

STEW-MAP O'AHU

SURVEY RESULTS OF THE STEWARDSHIP
MAPPING & ASSESSMENT PROJECT 2019

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Executive Summary

There are many community and civic groups that care for the lands and waters of Hawai'i. In so doing, these groups provide a vital service to maintaining the health, well-being, and resilience of our communities and ecosystems. However, many of their activities are undervalued or even unrecognized because there is limited public investment into assessing this non-agency based stewardship. The important roles of community leaders are particularly understudied. In response to these needs and to more comprehensively understand stewardship across geographical and social landscapes, the USDA Forest Service developed the Stewardship Mapping and Assessment Project (STEW-MAP), which is designed to work with environmental stewardship practitioners, groups, and organizations to document and map their stewardship activities. STEW-MAP seeks to address these three questions: 1) **Who takes care of this region?** 2) **Where are there concentrations of care?** And 3) **Where are there stewardship gaps?** Where STEW-MAP has been applied, the resulting data sets have been used to make more visible the work of stewardship groups, with STEW-MAP databases serving as a resource for community groups and partner agencies to: (i) more effectively collaborate with each other; (ii) better identify opportunities to support community-based efforts; (iii) increase the capacity of volunteers, teachers, agencies, funders, and others to communicate about community groups who steward their places; and (iv) help organizations, volunteers, and agencies to network, especially those groups serving similar geographic or mission areas. In 2019, we conducted a STEW-MAP survey for the Kona and Ko'olaupoko Districts of O'ahu. Key findings include:

A profound reach across geographic and social landscapes: The community of environmental stewardship groups that care for the lands, waters, special places and lifeforms of Hawai'i is profound. In total, 128 groups completed the survey, representing >500 volunteers, >4,000 staff, and well beyond \$110 million in annual budgets. These groups also identified over 641 unique organizations as their collaborators in environmental stewardship. Responding groups noted a diversity in their geographic scale, from stewarding a single garden to working across entire coastlines and forest reserves. Respondents also noted diversity in their stewardship locations, from stewarding areas locally to working internationally, indicating the vastness of the network.

Caring for people while caring for place: While the central focus for many environmental stewardship groups is caring for and educating about places, landscapes, and lifeforms, many of these groups also cultivate young leaders, community health and well-being, intergenerational family ties, and sharing of cultural values and knowledge.

Institutionalizing mālama 'āina: Half of the groups that participated in the survey were founded in the last 20 years. The number of younger groups may be due to several things including: an increased sense of urgency to address growing environmental concerns, concepts such as mālama 'āina becoming more mainstream, and a way for communities to maintain and/or re-establish their stewardship roles.

Reciprocal relationships with 'āina: 30% of groups have no paid employees. While volunteers play a vital role in assisting groups realize their missions and stewardship goals, volunteers also benefit by gaining access to land, water and other ecosystems, as well as experiences, knowledge, and resources that may otherwise be unavailable or hard to come by for urban and suburban residents.

Learning from 'āina: Providing educational opportunities was by far the most prevalent type of stewardship reported by respondents, with just over half (51%) of responding groups indicating that they provide 'āina-based learning opportunities, which focus on learning from and about 'āina. Increasingly, the integration of these opportunities and resources into stewardship activities is being normalized as formal educational systems are meeting the requests of teachers for 'āina-based learning opportunities for their students.

Holistic stewardship: We found that 47% of survey respondents were primarily focused on stewardship (i.e., 80-100% of their total efforts), but that about 10% of responding groups devote 20% or less of their efforts on environmental stewardship, focusing instead on other mission areas – for example environmental education. While most respondents represented non-profit environmental organizations, others included schools, farms, researchers, canoe clubs, health-focused groups, groups focused on youth, adults, and/or seniors, groups focused on social justice, policy, and more. Culturally-based groups that focus on stewardship do so specifically from Hawaiian worldviews, approaches, and values, which means that caring for place is caring for people, and that 'natural resources' are 'cultural resources' that are also viewed as family members.

An interdependent network of environmental stewards: Stewardship networks were made up of an assemblage of groups that are primarily civic (77%) with a significant number of government organizations (19%) and few private organizations (3%) or hybrid groups (2%). The composition of groups highlights the interdependent nature of caring for place in Hawai'i; the archipelago's complex history along with the rights and responsibilities of different groups in the network underscore the need for collaborations and connections.

For more information and to access the interactive map, visit:
<https://www.nrs.fs.fed.us/STEW-MAP/>

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Introduction

The USDA Forest Service developed the Stewardship Mapping and Assessment Project (STEW-MAP) to better understand stewardship across geographical and social landscapes. The project collects survey data to create a public online database and map of community, civic, and other organizations that participate in environmental stewardship. STEW-MAP is designed to become a resource for community groups and partner agencies to effectively communicate and collaborate with each other, to identify opportunities to support community-based efforts, and to enhance the capacity of stewards. It can help volunteers, agencies, funders, and others learn about a community group. It can also serve as a networking tool for organizations, volunteers, and agencies to learn about other groups in their geographic or mission areas.

STEW-MAP started in New York City in 2007 and has since been applied nationally and internationally including: Baltimore, MD; Chicago, IL; Denver, CO; Los Angeles, CA; Philadelphia, PA; Seattle, WA; Southern New England; Springfield, IL; Boston, MA; San Juan, Puerto Rico; North Kona and South Kohala, HI and Bridger-Teton National Forest, WY. International sites include Paris, France; Valledupar and Medellín, Colombia; and Santo Domingo, Dominican Republic.

Here we focus on the stewardship networks of Kona and Ko'olaupoko Districts of O'ahu, HI. Stewardship can be translated as **mālama 'āina** (mālama = care for, protect; 'āina=land), however the meaning of mālama 'āina goes beyond

caring for land. In the Hawaiian language, one interpretation of the word **'āina** is simply land, although it also corresponds to a much broader concept of "that which feeds." 'Āina can refer to terrestrial and/or aquatic systems and always includes people; land without people is not 'āina. In Hawaiian culture, mālama 'āina, or care for 'āina, developed as a foundational part of life. Before Western contact, Hawaiians created and practiced an elaborate system in which the islands were organized into biogeographic-political management units called ahupua'a, that typically ran from mountains to sea and encompassed one or more watersheds (or portions of watersheds). Within an **ahupua'a**, a complex social system existed, including social hierarchies and rules regarding resource harvesting, allocation, and use. **Hoa'āina**, the native inhabitants of the ahupua'a, had **kuleana**, both rights and responsibilities, to their place (McGregor 1996).

Mālama 'āina - To care for and protect the land.

'Āina - Land, earth.

Ahupua'a - Land division usually extending from the uplands to the sea.

Hoa'āina - Tenant, caretaker.

Kuleana - Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province; reason, cause, function, justification; small piece of property, as within an ahupua'a.

Definitions from wehewehe.org

However, people's relationship with the natural world changed as foreigners arrived, occupied the islands and then in 1893 illegally overthrew the Hawaiian Kingdom. In 1898, 1.8 million acres of land were stolen from the Hawaiian monarchy and "ceded" to the United States by the self-proclaimed Republic of Hawai'i (which, despite strong local resistance, became annexed in 1898, a territory in 1890, and a state in 1959). This violation of international law, recognized by the U.S. Congress in the 1993 Apology Resolution, states that the transfer of the lands in 1898 was "without the consent of or compensation to the Native Hawaiian people or their sovereign government." Other land became privatized and many *hoā'āina* lost their rights to their ancestral lands. Traditional farming and lifeways were displaced by industrial-scale agricultural production of sugarcane, pineapple, and coffee. In order to grow these crops on the dry leeward sides of the islands, water was diverted from the wet windward sides, disrupting natural ecosystem dynamics and traditional taro cultivation. These widespread changes also displaced many Native Hawaiians from the places where their families had long-standing,

multigenerational relationships and intimate ties to the land, the impacts of which are still unfolding today.

By the 1970's, a Hawaiian Cultural Renaissance had become a force for social change, including: the reclaiming of Kaho'olawe Island from the U.S. Navy; the voyage of the traditional Polynesian canoe, *Hōkūle'a*, to Tahiti; and the resurgence of Hawaiian cultural practice, agriculture and language in public life. During this time, the concept of *mālama 'āina* emerged in conventional conservation and resource stewardship. Agencies and Western organizations became more familiar with and then more accepting of the expertise and resulting ecological benefits and sustainability inherent to Hawaiian resource management knowledge, practices, and systems. From 2013-2019, *Hōkūle'a* made a worldwide voyage, bringing sustainability lessons from Hawai'i to over 150 ports in 18 nations. Today, biocultural approaches that integrate community and environment with Hawaiian and other diverse knowledge systems guide restoration and resource management throughout the archipelago (Chang et al., 2019).

...sustainability in an indigenous framework can be seen as the capacity of a community to access and manage local natural resources, or to construct a resource supply via agriculture or husbandry, so as to assure the survival of and interconnectedness of the members of both that community and the environment...

Kealiikanakaolehailani and Giardina 2016:59

Study Area

O'ahu is the third largest island in the Hawaiian archipelago and is the location of Honolulu, the state's capital city and Waikīkī, a world-renowned tourist destination. The state of Hawai'i has a total population of about 1.4 million people; of this population, just over two-thirds live on the

island of O'ahu (Census Bureau 2020). On O'ahu, the two districts, or **moku**, of Kona and Ko'olaupoko were the focus for this STEW-MAP effort (Figure 1). These districts are some of the most densely populated in the state (Figure 2).

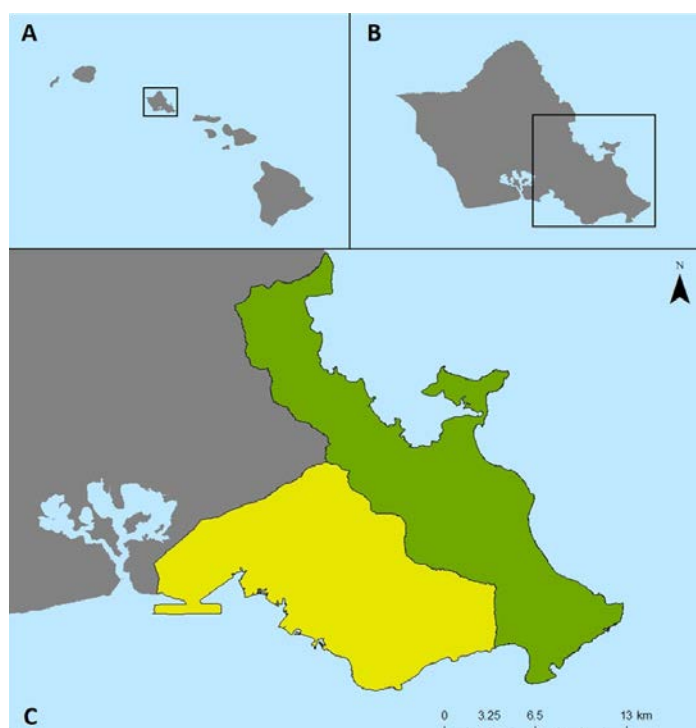


Figure 1.

Map of A) Main Hawaiian Islands, B) Island of O'ahu, C) STEW-MAP O'ahu's project area, Kona district, (greater Honolulu, yellow) and Ko'olaupoko district (green).

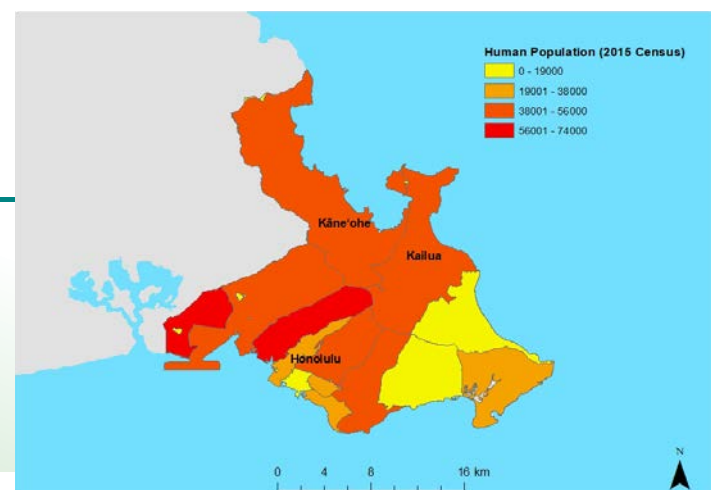


Figure 2.

Human population in study area by census block (based on 2015 census) with major towns labeled (From Hawaii Statewide GIS Program).

Moku - District, island, islet, section, forest, grove, clump, severed portion, fragment, cut, laceration, scene in a play.

Definitions from wehewehe.org

The Ko'olau mountain range runs from the southeast to the north of O'ahu and serves as a natural border between the two study districts. Younger volcanic peaks form landmarks in the southern region of the study area (Lē'ahi, Pū-o-waina, Kawaihoa and Kohelepelepe also known respectively as Diamond Head, Punchbowl, and Koko Craters). Because the tradewinds come from the east, the rain shadow effect causes the eastern side of the mountains (Ko'olaupoko) to be rainier than the western-facing side (Kona). The coastal environment of the region includes sandy beaches, rocky outcrops, and marsh wetlands. Directly offshore fringing, patch, and barrier coral reefs can be found on which culturally important fish, invertebrate, and algal species thrive.

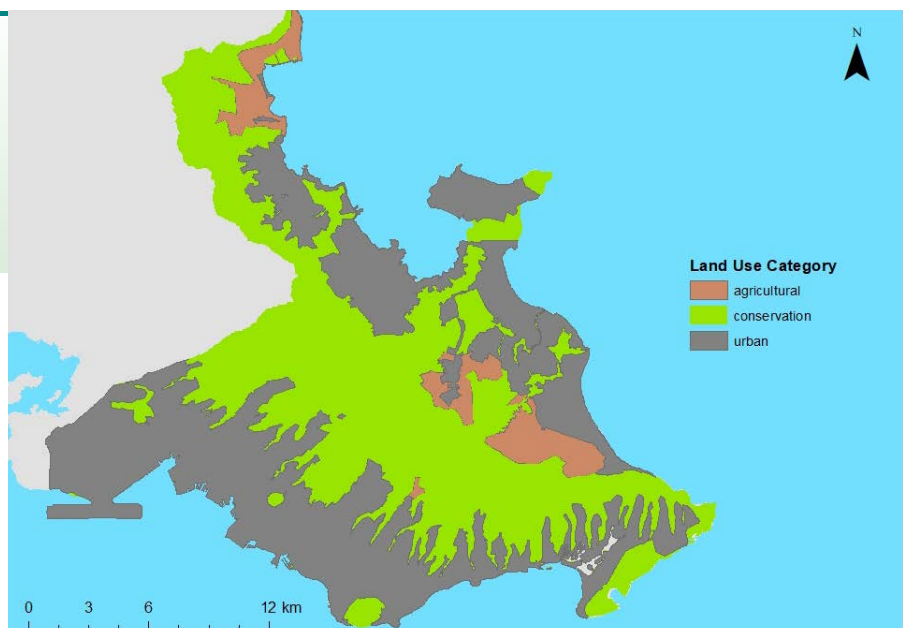
Much of the coastline in both districts is zoned as urban and the mountain peaks are zoned as conservation areas (Figure 3). It should be noted, however, that the urban areas in Kona are more

developed than in Ko'olaupoko; Ko'olaupoko also contains several farms (zoned agricultural). Almost all areas have been affected by people.

In conservation areas, the majority of native forests are limited to high peaks and inaccessible canyons. Most forests on O'ahu are dominated by non-native and invasive species. Past and present land management practices, such as non-native plant and animal introductions, indiscriminate grazing, intensive agricultural development, and military activities have left their mark on native ecosystems. Forest types are primarily lowland wet and mesic forests in the central and lower slope areas. Higher ridges are primarily the native wet and mesic shrub lands. Kona district also has very small patches of remnant tropical dryland forest, which is one of the rarest habitats in the world where many threatened and endangered plants, birds and insects are found.

Figure 3.

State designated land use in study area (From Hawai'i Statewide GIS Program).



There are several large landowners in this region, the largest being federal, state, and local governments (Figure 4, Table 1). It should be noted that federal lands include several military bases. The lands owned by Kamehameha Schools (a private, charitable educational trust) are ancestral lands of Bernice Pauahi Bishop, the last direct descendant of King Kamehameha I, and are largely conservation and agricultural.

While the largest Indigenous Hawaiian community on O'ahu is located on the West side of the island (not in the study area), there are Hawaiian communities in the study area on Hawaiian Homelands in Papakōlea (Kona district) and Waimānalo (Ko'olaupoko district). Hawaiian Homelands are state lands that are leased to Native Hawaiians by the State Department of Hawaiian Home Lands.

Table 1. Major landowners in the study area. Landowners listed own >500 acres in Kona and Ko'olaupoko Districts.

LANDOWNER	ACRES IN STUDY AREA	TOTAL ACRES ON O'AHU	TOTAL ACRES IN STATE
Govt. State	29,979	89,160	1,375,635
Govt. County of Honolulu	9,971	18,672	18,672
Govt. Federal	8,239	61,523	531,444
Kamehameha Schools	6,839	47,807	363,245
Kualoa Ranch	1,550	3,693	3,693
Ohulehule Forest Conservancy	1,466	1,471	1,471
HRT Realty LLC	1,066	1,488	1,761
Ko'olau Land Partners	1,036	1,036	1,036
Govt. State Department of Hawaiian Home Lands	862	61,523	198,896

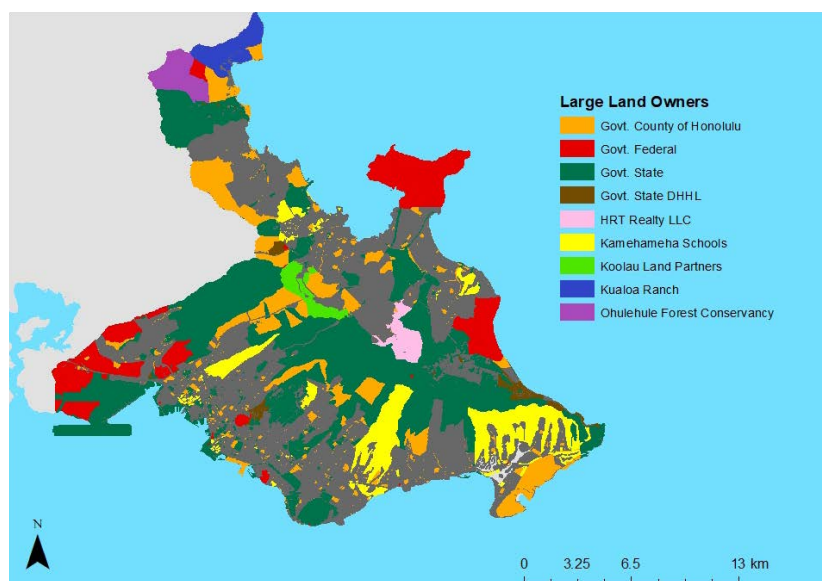


Figure 4.

Map of study area color coded by large landowners. Landowners here own >500 acres in Kona and Ko'olaupoko Districts (From Hawai'i Statewide GIS Program).

STEW-MAP O‘ahu Survey

There are many community and civic groups that care for Hawai‘i’s lands and waters. Our definition of environmental stewardship includes not only ‘hands-on’ or ‘boots on the ground’ work, but also activities that broadly conserve, manage, monitor, transform, advocate for, restore, or educate the public about the local environment. These groups are vital to the health and well-being of our communities, but many of their activities are undervalued because there is very little official information about the stewardship actions taken by community groups. STEW-MAP can help to better understand and visualize how communities mālama, or care for, the many special places in Hawai‘i that sustain us.

Here we share data collected from a 2019 survey to highlight environmental stewardship efforts and identify the gaps and overlaps in stewardship areas. Specifically, we report groups’ organizational characteristics, geographic stewardship areas, and social networks. The data that we report was all collected prior to the COVID-19 pandemic. We briefly reflect upon how the pandemic may have affected the environmental stewardship community in the conclusion of this report.

Methods

The process of STEW-MAP O'ahu (Figure 5) is similar to STEW-MAP efforts conducted elsewhere and was designed to obtain results that would be useful for the project as well as the community. All groups actively engaging stewardship within Kona and Ko'olaupoko districts were encouraged

to participate in the STEW-MAP O'ahu survey. Before the process began, we established relationships with a group of collaborating organizations to advise and guide our process and to provide input on preliminary results.

Identifying Potential Participants

Potential participant groups within the project area were identified through research, directories, and outreach. At least two people or more were required to qualify as a group. Participation was not limited to non-profit organizations or groups solely focused on environmental issues. Radio announcements through Hawai'i Public Radio and KTUH of the University of Hawai'i at Mānoa, online community calendar announcements, e-newsletters, emails, and other means of contact were used to introduce STEW-MAP to those who were potential environmental stewards in the area. The STEW-MAP O'ahu website (<http://stewmaphawaii.net/>) was a key resource in providing additional detailed information about the project. There were a few outreach opportunities at community events and conferences where STEW-MAP had a table to

inform potential participants about the project, hand out one-pagers, and ask community members to refer stewardship groups. Collaborators were also asked to recommend and share contact information to applicable groups. To be broadly inclusive, outreach efforts targeted canoe clubs, Hawaiian civic clubs, **hālau hula**, and schools. An interest form was made available on the STEW-MAP O'ahu website for groups to indicate their desire to participate in the survey or if they wanted more info on the project. Contact lists were compiled into a Microsoft Excel sheet, recording group name, contact person (if available), and contact information (mailing address, email, and phone number). We assigned unique ID numbers to each contact. During this pre-survey period, 438 groups were identified as stewards within the project area.

Hālau hula - A school or hall in which hula is taught.

Definitions from wehewehe.org

Figure 5.

The STEW-MAP Process



Kickoff Meetings

Groups were invited to attend a kickoff meeting to learn more about STEW-MAP, the benefits of participating in the survey, and to discuss what types of potential products they would like to see. Groups were notified via email and collaborators were asked to distribute the STEW-MAP Outreach Event flyer (Appendix A) to other stewardship groups in their networks. To be accommodating to these busy and hard working groups, two meeting locations on separate days were planned. A meeting was held in the Kona district on June 25, 2018 (35 attendees representing 29 groups) and in the Ko'olaupoko district on June 26, 2018 (37 attendees representing 23 groups). While most attendees represented non-governmental organizations, there were also representatives from government agencies, public-private partnerships, informal groups or alliances, private organizations, and families present.

At this interactive meeting, attendees were able to respond confidentially to questions in real-time

using their mobile devices and the program Poll Everywhere (<https://www.poll.everywhere.com>). When asked “What does stewardship mean to you?” their responses generated a word cloud (Figure 6). Responses from the Kona district and Ko'olaupoko district events were very similar. Both responses illustrate the breadth and depth of connections people have to place and caring for a place.

Attendees were able to ask questions and shared ideas on what products they would like to see from this project. One suggestion was to ask which groups offer **‘āina-based education** in the survey, as it could result in a useful resource for teachers who seek to find ‘āina-based education groups to engage their students. Another suggestion was to

‘Āina-based education - An experience-based way of teaching and/or learning through ‘āina that can deepen the kinship between people, communities, and lands so they can thrive.

Definition from Ledward 2013

timeline and what to expect in the coming months. A summary of the kick-off meetings was developed and distributed. The meeting summary was also uploaded to the STEW-MAP O'ahu website.

