

Hawaii Fishermen's Cooperative Research Project



**Use of the Lokahi Fishing App to Encourage Hawaii
Fishermen Engagement, Information Exchange, and
Dialogue between Fishermen, Scientists, and Managers for
Improved Understanding of Fishery Science and
Management**

October 31st 2023

Final Project Report

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Abstract:

The Lokahi Fishing App Cooperative Research Grant, a collaborative endeavor involving Hawaii's fishing community, scientists, and managers, has made substantial strides in enhancing engagement, information exchange, and dialogue within the state's non-commercial fishing sector. This initiative addresses the challenge of characterizing Hawaii's small boat fishing fleet, utilizing the Lokahi Fishing App, which has over 2,800 users, as a tool for understanding fishers' perspectives and engagement. By introducing a "one-stop shop" app feature, the project collected user feedback, improved understanding of fishery science and management, and fostered meaningful dialogue. While challenges were encountered, including survey engagement, the project increased user numbers, marking a significant step toward more effective, technology-driven fisheries management. This effort signifies a modern approach to marine resource management, leveraging technology to empower fishermen, improve collaboration, and contribute to sustainable fisheries in Hawaii.

1. Introduction

The Lokahi Fishing App project is a collaborative initiative aimed at assessing the feasibility of using the Lokahi App to increase engagement, information exchange, and dialogue within Hawaii's fishing community. Led by a team of dedicated Principal Investigators, including Clayward Tam, Jim Hori, and Adam Ayers Ph.D., this endeavor seeks to bridge the gap between fishermen, scientists, and fisheries managers to enhance our understanding of fishery science and management.

Characterizing Hawaii's non-commercial small boat fishing fleet has long been a priority for federal and state fishery scientists and managers. However, engaging with this vital user group has proven challenging due to the absence of an official registry, permit, or license program. Recognizing the need for innovation, the Lokahi Fishing App project was conceived. This project leverages the Lokahi Fishing App, which currently boasts over 2,800 users.

Project Goals: The primary goals of the Lokahi Fishing App Cooperative Research Project are as follows:

1. **Enhancing Engagement:** Collaborate with the fishing community, fishery scientists, and managers to improve the Lokahi Fishing App by creating a "one-stop shop" feature. This feature will facilitate the gathering of information from Lokahi App users to determine their interests in subject matter and content related to fisheries issues.
2. **Improving Understanding:** Provide fishermen with direct access to crucial information on fishery science and management, including fisheries data, MUS species information, and federal regulations. This initiative aims to improve fishers' understanding of complex science and management issues.
3. **Fostering Dialogue:** Enhance dialogue within and between fishing communities, scientists, and managers by establishing a Lokahi Fishing App "one-stop shop" feature that allows the collection of fishery issue feedback. This feature will contribute to improved communication and collaboration.
4. **Survey-Based Understanding:** Conduct surveys through the Lokahi Fishing App to gather feedback and information from the non-commercial fishing community.
5. **Effective Engagement:** Work towards getting more fishers involved and engaged in fishery information exchange, ultimately contributing to the enrichment of the Lokahi Fishing App's functionality and user engagement.
6. **Presentation and Reporting:** Provide presentations to Council advisory groups, as appropriate, and generate a comprehensive final report detailing the project's implementation and outcomes. This report will be prepared by the Principal Investigator (PI) in coordination with the project team.

Project Significance: The successful engagement of fishermen through the Lokahi Fishing App signifies a modern approach to marine resource management. With technology's increasing availability, this grant provides a unique opportunity to explore the potential uses of a Hawaii-based fishing application with over 2,800 members. It aims to facilitate more efficient, informed, and participatory fisheries management while strengthening the bond between fishermen, scientists, and managers.

This project aligns seamlessly with federal and regional priorities, emphasizing the importance of involving fishermen in the collection of fundamental fisheries information to enhance management and regulatory options.

In this report, we will delve into the methods employed in achieving these goals, highlight the progress made, and outline the next steps in the Lokahi Fishing App Cooperative Research Project. Through this effort, we aim to foster a collaborative environment that benefits all stakeholders in Hawaii's fisheries sector.

