0	12.0	40.0	48.0
Cultural	4	0.0	0.0	0.0	50.0	50.0
<b>By most common gear</b>						
Troll	183	0.5	0.0	9.8	32.2	57.4
Bait for pelagic	47	0.0	4.3	4.3	48.9	42.6
Handline for Deep 7 bottomfish	46	0.0	0.0	10.9	39.1	50.0
Handline/rod and reel for shallow bottomfish	27	0.0	3.7	0.0	59.3	37.0
Spear	6	0.0	0.0	33.3	16.7	50.0
<b>By sub-fishery</b>						
Pelagic	320	0.3	0.9	8.4	37.8	52.5
Deep 7 bottomfish	194	0.5	1.5	8.8	36.6	52.6
Non-deep 7 bottomfish	195	0.5	1.0	8.2	41.0	49.2
Coral reef	52	0.0	0.0	13.5	26.9	59.6

**Table B.49. Survey responses: “How important are the following for managing fisheries in Hawai‘i: My voice is included in decision making?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
All respondents	333	4.2	5.7	20.4	33.6	36.0
<b>By county</b>						
O‘ahu	120	7.5	7.5	16.7	29.2	39.2
Hawai‘i	125	2.4	4.8	20.0	32.8	40.0
Maui	49	2.0	4.1	24.5	42.9	26.5
Kaua‘i	37	2.7	2.7	29.7	37.8	27.0
<b>By primary fishing motivation</b>						
Recreational expense	102	2.0	3.9	27.5	32.4	34.3
Part-time commercial	90	5.6	8.9	17.8	34.4	33.3
Subsistence	47	10.6	6.4	21.3	25.5	36.2
Full-time commercial	33	0.0	0.0	6.1	36.4	57.6
Purely recreational	25	8.0	8.0	16.0	48.0	20.0
Cultural	4	0.0	0.0	50.0	25.0	25.0
<b>By most common gear</b>						
Troll	182	3.8	3.8	20.9	32.4	39.0
Bait for pelagic	47	0.0	2.1	21.3	40.4	36.2
Handline for Deep 7 bottomfish	46	6.5	6.5	21.7	30.4	34.8
Handline/rod and reel for shallow bottomfish	26	7.7	23.1	23.1	30.8	15.4
Spear	6	0.0	16.7	33.3	33.3	16.7
<b>By sub-fishery</b>						
Pelagic	318	4.1	5.0	21.4	33.6	35.8
Deep 7 bottomfish	193	6.2	5.7	22.8	26.9	38.3
Non-deep 7 bottomfish	194	3.6	6.2	20.1	33.5	36.6
Coral reef	52	5.8	5.8	21.2	26.9	40.4

**Table B.50. Survey responses: “How important are the following for managing fisheries in Hawai‘i: Managers know how many fish there are?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
All respondents	332	2.7	5.4	16.9	36.4	38.6
<b>By county</b>						
O‘ahu	119	5.9	7.6	12.6	31.9	42.0
Hawai‘i	125	0.8	3.2	18.4	40.0	37.6
Maui	49	2.0	8.2	16.3	36.7	36.7
Kaua‘i	37	0.0	2.7	24.3	37.8	35.1
<b>By primary fishing motivation</b>						
Recreational expense	102	4.9	4.9	12.7	40.2	37.3
Part-time commercial	89	1.1	9.0	18.0	41.6	30.3
Subsistence	47	2.1	4.3	23.4	25.5	44.7
Full-time commercial	33	3.0	6.1	9.1	24.2	57.6
Purely recreational	25	0.0	4.0	20.0	48.0	28.0
Cultural	4	0.0	0.0	25.0	50.0	25.0
<b>By most common gear</b>						
Troll	180	3.3	4.4	16.7	35.0	40.6
Bait for pelagic	47	2.1	6.4	19.1	34.0	38.3
Handline for Deep 7 bottomfish	46	2.2	4.3	10.9	43.5	39.1
Handline/rod and reel for shallow bottomfish	27	3.7	11.1	14.8	55.6	14.8
Spear	6	0.0	16.7	33.3	16.7	33.3
<b>By sub-fishery</b>						
Pelagic	317	2.8	5.4	17.0	36.0	38.8
Deep 7 bottomfish	194	3.1	6.7	17.5	35.6	37.1
Non-deep 7 bottomfish	195	2.1	6.2	17.4	36.9	37.4
Coral reef	52	0.0	0.0	15.4	32.7	51.9