Responses from the Kona district event (left) and the Ko'olaupoko event (right) to the question "What does stewardship mean to you?"



Survey

Development

The first STEW-MAP effort to be conducted in Hawai'i occurred in 2017 on Hawai'i Island. That team adapted their survey to the Hawai'i context, using a STEW-MAP survey template that had been used in other STEW-MAP locations (Landau et al. 2019). Specifically the Hawai'i Island STEW-MAP team tailored stewardship types, sites, and activities in the survey to reflect Hawai'i-based practices and Hawaiian language (e.g., care for, mālama, maintain, or manage a place; place-based or traditional hunting, fishing, and gathering; **lo'i kalo**; **loko i'a**; 'āina-based learning; **rapid 'ōhi'a death**). Other adaptations included:

- Asking whether groups steward outside of the project area.
- Having participants rank their choices instead of choosing a primary type, site, or activity.
- Asking how groups interact with other groups.
- Revising the types of services a group provides.
- Asking about types of resources a group desires.
- Asking about the types of metrics groups track.
- Asking about the level of impact groups have for specific outcomes.
- Instead of “turf,” which has been used in other STEW-MAP locations, using the phrase “stewardship area” which resonates better with people in Hawai'i.

Additionally, the “Level of Visibility” section was created to allow groups to choose how much of their information they would like to be shared. Groups had the options of full visibility, confidential and unnamed visibility, and no visibility (Table 2).

STEW-MAP collaborating organizations provided feedback on what they wanted to be asked about and learn from in the survey.

The survey was approved by the University of Hawai'i's Institutional Review Board (IRB) (#2017-00331). The survey was entered into the Qualtrics software platform (<https://www.qualtrics.com>) to provide a survey experience that could be easily

Lo'i kalo - Taro patch.

Loko i'a - Fishpond.

Definitions from wehewehe.org

Rapid 'Ōhi'a Death - 'Ōhi'a (*Metrosideros polymorpha*), the most abundant native tree in the state of Hawai'i, are dying from a new fungal disease. On Hawai'i Island, hundreds of thousands of 'ōhi'a have already died from this fungus, called *Ceratocystis*. Healthy trees appear to die within a few days to a few weeks, which is how the disease came to be called “Rapid 'Ōhi'a Death.” This disease has killed trees in all districts of Hawai'i Island and has the potential to kill 'ōhi'a trees statewide.

Definition from <https://cms.ctahr.hawaii.edu/rod/>

completed on a computer or mobile device. Using Qualtrics also allowed us to keep track of the completion status of our contacts and provided easy ways for us to send e-mail reminders to non-

respondents. In addition, the survey was formatted into a paper version (Appendix C: STEW-MAP O’ahu Survey) for those who preferred a hard copy.

Table 2. Level of visibility types and descriptions.

TYPE	DESCRIPTION
Full Visibility to the Public	■ Group level data is visible to the public. ■ Group name, stewardship area, social network connections, and other information submitted as part of the survey are visible. ■ Information may be used for the creation of products. Budget information is not included. It will only be summarized without revealing individual group budgets.
Confidential and Unnamed Visibility to the Public	■ Identity of the group is completely confidential and unnamed. ■ Stewardship area and group’s role in the stewardship network in any products created from submitted data will be represented but unnamed.
No Visibility to the Public	■ Participate for research purposes only. ■ Group name, characteristics, stewardship area, or network connections, is not displayed. ■ Information is only included in highly summarized conditions that would not result in the identity of the group or area being revealed.

Survey Distribution & Follow-up Outreach

The process of launching the survey and sending reminders to participants occurred over eight months (Figure 7). The survey launched in January 2019. Before the survey opened, postcards designed by the STEW-MAP O’ahu team were mailed to potential participants to advertise the upcoming launch. Two types of postcards (Appendix B)

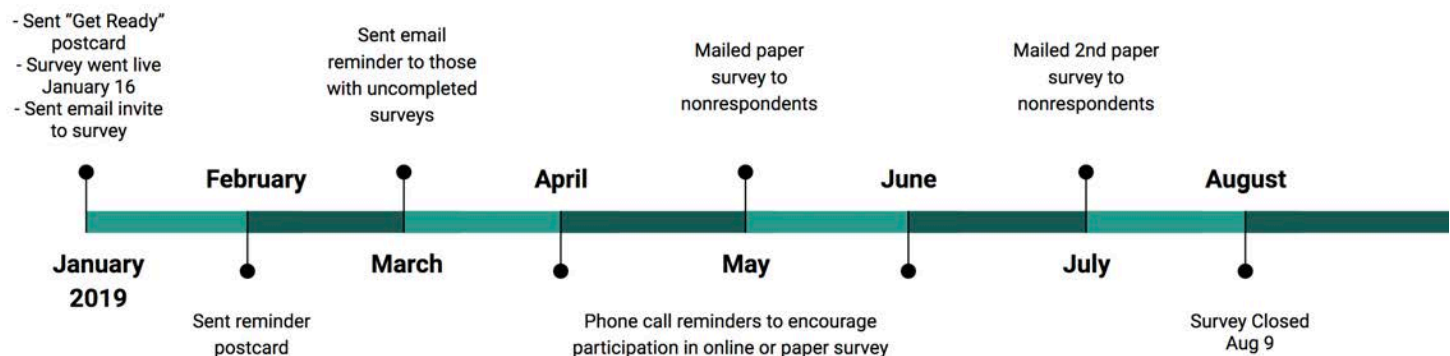
were created in order to appeal to audiences in urban and rural Hawai’i. A reminder postcard was also mailed approximately one month after the survey launched. News of the survey launch were also made through radio announcements, online community calendars, and e-newsletters.

As groups completed the survey, they were sent emails thanking them for their participation. Approximately two weeks after the survey launched, an email reminder was sent to all contacts who had yet to complete the survey; four other reminder emails were sent to nonrespondents, 4-6 weeks apart. To encourage participation and completion of the survey, incentives in the form of \$50 gift cards to a local supermarket were promoted in the reminder emails and on the STEW-MAP O'ahu website. Some email reminders were tailored specifically for hālau hula, canoe clubs, and teachers.

Personal phone calls were made to those who had yet to complete the survey, starting approximately three months after the survey launched. The phone calls were useful for confirming we had the correct contact information, making sure the email reminders were being received, and answering questions the contacts had about the survey. However, it should be noted that the majority of phone calls resulted in leaving voicemail messages. Paper surveys were sent to contacts who requested them and also to nonrespondents twice during the survey period. About 20 respondents completed and returned paper surveys.

Figure 7.

Timeline describing methods used to remind potential respondents to complete survey and when reminders occurred.



Recruitment of Alters

Social network analysis (SNA) is all about studying relationships. In SNA, "nodes" are the social units of study (e.g., individuals, families, groups) and "alters" are the units to whom nodes are connected. In this survey, "nodes" are groups. In the networks section of the survey, respondents were asked to identify:

- 1) Groups with whom they regularly collaborate on environmental projects or programs,
- 2) Groups they go to for knowledge, data, or expertise related to environmental issues, and
- 3) Groups that provide them with funding, materials, or labor for environmental projects or programs.

Groups that were named in this section are referred to as “alters.” As survey responses were received, we compiled the alters and sent out invitations to the alters that were not already invited to participate in the survey, based on the surveys that had been completed in the previous two weeks. At first, all non-private, non-government alters were invited regardless of their location, but after about two months, only alters located within the study were invited. This was because none of the organizations located outside of the study area that had been invited had participated in the survey. Additionally, several of the groups located beyond the survey were large, international organizations and it was difficult to identify the appropriate contact people to invite

to take the survey. Similarly, alters associated with the University of Hawai'i (UH) that were too broad (e.g., department names, school names, or just “UH”) were not contacted to take the survey. Regardless of whether alters were able to be contacted or not, they were all included in the social network analyses and associated visualizations. Private organizations that were listed as alters were invited to participate in the survey if they did environmental stewardship as a “pro bono” activity or as part of a foundation. Of all the alters invited to participate in the survey, 15.6% of them ended up completing a survey (these are included in the overall response rate reported below).

Data Processing

Responses were downloaded from Qualtrics. Respondents that did not make it to the end of the survey were removed from the data set. A total of 136 groups submitted completed surveys. Respondents that were forced to end the survey early because they did not engage in stewardship and/or did not engage in stewardship in the two districts that made up the survey area were removed from the data set, leaving 128 complete surveys.

For calculating the response rate, we removed hālau hula, schools, and University of Hawai'i groups from our survey frame, given the extremely low response rate from these groups (each of these groups had only a single respondent). We also removed duplicates from the sampling frame. Our resulting response rate was 38%.

Geospatial Mapping

ArcMap GIS was used to map polygons based on the respondents' descriptions of where their group stewards. Existing layers on the Hawai'i Statewide GIS Program website (<https://geoportal.hawaii.gov/>) were helpful for identifying some of the areas described (e.g., parks, nature reserves, watersheds, neighborhood boundaries, tax map key (tmk) parcels). A handful of respondents indicated in the survey that they had existing GIS files for their areas; in these cases, the respondents were asked to share their polygons. All areas were mapped using a WGS84 projection, to be consistent with the existing layers from the State.

Despite the directions to describe areas in the study districts, several respondents included descriptions

of areas outside the study boundary. These were all included in the preliminary mapping, as we thought these may be of use for future STEW-MAP efforts. All respondents were emailed a copy of their mapped areas for confirmation, along with any questions or notes about the mapping. If we did not receive a response, respondents were emailed a reminder and/or were contacted by phone.

After the maps were adjusted based on feedback and confirmed, they were processed for inclusion on the public portal. Areas outside of the study districts were removed. If a group responded that they work statewide, the area was adjusted to cover both study districts.

Networks

In the networks section of the survey, respondents were asked to identify:

- 1)** Groups with whom they regularly collaborate on environmental projects or programs,
- 2)** Groups they go to for knowledge, data, or expertise related to environmental issues, and
- 3)** Groups that provide them with funding, materials, or labor for environmental projects or programs.

Groups listed as responses to these questions were standardized and assigned unique IDs if they were

not already on our contact list. Each of the original groups were retained as the entity they were listed; however, if the group was part of a larger entity (e.g., a division that is part of a department or a school that is part of the University of Hawai'i), that was added to the organizational data, so that each organization listed had a "fine-scale name" and a "broad-scale name." The social network maps and analyses presented in this report use the "broad-scale" names. We present the in-degree statistic (i.e., the number of times a group is named) for the most mentioned groups for each network. Gephi (Bastian et al. 2009) was used to calculate the in-degrees and to create the social network maps.

Reporting of Results

There were three report back meetings. A meeting with project collaborators was held in October 2019. Two report back meetings were held in November 2019 (all survey respondents who indicated that they wished to be in touch for follow-up activities were invited). Like the kickoff meetings, a meeting was held in each district (Kona and Ko'olaupoko) on separate days to give attendees options of meeting at a convenient location. The purpose of these meetings was to share preliminary findings, get feedback from participants on what they think about the findings, their interpretation of the findings, and to gather recommendations on how participants would like to apply and visualize the data. Meeting attendees were also able to give suggestions on questions for the follow-up interviews. Attendees seemed

impressed with the size of the network and how it could be visualized. Several attendees shared how they might use the data to increase their collaborations, by finding other groups working on similar topics in their area or being able to identify groups working downstream from them in their watershed. Additionally, several attendees were interested in how the findings could be used by educators. One attendee thought it was important to know more about the barriers groups face in meeting their goals; a question addressing this was included in our follow-up interviews. A meeting summary was developed and distributed to attendees and participants that were unable to attend the report back meetings and was also uploaded to the STEW-MAP O'ahu website.

Follow-up Interviews

Twenty follow-up interviews were conducted with a subset of survey respondents from August-December 2020. Interviews were semi-structured and focused on gaining a better understanding of stewardship areas, collaborations, and impacts due to the COVID-19 pandemic (Appendix F). As

the interviews were being conducted at the time this report was being compiled, we do not share findings of our interviews here. Interview results are available here: <https://www.frontiersin.org/articles/10.3389/frsc.2021.710355/full>

Results

The results from the STEW-MAP O'ahu survey are a snapshot of some of the stewardship efforts conducted in 2018 within Kona and Ko'olaupoko districts. There were 128 non-governmental,

civic/community/non-profit organizations that completed the STEW-MAP survey (Appendix D). The scale these groups work in ranges from a single garden to working globally.

Basic Group Information

Year Founded

The STEW-MAP survey asked respondents about their group to get a better understanding of who they are and what type of stewardship they do. Respondents were asked to report the year their group was founded (Figure 8). Exactly half of the

groups who responded (64) were founded in the last 20 years (i.e., since the year 2000). The oldest group, Saint Louis School was founded in 1846 and the youngest, Keiki and Plow, in 2019.

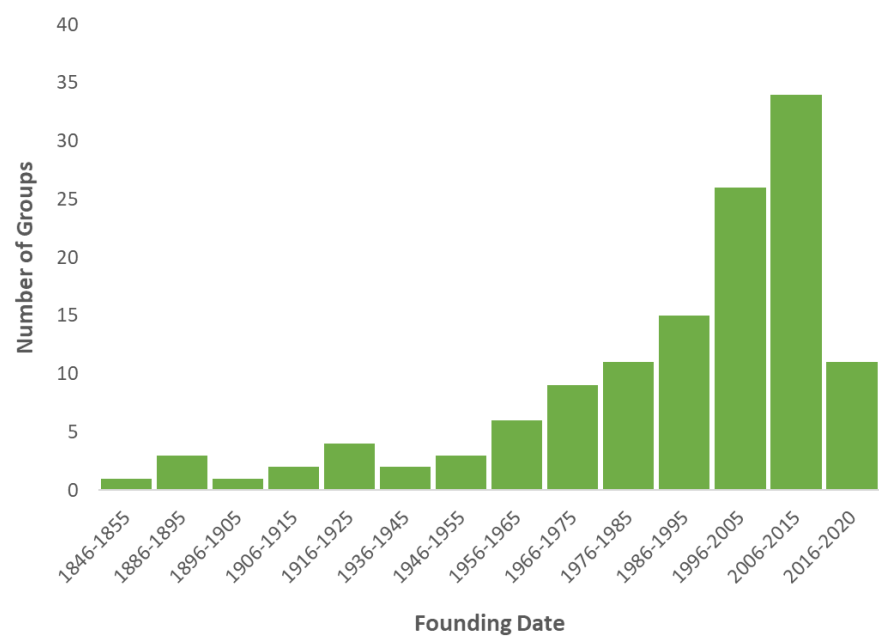


Figure 8.
Number of stewardship groups founded by year from 1846-2020 (n=128).

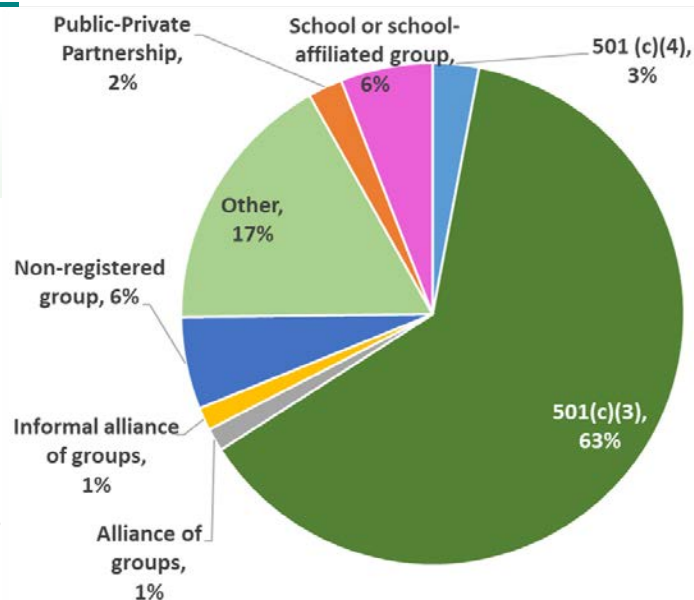
Group Type

When groups were asked to indicate what category best describes their organization type (Figure 9), the majority of respondents (63%) reported they

were registered 501(c)(3) groups. Many of those who indicated "Other" were private or University of Hawai'i affiliated groups.

Figure 9.

Group type (n=128).



Stewardship Location

To get an idea of where respondents are stewarding, they were asked to indicate which district they work in (Figure 10). Out of the 128 respondents, 20% indicated that they work in the Kona district, 27% work in the Ko'olaupoko district, and 52% indicated that they work in both districts.

Respondents were also asked if they work in areas beyond the Kona and Ko'olaupoko districts (Figure 11). Over half of the respondents (63%) work beyond the project area. Groups indicated that they worked in other areas on O'ahu (47), other

locations across the state of Hawai'i (32), statewide (48), nationally (12), other areas in the Pacific region (20), and internationally (13) (note, multiple responses could be selected for this question).



Figure 10.

Map of O'ahu with both districts in the project area outlined. Kona (yellow) and Ko'olaupoko (green). The percentages correspond to where respondents indicated they worked (n=128).

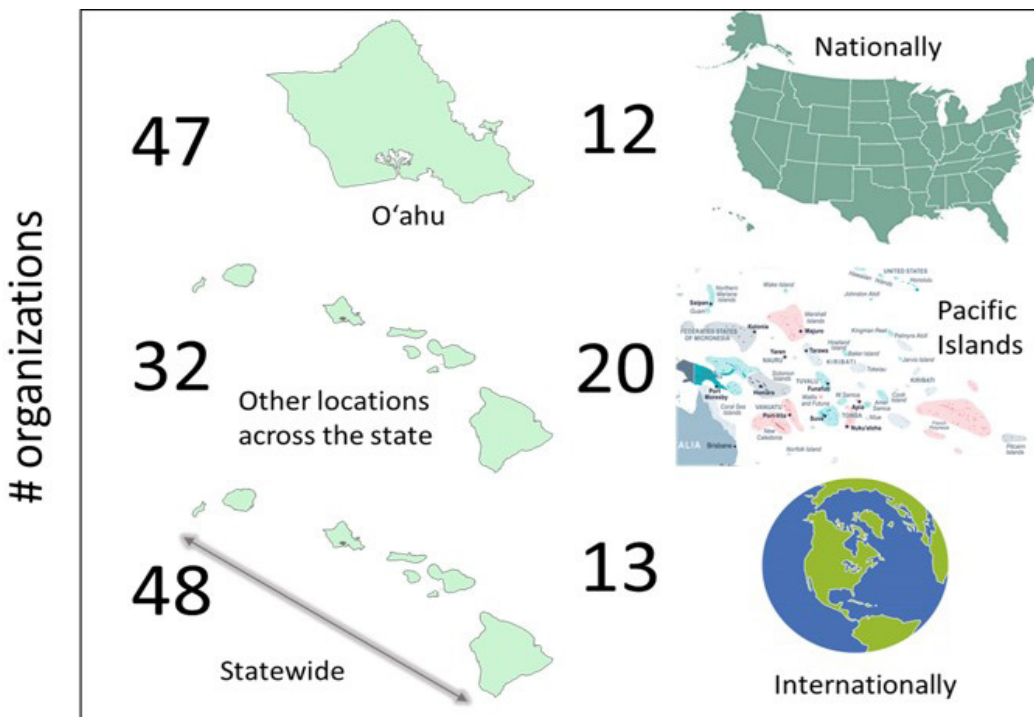


Figure 11.

Number of groups that work beyond the project area.

Group Capacity

Respondents were asked to indicate how many full-time staff, part-time staff, members, and volunteers their group has, which is an indication of a group's capacity (Table 3). Out of 128 respondents, the amount of full-time staff ranged from 0 to 2,114, with an average of 29 full-time staff. Out of 127 respondents, the amount of part-time staff ranged from 0 to 380, with an average of 7 part-time staff. Forty-five groups reported not having any full-time staff and 38 of those also reported not having any part-time staff either. Out of 124 respondents, the number of members in a group ranged from 0 to 1.5 million. For the purpose of this survey, "regular volunteers" are those who routinely volunteer in a group's activities and exclude volunteers from

one-time volunteer events. Out of 123 respondents, the number of regular volunteers participating in a group's stewardship activities ranged from 0 to 1,500. All categories have a minimum of zero because many groups do not have any paid staff, do not have a membership system in place, and some groups do not have regular volunteers.

When respondents were asked for an estimated annual budget for 2018, 42% indicated they had a budget, 9% had no budget, and 49% preferred not to answer. Of the organizations that reported their budgets, the median annual budget was \$350,000 (n=33). The annual mean budget (excluding a major outlier) was \$1,571,520.

Table 3. Number of staff and volunteers for groups responding to STEW-MAP survey.

MEASURE	FULL-TIME STAFF	PART-TIME STAFF	MEMBERS	REGULAR VOLUNTEERS
Mean	29	7	12,447	42
Standard Deviation	189	36	134,680	149
Minimum	0	0	0	0
Maximum	2,114	380	1,500,000	1,500
N	128	127	124	123

Proportion of effort focused on stewardship

Considering all of the programs, activities, and services an organization can have, groups were asked what percentage of their efforts focused on environmental stewardship in 2018 (Figure 12). Out of 123 respondents, about half of the organizations were 80-100% focused on stewardship. About

40% of groups indicated they focus less than 59% of their efforts on stewardship, highlighting the fact that groups with diverse missions engage in environmental stewardship. For example, canoe clubs were some of the groups that indicated they focus 1-19% of their efforts on stewardship.

Figure 12.

Number and frequency (as %) of groups by percentage of efforts focused on stewardship (n=124).

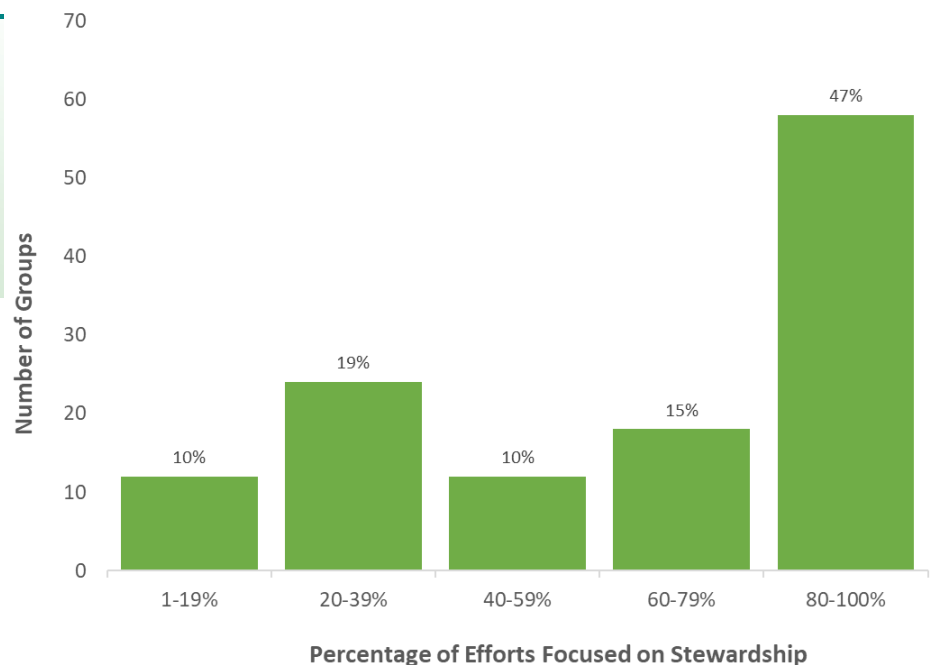


Table 4. Stewardship types and example practices.