2. Background

The Challenge of Characterizing Hawaii's Fishing Fleet

Characterizing Hawaii's non-commercial small boat fishing fleet has remained a formidable challenge for federal and state fishery scientists and managers. The root of this challenge lies in the absence of an official registry, permit, or licensing program dedicated to this crucial user group. This void in comprehensive data collection and engagement has hindered effective fisheries management, posing a significant concern for sustainable resource utilization and conservation efforts (CI-Hawai'i & WPFMC, 2016).

The Lokahi Fishing App: A Path to Engagement

During this challenge, the Lokahi Fishing App emerges as a future opportunity. This innovative smartphone application has already connected with over 2,800 fishers statewide. The Lokahi Fishing App represents a step forward in bridging the gap between fishermen, scientists, and fisheries managers.

A Cooperative Research Proposal for Enhanced Engagement

The cooperative research proposal at hand seeks to maximize the potential of the Lokahi Fishing App by introducing a transformative feature—a "one-stop shop" for fisheries engagement. This feature serves as a dynamic hub within the application, designed to aggregate information and insights directly from Lokahi App users. By tapping into the rich and diverse knowledge of Hawaii's fishing community, this initiative aspires to revolutionize fisheries engagement, information exchange, and dialogue.

Addressing the Information Gap

Central to this proposal is the objective of filling the information gap that has hindered non-commercial fishing fleet characterization. This "one-stop shop" feature will act as a conduit for gathering valuable data, including fishers' interests in specific subject matter and content related to fisheries science and management. Through this feature, Lokahi aims to establish a dynamic and responsive platform that facilitates the flow of information between fishermen, scientists, and managers.

Empowering Stakeholders for Sustainable Fisheries

By providing access to essential information about fisheries science, regulations, and management in Hawaii, this cooperative research initiative will empower fishermen with the knowledge needed to make informed decisions. It will foster a sense of ownership and participation in the fisheries management process while facilitating dialogue within fishing communities and between fishermen, scientists, and

managers. The Lokahi Fishing App Cooperative Research Grant signifies a pioneering step towards addressing the challenges of characterizing Hawaii's non-commercial small boat fishing fleet. Through this proposal, we aim to harness the potential of modern technology to engage, inform, and empower Hawaii's fishing community. By enhancing engagement, improving understanding, and fostering dialogue, we embark on a journey towards more sustainable and collaborative fisheries management.

Objectives and Methodology:

- Develop ways to collect fishery issue feedback through a Lokahi Fishing App “one stop shop” feature.
- Improve engagement with Hawaii non-commercial fishing communities through the app by:
 - Getting more fishers involved/engaged in fishery information exchange by providing direct access to receive and interact with programs, subjects of interest within PIFSC.
 - Improving fisher understanding of science/management issues through making available access to Fishery information, MUS species information and Federal Rules and Regulations.
 - Improving dialogue both within and between communities and scientists/managers by providing information on meetings, events, notices and project updates.
 - Tests of the two-way app function with existing users to gather basic information to better understand the non-commercial fishing community (interest, demographics, methods, seasons, gear, community networking, small boat owners, crew, etc.) through a survey.
 - PIFG will provide presentations to Council advisory groups, as appropriate.

Methodology

The Lokahi Cooperative Research Grant followed a methodology to complete the set forth objectives through a systematic approach. Starting with planning and discussions, a timeline of the project objectives and milestones was developed by the team. Several different objectives were run simultaneously to achieve each objective.

During the project, all objectives listed below were met and accomplished.

- **Objective 1:** Develop ways to collect fishery issue feedback through a Lokahi Fishing App “one stop shop” feature.
 - **Methodology:** Working with the cooperative research team, we discussed the “one stop shop” application feature, the functionality needed, how to best engage with fishers, and the deployment of the new feature within the app. Following this, we began app development, testing, and deployment. Once the feature was completed, we moved to test and seek feedback on the application feature.
- **Objective 2:** Improve engagement with Hawaii non-commercial fishing communities through the app by:

- Getting more fishers involved/engaged in fishery information exchange by providing direct access to receive and interact with programs, subjects of interest within PIFSC.
 - Improving fisher understanding of science/management issues through making available access to Fishery information, MUS species information and Federal Rules and Regulations.
 - Improving dialogue both within and between communities and scientists/managers by providing information on meetings, events, notices, and project updates.
 - Tests of the two-way app function with existing users to gather basic information to better understand the non-commercial fishing community (interest, demographics, methods, seasons, gear, community networking, small boat owners, crew, etc.) through a survey.
 - PIFG will provide presentations to Council advisory groups, as appropriate.
- **Methodology Engagement:** Over the course of the project, engagement with the non-commercial fishers using the Lokahi Fishing Application was essential. Sharing the data and the information both learned and received through meetings with the Pacific Islands Science Center, PIFG, and Lokahi Fishing LLC, the information, updates, and upcoming fisheries-related information and meetings were disseminated to the fishing communities via the application and Lokahi social media.
 - **Methodology App Survey:** The cooperative research team also worked together during this time to discuss and develop questions that would be released during the survey. The team brainstormed and looked at what ways the scientific and management had engaged fishers well in the past, how could new questions be developed to serve this same purpose, and how could we improve upon the questions to make this more successful in the format of a fishing application. Questions were developed and derived from both the fisherman's observations and feedback that the Western Pacific Council already completes, and ideas and needs identified by the fishermen participating in the meetings. These questions were then put together in a pool that were delivered and pushed out over time to the fishers. The responses were then reviewed, discussed, and recorded by the team. The outcomes of the surveys added to the overall value of testing and understanding how app surveys can be used as an efficient tool for getting feedback.

4. App Features and Functionality

The Lokahi Fishing app was created by fishermen for fishermen. Founded in 2016 by Jim Hori, the Lokahi Fishing LLC was designed to help inform, educate, and provide a mode for fishermen to catch more fish, share information, and be engaged. The application is available in both the apple and google play stores. Its focus is on logging your catch, posting pictures, and helping provide information regarding fishing policy and updates.

To date, the application has over 2,800 members, and has recorded 830 catch logs, totaling over 37,000 pounds of Hawaii caught fish.

During the cooperative research grant, the application was tested in its' current state and then additional features were added in alignment with the project scope.

The two front end features that were added create the goal of a “one stop shop” for fishers and management to engage one another. These features include (1) a survey function and (2) a “Ask a question” feature. Together this allows both fishermen to be surveyed and fishers to also propose questions back to management. The one stop shop function was also added to the home page. See figure 1. below.