**Table B.51. Survey responses: “How important are the following for managing fisheries in Hawai‘i: Managers know how healthy the reef/other habitats are?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
All respondents	333	2.4	3.9	9.9	36.6	47.1
<b>By county</b>						
O‘ahu	120	5.8	2.5	10.8	31.7	49.2
Hawai‘i	126	0.8	4.0	10.3	35.7	49.2
Maui	48	0.0	8.3	12.5	41.7	37.5
Kaua‘i	37	0.0	2.7	2.7	48.6	45.9
<b>By primary fishing motivation</b>						
Recreational expense	103	2.9	5.8	6.8	35.0	49.5
Part-time commercial	90	2.2	4.4	12.2	41.1	40.0
Subsistence	47	2.1	4.3	14.9	27.7	51.1
Full-time commercial	33	3.0	0.0	6.1	36.4	54.5
Purely recreational	25	0.0	4.0	8.0	44.0	44.0
Cultural	4	0.0	0.0	0.0	75.0	25.0
<b>By most common gear</b>						
Troll	182	2.7	2.7	8.8	36.3	49.5
Bait for pelagic	47	2.1	6.4	12.8	31.9	46.8
Handline for Deep 7 bottomfish	46	0.0	6.5	8.7	34.8	50.0
Handline/rod and reel for shallow bottomfish	27	7.4	7.4	7.4	55.6	22.2
Spear	6	0.0	0.0	33.3	33.3	33.3
<b>By sub-fishery</b>						
Pelagic	318	2.5	3.8	10.1	36.2	47.5
Deep 7 bottomfish	193	2.6	6.2	11.4	34.7	45.1
Non-deep 7 bottomfish	195	3.1	4.6	11.3	37.4	43.6
Coral reef	52	0.0	0.0	13.5	26.9	59.6

**Table B.52. Survey responses: “How important are the following for managing fisheries in Hawai‘i: Managers know about the fisher(men) and fishing community (income, culture, etc.)?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
All respondents	332	3.9	6.3	17.8	30.1	41.9
<b>By county</b>						
O‘ahu	119	6.7	8.4	14.3	23.5	47.1
Hawai‘i	125	2.4	4.8	17.6	30.4	44.8
Maui	49	2.0	8.2	22.4	34.7	32.7
Kaua‘i	37	2.7	0.0	21.6	45.9	29.7
<b>By primary fishing motivation</b>						
Recreational expense	103	3.9	7.8	19.4	27.2	41.7
Part-time commercial	90	3.3	10.0	18.9	30.0	37.8
Subsistence	47	4.3	4.3	12.8	29.8	48.9
Full-time commercial	33	3.0	3.0	12.1	24.2	57.6
Purely recreational	24	0.0	0.0	25.0	45.8	29.2
Cultural	4	25.0	0.0	0.0	50.0	25.0
<b>By most common gear</b>						
Troll	180	4.4	3.9	18.9	32.8	40.0
Bait for pelagic	47	6.4	8.5	10.6	27.7	46.8
Handline for Deep 7 bottomfish	46	0.0	10.9	19.6	28.3	41.3
Handline/rod and reel for shallow bottomfish	27	7.4	7.4	25.9	40.7	18.5
Spear	6	0.0	33.3	0.0	0.0	66.7
<b>By sub-fishery</b>						
Pelagic	317	4.1	6.3	17.7	30.6	41.3
Deep 7 bottomfish	192	3.6	5.7	21.4	26.0	43.2
Non-deep 7 bottomfish	194	4.1	6.7	17.5	31.4	40.2
Coral reef	52	0.0	7.7	17.3	21.2	53.8

**Table B.53. Survey responses: “How important are the following for managing fisheries in Hawai‘i: Managers build or maintain fisheries infrastructure (boat ramps, harbors, etc.)?” (percentage of responses).**