TYPE	DESCRIPTION
Advocate	■ Planning, organizing, direct action, fundraising
Care for (mālama), maintain or manage a place	■ School/community garden, park, roadway, trails ■ Fishpond, freshwater source, stream, shoreline ■ Special family ('ohana) site
Care for (mālama) specific living things	■ Plants, animals, stones, minerals ■ 'Aumākua (deified ancestors) or kino lau (myriad forms of deities)
Conserve	■ Perpetuate cultural values and practices related to stewardship ■ Hold a conservation easement ■ Protect freshwater resources
Educate	■ 'Āina-based education, research, science, training, and mentoring ■ Sharing mo'olelo wahi pana (histories of storied/pulsing places), mele (song), hula (dance), or oli (chant)
Engage with the spirit of the land/ocean for health and well-being	■ Through being present ■ Meditating and praying
Monitor	■ Air or water quality ■ Species monitoring ■ Rain or drought monitoring
Participate	■ Partner with groups ■ Support other environmental work
Place-based or traditional hunting, fishing, or gathering	■ For resources for consumption and exchange in reciprocal relationship with 'āina ■ Monitoring the quality and character of the 'āina and its resources in the process
Respond	■ Respond to or protect against tsunami, hurricane, flood, or fire/drought
Restore	■ Restore native habitats/species ■ Restore traditional and customary systems/structures (Agriculture, aquaculture, trails, navigation, rituals, etc.)
Transform	■ Changing the waste stream ■ Transitioning toward sustainable/clean energy ■ Promoting sustainable agriculture

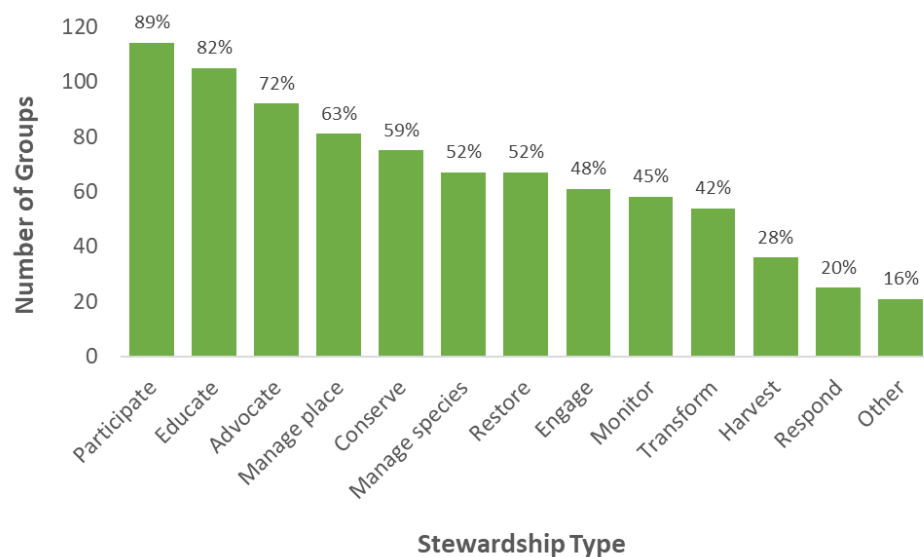


Figure 14.

Number and frequency (as %) of groups by stewardship type, when an unlimited number of selections were available to respondents (n= 128).

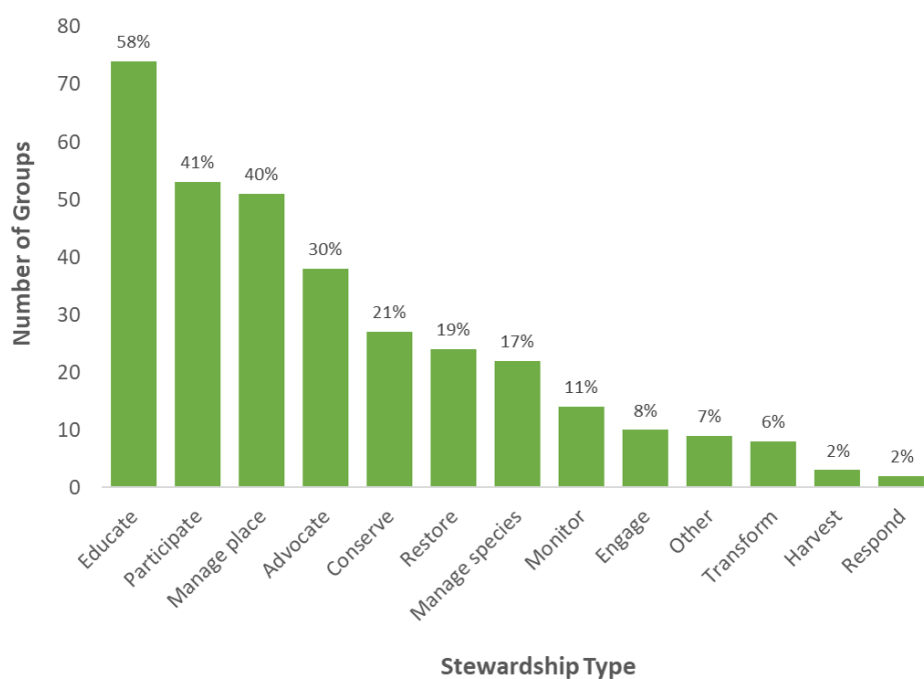


Figure 15.

Number and frequency (as %) of groups by stewardship type, when respondents were asked to list the top three (n=116).

Stewardship Sites

Respondents were presented with a long list of potential site types that they may have cared for in 2018 (Appendix C). Site types included terrestrial and marine sites, as well as more broad “systems” site types (e.g., food systems, stormwater management). More than 40% of respondents said

their stewardship work focuses on food systems (45%), community gathering spaces (44%), and cultural sites (43%) (Figure 16). In Hawai'i, food systems are inclusive of grocery stores, farmers' markets, community supported agriculture, food banks, farms, ranches, fishponds, fishing grounds,

hunting areas, gardens, forests, agroforests and compost sites. Community spaces include parks, community meeting areas, and other places where people can gather. Cultural sites may refer to wahi pana (pulsing, storied, celebrated, or legendary places), burial sites, shrines, and places where

cultural resources can be gathered, and offerings can be made. It should be noted that in the Hawai'i context, cultural resources are natural resources and in many cases there is no distinction between the two.

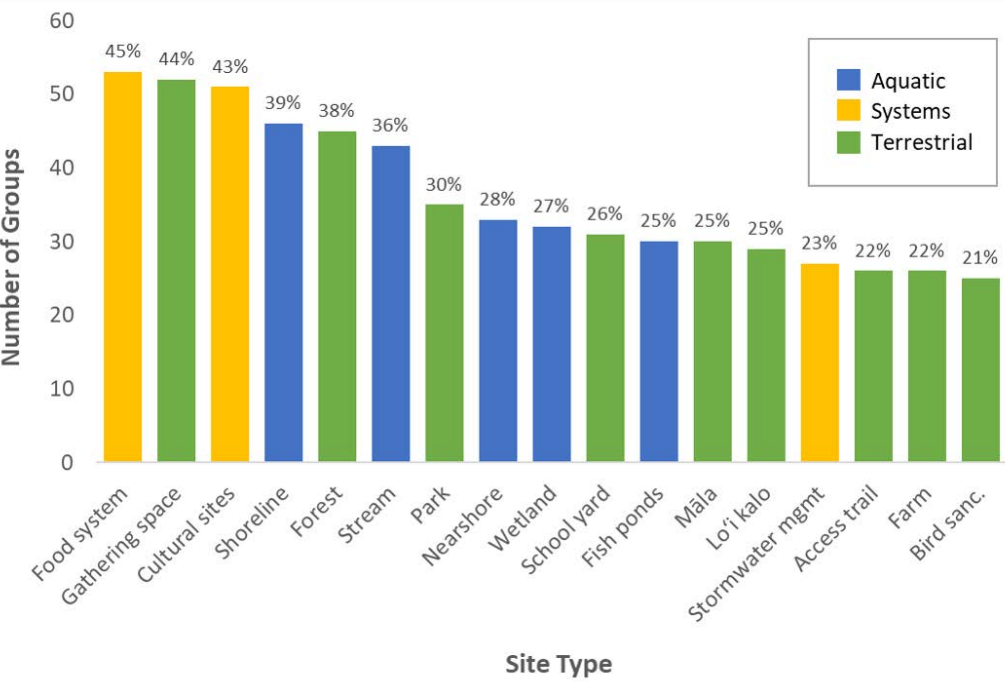


Figure 16. Number and frequency (as %) of groups by stewardship site type, when an unlimited number of selections were available to respondents (n= 118). There were 40 possible site types presented as options; only site types chosen by at least 20 respondents are shown in this figure. Sites represented with green bars represent terrestrial site types, blue aquatic site types, and yellow systems site types. See survey for all possible site types (Appendix C).

Respondents were also asked to select their group's three most important stewardship site types (Figure 17). While cultural sites (23%), was also a top response to this question, the other two top responses (forest (23%) and shoreline (20%)) differed from the previous question. No group listed dog parks, playgrounds, caves, rooftops, or anchialine ponds (while found elsewhere on the island are not in the study area) as top site types.

Respondents were asked to indicate who owns the majority of the properties where their group worked in 2018 (Figure 18). Out of 127 respondents, 29% indicated that the state government owns the land that their group stewards. Many groups (27%) indicated that they work across public and

private lands. Other properties were owned by the city/county government (12%), nonprofits (8%), private landowners (7%), individuals (1%), and federal government (1%), Hawai'i does not have any National Forest and there are no National Parks in the study area; federal government owned lands in the study are likely military areas. Three percent of respondents did not know who owned the land they steward. The majority of the respondents that indicated "other" (12%) selected this option because their property is owned by more than one entity.

Wahi Pana - Legendary place.

Definitions from wehewehe.org

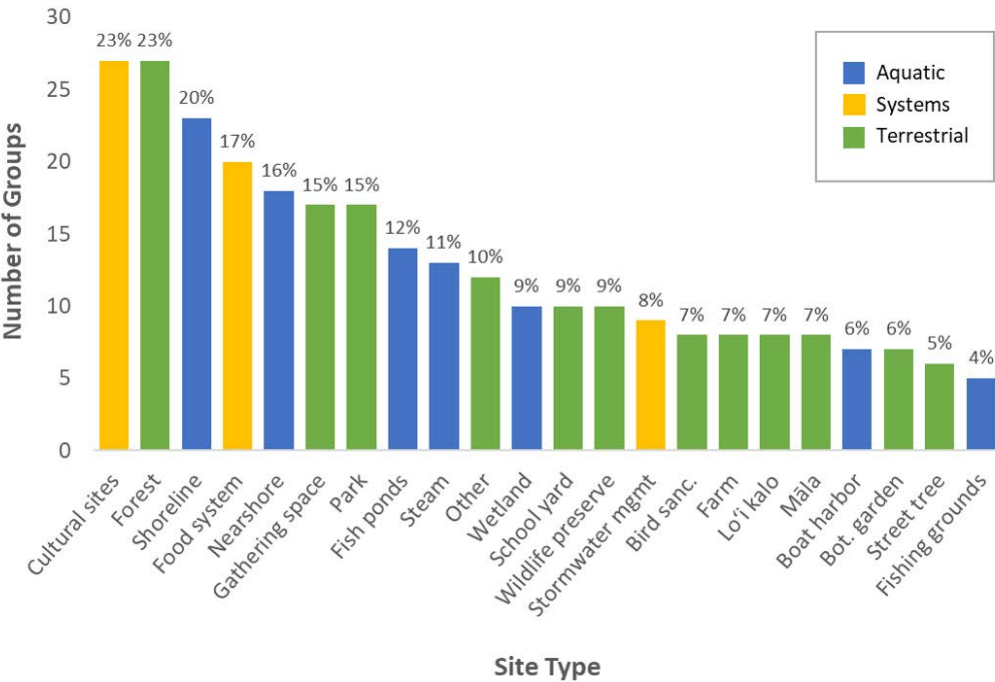
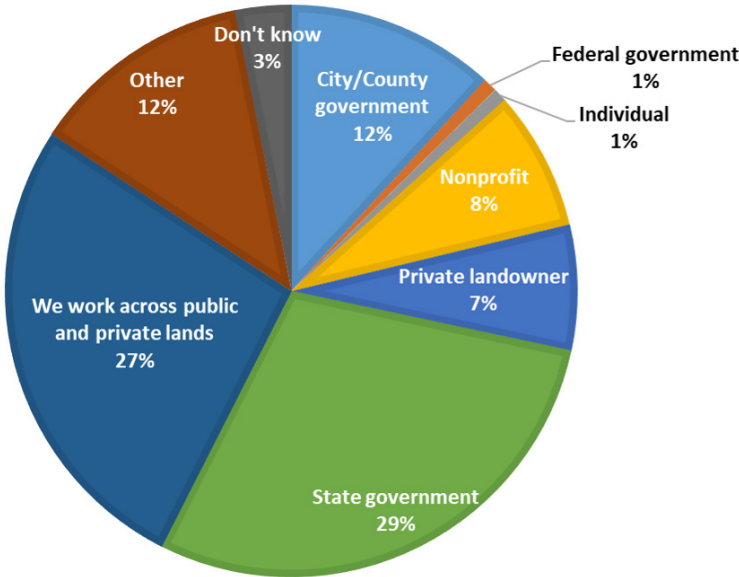


Figure 17. Number and frequency (as %) of groups by stewardship site type, when respondents were asked to list the top three (n=116). There were 40 possible site types presented as options; only site types chosen by at least five respondents are shown in this figure. Sites represented with green bars represent terrestrial site types, blue aquatic site types, and yellow systems site types. See survey for all possible site types (Appendix C).

Figure 18. Ownership of land being stewarded by groups (n=127).



Group Activities and Services

Respondents were asked about the types of activities they conduct (Figure 19). Environment and education were the top two responses, which makes sense, given that groups self-identified as participating in environmental stewardship and many indicated education as a stewardship type conducted (Figure 15). Interestingly, more than

half of organizations indicated that they work on community improvement and capacity building (60%) and cultural and place-based knowledge, values, and practices (58%), highlighting the holistic approaches taken by many of the participating groups.

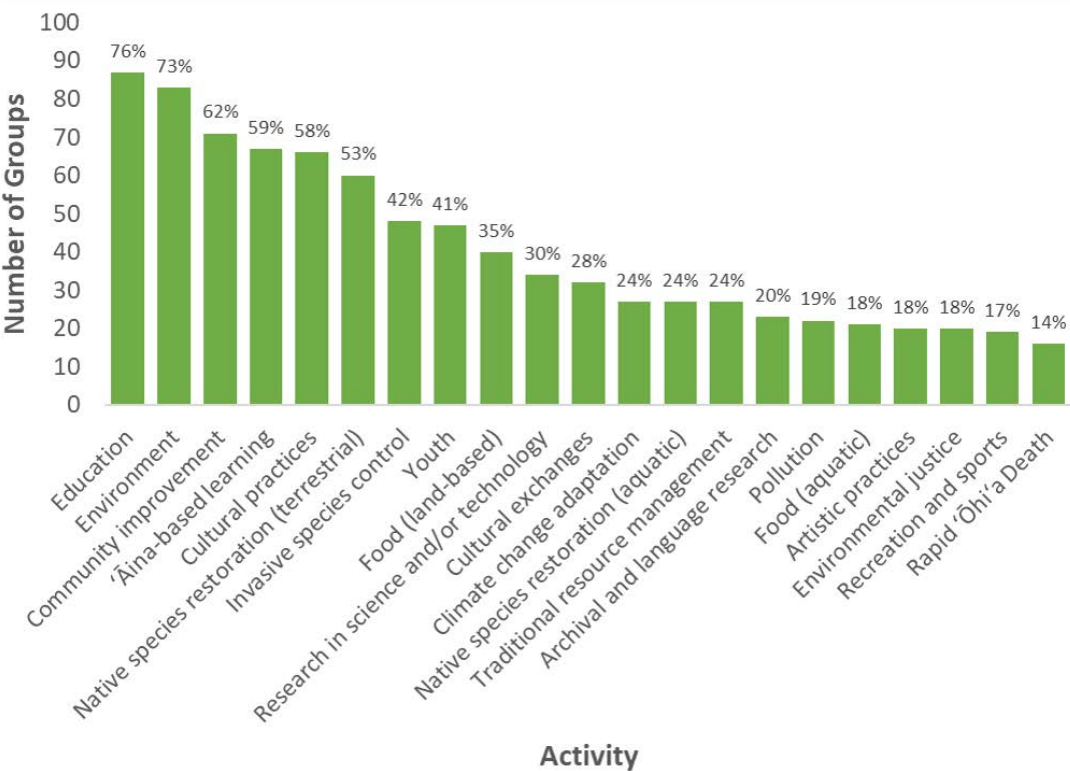


Figure 19. Number and frequency (as %) of groups by additional activities to stewardship (n=114). There were 42 possible activities presented as options; only activities chosen by at least 10 respondents are shown in this figure. See survey for all possible additional activity types (Appendix C).

Metrics tracked

Groups were asked if they track metrics and if so, what is measured. Sixty-seven groups reported metrics that they track. We reviewed these metrics and used an open coding approach that resulted in the identification of 18 codes (Table 5). Some

metrics were characterized by multiple codes. For example, the “number of student participants” was coded as participation and schools. The most commonly listed metrics measured some aspect of participation, volunteers, and events.

Table 5. Coded measures of listed metrics and number of times each code was identified in a metric. Some metrics were characterized by multiple codes.

MEASURE	DESCRIPTION	# OF METRICS
Participation	Numbers of participants, attendees, visitors, tours, groups, people reached	38
Volunteers	Number of volunteers and volunteer hours	27
Events	Number of events, projects, meetings, programs, groups visited	24
Plantings	Number of trees/seeds/seaweed/plants planted	17
Areas	Areas conserved, maintained, managed, restored, fenced, preserved, protected	17
Schools	Number of schools visited; students served	13
Removal	Amounts and types of garbage, invasive species removed	12
Evaluation	Level of satisfaction and/or success, of programs/events/ experiences	11
Species	Presence, number, and/or status of native species	10
Infrastructure	Measure of fences and/or walls built or repaired	7
Collaborators	Number of partners and/or collaborators	6
Harvest	Amount of taro, seafood, fish, or other local food harvested	5
Conservation	Measure of areas conserved	5
Publicizing	Number of publications and/or presentations	5
Invasive Species	Measure of invasive species present or removed	4
Support	Grants, funding, donors, in-kind support	4
Environmental Data	Environmental data monitoring	3
Shared	Sharing, donating, or distributing resources to the public	3

Some of the unique metrics are listed below, along with the group that tracks the metric:

- 'Alae 'ula presence [the presence of this endangered, endemic wetland bird species, Hawaiian gallinule or mudhen (*Gallinula chloropus sandvicensis*), is an indicator of the restoration of wetland ecosystems] (Kāko'o 'Ōiwi)
- Number of huli planted per week [huli are taro petioles that include a portion of the corm and are used as planting material] (Kāko'o 'Ōiwi)
- Number of ungulates controlled [ungulates including boars, goats, and deer are not native to Hawai'i and damage habitats, consume native species, and compete with native species for resources]. (Ko'olau Mountains Watershed Partnership)

- Amount of invasive alien algae donated to local farmers [the algae is used as fertilizer]. (Mālama Maunalua)
- Number of farms started (GoFarm Hawai'i)
- Number of legislative visits (Hawai'i Association of Watershed Partnerships)
- Feet of fishpond wall built/restored (Kua'aina Ulu 'Auamo (KUA))
- Amount of mangrove wood shared as a resource [mangroves are an invasive species in Hawai'i but can be used for firewood and material for building traditional Hawaiian structures]. (Paepae o He'eia)

Information Sharing

Respondents were asked how their group shared information with the public (Figure 20). The most common communication methods were through

websites (87%), social media (83%), and word of mouth (78%). There are 2% of groups that don't share information at all.

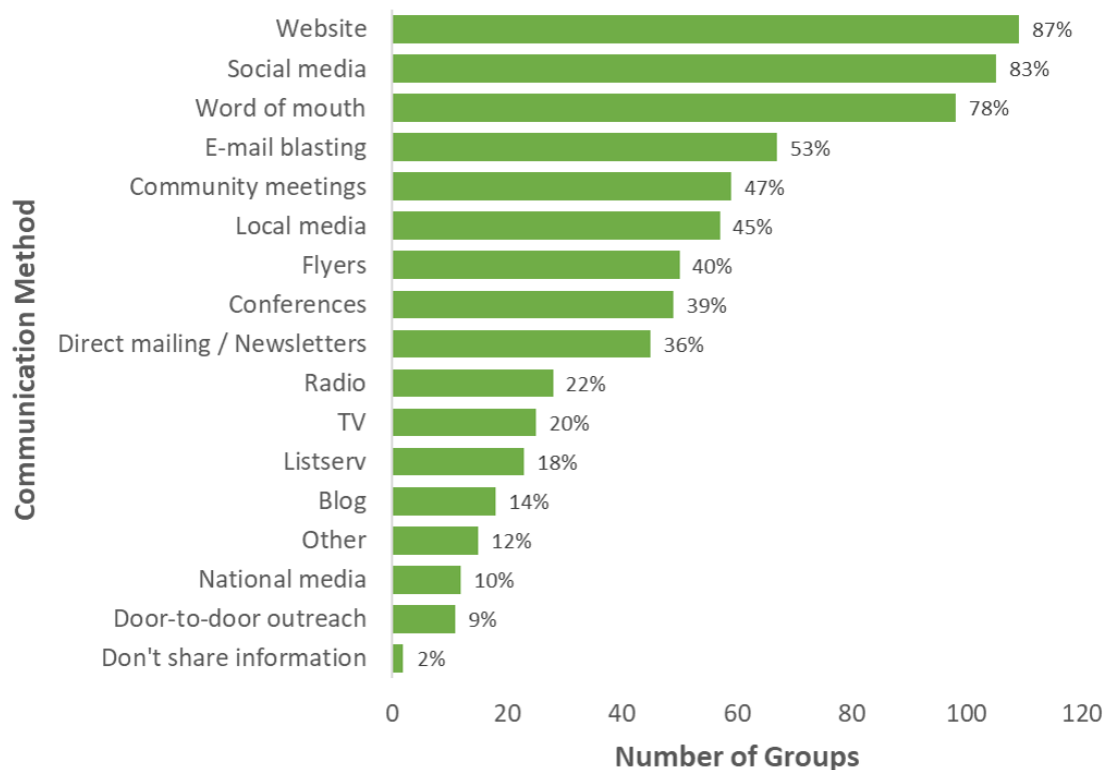


Figure 20.

Number and frequency (as %) of groups by methods of communication used by organizations to share information with the public (n=126).

Impacts and Influences

To better understand a group's level of impact and influence in the communities they work in, respondents were asked about their perceived influence on environmentally-focused (Figure 21) and community-focused (Figure 22) outcomes. The average scores for all perceived outcomes hovered around 2 (where 0 was not influential and 5 was highly influential). Sustainability was the highest rated outcome for the environmentally-focused outcomes (mean= 2.5, s.d.=1.4); intergenerational family ties was the highest rated community-

focused outcome (mean= 2.5; s.d.= 1.5). We suspect these scores are relatively low due to the Hawaiian value of humility or **ha'aha'a** that is a social norm not just in Hawaiian families, but also observed across our local communities (Kuratani 2015). Another reason for these lower than expected scores could be due to the focus of the group; a group that focuses on marine areas may give a high rating to "Protection of ocean-based resources" but a low score to "Protection of land-based resources."