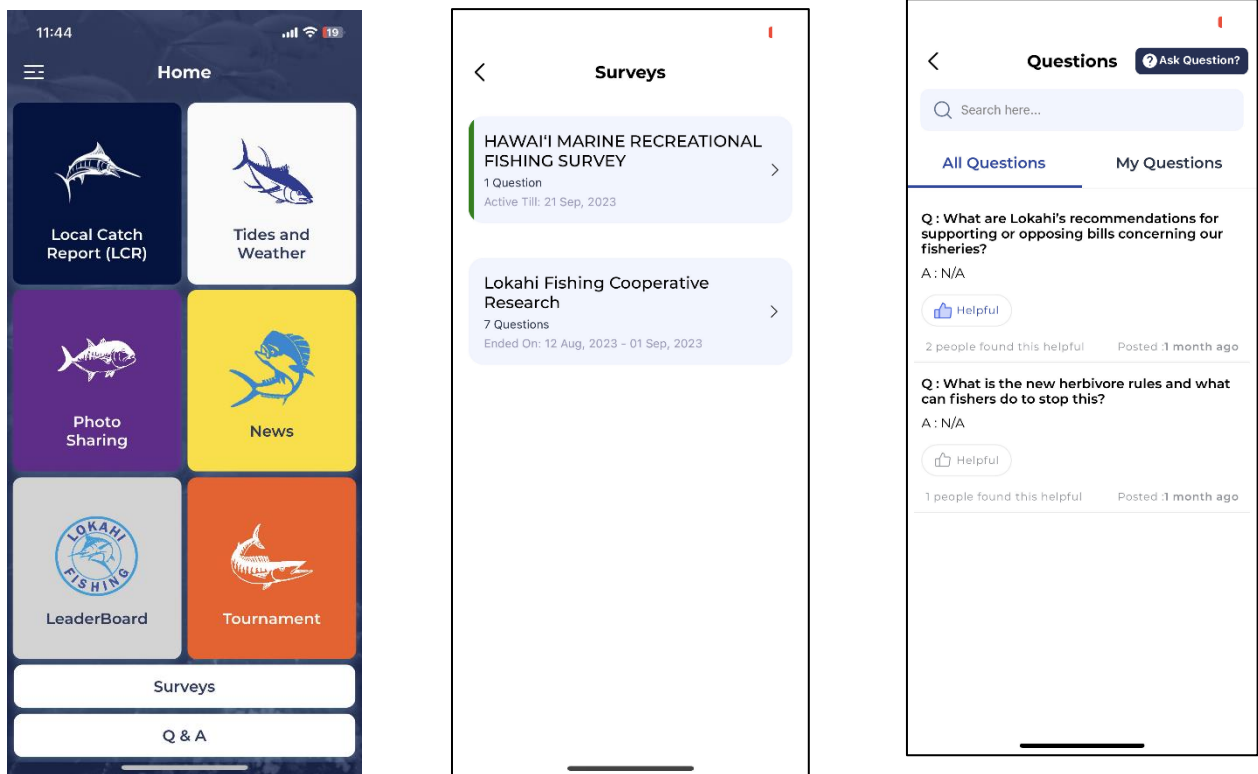


Figure 1. The two functional buttons were added to the main Lokahi Fishing App homepage.

5. Results of Surveys

The Cooperative research team developed an overall project timeline that included running proof of concept tests, and testing of survey function once the application feature was developed. Through the course of the cooperative research from April to October 2023, the team developed and ran 4 surveys including 02 proof of concept tests, and 02 survey tests upon the update and deployment of the new survey and “one stop shop” functional feature was developed and deployed.

Proof of Concept Surveys:

In June and July as the new application feature was being designed by the team, we put two proof of concept surveys out to test and see what engagement and feedback for the surveys would be. This was the first test to experiment and see what the results and user feedback would be.

Survey 1 and Survey 2: Proof of Concept.

The initial surveys were run for a week each June 19th and July 7th. These surveys were tested in two different capacities. The first survey was tested with only a social media post. The second survey was tested with social media, a newsletter, and links to the application. The first survey received one completion, the second survey 9 additional completions. Along with this, the content and newsletter received 1,375 views from the Lokahi fishing audience. The questions were run on the original survey feature of the application and the following is what was asked of the fishers developed by the cooperative research grant team. The same questions were used for both tests due to the low number of engagements on the first proof of concept.

Questions:

Are you interested to get more involved in the science and management of Hawaii's Fisheries?

Do you feel there is enough communication from fisheries managers to fishers?

Do you believe your fishery has improved over the last four years?

Did you take more than 12 fishing trips in 2022?

Do you hold a commercial marine license?

The Survey Results:

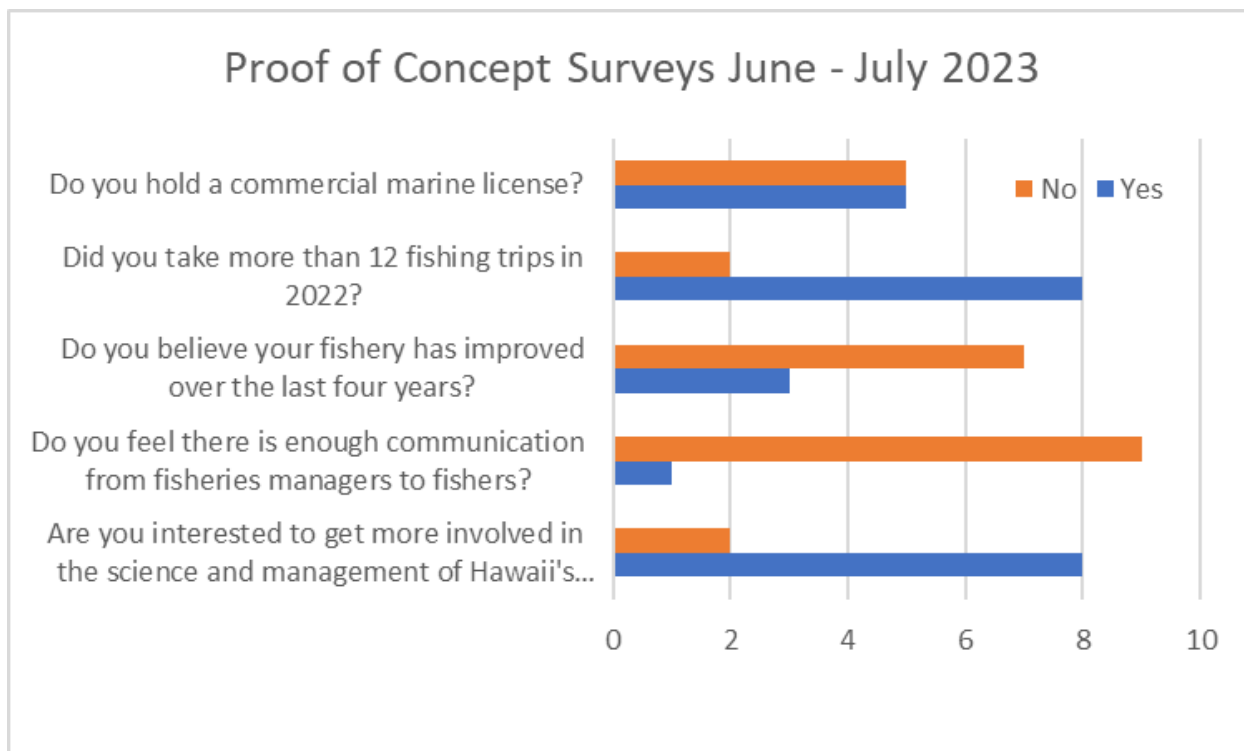


Figure 2. Proof of Concept Surveys from June and July 2023

After receiving more feedback, we had a total of 9 engagement from fishermen using the Lokahi Fishing app that completed the proof-of-concept survey. The feedback to the questions included most fishers were more active than fishing monthly, half of which, did hold a commercial fishing license, and that there was an interest in more communication from fishery management and a desire to be more involved.

Survey 3:

The next survey conducted began on August 12th 2023 and followed some of the similar questions as the previous survey. This information revolved around trips taken, motivation for fishing, communication with Hawaii fishermen, and how to better engage. The survey was again also shared via social media posts on Instagram, a Lokahi fishing newsletter and received 9 responses from fishers. The newsletter also received 1,280 views. The engagement was still approximately the same as the previous survey and there were 5 unique (new) survey participants that differentiated from the previous surveys.

Questions:

How many fishing trips did you take in 2022?

What types of fishing did you do in 2022?

If you practiced a different fishing technique from question 2, (other), please describe

What is the main reason you go fishing?

What is the best way to communicate with Hawaii non-commercial fishers about important issues?

What makes it easier for fishers to be aware of and involved in science and management of Hawaii fisheries?

Any additional feedback/recommendations/thoughts?

The Survey Results:

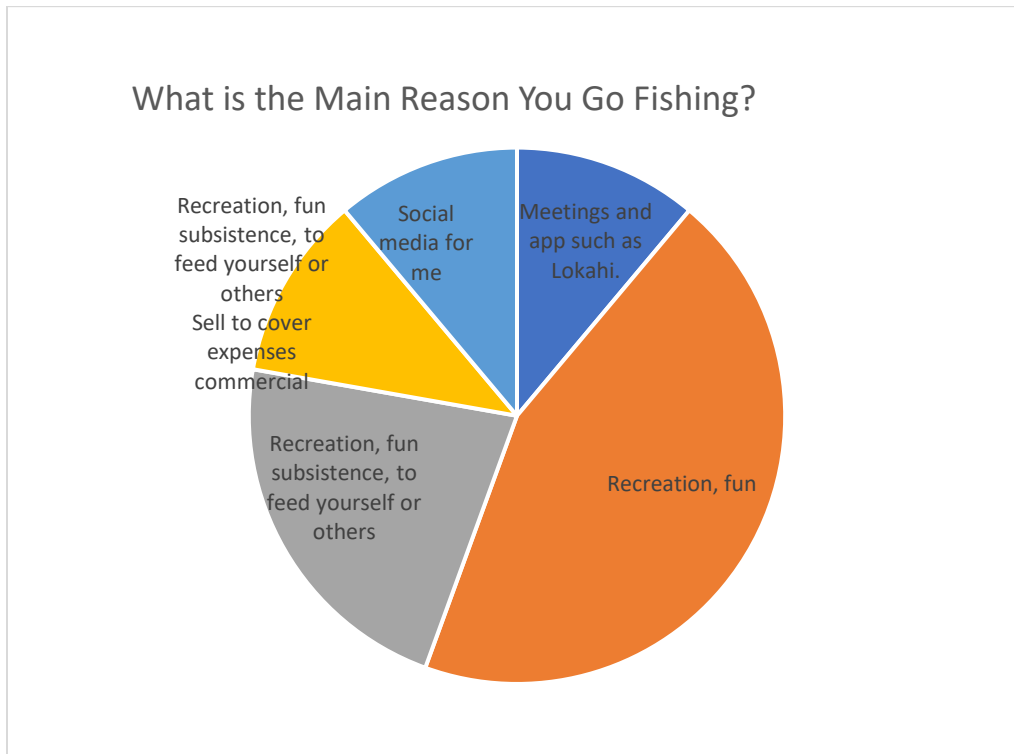


Figure 3. Survey results and information relating to the reason why people go fishing