	Number of respondents (n)	Not at all important (%)	Slightly important (%)	Moderately important (%)	Very important (%)	Extremely important (%)
All respondents	332	2.4	1.5	6.3	21.7	68.1
<b>By county</b>						
O‘ahu	120	4.2	2.5	7.5	19.2	66.7
Hawai‘i	124	0.8	0.8	7.3	25.0	66.1
Maui	49	2.0	2.0	4.1	22.4	69.4
Kaua‘i	37	2.7	0.0	2.7	16.2	78.4
<b>By primary fishing motivation</b>						
Recreational expense	103	2.9	3.9	4.9	27.2	61.2
Part-time commercial	90	2.2	1.1	7.8	23.3	65.6
Subsistence	46	2.2	0.0	8.7	17.4	71.7
Full-time commercial	33	3.0	0.0	6.1	18.2	72.7
Purely recreational	25	0.0	0.0	0.0	20.0	80.0
Cultural	4	0.0	0.0	25.0	25.0	50.0
<b>By most common gear</b>						
Troll	180	1.7	1.1	6.7	22.2	68.3
Bait for pelagic	47	2.1	2.1	6.4	25.5	63.8
Handline for Deep 7 bottomfish	46	2.2	0.0	4.3	21.7	71.7
Handline/rod and reel for shallow bottomfish	27	7.4	7.4	3.7	25.9	55.6
Spears	6	16.7	0.0	16.7	16.7	50.0
<b>By sub-fishery</b>						
Pelagic	317	2.5	1.3	6.6	22.4	67.2
Deep 7 bottomfish	192	3.1	1.6	6.3	19.8	69.3
Non-deep 7 bottomfish	194	3.1	2.1	7.2	22.7	64.9
Coral reef	52	0.0	0.0	11.5	17.3	71.2

**Table B.54. Survey responses: “Please state how much you agree or disagree that following management is being done well: Rules are followed and enforced?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	330	10.9	19.1	30.6	25.5	13.9
<b>By county</b>						
O‘ahu	119	20.2	26.9	28.6	16.8	7.6
Hawai‘i	125	4.0	13.6	32.0	30.4	20.0
Maui	47	4.3	12.8	40.4	27.7	14.9
Kaua‘i	37	13.5	18.9	21.6	32.4	13.5
<b>By primary fishing motivation</b>						
Recreational expense	103	8.7	22.3	32.0	26.2	10.7
Part-time commercial	88	20.5	13.6	23.9	29.5	12.5
Subsistence	47	14.9	23.4	38.3	12.8	10.6
Full-time commercial	32	3.1	31.3	15.6	25.0	25.0
Purely recreational	25	0.0	16.0	44.0	32.0	8.0
Cultural	4	0.0	0.0	0.0	50.0	50.0
<b>By most common gear</b>						
Troll	183	10.9	20.2	27.9	26.8	14.2
Bait for pelagic	47	6.4	14.9	34.0	29.8	14.9
Handline for Deep 7 bottomfish	43	14.0	32.6	34.9	14.0	4.7
Handline/rod and reel for shallow bottomfish	26	15.4	7.7	34.6	34.6	7.7
Spear	5	20.0	20.0	40.0	0.0	20.0
<b>By sub-fishery</b>						
Pelagic	316	11.1	19.6	30.4	25.6	13.3
Deep 7 bottomfish	191	8.9	24.1	31.9	24.1	11.0
Non-deep 7 bottomfish	192	10.4	21.9	29.7	26.0	12.0
Coral reef	51	9.8	17.6	33.3	17.6	21.6