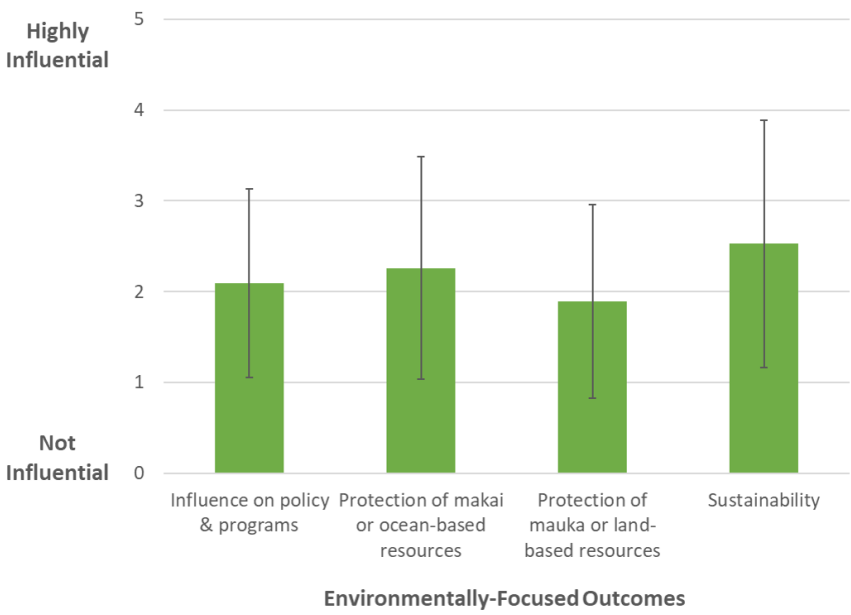


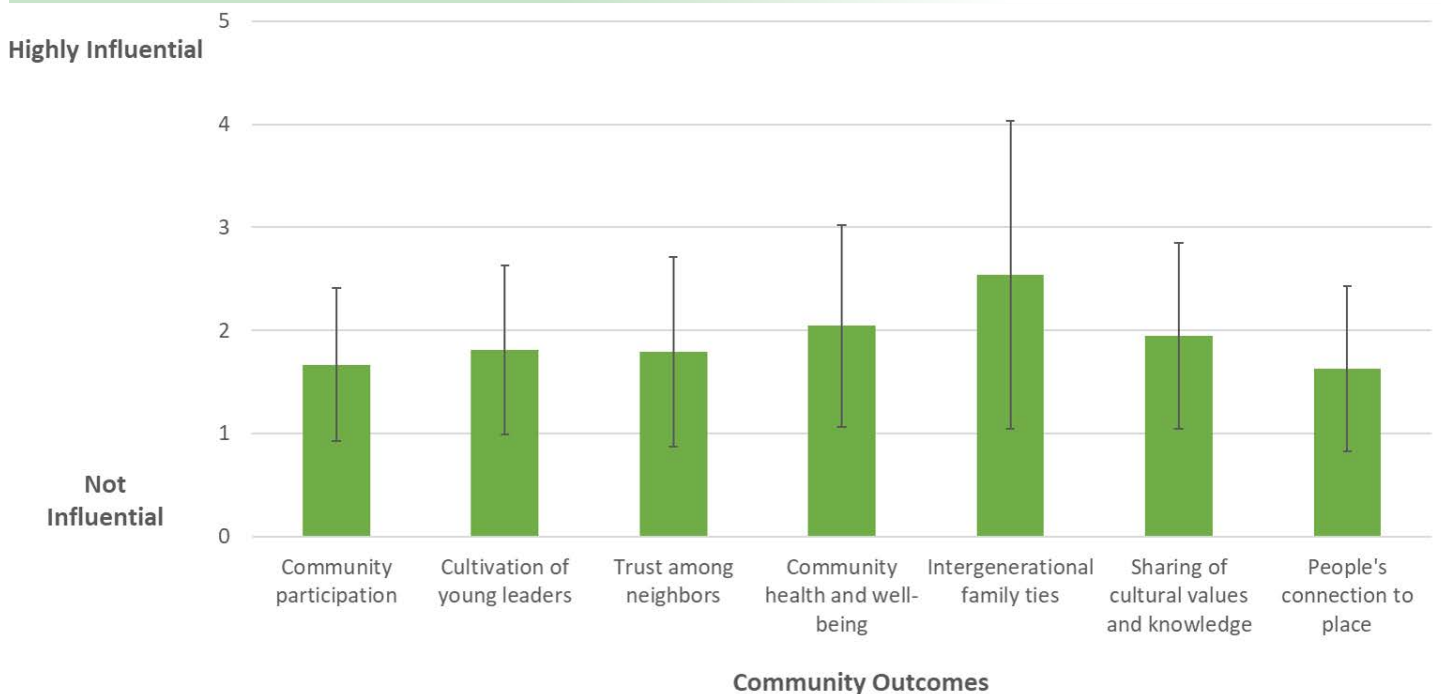
Figure 21.
Average perceived impact on maintaining or improving environmental outcomes. Error bars indicate standard deviation (n=122).

Ha'aha'a - Low, lowly, minimum, humble, degraded, meek, unpretentious, modest, unassuming, unobtrusive; lowness, humility.

Definitions from wehewehe.org

Figure 22.

Average perceived impact on maintaining or improving community outcomes. Error bars indicate standard deviation (n= 122).



Services and Needs

Respondents were asked to indicate what types of services their group provides (Figure 23). Educational curricula/training was the most selected, followed by 'āina-based learning and community organizing. Legal resources are the least provided service; groups that indicated they do provide them include The American Association of Retired Persons (AARP), The Native Hawaiian Legal Corporation, The Trust for Public Land, and Friends of the Natatorium.

To understand more about the types of information or expertise that would help organizations undertake their stewardship activities, respondents were asked about what kinds of resources their group has sought (Figure 24). Funding was the most sought after listed resource (73%), followed by labor (volunteers, students, and interns) (50%) and data/information (48%). Natural-cultural resources were the least sought after resource.

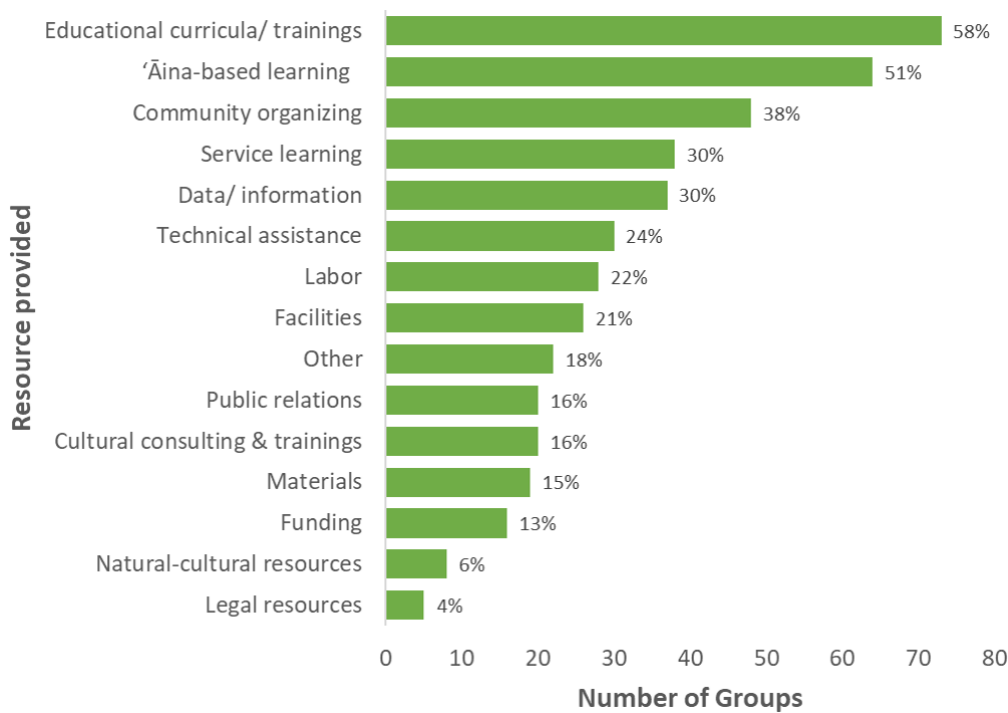


Figure 23.

Number and frequency (as %) of groups by types of services offered by organizations (n=125).

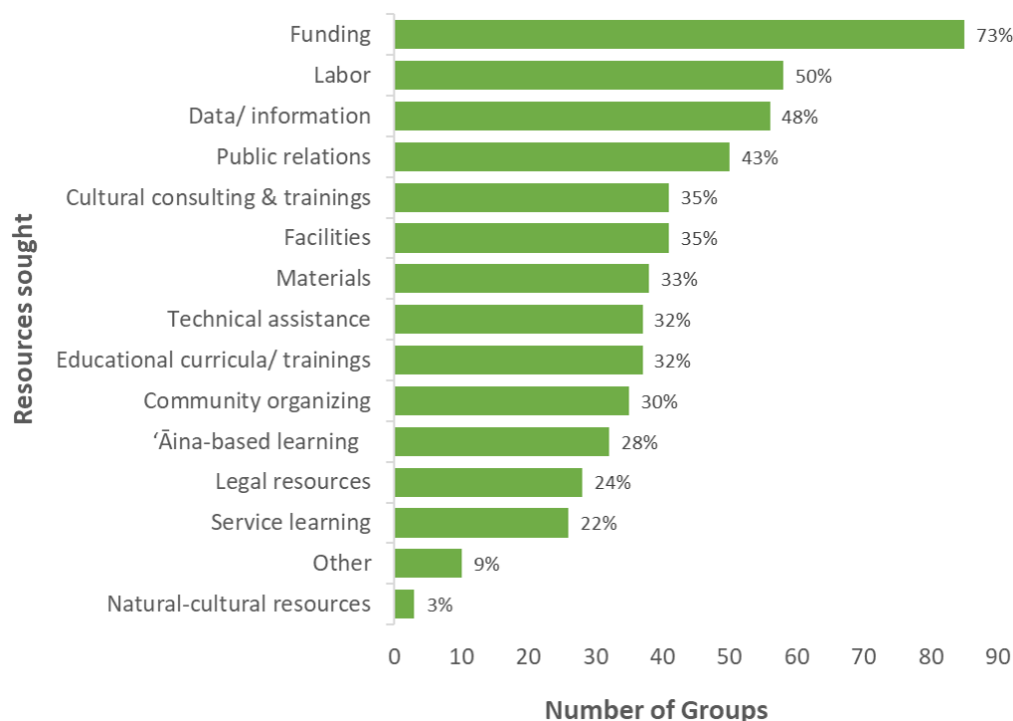


Figure 24.

Number and frequency (as %) of groups by types of services needed by groups (n=116).

Geography

There were 110 groups that described the areas they steward; areas range in size from a small community garden (e.g., Perma Blitz Hawaii and Waimānalo Health Center) to statewide (e.g., Hawai'i Conservation Alliance, Hau'oli Mau Loa Foundation, Blue Planet Foundation), and beyond (e.g., The Nature Conservancy, Sierra Club) and cover both terrestrial and aquatic ecosystems. Approximately half (61) of the groups reported working in areas of less than 10 acres. Thirteen groups reported working in areas encompassing the study area or larger. These groups' area-wide activities are not "boots on the ground" work, but rather include education, outreach, advocacy, and funding of environmental stewardship activities. When these areas are all mapped together, we can look for concentrations and gaps in stewardship (Figure 25).

In the Ko'olaupoko district, the places with the highest density of stewardship groups include the fishpond and wetlands of He'eia, Kāne'ohe Bay, and Kawainui Marsh. In the Kona district, Maunalua Bay and the Ala Wai Watershed have high densities of stewardship groups working (breakout boxes in the Discussion provide more detail on these high-density stewardship areas). These areas are

mostly lowland and coastal, are highly visible, and are in close proximity to residential areas. As such, they are easily accessible and may be prioritized for stewardship because they are seen in everyday life and are public spaces. Throughout the study area, military areas (Hickam Air force Base, Marine Corps Base Hawai'i) and mountain peaks were areas in which few to no groups mentioned working. The Daniel K. Inouye International Airport (managed by the Hawai'i Department of Transportation) is also an area that no stewardship groups reported stewarding. These are places that have highly restricted and/or difficult access.

Areas with few groups (indicated by light green in Figure 4) raise questions about why there are gaps in stewardship. Is it a question of access or safety? Or are those areas adequately maintained and not in need of stewardship? Is there a lack of information about those places and their needs? Or are they cared for by informal groups who did not participate in the survey? Further research is needed.

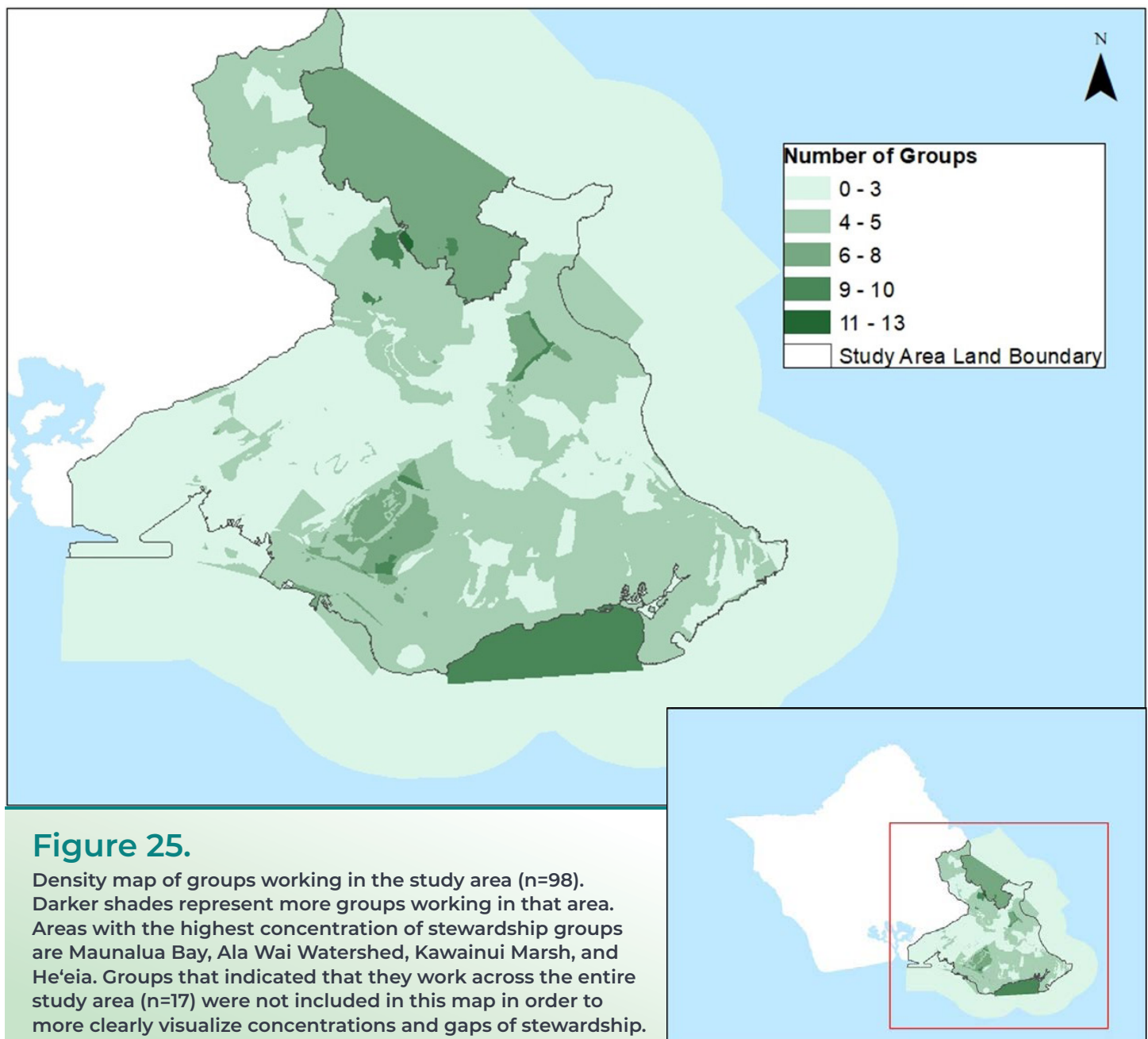
While some military lands face threats such as destructive activities associated with combat practice, the military is required to balance

Densely populated, multicultural urban environments may appear to be unlikely starting places for these discussions on applying Indigenous and place-based ways of knowing and engaging with natural resources; however, the intense layering of experiences and practices in a bounded space might just be the urban crucible that can create new systems of stewardship that promote biophysical and sociocultural resilience into the future.

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their actions with natural resource conservation activities including restoration; such environmental stewardship activities were not captured in our results, as these are government activities. Similarly, although mountain peaks also appear to be less stewarded based on our results, these are largely state lands (see large landowner maps, Figure 4) that are protected areas with restricted

access, and/or physically difficult to access because of their steep gradient and dense vegetation. While our results can provide important information on places that are being actively stewarded and by whom it is important to remember that our response rate was ~40%, so there are other groups that participate in environmental stewardship that are not represented in our data.



Networks

The STEW-MAP survey asked participants to list groups they collaborate with and indicate how they collaborate across three types of social networks: regular collaborators, expertise, and support. Together, over 600 unique groups were named across these three networks (Appendix E); these groups ranged in their locations from being within the study area, to elsewhere on O'ahu, on another Hawaiian Island, to overseas. Of all the groups named, 77% were civic groups, 19% were governmental organizations, 3% private organizations, and 2% hybrid groups. We use the label “civic” for non-governmental, non-private groups, inclusive of community groups and non-governmental organizations. There is overlap among these three networks. When a group was listed as a “regular collaborator,” 42% of the time, it was also listed as a group that is referred to for expertise, while only 22% of the time, the group was also listed as a group that is referred to for resources. Similarly, when a group was listed as a group referred to for expertise, 22% of the time the group was also listed in the resource network.

The in-degree statistic, or the number of times a group was named, was calculated for each network (Table 6, Table 7, Table 8). In-degree is a standard network measure that can be an important metric for identifying groups that are well connected in the network. However, it is just one measure and there may be groups in the network that have low in-degree statistics, yet still play vital roles.

In all three networks, the same groups were mentioned in the top three: State of Hawai'i Department of Land and Natural Resources, the

University of Hawai'i, and the City and County of Honolulu. These governmental agencies were either referred to as we have listed, or offices and/or programs within these agencies were listed and we grouped them at the higher level. For example, the State of Hawai'i Department of Land and Natural Resources encompasses twelve Divisions and Commissions. The Division of Forestry and Wildlife, the Division of Aquatic Resources, and the Division of State Parks all have community-engagement stewardship efforts. The Department's other nine Divisions have less of a community engagement focus (e.g., Land Division, Bureau of Conveyances, Engineering) or manage areas that are less accessible (e.g., The Koho'olawe Island Reserve Commission). The City and County of Honolulu includes such agencies as the Board of Water Supply and the Department of Parks and Recreation, which also have community-engagement around stewardship. The top named groups in each network (Table 4) showed that the Department of Land and Natural Resources, State of Hawai'i was mentioned the most. Paepae o He'eia, Livable Hawaii Kai Hui, Kāko'o 'Ōiwi, and Hui o Ko'olaupoko were the civic groups mentioned the most as regular collaborators; it should be noted that these civic groups are place-based, as opposed to other groups that work on broader topics and geographies at larger scales. In the regular collaborator network, most groups are connected to the main component in the network (i.e., there are few groups that are not connected in some way to the rest of the groups in the network) (Figure 26). On average, the number of regular collaborators named by any one group was 10.7.

Table 6. In-degree statistic for the top named groups in the regular collaborator network. Abbreviations correspond to the labels in the network diagram (Fig. 26).

GROUP	IN-DEGREE STATISTIC	GROUP TYPE
Department of Land & Natural Resources, State of Hawai'i (DLNR)	34	government
University of Hawai'i (UH) ¹	31	civic
City & County of Honolulu (C&C Hnl)	21	government
US Fish & Wildlife Service (USFWS)	14	government
Paepae o He'eia (Paepae)	12	civic
Livable Hawaii Kai Hui (LHK)	10	civic
Kāko'o 'Ōiwi (Kakoo)	10	civic
Hui o Ko'olaupoko (HOK)	10	civic
Department of Agriculture, State of Hawai'i (DoA)	9	government
The Nature Conservancy, Hawai'i (TNC)	9	civic
Mālama Maunalua (Mmalua)	8	civic
Kamehameha Schools (KS)	8	private
Hawai'i Institute of Marine Biology (HIMB) ²	8	civic
US Forest Service (USFS)	8	government
Papahana Kuaola (Papahana)	8	civic
Surfrider Foundation Oahu Chapter (Surfrider)	7	civic
Hawai'i Conservation Alliance (HCA)	7	civic
Oahu Invasive Species Committee (OISC)	7	hybrid
National Oceanic and Atmospheric Administration (NOAA)	7	government
Kōkua Hawai'i Foundation	6	civic
Natural Resource Conservation Service, US Department of Agriculture	6	government
Kua'āina Ulu 'Auamo	6	civic
Sierra Club of Hawai'i	6	civic
National Tropical Botanical Garden	6	civic
The Outdoor Circle	6	civic
Maunalua Fishpond Heritage Center	6	civic

¹The University of Hawai'i is a government entity, but for our purposes functions more like an umbrella organization for civic groups.

²Hawai'i Institute of Marine Biology is part of the University of Hawai'i

Table 7. In-degree statistic for the top named groups in the information sharing network.

GROUP	IN-DEGREE STATISTIC	GROUP TYPE
Department of Land & Natural Resources, State of Hawai'i (DLNR)	31	government
University of Hawai'i ¹	30	civic
City & County of Honolulu	21	government
US Fish & Wildlife Service	15	government
US Forest Service	10	government
Paepae o He'eia	10	civic
Livable Hawaii Kai Hui	9	civic
National Oceanic and Atmospheric Administration	9	government
The Nature Conservancy, Hawai'i	8	civic
Hawaii Institute of Marine Biology ²	8	civic
Ko'olau Mountains Watershed Partnership	8	civic
Surfrider Foundation Oahu Chapter	7	civic
Natural Resource Conservation Service, US Department of Agriculture	6	government
Kamehameha Schools	6	private
Department of Agriculture, State of Hawai'i	6	government
Sierra Club of Hawai'i	6	civic
National Tropical Botanical Garden	6	civic
Kāko'o 'Ōiwi	6	civic
Lyon Arboretum ²	5	civic
Kua'āina Ulu 'Auamo	5	civic
Hui o Ko'olaupoko	5	civic
Maunalua Fishpond Heritage Center	5	civic

¹The University of Hawai'i is a government entity, but for our purposes functions more like an umbrella organization for civic groups.

²Hawai'i Institute of Marine Biology and Lyon Arboretum are part of the University of Hawai'i; these were not included in the University of Hawai'i grouping because they were regularly named as separate entities and both of these groups independently participated in the survey.

Table 8. In-degree statistic for the top named groups in the resource network.