The feedback from the survey identifies that most fishers explained the main reason they go fishing is for recreation/fun with additional pieces of interest include feeding self/others and to sell fish to cover fuel expense. The survey did also receive two comments – one regarding fishing to post on social media and to be engaged with apps such as Lokahi. The app also asked for how best to communicate with non-commercial fishers which, received the following input:

A monthly webinar hosted by Lokahi with leaders in our fisheries giving updates on anything important or interesting this past month and willing to answer our questions.
more opportunities to meet and talk story in person, more notifications of rules from apps such as Lokahi
Social media
more communication on social media, more notifications of rules from apps such as Lokahi streamlined government public input and comment process

Social media, website notifications, and brochures at local fishing stores.
Social media
Text, app, social media.
Social Media
More engagement. There is very little information and the info we get is long and confusing. What is the role?

Table 1. Recommendations by fishers on how to better engage them from fisheries management

Survey 4:

The final survey for the Cooperative Research Grant was run with one question to get fishers’ feedback. The survey was posted on 14 September and was live for one month. This was a different approach to the survey response time than previous surveys. During this time, the fishers’ forum and WP Council meeting occurred where Lokahi Fishing presented their cooperative research grant. During this time, there were 13 respondents to the survey.

Questions:

Have you participated in the Hawai’i Marine Recreational Fishing Survey in 2022?