**Table B.55. Survey responses: “Please state how much you agree or disagree that following management is being done well: My voice is included in decision making?” (percentage of responses)**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	330	9.1	21.2	41.2	17.9	10.6
<b>By county</b>						
O‘ahu	120	13.3	25.0	41.7	12.5	7.5
Hawai‘i	124	7.3	18.5	44.4	18.5	11.3
Maui	47	8.5	14.9	42.6	21.3	12.8
Kaua‘i	37	2.7	21.6	29.7	29.7	16.2
<b>By primary fishing motivation</b>						
Recreational expense	103	4.9	20.4	50.5	16.5	7.8
Part-time commercial	87	14.9	21.8	26.4	25.3	11.5
Subsistence	48	12.5	20.8	47.9	12.5	6.3
Full-time commercial	32	3.1	25.0	31.3	12.5	28.1
Purely recreational	25	4.0	16.0	56.0	20.0	4.0
Cultural	4	0.0	0.0	75.0	25.0	0.0
<b>By most common gear</b>						
Troll	183	10.4	19.1	41.5	18.6	10.4
Bait for pelagic	46	4.3	23.9	37.0	23.9	10.9
Handline for Deep 7 bottomfish	43	11.6	27.9	44.2	9.3	7.0
Handline/rod and reel for shallow bottomfish	27	0.0	22.2	51.9	18.5	7.4
Spear	5	0.0	20.0	40.0	0.0	40.0
<b>By sub-fishery</b>						
Pelagic	316	8.9	21.5	42.1	18.0	9.5
Deep 7 bottomfish	190	10.5	23.2	42.1	15.3	8.9
Non-deep 7 bottomfish	192	8.3	23.4	42.7	16.7	8.9
Coral reef	52	9.6	30.8	34.6	11.5	13.5

**Table B.56. Survey responses: “Please state how much you agree or disagree that following management is being done well: Managers know how many fish there are?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	310	5.5	27.1	35.8	20.6	11.0
<b>By county</b>						
O‘ahu	106	9.4	31.1	36.8	14.2	8.5
Hawai‘i	120	3.3	26.7	30.8	28.3	10.8
Maui	46	4.3	26.1	37.0	17.4	15.2
Kaua‘i	36	2.8	16.7	47.2	19.4	13.9
<b>By primary fishing motivation</b>						
Recreational expense	96	1.0	29.2	37.5	25.0	7.3
Part-time commercial	82	9.8	25.6	35.4	22.0	7.3
Subsistence	44	9.1	27.3	34.1	20.5	9.1
Full-time commercial	29	0.0	37.9	27.6	6.9	27.6
Purely recreational	25	0.0	16.0	56.0	24.0	4.0
Cultural	4	0.0	0.0	25.0	50.0	25.0
<b>By most common gear</b>						
Troll	169	5.3	20.7	42.0	20.7	11.2
Bait for pelagic	44	2.3	34.1	34.1	18.2	11.4
Handline for Deep 7 bottomfish	41	9.8	51.2	22.0	17.1	0.0
Handline/rod and reel for shallow bottomfish	27	0.0	22.2	44.4	25.9	7.4
Spear	4	0.0	25.0	25.0	25.0	25.0
<b>By sub-fishery</b>						
Pelagic	296	5.1	27.7	36.1	20.6	10.5
Deep 7 bottomfish	176	6.3	34.7	31.8	21.6	5.7
Non-deep 7 bottomfish	179	6.1	26.8	34.6	23.5	8.9
Coral reef	45	8.9	28.9	31.1	13.3	17.8

**Table B.57. Survey responses: “Please state how much you agree or disagree that following management is being done well: Managers know how healthy the reef/other habitats are?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	329	8.8	22.8	30.7	27.4	10.3
<b>By county</b>						
O‘ahu	120	15.8	26.7	29.2	20.8	7.5
Hawai‘i	125	6.4	16.8	31.2	35.2	10.4
Maui	46	2.2	32.6	34.8	19.6	10.9
Kaua‘i	36	2.8	16.7	30.6	30.6	19.4
<b>By primary fishing motivation</b>						
Recreational expense	103	3.9	26.2	31.1	30.1	8.7
Part-time commercial	88	17.0	22.7	25.0	27.3	8.0
Subsistence	47	10.6	17.0	40.4	23.4	8.5
Full-time commercial	32	6.3	18.8	34.4	21.9	18.8
Purely recreational	24	0.0	12.5	54.2	33.3	0.0
Cultural	4	0.0	0.0	0.0	75.0	25.0
<b>By most common gear</b>						
Troll	181	8.3	20.4	30.4	29.8	11.0
Bait for pelagic	47	6.4	29.8	21.3	31.9	10.6
Handline for Deep 7 bottomfish	43	11.6	39.5	34.9	11.6	2.3
Handline/rod and reel for shallow bottomfish	27	3.7	7.4	51.9	33.3	3.7
Spear	5	20.0	0.0	60.0	0.0	20.0
<b>By sub-fishery</b>						
Pelagic	315	8.6	23.5	30.2	27.9	9.8
Deep 7 bottomfish	189	10.6	29.1	29.1	25.4	5.8
Non-deep 7 bottomfish	193	10.4	22.3	31.6	28.0	7.8
Coral reef	52	13.5	32.7	11.5	26.9	15.4