GROUP	IN-DEGREE STATISTIC	GROUP TYPE
Department of Land & Natural Resources, State of Hawai'i (DLNR)	21	government
University of Hawai'i ¹	19	civic
City & County of Honolulu	17	government
Kamehameha Schools	14	private
US Fish & Wildlife Service	13	government
Harold K. L. Castle Foundation	11	civic
Office of Hawaiian Affairs	9	government
US Forest Service	7	government
National Oceanic and Atmospheric Administration	7	government
Hau'oli Mau Loa Foundation	6	private
Natural Resource Conservation Service, US Department of Agriculture	5	government
Hawai'i Community Foundation	5	civic
Ko'olau Mountains Watershed Partnership	5	civic
Hawaiian Electric Company	5	private
Kōkua Hawai'i Foundation	4	civic
The Nature Conservancy, Hawai'i	4	civic
National Park Service	4	government
Hawai'i Tourism Authority	4	government

¹The University of Hawai'i is a government entity, but for our purposes functions more like an umbrella organization for civic groups.

Paepae o He'eia and Livable Hawaii Kai Hui were the most mentioned civic groups in the regular collaborator network and the information sharing network. In the resource network (i.e., funding, materials, or work share/trade), Kamehameha Schools (private) and the Harold K.L. Castle Foundation (civic) were the most listed non-governmental organizations.

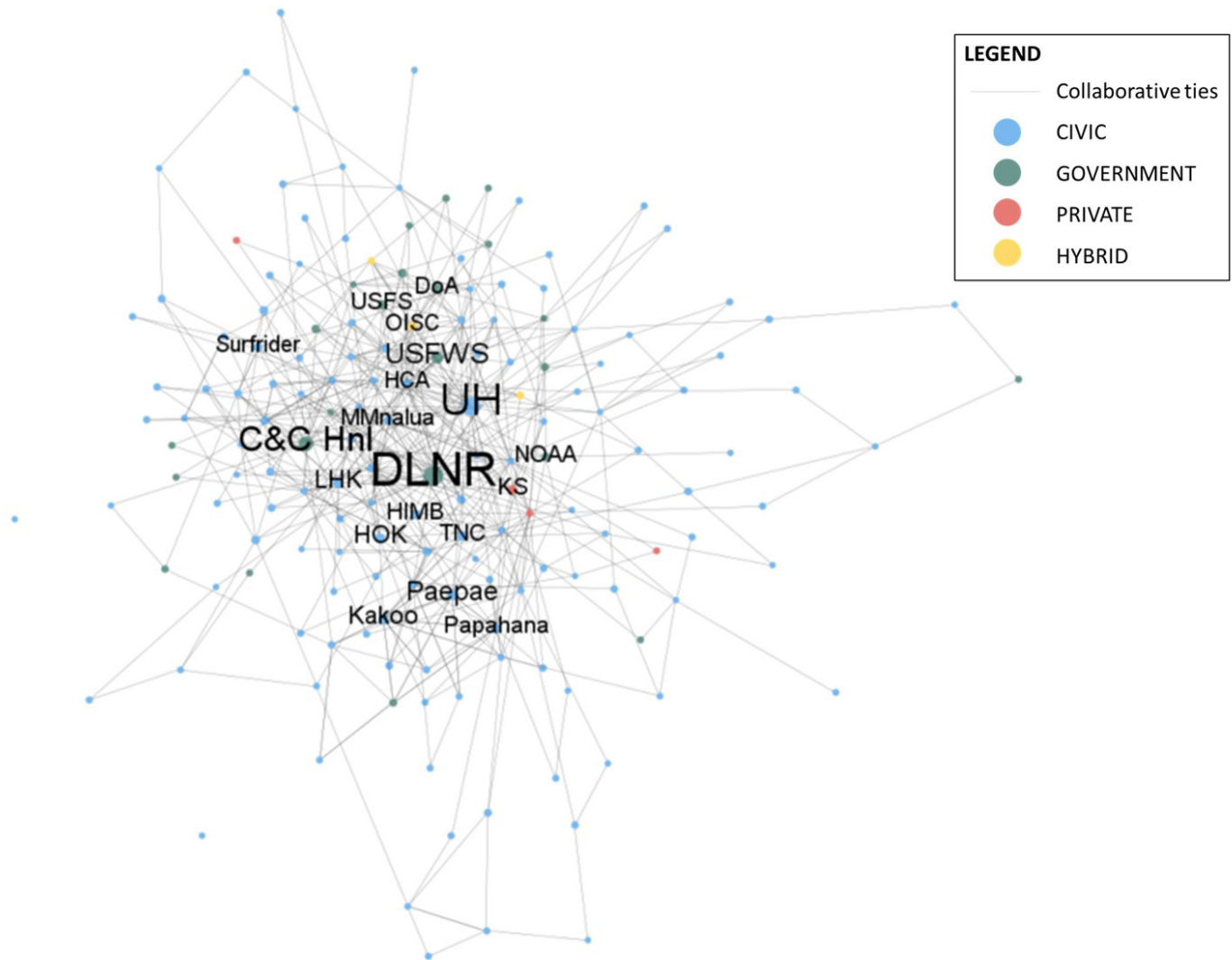
Social networks can be visualized in sociograms, or network maps. The regular collaboration network

map (Figure 26) visualizes which groups regularly collaborate on environmental projects or programs.

To be transparent, we acknowledge that Dacks (University of Hawai'i) and McMillen (Hawai'i Department of Land and Natural Resources), both authors on this report, are employees of two of the most listed government institutions in the social networks. It should be noted, however, that these institutions are very large and that we do not expect our affiliations have influenced our results.

Figure 26.

Regular collaboration network of respondents and the groups they named. Groups are color-coded by sector and size-coded by the number of times they were listed as regular collaborators. The most named groups are labeled (see Table 6 for full names). Groups that were named only once are not represented in the figure.



Discussion

Institutionalizing Mālama 'Āina

Half of the groups that participated in the survey were founded in the last 20 years. This may be due to an increase in awareness of the importance of the environment, current and potential environmental issues (including increased development pressures), and the feeling of urgency to address those problems (see Box 1); it could also mean that groups founded in the past ceased to exist, or transformed into new groups. The growth of stewardship groups may have also been spurred by the Hawaiian Cultural Renaissance, in which concepts such as mālama 'āina became more mainstream.

Or, potentially this growth is the result of the formalization of groups and activities that may have otherwise been carried out in smaller, kinship- and place-based groups. Before the

illegal occupation of Hawai'i, mālama 'āina was very much a part of everyday life. However, after occupation the resulting displacement of Native Hawaiians and changes to land rights transformed the context in which Native Hawaiians could engage their traditional stewardship relationships with their homelands. The formalization of mālama 'āina efforts (e.g., self-organizing as informal community groups or registering as non-profit organizations) has been one way that Native Hawaiians have maintained and/or re-established their stewardship roles. In an increasing number of cases, community groups are working with government agencies in collaborative partnerships that integrate place-based knowledge and practices in the caretaking of places (Vaughan et al. 2017, Montgomery and Vaughan 2018, Winter et al. 2021).

We posit that embracing biocultural stewardship enhances psycho-social-spiritual well-being for urban dwellers, while helping stewards to cultivate sustainability on an increasingly urbanized planet undergoing rapid environmental, social, and climate changes.

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Photo courtesy of Mālama Maunalua

BOX 1: MAUNALUA BAY

The place name Maunalua literally means “two mountains” and refers to the two peaks that define the area. Maunalua was once the site of one of the largest fishponds in all of Hawai‘i but it was dredged for real estate development and is now filled with multi-million-dollar homes. By the year 2000, after years of intensive development, poor land use practices, and overfishing, Maunalua Bay was silty and overrun with invasive algae. In the last 20 years, grassroots efforts helped to start several community groups in this area with the goal of restoring the bay. The Nature Conservancy has assisted with project planning. One of the youngest groups to participate in the STEW-MAP survey was Huli, a group focused on exposing students to environmental stewardship in Maunalua Bay, which was founded in 2015. Together these groups and partnerships with local, state, and federal government have transformed the Bay from its highly degraded state and brought attention and resources to many important cultural sites surrounding the Bay. Community groups continue to remove invasive algae from the Bay and donate it to be used as fertilizer on nearby farms. They also focus on restoring the watershed in other ways (such as the “Plant a Tree, Save the Sea” initiative by Mālama Maunalua) to improve water quality. Water quality is monitored by Pacific Islands Ocean Observing System sensors in the Bay.

Reciprocal Relationships with 'Āina

Volunteers play a vital role in the realization of groups' stewardship goals and missions. Almost a third of participating groups indicated that they have no paid staff; these groups rely solely on volunteers. In addition, many groups that participate in "boots on the ground" stewardship maximize their capacity to steward by hosting large volunteer events that occur once or just a couple of times per year. However, in the survey we ask about "regular volunteers," so respondents likely did not include volunteers from these one-off or even annual events in their estimates. We hypothesize that volunteers play an even more significant role than we report here.

On the flip side, volunteers may benefit from gaining access to land, experiences, and

resources (e.g., engaging with natural or native habitats, native species, and food plants and animals) that may otherwise be unavailable or hard to come by for urban and suburban residents. Volunteers have also reported that volunteering with environmental stewardship groups provides them with valuable opportunities to connect socially with others in their communities (Dacks et al. 2021), to engage in traditional and cultural activities, and to share the experiences and knowledge with younger generations. As such, some volunteers view their engagement as part of a reciprocal relationship with stewardship organizations and the places they steward. Some also value these experiences as important to their identities and fulfilling their responsibilities.

Biocultural stewardship defined this way recognizes critical feedbacks between ecological and human well-being, whereby stewardship of place is inseparable from stewardship of people, their cultural practices, and their values.

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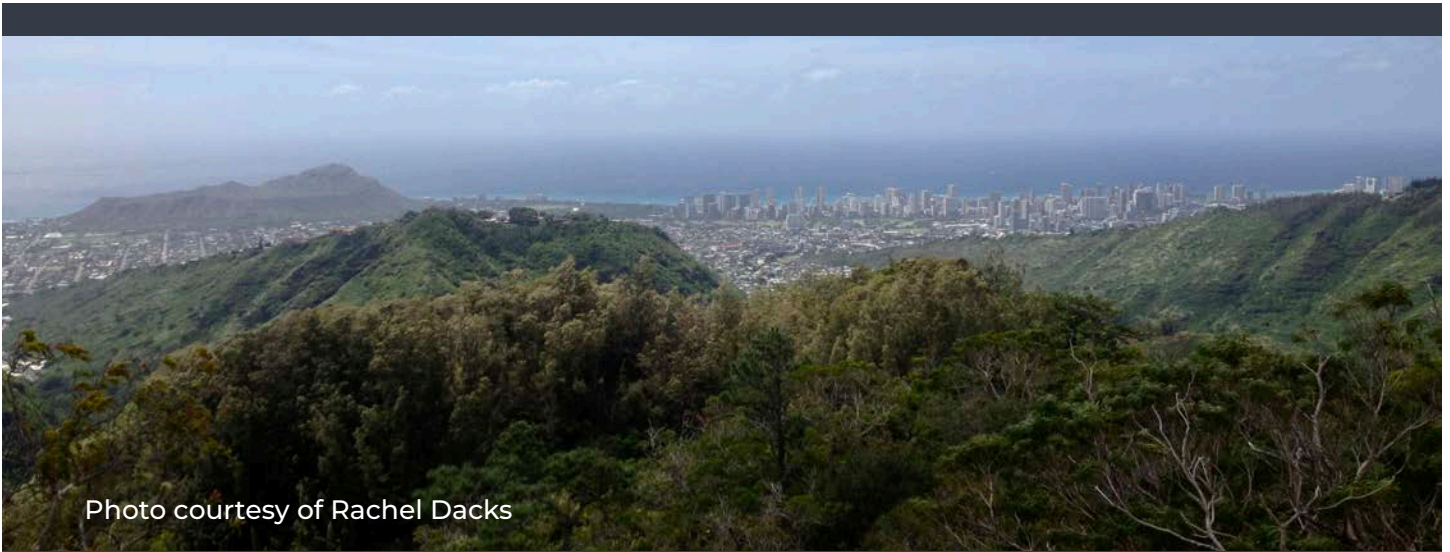


Photo courtesy of Rachel Dacks

BOX 2: ALA WAI WATERSHED

The Ala Wai Watershed was once full of flowing waters from the Mānoa, Pūkele, and Wai'ōma'o Streams, underwater springs, and the ocean waves of Waikīkī, which can be translated as “Place of Spouting Waters.” Because of the abundance of water, this area historically supported the farming of taro, a culturally significant food staple, and many fishponds in which fish and algae were cultivated. After the occupation of the Hawaiian Kingdom by the U.S. Government, the Territorial Government oversaw the Waikiki Reclamation Project; American businesses together with the U.S. Army Corps of Engineers channelized the streams in the watershed and re-routed them into the Ala Wai Canal in order to develop Waikīkī into a tourist destination. The watershed became highly urbanized with the growing human population. Today the Ala Wai Canal is highly polluted from many anthropogenic sources and is unsafe for swimming or fishing for food. Yet, where it enters Waikīkī, it has become a community landmark where pedestrians enjoy walks along its banks and many canoe clubs paddle. Several community groups and schools are committed to connecting communities to places around the watershed through hosting education and volunteer events throughout the watershed. For example, students at Hanahau'oli School steward a section of Makiki Stream that runs by its campus; Mālama Mānoa does the same for a portion of the Mānoa Stream. The Hawai'i Nature Center provides 'āina-based educational opportunities for students and families in the area. The Waikiki Business Improvement District Association maintains landscaping in Waikīkī to keep it clean. The Surfrider Foundation and 808 Cleanups coordinate cleanups along the coast. Faculty with the University of Hawai'i SMART Ala Wai initiative, along with teachers and students in the community, collect and analyze water quality data throughout the watershed. The Ala Wai Watershed Association advocates for policy and testifies at the legislature on issues that support the health of the watershed.

Learning from 'Āina

Survey participants identified education as a commonly practiced stewardship type and many identified 'āina-based learning, in particular, as a service they offer. 'Āina-based education is not just learning about 'āina, but learning through and from 'āina; in doing so, learners are exposed to experiential learning while building connection to place and to those who cared for these places in the past, as well as their role in stewarding these places for the future (Ledward 2013). Although this type of learning was largely discouraged and even forbidden during and after colonization, it has flourished in the years since the Hawaiian Cultural Renaissance; today there are several Hawaiian language immersion schools and Hawaiian culture focused charter schools with 'āina-based learning at the core of their

curricula; additionally, there is a growing demand from teachers in both private and public schools for 'āina-based learning opportunities. However, schools may not have access to appropriate spaces and/or teachers may not be familiar with places in their school's community. Providing 'āina-based learning opportunities is a type of stewardship that sometimes requires several types of collaboration, as groups may require access from landholders and need to be connected to students. Just over half (51%) of responding groups indicated that they provide 'āina-based learning opportunities (see Box 3). Our key collaborators and other survey participants requested the STEW-MAP team develop products that would help to connect teachers with groups that could host service learnings and field trips.

The notion that Hawai'i needs education programs that produce future elders as much as they produce future professionals has taken root.

Chang et al. 2019



Photo courtesy of Division of Forestry and Wildlife

BOX 3: THE HE'EIA AHUPUA'A

Before Western contact, the ahupua'a of He'eia, including Kāne'ohe Bay supported a large Hawaiian population with its rich marine resources and agricultural lands that were sustainably managed using traditional ecological knowledge, practices, and beliefs. However, foreigners introduced different land use practices, including the monoculture of sugarcane, stream channelization, dredging of parts of the bay, and a rapid increase in human population. These land use changes and increased sewage discharge resulted in devastating impacts to the coral reefs in the bay. For decades that followed, Kāne'ohe Bay was known for its unpleasant odor. In 1979, the sewage outfall was diverted to deeper waters beyond the bay; a dramatic, rapid improvement in water quality followed, which led to recovery in the coral reefs.

Such recovery in this type of ecosystem is rarely, if ever, seen and Kāne'ohe Bay has become a model system that has been extensively studied.

Today, several organizations, guided by Hawaiian knowledge and values, care for places in the ahupua'a of He'eia. Paepae o He'eia (literally, the support of / foundation for He'eia) is restoring an ancient fishpond and carries out 'āina-based education for students of all ages and backgrounds. With a similar vision and mission, Kāko'o 'Ōiwi is restoring ecological and agricultural productivity to adjacent wetlands in the ahupua'a and hosts numerous school groups every year. The He'eia National Estuarine Research Reserve is a partnership among federal, state, and community-based entities (including the two aforementioned organizations) to support and coordinate restoration, research, education, and training in the ahupua'a. Kua'āina Ulu 'Auamo also supports networks of community groups including several that care for He'eia.

Holistic Stewardship

One of the goals of our STEW-MAP effort is to highlight the diverse groups that care for Hawai'i's special places. We did not focus solely on “environmental stewardship organizations” and defined stewardship broadly in order to be inclusive of the many ways people care for place (Table 4). While 47% of groups that responded to the survey are mostly focused on stewardship (i.e., 80-100% of their total efforts), a tenth of groups focus less than 20% of their efforts on environmental stewardship and engage in stewardship as a means to achieve their mission (see Box 4).

While there are obvious ecological benefits of environmental stewardship, social benefits can also be a product of such activities (Svendsen 2011). For example, Blue Zones Hawai'i is focused on improving the well-being of individuals in order to support healthy communities. By engaging in environmental stewardship activities, individuals have opportunities to be physically active, have a sense of purpose, and connect socially with others — three Blue Zones principles for healthier living (<https://info.bluezonesproject.com/bzphawaii>).

Other groups that may not explicitly articulate stewardship as their primary focus engage in stewardship as part of an integrated cultural practice. In addition to practicing the traditional art of hula, some hālau hula, such as Hālau Mōhala 'Ilima, care for sacred sites and help maintain natural resources in their practice of hula, which is based on reverence for and connection to the environment via kino lau, or physical forms of Hawaiian deities or life forces (e.g., plants, animals, minerals, weather conditions).

Other culturally-based groups that do focus on stewardship do so specifically from Hawaiian worldviews, approaches and values, which means that caring for place is caring for people, and that ‘natural resources’ are not only ‘cultural resources’ but also family members. Cultural significance is a feature that defines the sites groups steward most. Responses to the question about ‘site types’ where your group stewards were tied between “Cultural sites” and “Forests” (23% of groups). This points to the need for government agencies to address (or at least acknowledge) resource management work through a cultural lens and as part of a cultural practice.

By engaging multiple, varied, place-based relationships with the natural world, biocultural stewardship can catalyze efforts to develop more effective approaches to thriving in a dynamic environment.

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Multiple groups who participated in the survey engage in biocultural approaches to meet holistic goals that are aligned with reciprocal relationships with place and defined by culture. Within the last 20 years there has also been an amplified worldwide call for the incorporation of traditional ecological knowledge and the use of biocultural approaches into institutionalized resource management (Sterling et al. 2017). Hawai'i has played a central role in both sounding these calls and modeling how this integration can be done (Chang et al. 2019, Morishige et al. 2018).

It should be noted that Hawaiian-based cultural groups do not act in isolation; collaborative partnerships among stewardship groups, Indigenous cultural practitioners, and their relationships to place are important cornerstones in the stewardship of Hawai'i. Hawaiian cultural practitioners are key advisors, educators, and

leaders of restoration efforts throughout the archipelago. Hālau 'Ōhi'a, an intensive professional and personal development training program in Hawai'i lifeways, of which stewardship is an embedded element, was created by a Hawaiian **kumu hula**, artist, educator, and scholar to amplify the capacity of conservation and natural resource professionals in Hawai'i. Its multidimensional framework allows professionals to engage self, others, and place (Kealiikanakaoleohailani et al. 2018) through Native Hawaiian rituals, telling of sacred stories, performing traditional chants and dance, and creating poetic texts and art forms. Due to its success and a high demand for this type of unique training, over the past six years the program has spread from Hawai'i Island, to O'ahu, Maui, and globally through cohorts that are exclusively online. Co-authors of this report (McMillen, Dacks, and Kahaleua) have all been learners in Hālau 'Ōhi'a.

Kumu hula - hula teacher

Definitions from wehewehe.org

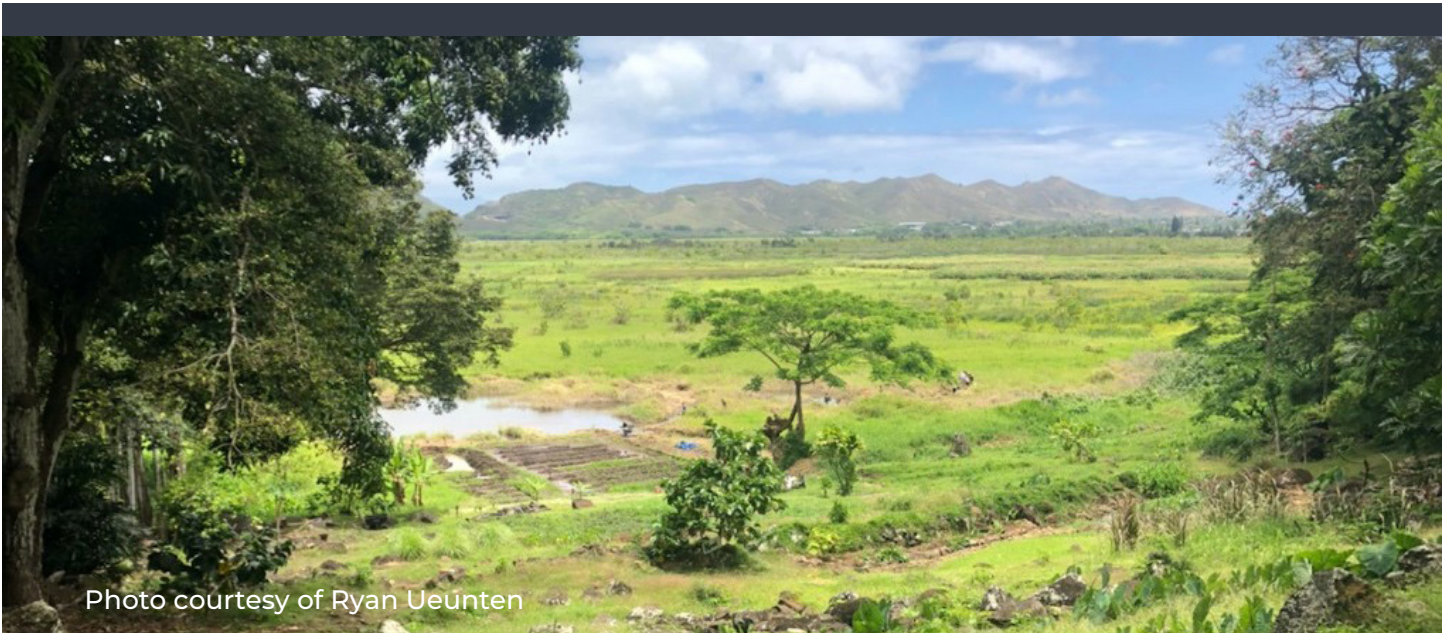


Photo courtesy of Ryan Ueunten

BOX 4: KAWAINUI MARSH

Kawainui literally means “big or expansive waters”. Kawainui Marsh was once the site of the second largest fishpond on O’ahu. Ulupō Heiau, an agricultural heiau, or shrine, and Nā Pōhaku O Hauwahine, a significant cultural site and storied place, are also located at Kawainui. After the Great Māhele (land redistribution in the mid-1800s that established private land ownership), it was farmed for rice and also used as a ranch, planted with non-native plants used to feed the livestock. It later became overrun with these non-native, invasive species, and trash. More recently, community groups and Hawaiian leaders have been driving efforts to restore this storied place to health and abundance and foster connections between people and this place.