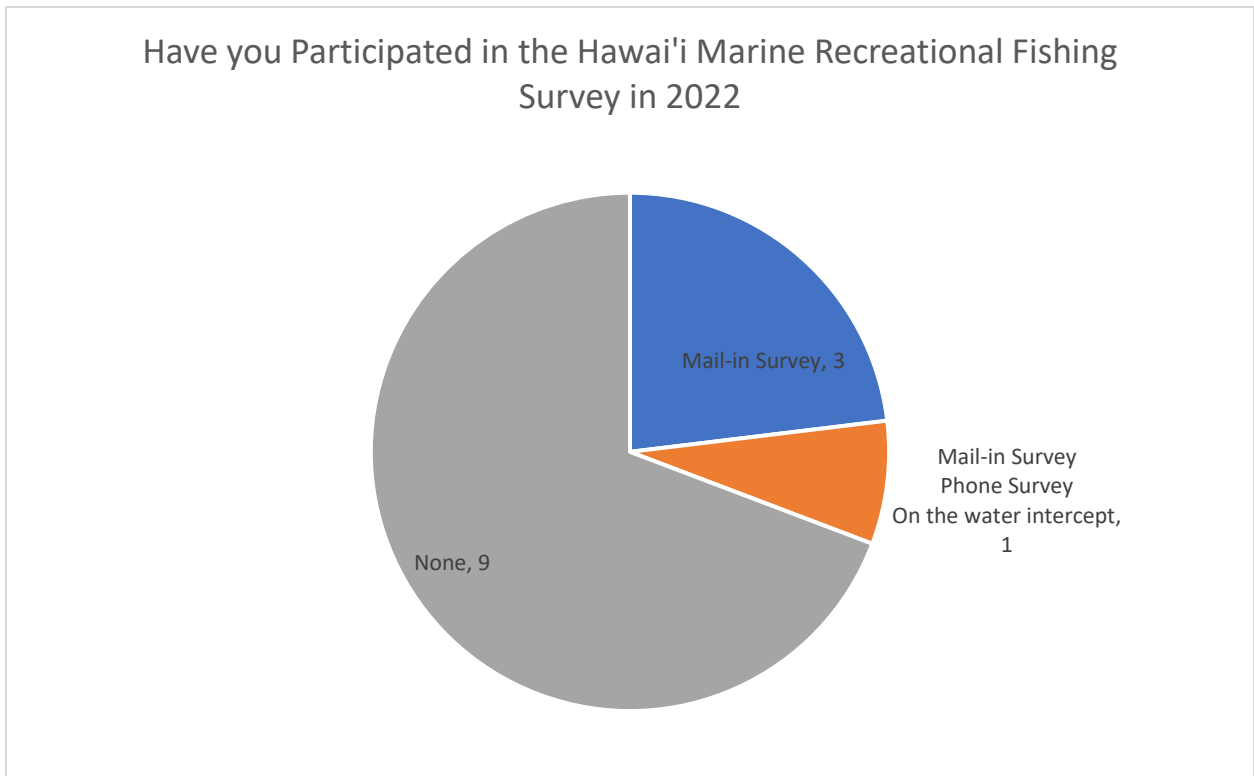


Figure 4. Survey on have you participated in the Hawaii Marine Recreational Fishing Survey

The overall feedback from fishers showed that majority had not participated in the Marine Recreational Fishing Survey, while three did mail-in surveys, and 1 had participated in all three.

This concluded the surveys and testing of the “one stop shop” Survey function during the cooperative research grant.

6. Discussion

The Lokahi Fishing Cooperative Research Project provided a team of individuals from the fishing community, the science community, and management to come together and test a concept for increasing engagement for fishermen with management and science. In the goal of increasing transparency, data collection, and trust, this project provided all an opportunity to learn more about the roles and responsibilities of others. During the time period from April to October 2023, the team developed a methodology, questions to ask fishers, completed app development, and then tested the app to understand engagement of fishers with the app.

The overall feedback of the surveys within the app was much lower than originally expected by the research team. A total of 22 unique survey respondents participated in the surveys. Survey respondents came primarily from Oahu and Hawai'i. The team adjusted with additional social media engagement to get more feedback and user participation, though this proved ineffective. One cause for low survey engagement is the fact that this is a new mode for participation that had not previously been used by Lokahi Fishing LLC and the amount of marketing around it has still been limited.

The feedback to the surveys shows an overall interest in social media as a tool for engagement. It is noted that the Western Pacific Fisheries Management Council does utilize a social media (Instagram) account to post content related to council meetings. Understanding where fishermen spend their time is an important lesson for fisheries managers when they think of community engagement and that messages need to be varied and outreach must take multiple forms in order to reach necessary audiences and provide equity across the board.

The Cooperative Research Project also allowed PIFG analysts to look at the overall catch data from the App. What was highlighted from this was that over the past four years, 2019-2023, 37,000 pounds of fish had been reported/logged in the Lokahi Fishing App. The majority of fish landed by weight were Ahi (Yellowfin Tuna), Au (Blue Marlin), and Mahi Mahi (Dolphin fish). This data could be very useful as an additional estimation or tool to consider when making fishers' catch and effort assessments. One comment from a scientist at NOAA during the Fisher's Forum included that trips with “no-catch” are also extremely important for understanding of the data. As social media including the Lokahi Fishing App largely encourage the logging and submission of catch and often do not include logging and reporting of what fishermen call “skunk” trips where no fish are landed. This data is important and not including a means for recording/reporting would miss and create a bias towards trips with positive outcomes.

Outreach and Public Engagement

Throughout the course of the cooperative research project, Lokahi Fishing LLC and PIFG conducted a coordinated effort to provide communication and outreach to the community. One of the key aspects of this survey was to assess and quantify the reach of a fishing application such as the Lokahi Fishing LLC for information distribution and sharing related material. Overall, more than 1,000 individuals within Hawaii's fishing community. The cooperative research also included over 10 meetings internally and with

the Pacific Islands Fisheries Science Center (PIFSC) and Western Pacific Fishery Management Council members. The meetings helped bridge the gap of understanding science needs, management needs, and fishermen's needs. This helped guide both the development of the application during the cooperative research, the surveys developed, and a clearer vision for how technology and citizen science could support fisheries.

Statistics related to outreach and engagement:

Social media posts on Instagram:

- Lokahi App Survey June 19th: 243 accounts reached, 13 likes.
- Public Hearing Outreach July 27th: 522 accounts reached 27 likes, 7 comments, 35 shares, 7 saves.
- Lokahi App Survey August 21st: 430 accounts reached, 29 likes, 1 share.
- WP Council Fishers Forum September 14th: 243 accounts reached, 13 likes, 1 comment, 2 shares.

Newsletter:

- July: Announcing Cooperative Research Project – 1,406 opens.
- August: Update on the Cooperative Research Project – 1,281 opens.
- September: Update on Cooperative Research Project – 1,463 opens.