**Table B.58. Survey responses: “Please state how much you agree or disagree that following management is being done well: Managers know about the fisher(men) and fishing community (income, culture, etc.)?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	329	12.2	17.6	40.7	20.4	9.1
<b>By county</b>						
O‘ahu	120	17.5	19.2	44.2	13.3	5.8
Hawai‘i	125	12.0	16.0	37.6	23.2	11.2
Maui	46	6.5	19.6	37.0	26.1	10.9
Kaua‘i	36	2.8	13.9	44.4	27.8	11.1
<b>By primary fishing motivation</b>						
Recreational expense	103	7.8	15.5	53.4	16.5	6.8
Part-time commercial	88	18.2	17.0	37.5	19.3	8.0
Subsistence	47	12.8	21.3	38.3	19.1	8.5
Full-time commercial	32	6.3	25.0	25.0	18.8	25.0
Purely recreational	24	8.3	12.5	54.2	25.0	0.0
Cultural	4	0.0	0.0	25.0	50.0	25.0
<b>By most common gear</b>						
Troll	181	10.5	14.9	44.2	21.5	8.8
Bait for pelagic	47	14.9	23.4	34.0	17.0	10.6
Handline for Deep 7 bottomfish	43	16.3	32.6	32.6	18.6	0.0
Handline/rod and reel for shallow bottomfish	27	7.4	7.4	51.9	29.6	3.7
Spear	5	20.0	0.0	60.0	0.0	20.0
<b>By sub-fishery</b>						
Pelagic	315	12.1	18.4	41.0	20.0	8.6
Deep 7 bottomfish	189	13.2	21.7	38.6	20.6	5.8
Non-deep 7 bottomfish	193	13.5	20.2	38.9	20.7	6.7
Coral reef	52	21.2	15.4	28.8	19.2	15.4



**Table B.59. Survey responses: “Please state how much you agree or disagree that following management is being done well: Managers build or maintain fisheries infrastructure (boat ramps, harbors, etc.)?” (percentage of responses).**

	Number of respondents (n)	Strongly disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly agree (%)
All respondents	328	23.2	25.6	19.2	15.5	16.5
<b>By county</b>						
O‘ahu	120	33.3	30.0	17.5	10.8	8.3
Hawai‘i	124	17.7	19.4	21.8	20.2	21.0
Maui	45	13.3	33.3	17.8	20.0	15.6
Kaua‘i	37	21.6	18.9	18.9	10.8	29.7
<b>By primary fishing motivation</b>						
Recreational expense	102	24.5	24.5	21.6	18.6	10.8
Part-time commercial	88	28.4	25.0	15.9	13.6	17.0
Subsistence	47	29.8	23.4	21.3	12.8	12.8
Full-time commercial	32	15.6	25.0	21.9	15.6	21.9
Purely recreational	24	12.5	45.8	16.7	16.7	8.3
Cultural	4	0.0	0.0	25.0	25.0	50.0
<b>By most common gear</b>						
Troll	181	27.1	22.1	19.9	14.4	16.6
Bait for pelagic	47	17.0	29.8	19.1	19.1	14.9
Handline for Deep 7 bottomfish	42	19.0	42.9	21.4	11.9	4.8
Handline/rod and reel for shallow bottomfish	27	18.5	25.9	11.1	29.6	14.8
Spear	5	20.0	20.0	40.0	0.0	20.0
<b>By sub-fishery</b>						
Pelagic	314	23.6	25.5	19.7	15.6	15.6
Deep 7 bottomfish	188	26.6	27.1	19.7	13.3	13.3
Non-deep 7 bottomfish	193	25.4	26.9	18.7	14.5	14.5
Coral reef	51	19.6	23.5	23.5	15.7	17.6