Hālau Mōhala ‘Ilima practice hula to perpetuate Hawaiian culture and sustain the ‘āina of Kawainui. ‘Ahahui Mālama i ka Lōkahi is guided by a Native Hawaiian conservation ethic to care for the vital cultural resources in Kawainui; they organize volunteer days for restoration work and provide educational tours. With the goal of improving water quality through habitat restoration, Hui o Ko’olaupoko replaced non-native grasses and other plants with native species in a neighborhood garden in Kawainui. The Kailua Historical Society works to restore and preserve historical sites in Kawainui in order to educate others of these wahi pana. Community groups, along with the State’s Department of Land and Natural Resources have developed a master plan that would create several public cultural and educational spaces in the area.

An Interdependent Network of Environmental Stewards

The three stewardship networks (regular collaborators, knowledge/data/expertise, and resources) are an assemblage of groups that were mostly civic (77%) with a significant number of government organizations (19%) and few private organizations (3%) or hybrid groups (2%). That most groups were civic suggests the value of environmental stewardship to communities and the role they want to play in the larger system of resource management. The composition of groups also highlights the interdependent nature of caring for place in Hawai'i; the archipelago's complex history along with the rights and responsibilities of different groups in the network underscores the need for collaboration.

Across all three social networks (regular collaborators, knowledge/data/expertise, and resources), government agencies (more than civic groups or private organizations) were named most often as a collaborator. One way to interpret this is that many groups steward places on state administered land, so collaborating with the state is necessary. Recall Figure 18 that shows the most common response to the question about who owns the land where your group works was 'state' (29%) and 'across public and private lands' (27%), which also would include working on state (as well as county and possibly federal) land. (Note: the state does not actually own ceded lands. It administers public lands which are held in trust.) Another way to interpret this is that government agencies, while charged with the management of natural resources, do not have the capacity, funds, or experience to do it alone. With limited staff and less than 1% of

the State's budget to manage 1.3 million acres of State land, 3 million acres of state ocean waters, and 2 million acres of conservation district lands, the ability of the Hawai'i Department of Land and Natural Resources to effectively carry out its management responsibilities is hindered. Resource management and stewardship can be enhanced through strengthened relationships that engage many ways of knowing and doing and promotes collaboration. Watershed partnerships, large private land owners, international non-profit organizations as well as place-based community and civic groups (including those with ancestral ties to and multi-generational relationships with places) bring a diverse body of in-depth and nuanced knowledge and practices to enhance the effectiveness of the care for Hawai'i's lands and waters. One manager explained, "We don't need to micromanage – let us trust that community members can come with valid and valuable expertise and experience to effectively manage and steward public lands". Given the prevalence of civic groups who collaborate with government agencies, these agencies may be in a good position to connect groups working on similar issues or in a similar geography if they are not already working together; however, this needs to be tested as such groups may already be aware of and/or partnering with similar groups.

In any case, state lands are a public land trust and "as the Hawai'i Supreme Court has stated, State officials are obligated 'to use reasonable skill and care in managing the public lands trust' and the State's conduct should be judged 'by the most

exacting fiduciary standards' ([http://www.naiaupuni.org/docs/pres/mm/Public%20Land%20Trust%20Summary%20\(8.15\).pdf](http://www.naiaupuni.org/docs/pres/mm/Public%20Land%20Trust%20Summary%20(8.15).pdf)). Thus, the State's well-established commitment to reconciliation with the Native Hawaiian community includes the preservation of the trust lands to the greatest extent possible, until the unrelinquished claims of the Native Hawaiian community to the trust lands are resolved." With that in mind, the management of state (public) lands should be for the public good, which includes involving community stewards, guardians, and care takers in truly collaborative partnerships (Winter et al. 2021).

Civic and community involvement can benefit both agencies and the lands they are charged

with managing, but also community members themselves by connecting to and engaging with 'āina in ways that are meaningful to them. As illustrated by Figure 24, civic groups involved in environmental stewardship benefit the community and promote community resilience through, for example, supporting community health and well-being, intergenerational family ties, cultivation of young leaders, and sharing of cultural values. Although agencies typically do not attempt to provide these elements, they are highly valued by community groups who see them as integral to stewardship practices. In fact, this set of questions was added to the survey at the suggestion of key collaborators in the Hawai'i Island STEW-MAP study.

We have much to learn from place-based, kincentric models of resource stewardship as they offer a pathway to social-ecological resilience and community well-being that may not be achievable under approaches that are purely agency based, and severely funding constrained.

McMillen et al. 2020

BOX 5: THE ALA MAHAMOE CULTURAL FOREST

The Ala Mahamoe Cultural Forest is on the edge of a Moanalua residential neighborhood and was historically known by cultural practitioners as a place abundant in native plant species, including many that are used for traditional medicines. Today, the larger forest is overrun with non-native species, a product of land use change including cattle ranching for many years. Through a collaboration between DLNR's Division of Forestry and Wildlife, the Ko'olau Mountains Watershed Partnership, lineal descendants, the community, and other government partners, this project aims to restore the land to a biodiverse dryland forest dominated by native Hawaiian and culturally significant species. In doing so, there is a drastic increase in a multitude of ecological services provided by the site. These include but are not limited to improving wildlife habitat, increasing carbon sequestration, wildfire prevention, lower regional temperatures and the ability for the land to more effectively capture rainwater, thus decreasing runoff to the nearshore environment. The restoration project also provides educational opportunities to school groups and a community-supported garden provides valuable outdoor and cultural resources to the community. While the State and the Hawai'i Department of Land and Natural Resources administers the land and has the responsibility to manage it, this government agency unfortunately does not have the capacity to steward all of the lands and resources. The Ala Mahamoe Cultural Forest would never have been possible without the time, experience, and expertise of those who have participated in the collaboration. A lineal descendant and cultural steward of the area has shared knowledge and expertise of the place, providing a blueprint for the project. The Ko'olau Mountains Watershed Partnership continues to conduct the on the ground restoration actions and serves as the primary coordinating body for educational events and community workdays. The State of Hawai'i Water Security Advisory Group, State Division of Forestry and Wildlife, and most recently, the Honolulu Board of Water Supply have provided funding and technical expertise to support the effort. Because this area is adjacent to a residential neighborhood, it is highly accessible, and individuals are also known to care for this place independently.



Photo courtesy of J.C. Watson

Lessons Learned for Future STEW-MAP Efforts

Outreach

There were lessons learned at each step of this project. During the survey period, we noted that follow-up calls with contacts who had been invited to participate in the survey were useful. These calls were effective for confirming that the appropriate person had been contacted; in several cases our contact on record was no longer with the group and/or was not a person with the knowledge and/or time to complete the survey. In addition, these calls provided a good opportunity for further explanation of the project and for encouraging groups that do not primarily focus on environmental stewardship to participate. However, it should be noted that making these calls was extremely time consuming and in the majority of the calls we ended up leaving voicemails. In future efforts, it may be worth doing these calls earlier in the process (e.g., before launching the survey) to confirm the contact person and their information is correct, so that future reminders reach the right person.

Another time- and resource-consuming step of the reminder process was sending out survey

packets. Each non-respondent was sent paper surveys two times. We mailed 113 groups in the first round; another 130 surveys were mailed in the second round and about a dozen were handed out in-person. However, in total, we only received ~20 returned paper surveys. Each survey packet cost about \$5 to print and ship. In the future, it may be more time and cost effective to only mail paper surveys to those who request one in a phone conversation. Or, perhaps that could be the first question on the online survey-- whether it is of interest to complete the survey online or in paper. Each team has to weigh the investment of time and resources against potential additional data.

Although we used incentives in the form of the chance at winning a \$50 gift card from a local supermarket to promote participation when we sent out reminder emails and on the STEW-MAP O'ahu website, we do not have a sense that it made a difference.

Participation

Participation from schools, hālau hula, and canoe clubs was encouraged through pre-survey period outreach and during the survey invitation phase. However, in the end there were low rates of participation from these groups. Potential reasons for this could be that they did not do any stewardship, did not recognize that they might be participating in stewardship activities, and/or did not see it as worth their time to participate. As for schools, we had difficulties finding the right contact people. At first, survey invitation emails were sent to the principals, in hopes that they would be the most knowledgeable of the

comprehensive activities of the school (i.e., as opposed to the activities in a single classroom) or know who the best person would be. In a couple of cases, we invited individual teachers, but in one follow up conversation we had, we learned that teachers may not be comfortable responding on behalf of their entire school, as they did not represent all of their school's stewardship activities and/or were not knowledgeable about all the activities conducted by all teachers. Although we did get some responses from schools (6), the majority of the schools that were invited (~100) did not participate in the survey.

Survey

Our original plan was to have the survey open for only six months. However, at the six-month mark, we did not feel as though all contacts who were interested in participating in the survey had done so. Future efforts should plan for having the survey open for at least nine months, depending on the capacity of the team.

Future STEW-MAP survey efforts in the state may want to include more detailed questions regarding volunteers. It may be of interest to ask about irregular volunteer events that occur annually or a couple of times a year if these events attract numerous volunteers; such questions could help to more accurately capture the contributions of volunteers. Additionally, we had multiple requests for STEW-MAP to aggregate volunteer opportunities by sharing community work day schedules. However, this was not possible because we did not ask about community work days in the survey. We were reluctant to do so because such

opportunities may change, and we do not have the capacity to update such a list. However, since this request came up multiple times, it is probably worth thinking about for future STEW-MAP efforts in the state. Perhaps it could be done only during the recruitment period as a way to promote participation in the project.

Finally, despite the instructions, many groups described caring for places outside of the study area. Perhaps this is due to people not distinguishing the places they steward by district. Although an island-wide effort would require significantly more resources and capacity, it might be more efficient in the long run if it means that some respondents only have to respond to one survey. An island-wide effort may also increase overall response rate; groups that engage in multiple districts may be reluctant to complete future STEW-MAP surveys if they think they “already participated.”

Conclusion

The diverse community of groups that participate in environmental stewardship in Kona and Ko'olaupoko districts of O'ahu is significant. From the responses of the 128 groups that responded to our survey, we identified over 600 groups in the network. Together, the respondents identified locations that they care for throughout the extent of the study area, though few groups mentioned military areas and mountain peaks.

Though the State of Hawai'i Department of Land and Natural Resources is tasked with managing the natural areas on the islands, they have a history

of being under-resourced and not trusted by some community members. While this network of community stewards has been instrumental in successfully caring for our important places, there is room for stronger collaboration among agency, civic, and private organizations for increased success. A better understanding of the extent of the mālama 'āina network, the diverse motivations and goals of the groups in the network, and where concentrations and gaps of stewardship are located can help in planning for how best to elevate the community of stewards and better care for our special places that sustain us.

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Glossary

Many of these words have multiple meanings; the definitions given here are the ones that correspond with how the words are used in this report. Source: <http://wehewehe.org/>

‘Āina - Land, earth.

‘Āina-based education - An experience-based way of teaching and/or learning through ‘āina that can deepen the kinship between people, communities, and lands so they can thrive.

Ahupua‘a - Land division usually extending from the uplands to the sea.

‘Alae ‘ula - Hawaiian gallinule or mudhen (*Gallinula chloropus sandvicensis*), distinguished from ‘alae kea reddish bill and frontal plate; endangered.

Aloha - Love, affection, compassion, mercy, sympathy, pity, kindness, sentiment, grace, charity; greeting, salutation, regards; sweetheart, lover, loved one; beloved, loving, kind, compassionate, charitable, lovable; to love, be fond of; to show kindness, mercy, pity, charity, affection; to venerate; to remember with affection; to greet, hail.

Aloha ‘āina - Love of the land or of one's country, patriotism.

‘Aumakua - Family or personal gods, deified ancestors who might assume the shape of sharks (all islands except Kaua‘i), owls (as at Mānoa, O‘ahu and Ka‘ū and Puna, Hawai‘i), hawks (Hawai‘i), ‘elepaio, ‘iwi, mudhens, octopuses, eels, mice, rats, dogs, caterpillars, rocks, cowries, clouds, or plants. Plural. ‘Aumākua.

Ha‘aha‘a - Low, lowly, minimum, humble, degraded, meek, unpretentious, modest, unassuming, unobtrusive; lowness, humility.

Hālau - Long house, as for canoes or hula instruction; meeting house.

Hālau hula - A school or hall in which hula is taught.

Hoa‘āina - Tenant, caretaker.

Hōkūle‘a - A navigational star, probably Arcturus; a zenith star above Hawai‘i. Also the performance-accurate full-scale replica of a wa‘a kaulua, a Polynesian double-hulled voyaging canoe, launched on 8 March 1975 by the Polynesian Voyaging Society, best known for her 1976 Hawai‘i to Tahiti voyage performed with Polynesian navigation techniques, without modern navigational instruments.

Honua - Land, earth, world; background, as of quilt designs; basic, at the foundation, fundamental.

Hui - Club, association, society, corporation, company, institution, organization, band, league, firm, joint ownership, partnership, union, alliance, troupe, team; to form a society or organization; to meet, intermingle, associate, congregate. To join, unite, combine, mix; combination.

Hula - A Hawaiian dance form that is accompanied by song or chant.

Huli - Taro top, as used for planting.

Kai - Sea, sea water; area near the sea, seaside, lowlands; tide, current in the sea; insipid, brackish, tasteless.

Kino lau - Many forms taken by a supernatural body.

Kōkua - Help, aid, assistance, relief, assistant, associate, deputy, helper.

Kuleana - Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province; reason, cause, function, justification; small piece of property, as within an ahupua'a; blood relative through whom a relationship to less close relatives is traced, as to in-laws.

Kumu hula - Hula teacher.

Loko i'a - Fishpond.

Lo'i kalo - Taro patch.

Māla - Garden, plantation, patch, cultivated field.

Mālama - To take care of, tend, attend, care for, preserve, protect, beware, save, maintain; to keep or observe, as a taboo; to conduct, as a service; to serve, honor, as God; care, preservation, support, fidelity, loyalty; custodian, caretaker, keeper.

Mālama 'āina - To care for and protect the land.

Mele - Song, anthem, or chant of any kind; poem, poetry; to sing, chant.

Moku - District, island, islet, section, forest, grove, clump, severed portion, fragment, cut, laceration, scene in a play.

Mo'olelo - Story, tale, myth, history, tradition, literature, legend, journal, log, yarn, fable, essay, chronicle, record, article; minutes, as of a meeting.

'Ohana - Family, relative, kin group; related.

‘Ōhi‘a - Name of a species of large native Hawaiian tree ().

Oli - Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill (‘i‘i) at the end of each phrase; to chant thus.

Pono - Goodness, uprightness, morality, moral qualities, correct or proper procedure, excellence, well-being, prosperity, welfare, benefit, behalf, equity, sake, true condition or nature, duty; moral, fitting, proper, righteous, right, upright, just, virtuous, fair, beneficial, successful, in perfect order, accurate, correct, eased, relieved; should, ought, must, necessary.

‘Ulu - The breadfruit (*Artocarpus altilis*), a tree perhaps originating in Malaysia and distributed through tropical Asia and Polynesia. It belongs to the fig family, and is grown for its edible fruits, sometimes for ornament. The leaves are large, oblong, more or less lobed; fruits are round or oblong, weighing up to 4.5 kilos, when cooked tasting something like sweet potatoes.

Rapid ‘Ōhi‘a Death - ‘Ōhi‘a (*Metrosideros polymorpha*), the most abundant native tree in the state of Hawai‘i, are dying from a new fungal disease. On Hawai‘i Island, hundreds of thousands of ‘ōhi‘a have already died from this fungus, called *Ceratocystis*. Healthy trees appear to die within a few days to a few weeks, which is how the disease came to be called “Rapid ‘Ōhi‘a Death.” This disease has killed trees in all districts of Hawai‘i Island and has the potential to kill ‘ōhi‘a trees statewide. Source: <https://cms.ctahr.hawaii.edu/rod/>

Wahi pana - Legendary place.

Wai - Water, liquid or liquor of any kind other than sea water, juice, sap, honey; liquids discharged from the body, as blood, semen; color, dye, pattern; to flow, like water, fluid.

Appendix A: STEW-MAP Outreach Event Flyer



ARE YOU PART OF THE
COMMUNITY THAT CARES FOR
OUR LAND & WATERS?

Your work is vital to the health & well-being of our communities and
we want to hear from you!

**STEWARDSHIP MAPPING & ASSESSMENT PROJECT
OUTREACH EVENT**

www.StewMapHawaii.net

Please Join Us To:

- Learn about the largest effort to take stock of and highlight the efforts of all who care for our 'āina.
- Help us learn about your organization & partners.
- Discuss how surveying and mapping stewardship activities & connections can create resources for collaboration.

Who Should Attend?

- All groups active in our project area from Moanalua to Kualoa (see map)---big & small, mauka to makai.
- Foundations, civic clubs, non-profits, hui, government agencies, environmental alliances, community groups, researchers, cultural and educational organizations, etc.
- Your collaborators - please refer others to join us!

Get on the Map!



O'ahu Phase 1 Project Area

JUNE 25 OR JUNE 26

**MONDAY
10AM-12PM**

Paki Hale | 3840 Paki Ave
Honolulu

**TUESDAY
10AM-12PM**

Ho'omaluhia Botanical Garden
45-680 Luluku Road | Kāne'ohe



RSVP by June 24
Click or Scan QR Code, or Email
info@stewmap.net



This project is supported by the Hawai'i Division of Forestry & Wildlife and Region 5 of the US Forest Service; in partnership with the Kaulunani Urban & Community Forestry Program and the University of Hawai'i at Mānoa; and in collaboration with Smart Trees Pacific, Paepae o He'eia, The Outdoor Circle, Resilient O'ahu, Kāko'o 'Ōiwi.

Appendix B: Postcards

Pre-launch postcard for urban Kona district. O'ahu was designed to look like a string art board with the string focusing on our project area. 'Ulu leaves were used to give the postcard color and were chosen because it is recognizable. On the back we wanted to include those who steward our waters, so nets were added. Plus, it added to the phrase "STEW-MAP casts a broad net!"

STRENGTHEN
your ties

**GET ON
THE MAP!**

CALLING ALL STEWARDS!

Join the Stewardship Mapping and Assessment Project (STEW-MAP) to strengthen your ties and be recognized as part of the community that cares for our lands and waters.

STEW-MAP creates an interactive map and resource to promote collaboration across communities, landscapes, and topics.

STEW-MAP casts a broad net! If you are a community organizer, canoe club, researcher, care for lo'i, or clean up the beach – get on the map!

*Look for a personal email invitation
with your survey this week...*

WWW.STEWMAPHAWAII.NET

info@stewmaphawaii.net (808) 587-0054



USDA is an equal opportunity provider and employer.

Reminder postcard for urban Kona district. The cover is the same as the pre-launch postcard but the verbiage on the back encourages participants to check their emails and complete the survey.

STRENGTHEN *your ties*

**GET ON
THE MAP!**

REMINDER: CALLING ALL STEWARDS!

Join the Stewardship Mapping and Assessment Project (STEW-MAP) to strengthen your ties in the community and access resources to increase your organization's efficacy and collaboration potential.

STEW-MAP casts a broad net! If you are a community organizer, environmental educator, gardener, canoe club, researcher, care for lo'i, or clean up the beach – get on the map!

Be recognized as part of the community that cares for our land and waters.

*Check your inbox for your survey invitation.
Take the survey today to get on the map!*

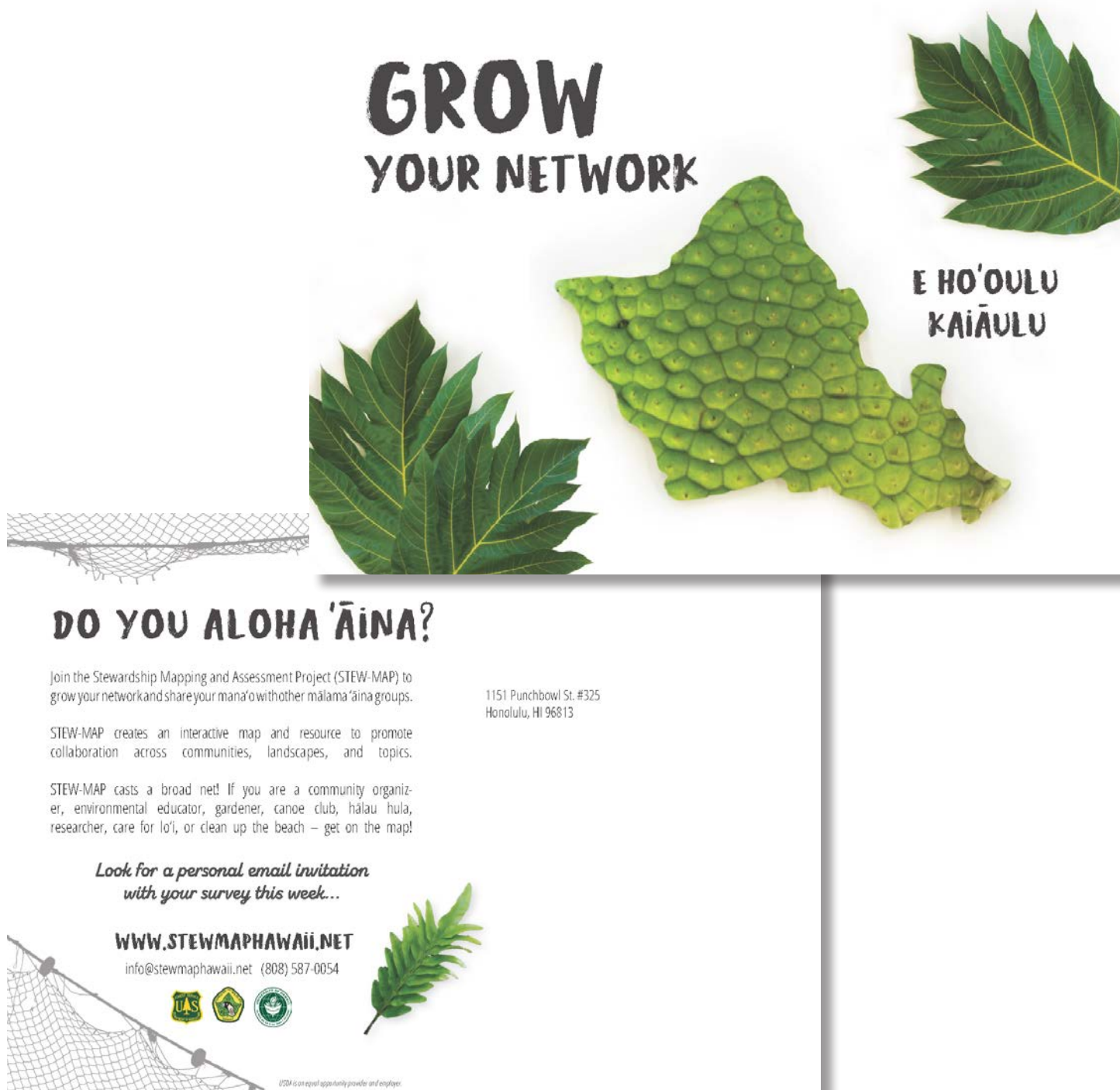
WWW.STEWMAPHAWAII.NET

info@stewmaphawaii.net (808) 587-0054



USDA is an equal opportunity provider and employer.