Meetings, discussions, and bigger meetings with WP staff

- 6 meetings with Lokahi and PIFG Cooperative.
- 4 meetings with PIFSC and WP Council Staff.
- Presentation at Fishers Forum 18 September 2023.

7. Challenges and Lessons Learned

One of the main challenges with the cooperative research project was timing. Originally the team assembled in December 2022, when the grant was approved, however there were issues with funds release and review, that postponed the project to April 2023, thus impacting the team's effort and time. The team jumped back in and completed the project and a much more condensed schedule, though being successful in meeting all objectives, it placed additional stress and the need for an abbreviated timeline. A longer duration of steady survey opportunities along with feed back to the fishing community. Especially during the heavy summer fishing season may have provided greater participation and survey intercepts. It takes time and dedication to build presence on social media that is important in building trust and respect within the fishing community.

Although there were 1438 accounts reached, engagement with fishers was a challenge as there were only 22 unique individuals completing these surveys completed during the time frame. The Lokahi Fishing App team learned the real challenge of fisher engagement within our own fishing community. This was a good lesson learned and, in the future, potential benefits including prizes or engagement appreciation gifts should be considered by the Lokahi Fishing app to increase and incentive fishers' engagement.

The Lokahi App also did not send push notifications to individuals' phones to complete surveys, this may have been a useful decision, though it was not done during the cooperative research grant.

Overall, the Lokahi Fishing Team, PIFG, and PIFSC all had good takeaways that were valuable to the ongoing collaboration, support, and engagement of fishers in the Pacific Islands region.

8. Future Directions

The Lokahi Fishing Application plans to continue to run monthly surveys and provide useful information to the fishermen regarding upcoming Fishery management meetings, information and updates.

This project could be expanded upon to build a framework for engagement by the WP Council and Science center with fishers through a communication method of sharing and putting products out to the public via social media that would prove useful to fishers based on the surveys conducted during this cooperative research grant. Fishers are interested and eager to participate in fisheries management, but often lack the knowledge and avenue of how to be more involved and engaged. There is a large community of fishers who actively engage and participate in social media, and that increased communication through channel partners such as the Lokahi Fishing could be a way to encourage and involve more new-entrants into management and science.

The Lokahi Fishing App will also continue to look at ways in which to improve engagement of surveys and believes that running surveys more frequently will create a habit for fishers to complete when they login to the application. On top of this, Lokahi Fishing plans to develop and create informational videos regarding the application, survey function, and how fishers can get more involved in their fishery.

9. Conclusion

The Lokahi Fishing App Cooperative Research Project, aimed at improving engagement and dialogue within Hawaii's fishing community, has achieved significant milestones. This collaborative initiative addresses the challenge of characterizing Hawaii's non-commercial small boat fishing fleet, a task complicated by the absence of an official registry license program. With over 2,800 users, the Lokahi Fishing App serves as a powerful tool for connecting fishermen, scientists, and managers.

The project has enhanced engagement by introducing a "one-stop shop" feature within the app, gathering vital information from users to better understand their interests in fisheries issues. Additionally, the initiative has improved fishermen's understanding of science and management matters by providing direct access to fisheries data, species information, and regulations. Moreover, it has fostered dialogue among fishing communities, scientists, and managers, making communication and collaboration more accessible.

At a minimum, the app proved effective in reaching app users to distribute information on fishery management and science initiatives, such as promoting the Fishers Forum.

While the cooperative research project encountered challenges, including initial survey engagement, it has successfully increased user numbers and catch data in the app, demonstrating the potential for technology-driven engagement in fisheries management. Moving forward, the Lokahi Fishing App plans to continue its efforts, expanding engagement strategies and sharing valuable updates with fishermen. This project signifies a forward-thinking approach to marine resource management, leveraging technology to empower fishermen and strengthen collaboration, ultimately contributing to more sustainable fisheries management in Hawaii.

Lokahi Fishing Application

iOS: <https://apps.apple.com/us/app/lokahi-fishing/id1354310384>

Android: https://play.google.com/store/apps/details?id=lokahi.com.lokahi&hl=en_US&gl=US&pli=1

Instagram: <https://www.instagram.com/lokahifishing/>

Presentation: Fishers Forum: [Fishers Forum Presentation Electronic Document](#)