Pre-launch postcard for rural Ko'olaupoko district. 'Ulu (breadfruit) is a well known traditional staple in the local community. The 'ulu was used to represent O'ahu because the skin looks like networks connected together. It represented STEW-MAP's goal of connecting the stewards in Hawai'i. Since there seems to be more indigenous presence and practice of the Hawaiian language speakers in this particular district, the phrase "E Ho'oulu Kaiāulu," which translates to grow the community, was used on the front of the postcard.



Reminder postcard for rural Ko'olaupoko district. The cover is the same as the pre-launch postcard but the verbiage on the back encourages participants to check their emails and complete the survey.

GROW YOUR NETWORK



E HO'OULU
KAIĀULU



REMINDER: CALLING ALL STEWARDS!

Join the Stewardship Mapping and Assessment Project (STEW-MAP) to strengthen your ties in the community and access resources to increase your organization's efficacy and collaboration potential.

STEW-MAP casts a broad net! If you are a community organizer, environmental educator, gardener, canoe club, researcher, care for lo'i, or clean up the beach – get on the map!

Be recognized as part of the community that cares for our land and waters.

*Check your inbox for your survey invitation.
Take the survey today to get on the map!*

WWW.STEWMAPHAWAII.NET

info@stewmaphawaii.net (808) 587-0054



1151 Punchbowl St. #325
Honolulu, HI 96813



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Appendix C: STEW-MAP O'ahu Survey

ALOHA & WELCOME TO THE 2019 O'AHU STEW-MAP SURVEY

STEW-MAP stands for the Stewardship Mapping and Assessment Project

The goal of STEW-MAP is to strengthen our understanding of where and how stewardship (mālama 'āina and kai) happens. To do this, STEW-MAP collects information about the what, where, and who of community stewardship.

If your group engages in stewardship in the greater Honolulu area (south shore and east side), specifically the Kona and/or Ko'olaupoko Districts (see map below), please consider taking this survey.

We have a broad definition of stewardship, so even if your organization's primary focus is on education, culture, social services, or something else, but you also engage in caring for the environment in some way, we invite you to participate in the survey.



The survey is estimated to take 20-30 minutes.

If you would prefer to answer the STEW-MAP survey online or in-person, please contact info@stewmaphawaii.net or call (808) 587-0054.

Mahalo nui for your time and participation!

SECTION 1: CONTACT INFORMATION

Your personal contact information will not be made public in any way; it will only be used to contact you if we have questions about information you provide on the survey.

Your Name:

Your Position in Your Organization:

Your Phone Number:

Your Email:

Are You In A Group?

We define a group as having two or more members. This survey is intended for groups and organizations, not for individuals working alone, as sole proprietors, or as independent contractors.

If your organization has multiple environmental stewardship programs, please answer for your entire organization. If you are from a national organization, please answer for your local chapter. If you are a member of multiple groups, please only answer for one group per survey.

Are you a member of a group or organization?

- ☐ Yes
☐ No

If you selected "No," please stop taking the survey. Thank you for your interest, but because you are not part of a group we have no further questions. Contact us at info@stewmaphawaii.net or (808) 587-0054 to learn how you can participate at a later date.

SECTION 2: TELL US ABOUT YOUR GROUP

Below are a series of questions related to your group. If you are not able to answer all of the questions, please reach out to someone else in your group or organization and ask them to help fill out the survey. At the end of the survey you can choose how visible the information you share about your group will be to the public.

Group name ---*please spell out instead of using abbreviations*

Group/Main Contact Email:

Group Phone Number:

Website (if available):

Social media handle (if available):

Group mailing address:

Street:

City/Town: _____

State: _____

Zip Code: _____

Group's physical address, if different from mailing address:

Street:

City/Town:

State:

Zip Code:

What year was your group founded?

What category best describes your group?
(Select the most appropriate response)

- ☐ 501(c)(3) (or has applied)
- ☐ 501 (c)(4) (or has applied)
- ☐ School or school-affiliated group
- ☐ Alliance of groups or hui of hui
- ☐ Group or hui (not a registered non-profit)

Example: 'ohana (family), community board, neighbors, and friends

- ☐ Informal alliance of groups or informal hui of hui
- ☐ Public-Private Partnership
- ☐ Other--please specify:

Describe your group's mission. If you have a formal mission statement, please use that, otherwise use your own words to describe your group's mission.

SECTION 3: STEWARDSHIP



Does your group do any of the following in the Kona and/or Ko'olaupoko districts of O'ahu? (Select all that apply)

- ☐ ADVOCATE and/or plan for the local environment.

Examples - planning, organizing, direct action, fundraising

- ☐ CARE FOR, MĀLAMA, MAINTAIN or MANAGE A PLACE in the local environment such as a ranch, school or community garden, playground, park, roadway, fishpond, freshwater source, stream, shoreline, special 'ohana sites, trails, camping areas, etc.
- ☐ CARE FOR or MĀLAMA SPECIFIC LIVING THINGS including plants, animals, insects, birds, waters, stones, or minerals including 'aumakua or kinolau.
- ☐ CONSERVE or preserve the local environment.

Examples - perpetuate cultural values and practices related to stewardship, hold a conservation easement, protect freshwater resources

- ☐ EDUCATE the public about the local environment.

Examples - 'āina based education, curriculum, research, science, training, mentoring, sharing mo'olelo wahi pana (histories of storied/pulsing places), mele (song), hula (dance), or oli (chant)

- ☐ ENGAGE with the spirit of the land and/or ocean ('āina) for health and well-being.

Examples - through being present, meditating, praying

(continued choices from previous page)

- ☐ MONITOR the character and quality of the local environment or plant and animal life cycles and migration patterns.

Examples - air or water quality, dumping, species monitoring, invasive species spread, rain or drought monitoring

- ☐ PARTICIPATE in, partner with groups, or support other environmental work.
- ☐ PLACE-BASED OR TRADITIONAL HUNTING, FISHING, GATHERING of resources for consumption and exchange in reciprocal relationship with 'āina; monitoring the quality and character of the 'āina and its resources in the process.
- ☐ RESPOND to or protect against tsunami, hurricane, flood, and/or fire/drought.
- ☐ RESTORE native habitats, native species, (remove invasive species, control ungulates), traditional and customary systems and/ or structures.

Examples - for ritual, agriculture, water, navigation, aquaculture, trails/travel

- ☐ TRANSFORM local environmental systems.

Examples - changing the waste stream, transitioning toward sustainable/clean energy, promoting sustainable agriculture

- ☐ OTHER - please specify: _____

- ☐ NONE OF THE ABOVE. *Thank you for your interest in filling out this survey. Because you do not participate in environmental stewardship, we have no further questions.*

Of your selections from the previous question, please list your group's top 3 most important stewardship activities.

1. _____
2. _____
3. _____

SECTION 4: WHERE YOUR GROUP WORKS



In which district(s) on O'ahu does your group work? (Select one)

- ☐ Kona District (see map above - green area)
- ☐ Ko'olaupoko District (see map above - yellow area)
- ☐ Both Kona and Ko'olaupoko Districts
- ☐ None of the above (This will conclude your survey)

Does your group also work in areas beyond the Kona and Ko'olaupoko Districts?

- ☐ Yes
- ☐ No

If you answered yes on the previous question, please indicate where else your group works. (Select all that apply)

- ☐ Other areas on O'ahu
- ☐ Other areas in the state
- ☐ Statewide
- ☐ Nationally
- ☐ Other areas in the Pacific region
- ☐ Internationally

Specific Location and Place:

In the following section, we ask you to describe the specific boundaries or place names where your group has done stewardship work within the past year. Keep in mind this information is being collected to create a publicly available map that displays stewardship of groups that agree to share their data publicly.

Please be as specific as possible; you can also list multiple locations. This will improve the usefulness of the map for potential collaborators. We recognize it is not appropriate to disclose specific locations for some sites and we respect the need to describe them generally, or not at all, as your group sees best. While we are interested in recognizing a wide range of stewardship activities, we wish to protect sites that should remain private such as: pāilina (family burial sites), ko'a (fishing grounds), and threatened and endangered plant and wildlife habitats.

At the end of the survey you can indicate the ways your group wishes to share its stewardship area and network information.

Please describe the place names or boundaries of where your group has done stewardship work within the past year. *Use additional sheet as needed.*

For example:

--the fishpond in He'eia	--the lo'i at Papahana Kuaola
--Waikīkī Elementary School garden	--Maunalua Bay
--Makiki stream	--TMK: (1) 2-5-003:002

If you have multiple programs in different sites or at different scales, please list each with corresponding programs (example - our education programs are region-wide; we operate a compost facility at X school.) If your stewardship site is within a private land holding, please check with the landholder to inquire about sharing information publicly on the map.

Does your group have a Geographic Information System (GIS) file showing the boundaries of where you have done stewardship work within the past year?

- ☐ Yes (*If you check here, we will contact you to follow-up*)
☐ No

SECTION 5: SITES YOUR GROUP'S WORK FOCUSES ON

In the last year, what kind of sites has your group's stewardship work focused on?

Remember that stewardship includes conservation, restoration, responding to disturbance, place-based or traditional hunting/fishing/gathering, monitoring, transformation, education, and advocacy about the local environment. (Select all that apply)

'Āina (Land) & Built Environment Related

- ☐ Ala hele / Bike, Hiking, Beach access trail
- ☐ Athletic field
- ☐ Bird sanctuary
- ☐ Botanical garden / Arboretum
- ☐ Building courtyard (e.g. privately owned public spaces)
- ☐ Community gathering space (need not be a physical building structure)
- ☐ Designated hunting areas
- ☐ Dog park
- ☐ Farm
- ☐ Green buildings
- ☐ Grounds of public building other than school (e.g. city hall, library, hospital, rec center)
- ☐ Lo'i kalo/ Irrigated taro terrace
- ☐ Māla/ Community garden
- ☐ Pāka/ Park (county, state, or national)/ Beach park /Recreation area
- ☐ Playground
- ☐ Public right of way (sidewalk, street ends, traffic island, public area)
- ☐ Ranch
- ☐ Residential building grounds (apartment courtyard, backyard, etc.)
- ☐ Rooftop
- ☐ School yard / outdoor classroom
- ☐ Street tree
- ☐ Ululā'au / Forest / Woodland
- ☐ Vacant land / vacant lot
- ☐ Wildlife preserve

Wai and Kai (Fresh Water & Marine) Related

- ☐ Ana wai / Cave water
- ☐ Awa / Canoe landing / Boat harbor
- ☐ Kahakai / Beach / Shoreline
- ☐ Kahawai / Stream / River
- ☐ Kai kohala / Kai Kua'au / Nearshore marine/ Reef
- ☐ Ko'a / Fishing grounds
- ☐ Loko i'a / Fish ponds
- ☐ Muliwai / Estuary / Freshwater wetland
- ☐ Pūnāwai / Freshwater spring / Reservoir
- ☐ Wai 'ōpae / Anchialine ponds

Systems Related

- ☐ Cultural / sacred sites including living sites in use and preserved archeological sites
- ☐ Energy system (examples - solar, wind, geothermal)
- ☐ Food system (examples - grocery stores, community supported agriculture, food bank, farm, ranch, fish pond, fishing grounds, compost site)
- ☐ Stormwater management system (examples - rain barrels, permeable paver, bioswales, water tanks)
- ☐ Waste system (examples - e-waste drop off location)

Other

- ☐ None of the above
- ☐ Other - please specify:

Of your selections from the previous question, please list your group's top 3 most important stewardship site types.

1. _____
2. _____
3. _____

Who owns the majority of the properties where your group worked within the past year? (*Select one*)

- ☐ City/County government
- ☐ State government
- ☐ Federal government
- ☐ Other government
- ☐ Individual
- ☐ Corporation (including joint ventures, real estate investment groups)
- ☐ Nonprofit
- ☐ Private landowner
- ☐ We work across public and private lands
- ☐ I don't know
- ☐ Other--please specify: _____

SECTION 6: MORE ABOUT YOUR GROUP AND WHAT IT DOES

What does your group work on in addition to stewardship activities?
(Select all that apply)

- | | |
|--|---|
| ☐ 'Āina-based learning | ☐ International, foreign affairs, and national security |
| ☐ Archival, mo'olelo (histories), and language research | ☐ Invasive species control |
| ☐ Artistic or creative expressions and practices | ☐ Native species restoration - 'āina / land related |
| ☐ Climate change adaptation | ☐ Native species restoration - kai / ocean related |
| ☐ Community improvement and capacity building | ☐ Power/electricity generation |
| ☐ Crime, criminal justice | ☐ Private grantmaking foundation |
| ☐ Cultural exchanges | ☐ Provide Legal services (including civil rights, Native Hawaiian rights) |
| ☐ Cultural / place-based knowledge, values, and practices | ☐ Public health (including mental health, crisis intervention, health care) |
| ☐ Drought management / fire control | ☐ Rapid 'Ōhi'a Death |
| ☐ Economic development | ☐ Ranching |
| ☐ Education | ☐ Recreation and sports (including birding and fishing) |
| ☐ Emergency management and disaster response | ☐ Research in science and/or technology |
| ☐ Employment, job related | ☐ Seniors / Kūpuna |
| ☐ Energy efficiency | ☐ Subsistence rights and land rights (including hunting, fishing, gathering) |
| ☐ Environment (including conservation) | ☐ Tourism |
| ☐ Environmental justice | ☐ Toxics/pollution (including runoff/ brown water/ sedimentation) |
| ☐ Religious-based activities (with a church, temple, mosque, etc.) | ☐ Transportation |
| ☐ Food-kai / ocean related (including lawai'a pono / fishing / aquaculture) | ☐ Traditional resource management (including hunting, fishing, gathering) |
| ☐ Food - 'āina / land related (including farming, etc.) | ☐ Youth |
| ☐ Feral goat and pig control | ☐ Other - please specify: _____ |
| ☐ Housing and shelter | ☐ None of the above |
| ☐ Human services (including day care, family services) | |

Of your selections from the previous question, please list your group's top 3 most important activities.

1. _____
2. _____
3. _____

What types of services does your group provide? (Select all that apply)

Note: This may help other groups know where to go for specific resources.

- ☐ 'Āina-based learning
- ☐ Buildings/ facilities/ spaces for hosting meetings and events
- ☐ Community organizing
- ☐ Cultural consulting and trainings
- ☐ Data/ information
- ☐ Educational curricula/ trainings
- ☐ Funding
- ☐ Labor (including volunteers, students, interns)
- ☐ Legal resources
- ☐ Materials/ equipment for planting
- ☐ Natural-Cultural resources (including spring water, 'ōlena, pa'akai, etc.)
- ☐ Public relations /marketing/ communications
- ☐ Service learning
- ☐ Technical assistance
- ☐ Other - please specify: _____
- ☐ None of the above

Considering all of the programs, activities, and services your group works on, what percentage of your group's effort has been focused on environmental stewardship during the past year? (Select one range)

- ☐ 0%
- ☐ 1-19%
- ☐ 20-39%
- ☐ 40-59%
- ☐ 60-79%
- ☐ 80-100%

Your Group's Capacity

How many staff, members, and volunteers does your group have?

_____ Full-time staff

_____ Part-time staff

_____ Members

_____ Regular volunteers-- Those who routinely volunteer in your group's activities.
This is different from volunteers who may come out for a single work day.

If you indicated that you have volunteers, please estimate the total number of volunteer hours contributed per year.

_____ Hours

☐ I don't know

Does your group track metrics about your activities?

(Examples - number of trees planted, schools visited, acres conserved, volunteers/events; level of program satisfaction; history of genealogical ties)

☐ Yes

☐ No

☐ I don't know

If yes, please list metrics that your group tracks:

SECTION 7: YOUR GROUP'S RELATIONSHIPS TO OTHER GROUPS

List the groups that your group collaborates with and indicate how you collaborate.

Note: These groups may be government agencies, offices of elected officials, community-based groups, nonprofits, private companies, religious-based groups, informal groups, etc.

Please be as specific as possible, for example, if you collaborated with a specific program or department within a larger agency or organization, please name both on the same line.

Please spell out the whole name rather than using abbreviations and select all that apply. Use additional sheet if needed.

Group Name	We go to these groups for:		
	Regular collaboration on environmental projects or programs	Knowledge, data, or expertise related to environmental issues	Funding, materials, work share, or work trade for environmental projects or programs
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

SECTION 8: IMPACTS AND INFLUENCES

What does your group want to achieve specifically from its stewardship activities?

Please indicate, to the best of your ability, your group's level of impact on maintaining or improving the following outcomes in the communities in which you work.

	High	Somewhat	Slight	Not At All	Not Sure
Community participation	☐	☐	☐	☐	☐
Cultivation of young leaders	☐	☐	☐	☐	☐
Trust among neighbors	☐	☐	☐	☐	☐
Influence on policy & programs	☐	☐	☐	☐	☐
Protection of makai or ocean-based resources	☐	☐	☐	☐	☐
Protection of mauka or land-based resources	☐	☐	☐	☐	☐
Sustainability (Example- food, waste, and energy systems)	☐	☐	☐	☐	☐
Community health and well-being	☐	☐	☐	☐	☐
Intergenerational family ties	☐	☐	☐	☐	☐
Sharing of cultural values and knowledge	☐	☐	☐	☐	☐
People's connection to place	☐	☐	☐	☐	☐
Other - please specify: 	☐	☐	☐	☐	☐

SECTION 9: A BIT MORE ABOUT YOUR GROUP

How does your group share information with the public? (Select all that apply)

- | | |
|---|--|
| ☐ Blog | ☐ National media |
| ☐ Community meetings | ☐ Radio |
| ☐ Conferences | ☐ Social media (Example -Facebook, Twitter) |
| ☐ Direct mailing / Newsletters | ☐ TV |
| ☐ Door-to-door outreach | ☐ Website |
| ☐ E-mail blasting | ☐ Word of mouth |
| ☐ Flyers | ☐ N/A, we don't share information |
| ☐ Listserv | ☐ Other - please specify: |
| ☐ Local media | _____ |

What is your group's estimated annual budget for the current year?

Note: We will summarize this information with all groups budgets and we will not share your specific budget publicly.

- ☐ Budget: \$_____
- ☐ We have no budget
- ☐ Prefer not to answer

Approximately what percentage of your budget comes from the following funding sources for the current year? (Total must sum to 100)

Government:	_____%
Foundations:	_____%
Endowment:	_____%
Corporate giving/sponsorship:	_____%
Individual giving:	_____%
Memberships:	_____%
Fee for service:	_____%
Other:	_____%

SECTION 10: NEEDS & GAPS

We want to understand more about what types of information or expertise would help your organization undertake its stewardship activities.

What resources is your group seeking? (Select all that apply)

- ☐ 'Āina-based learning
- ☐ Buildings/ facilities/ spaces for hosting meetings and events
- ☐ Community organizing
- ☐ Cultural consulting and trainings
- ☐ Data/ information
- ☐ Educational curricula/ trainings
- ☐ Funding
- ☐ Labor (including volunteers, students, interns)
- ☐ Legal resources
- ☐ Materials/ equipment for planting
- ☐ Natural-Cultural resources (including spring water, 'ōlena, pa'akai, etc.)
- ☐ Public relations /marketing/ communications
- ☐ Service learning
- ☐ Technical assistance
- ☐ Other - please specify: _____
- ☐ None of the above

SECTION II: LEVEL OF VISIBILITY IN PRODUCTS CREATED BY THIS PROJECT

The information collected in this survey will be used to create products such as:

- Online, publicly accessible geospatial database of stewardship that shows groups' stewardship area connections among groups, and group characteristics
- Map showing stewardship areas
- Social network map showing relationships among groups (who works with whom)
- Other educational and outreach products for promoting stewardship (to be determined through a collaborative process)

Indicate how your group wants to be included in products created by this project.
(Select one)

☐ **Full Visibility to the Public**

My group wishes to have all of our group level data be visible to the public. This includes our group name, our stewardship area, social network connections, other information submitted as part of the survey, and possible use of this information in products created by STEW-MAP. (Note: this does not include budget information which will only be summarized without revealing individual group budgets).

☐ **Confidential and Unnamed Visibility to the Public**

My group wishes to have its stewardship area and its role in the stewardship network represented in any products created from submitted data but wishes to keep the identity of our group completely confidential and unnamed. This means an area we identify would be shown on the map and our 'node' in the stewardship network would be shown, but they would not be labeled with our group name.

☐ **No Visibility to the Public**

My group wishes to participate in the project for research purposes only. Do not display our group name, characteristics, our stewardship area, or our network connections. Our data can be included in highly summarized condition, for example synthesized data tables or summary statistics, such that sharing this information in presentations and/or research reports and articles would not result in the identity of our group our area being revealed.

SECTION 12: FINAL SECTION

Are you or another person from your group willing to participate in a follow-up interview or focus group related to the STEW-MAP project?

☐ Yes

☐ No

Is there anything else you would like to tell us about your group or this survey?

THIS CONCLUDES THE STEW-MAP SURVEY. MAHALO FOR YOUR PARTICIPATION!

To learn more visit: www.StewMapHawaii.net

Once the O'ahu 2019 STEW-MAP is complete, we will email you with the results.
If you have any questions, feel free to contact us at info@stewmaphawaii.net.



STEW-MAP is a program of the USDA Forest Service. This project is supported by the Hawai'i Division of Forestry & Wildlife and Region 5 of the US Forest Service; in partnership with the Kaulunani Urban & Community Forestry Program and the University of Hawai'i at Mānoa; and in collaboration with Kāko'o 'Ōiwi, Smart Trees Pacific, Paepae o He'eia, Hawai'i Coastal Zone Management, The Outdoor Circle, Resilient O'ahu, Kua'āina Ulu 'Auamo (KUA), Pacific Internship Programs for Exploring Science (PIPES), Promise to Pae 'Āina, Travel2Change, Polynesian Voyaging Society, and Papahāna Kuaola.

Appendix D: STEW-MAP Survey Respondents

(does not include groups who did not wish to be named)

808 Cleanups	Hawaii Wildfire Management Organization
AARP	Hawaiian Electric Company
'Ahahui Mālama i ka Lōkahi	Healthy Climate Communities
Ala Wai Watershed Association, Inc.	He'eia National Estuarine Research Reserve
Aloha 'Aina Conservation Fund for the Honolulu Zoo	Honolulu Habitat for Humanity
Blue Planet Foundation	Ho'okua'āina
Blue Zones Project	Ho'omaluhia Botanical Garden
Coordinating Group on Alien Pest Species	Hui Lanakila Canoe Club
EPIC Ohana	Hui Mālama O Ke Kai
Friends of Hanauma Bay	Hui Manu-o-Kū
Friends of Hawaii's Urban Forest dba Smart Trees Pacific	Hui o Ko'olaupoko
Friends of Kamehameha Canoe Club	Huli
Friends of Kewalos	Kailua Hawaiian Civic Club
Friends of the Natatorium	Kailua Historical Society
GoFarm Hawaii	Kāko'o 'Ōiwi
Green Rows Farm	Kama'āina Kids
Halau Mohala Ilima	Kānehūnāmoku Voyaging Academy
Hanahau'oli School	Kanu Hawaii
Hau'oli Mau Loa Foundation	Kaulunani Urban & Community Forestry Advisory Council
Hawai'i Alliance of Nonprofit Organizations (HANO)	Keiki and Plow
Hawai'i Association of Watershed Partnerships	Ko'olau Foundation
Hawaii Audubon Society	Ko'olau Mountains Watershed Partnership
Hawai'i Community Foundation	Ko'olaupoko Hawaiian Civic Club
Hawai'i Conservation Alliance	Kua'āina Ulu 'Auamo (KUA)
Hawai'i Farm to School Hui	Laukahi: The Hawai'i Plant Conservation Network
Hawai'i Institute of Marine Biology	Livable Hawaii Kai Hui
Hawai'i Nature center	Lōkahi Canoe Club
Hawaii Nature Hui	Luluku Farmer's Assoc./Aloha 'Aina Health
	Lyon Arboretum

Mālama Mānoa	Puakea Foundation of Hawaii, Inc
Mālama Maunaloa	Rapid 'Ōhia Death Project (CTAHR-UHM)
Mālama Nā Wahi Pana O Waimānalo	Roth Ecological Design Int.
Mānoa Cliff Forest Restoration Group	Saint Louis School
Mānoa Heritage Center	SEEQS: the School for Examining Essential Questions of Sustainability
Marimed Foundation	Society for Conservation Biology Hawai'i Chapter
Marine Embedded Systems Hui Laboratory	Surfrider Foundation O'ahu Chapter
Moanalua Gardens Foundation	Surfrider Spirit Sessions
Nā Kama Kai	The Native Hawaiian Legal Corporation
Niu Valley Middle School	The Nature Conservancy, Hawai'i
O'ahu Invasive Species Committee	The Outdoor Circle
Oceanic Institute of Hawai'i Pacific University	The Trust for Public Land
'Ōhi'a Legacy Initiative	travel2change
Pacific American Foundation	Trees for Honolulu's Future
Pacific Birds Habitat Joint Venture	University of Hawaii at Mānoa Sustainability Council
Pacific Islands Ocean Observing System (PacIOOS)	Wai Lan Preservation Group LLC
Pacific Resources for Education and Learning	Waikiki Aquarium
Paepae o He'eia	Waimānalo Limu Hui
Papahana Kuaola	Waimānalo Public and School Library / Hawaii State Public Library System
Partners in Development Foundation	Windward Community College
Permablitz Hawaii	
Pig Hunters Association of Oahu	
Polynesian Voyaging Society	

Appendix E: Groups Listed in Network Questions

808 Cleanups	Apoalewa LLC
350 Hawai'i	Arbor Day Foundation
Three Mountain Alliance	Arbor Global
'Imi Pono no ka 'Āina, Three Mountain Alliance	Hawai'i Army National Guard
Aloha Arborist Association	Atherton Family Foundation
Luluku Farmer's Assoc./Aloha 'Aina Health	National Audubon Society
Aloha 'Āina 'O Kamilo Nui	Awaiaulu
AARP	Ala Wai Watershed Collaboration
American Cetacean Society	AZA Komodo Dragon SSP
Association of Fundraising Professionals	AZA Tiger SSP
After Oceanic	b+k design group, llc
AgReFab	Big Brothers Big Sisters
'Aha Kāne	Beach Environmental Awareness Campaign
Association of Hawaiian Civic Clubs	Hawai'i (B.E.A.C.H.)
'Āina University	The Bennett Foundation
Aloha Kuamo'o 'Āina	Botanic Gardens Conservation International
Ala Kahakai Trail Association	Big Island Invasive Species Committee
Alaka'ina Foundation	Bishop Museum
Ala Wai Elementary	Oahu Early Detection
Ala Wai Watershed Association, Inc.	Bank of Hawai'i
Nunavut Sivuniksavut, Algonquin College, Ottawa	Blue Planet Foundation
'Ai Love Nalo	Blanche Pope Elementary School
Aloha United Way	Boy Scouts of America Aloha Council
ALTRES	Blue Zones Project
Alu Like	Board of Water Supply, City & County of Honolulu
Ama Olu Kai	Center for Plant Conservation
American Legion	City & County of Honolulu
Ahahui Malama i ka Lokahi	Department of Environmental Services, , City & County of Honolulu
American Veterans	Department of Facilities Maintenance, City & County of Honolulu
Anahola Hawaiian Homestead Association	

Department of Parks & Recreation, City & County of Honolulu
 Department of Transportation Services, City & County of Honolulu
 Division of Urban Forestry, City & County of Honolulu
 Fire Department, City & County of Honolulu
 Honolulu Botanical Gardens, City & County of Honolulu
 Liliuokalani Botanical Garden, City & County of Honolulu
 Office of Climate Change, Sustainability, and Resiliency, City & County of Honolulu
 Refuse Division City & County of Honolulu
 Storm Water Quality Branch, City & County of Honolulu
 State Rep Chris Lee
 The Campbell Foundation
 Harold K. L. Castle Foundation
 Castle High School
 Catholic Charities Hawai'i
 Conservation Council of Hawai'i
 Concerned Citizens of Hawai'i
 Center for Tropical and Subtropical Aquaculture
 Center for Food Safety
 Coordinating Group on Alien Pest Species
 Ching Foundation
 Church Row Homeless Coalition
 Conservation International Hawai'i
 Citizen Foresters
 Climate Strike HI
 Council for Native Hawaiian Advancement
 Community Garden Associations
 Common Grace
 Consuelo Foundation
 Corteva

Coconut Rhinoceros Beetle Response (CRB)
 Daughters & Sons of Hawaiian Warriors
 Daughters of the American Revolution
 Hawai'i Community Development Authority
 Hawai'i Housing Finance & Development Corporation
 Department of Hawaiian Homelands, State of Hawai'i
 US Customs & Border Protection, Department of Homeland Security
 Disabled Veterans Assoc.
 Kaulunani Urban & Community Forestry Program, Division of Forestry and Wildlife, Department of Land & Natural Resources, State of Hawai'i
 Department of Land & Natural Resources, State of Hawai'i
 Kapāpala Koa Canoe Forest Working Group
 Anuenue Fisheries Research Center (DAR)
 Diamond Head State Park Restoration, Division of State Parks, Department of Land & Natural Resources, State of Hawai'i
 Division of Aquatic Resources, Department of Land & Natural Resources, State of Hawai'i
 Division of Boating and Ocean Recreation
 Division of Forestry and Wildlife, Department of Land & Natural Resources, State of Hawai'i
 Division of State Parks, Department of Land & Natural Resources, State of Hawai'i
 Natural Area Reserves, Division of Forestry and Wildlife, Department of Land & Natural Resources, State of Hawai'i
 Office of Conservation and Coastal Lands, Department of Land & Natural Resources, State of Hawai'i
 Snail Extinction Prevention Program, Division of Forestry and Wildlife, Department of Land & Natural Resources, State of Hawai'i

Water Commission, Department of Land & Natural Resources, State of Hawai'i	Friends with Farms
Department of Agriculture, State of Hawai'i	Friends of the Natatorium
Department of Agriculture Plant Quarantine Branch	Food Recovery Network at the University of Hawai'i at Mānoa
State Agribusiness Development Corporation	Garden Club of Honolulu
Hawai'i Department of Education	Giraffe Conservation Foundation
Department of Health, State of Hawai'i	God's Country Waimānalo
Department of Health Clean Water Branch	GoFarm Hawai'i
Department of Human Services, State of Hawai'i	Oahu Going Home Consortium
Dole Food Company	Green Magazine
Department of Transportation, State of Hawai'i	Green Rows Farm
DTL Hawai'i	Growing Pono Schools
Ducks Unlimited, Inc.	Guayaki
Duke's Waikiki	Kalama Ku Kokua
Durrell Wildlife Conservation Trust	Habitat for Humanity
East Honolulu Chamber of Commerce	Hawai'i Alliance for Community-Based Economic Development
East Maui Watershed Partnership	Hawaiian Airlines Foundation
East Molokai Watershed Partnership	Ka Huli o Hāloa
Earthjustice	Hakipu'u Learning Center PCS
Elemental Excelsior	Hawai'i Ant Lab (HAL)
Enchanted Lake Elementary	Haleakala Ranch
EPIC Ohana	HĀLOA School Charter
Ewa Limu Project	Hāna Build/Ma Ka Hana Ka 'Ike
Faith Action for Community Equity (FACE)	Hanahau'oli School
Farm to Keiki	Hawai'i Alliance of Nonprofit Organizations (HANO)
Hawai'i Farm to School Hui	The Hanzaki Institute
Feed the Hunger Hawai'i	Hawai'i Agriculture Research Center
Fleming Arboretum	Hawai'i State Legislature
FoodCorps Hawai'i	Hawai'i WWI Centennial Task Force
Sidney E. Frank Foundation	Hawai'i Association of Watershed Partnerships
Freeman Foundation	Ho'omaluhia Botanical Garden
Friends of Hanauma Bay	Hawai'i Conservation Alliance
Friends of Honolulu Botanical Gardens	Healthy Climate Communities
Friends of Kewalos	Hawaiian Community Development Board

Hawai'i Community Foundation
 Hawai'i Canoe Racing Association
 Hawaiian Electric Company
 Hawai'i Environmental Education Alliance (HEEA)
 Holokai Adventures - He'eia State Park
 Haereticus Environmental Laboratory
 Helping Hands Hawai'i
 Hawai'i Fisherman's Alliance for Conservation and Tradition
 Hawai'i Farm Bureau
 Hawai'i Farmers Union United Oahu-Waimanalo Chapter
 Hawai'i Green Growth
 HHF Planners
 Honolulu Habitat for Humanity
 Hawai'i Appleseed
 Department of Parks & Recreation, Hawai'i County
 Public Access, Open Space, Natural Resources Preservation Commission, Hawai'i County
 Hawai'i State Judiciary
 Hawai'i State Legislators
 Hawai'i Island School Garden Network
 Hawaiian Kingdom
 Hawai'i Audubon Society
 Hawaiian Community Assets
 Hands in Helping Out (HIHO)
 Waimea Valley Arboretum (Hi'ipaka LLC)
 Hika'alani
 Hawai'i Kai Neighborhood Board
 Hawaiian Islands Land Trust
 Hawai'i Maoli
 Hawai'i Institute of Marine Biology
 Hawai'i Nature Hui
 Hawai'i Institute of Pacific Agriculture

Hawai'i Pilots Association
 Hiroshima Flora and Fauna Society
 Hawai'i Reef and Ocean Coalition
 Hawai'i Island Seed Bank
 Hawai'i Invasive Species Council
 Hawaiian Silversword Foundation
 Historic Hawai'i Foundation
 Hawai'i Theatre Center
 Hawai'i's Thousand Friends
 Hālau Kū Mana
 Hui Kū Maoli Ola
 The Native Hawaiian Legal Corporation
 Hawai'i Marine Animal Response
 Hui Mālama i ke Ala ' Ūlili
 Hau'oli Mau Loa Foundation
 Hui Mālama O Ke Kai
 HMSA Foundation
 Hawai'i Nature Center
 Hanalei Watershed Hui
 Ho'āla 'Āina Kūpono
 Hui O Ho'ohonua
 Hui o Ko'olaupoko
 Hōlani Hāna
 Homestead Housing Authority
 Honolulu Waldorf Schools
 Aloha Aina Conservation Fund for the Honolulu Zoo
 Ho'okua'āina
 Ho'ōla Mokauea/ Mokauea Fisherman's Association
 HOPE Services
 Hawai'i Procurement Institute
 Hawai'i Pacific University
 Hawai'i Reserves Latter Day Saints
 Hawai'i Tourism Authority

Hui Aloha 'Āina: Ha'a Kalaepōhaku	Ka'elepulu Elementary
Hui Ho'olei Maluō	Kahana community
Hui Kaloko-Hanokōhau	KAHEA: The Hawaiian-Environmental Alliance
Hui Kawainui-KAILUA Ka Wai Ola	Kahinapōhaku
Hui Aloha Kīholo	Ka Honua Momona
Hui Lanakila Canoe Club	Kahouna
Hui Maka'āinana o Makana	Kahua Pa'a Mua
Hui Manu-o-Kū	Kalaeokauna'oa (Kahuku Point) Restoration
Hui Mālama o Mo'omomi	Kailua Hawaiian Civic Club
Hui Nalu O Hawai'i Canoe Club	Kailua Historical Society
Hālau Mōhala 'Ilima	Kailua Kau a Ho'oilo
Mālama Hulē'ia	Kailua Canoe Club
Huli	Kailua Elementary
Hunakai Park Association	Kailua Neighborhood Board
Hawai'i Wildlife Center	Kaimuki High School
Hawai'i Wildlife Fund	Kaimuki-Waialae YMCA
Pacific Birds Habitat Joint Venture	Kainalu Elementary
Hawai'i Wildfire Management Organization	Kai Oni Canoe and Athletic Club
International Association of Fire Chiefs Ready, Set, Go!	Kaiser High School
Ikaika Ohana	Kāko'o 'Ōiwi
International Society for Arboriculture	Kalaeloa Heritage and Legacy Foundation
'Iolani School	Kalaheo High School
Invasive Species Committees of Hawai'i	Kama'aina Kids
International Union for Conservation of Nature	Kama'aina United to Protect the 'Āina
Amphibian Specialist Group SSC IUCN	Ke Kula 'o Samuel M. Kamakau Laboratory
IUCN Species Survival Commission	Public Charter School
'Iwi Kuamo'o o Ko'olau	Friends of Kamehameha Canoe Club
James and Abigail Campbell Foundation	Edith Kanaka'ole Foundation
Ka Lau Ona One O Puna	Kanalu
Ka 'Ohana O Honu'apo	Kanu Hawai'i
Ko'olau 'Āina Aloha	Department of Finance, Kaua'i County
Ka'ōhao Public Charter School	Department of Parks & Recreation, Kaua'i County
Ka'ala Cultural Learning Center	Kauai County Planning Department
Ka'ala Farms	Open Space Commission, Kauai County

Kauai School Garden Network (Malama Kauai)	Kamehameha Schools
Kauai Watershed Alliance	Kaka‘ako Ūnited
Kaukonahua Ranch	Kua‘āina Ulu ‘Auamo (KUA)
Kailua Beach Adventures	Kualoa Ranch
Ko‘olaupoko Community Emergency Response Teams	Kuamo‘o Farms/Indigenous Warriors Initiative
Kealahou West	Kumuola Foundation
Keiki and Plow	Kumuola Marine Science Learning Center
Ke Kula Nui O Waimānalo	Kūpa‘a No Lāna‘i
Keolu Elementary	Kupu Hawai‘i
Ke One O Kākuhihewa - O‘ahu Council for the Association of Hawaiian Civic Clubs	Kanehunamoku Voyaging Academy
Kualoa-Heeia Ecumenical Youth (KEY) Project	Leeward Haleakala Watershed Restoration Partnership
Ko‘olau Foundation	State Senator Laura Thielen
Ko‘olaupoko Hawaiian Civic Club	Lā‘au Hawai‘i The Hawaiian Fern Project
Kids Hurt Too Hawai‘i	Laiopua 2020
Kīholo	Lālākea Loko Wai Hui
Samuel Wilder King Intermediate School	Laukahi: The Hawai‘i Plant Conservation Network
Kīpahulu ‘Ohana	LEGO enthusiasts of Hawai‘i
Kipapa ‘Ohana	Le Jardin Academy
Kauai Invasive Species Committee	Livable Hawai‘i Kai Hui
Ho‘oulu ‘Āina (Kokua Kalihi Valley)	Life of the Land
Kamilonui-Mariner’s Cove Firewise committee	The Limu Hui (individuals)
Ka‘ūpūlehu Marine Life Advisory Committee	Living Life Source Foundation
Ko‘olau Mountains Watershed Partnership	Local Initiative Support Corporation
Koa Kai Canoe Club	Lokahi Canoe Club
Kohala Watershed Partnership	Hui Mālama Loko I‘a
Kohala Center	Iululemon
Kohanaiki	Lyon Arboretum
Kōkua Hawai‘i Foundation	The Mabula Ground Hornbill Project
Mālama Kōloa	Maika‘i Kamakani ‘O Kohala
Koloa Recovery Implementation Group	Malama Hule‘ia
Kona Brewing Company	Mālama Kaua‘i
Kosasa Foundation	Mālama Pūpūkea-Waimea
Koke‘e Resource Conservation Program	Mālama Moana

Mānoa Cliff Forest Restoration Group	Moanalua Valley Community Association
Mānoa Neighborhood Board	Mokapu Elementary
Mānoa Valley Theatre	Molokai Farm to School Network
MA'O Organic Farms	Molokai Land Trust
Marimed Foundation	Nā Hopena A'o
Maryknoll School	North American Bird Conservation Initiative
Ka Ipu Aina (Matson)	Nā Kama Kai
Department of Parks & Recreation, Maui County	Nā Mamo o Kāwā
Maui County Planning Department	Nā Mamo O Mū'olea
Maui Nonprofit Directors Association	Nanakuli Hawaiian Homestead Community Association
Maui Nui Seabird Recovery Project	Native American Rights Fund
Maui Open Space Fund	National Endowment for the Arts
Maui School Garden Network	National Association for Uniformed Services
Maui Dept. of Water Supply	Naval Facilities Engineering Command
Maui Forest Bird Recovery Project	Neighborhood Boards
Maui Nui Botanical Garden	Neighborhood Place of Puna
Mauna Kahalawai Watershed Partnership	He'eia National Estuarine Research Reserve
Mauna Kea Watershed Alliance	National Fire Protection Association
Mauna Lani Resort	Niu Valley Middle School
Maunalei Ahupua'a Mauka-Makai Managed Area	No Single Use Hawai'i
Maunalua Watershed Hui	National Oceanic and Atmospheric Administration
Maunalua.net	Marine Education and Training (MET) Mini-Grant Program, NOAA
Maunalua Fishpond Heritage Center	NOAA Fisheries Pacific Islands Regional Office
Master Gardeners	NOAA- National Marine Sanctuaries
Mānoa Heritage Center	NOAA National Ocean Service
Mālama Honua Public Charter School	NOAA National Weather Service
Mid-Pacific Institute	NOAA Pacific Islands Fisheries Science Center
Military Order of Foreign Wars	Natural Resource Conservation Service, US Department of Agriculture
Maui Invasive Species Committee	North Shore Community Land Trust
Mālama Learning Center	National Science Foundation
Mālama Mānoa	North Shore Eco Tours
Mālama Maunalua	National Tropical Botanical Garden
Moanalua Gardens Foundation	

National Tropical Botanical Gardens Limahuli	Pacific Islands Climate Change Cooperative
National Trust for Historic Preservation	Partners in Development Foundation
Nui Ke Aho/Wanana Paoa	Pig Hunters Association of Oahu
NWHI Coral Reef Ecosystem Reserve	Polynesian Voyaging Society
Oahu Army Reserve	Pono Home
Oahu Country Club	Pono Pacific Land Management LLC
Oahu Farm to School Network	POP Creative Media
Oceanic Institute of Hawai'i Pacific University	Pacific Resources for Education and Learning
Office of Hawaiian Affairs	Protectors of Paradise
The Oahu Hawaiian Canoe Racing Association (OHCRA)	Pū'ā Foundation
Oahu Invasive Species Committee	Puakea Foundation of Hawai'i, Inc
Ola Wellness	Pūlama Lāna'i
'Ōlelo Community Media	Pūlama Nōmilu
'Ōhi'a Legacy Initiative	Punahou School
Office of Planning, State of Hawai'i	Pū'ōhala Elementary
The Orangutan Foundation	Pu'u Kukui Watershed Preserve
O'ahu Resource Conservation & Development Council	Queen Lili'uokalani Trust
Oregon State University, Department of Fisheries and Wildlife	Queen Emma Land Co.
Outrigger Duke Kahanamoku Foundation	Royal Botanic Gardens Kew, Millennium Seed Bank Partnership
Pa Kui a Holo	Rural Community Assistance Corporation
Pacific Fire Exchange	The Research Corporation of the University of Hawai'i
Pacific Rim Conservation	Reeves Ohana
Pacific Islands Ocean Observing System (PacIOOS)	RISE Keaukaha One Youth Development Program
Parents and Children Together (PACT)	Rapid Ohia Death Project (CTAHR-UHM)
Paepae o He'eia	Royal Order of Kamehameha I
Pacific American Foundation	Rotary Clubs
PA'I Foundation	Rotary Club of Honolulu Pau Hana (81038)
Palaka Moon Farm	Roth Ecological Design Int.
Papahana Kuaola	Sam N. and Mary Castle Foundation
Perma Blitz Hawai'i	SANCOB African Penguin Conservation
PHOCUSED	Save Ala Moana Park Hui
Pacific Islands Climate Adaption Science Center	Save Ka'iwa Ridge
	Save Honolua Coalition

Society for Conservation Biology (Global and Sections)	travel2change
Society for Conservation Biology Hawai'i Chapter	Tufts University
Sustainable Coastlines Hawai'i	Turtle Conservancy
Schools	U.S. Army Corps of Engineers
Windward Complex Schools	U.S. Shorebird Conservation Partnership
Schmidt Family Foundation	University of California - Davis, Wildlife, Fish and Conservation Biology
SEEQS: the School for Examining Essential Questions of Sustainability	University of Hawai'i at Mānoa Sustainability Council
Shima's	Pacific Internship Programs for Exploring Science (PIPES)
Sierra Club of Hawai'i	University of Hawai'i - Botany
Marine Embedded Systems Hui Laboratory	University of Hawai'i - Building and Grounds
Smithsonian Institution	University of Hawai'i - CTAHR
Service Systems Associates	University of Hawai'i - Ka Papa Lo'i O Kānewai, Hawai'i Inuiākea School of Hawaiian Knowledge
Saint Louis Green Club	University of Hawai'i - Pacific Cooperative Studies Unit (PCSU)
Saint Louis School	University of Hawai'i - Sea Grant
State of Hawai'i	University of Hawai'i - Center for Conservation Research
State Procurement Office	UH Cooperative Extension
St John Vianney School	University of Hawai'i
Friends of Hawai'i's Urban Forest dba Smart Trees Pacific	Food Service, University of Hawai'i Mānoa
Surfrider Foundation Oahu Chapter	Hawai'i Exemplary State Foundation, PBRC, UHM
Surfrider Spirit Sessions	Kapiolani Community College, University of Hawai'i
Sustainable Island Products	Plant Extinction Prevention Program, Pacific Cooperative Studies Unit, University of Hawai'i at Mānoa
Sustainable Molokai	UH Mānoa Dining Services
Sustain Hawai'i	University of Hawai'i at Mānoa, Ecology, Evolution, Conservation Biology
Swayne Family Foundation	University of Hawai'i at Mānoa
SWCA Environmental Consultants	University of Hawai'i at Mānoa, School of Ocean and Earth Science and Technology (SOEST), Hawai'i Natural Energy Institute
Susannah Wesley Community Center	
US Rep Tulsi Gabbard	
The Trust for Public Land	
Trees for Honolulu's Future	
Tiana Partners	
The Nature Conservancy, Hawai'i	
The Outdoor Circle	

University of Hawai'i at Mānoa, College of Tropical Agriculture and Human Resources	US Forest Service
University of Hawai'i at Mānoa, Department of Education	Institute of Pacific Islands Forestry, US Forest Service
University of Hawai'i at Mānoa, Department of Microbiology	USDA Forest Service, Region 5, Forest Stewardship and Forest Legacy
University of Hawai'i at Mānoa, Deptment of Urban & Regional Planning	USDA Forest Service, Region 5, Urban & Community Forestry Program
University of Hawai'i at Mānoa, Natural Resource Environmental Management	US Fish & Wildlife Service
University of Hawai'i at Mānoa, School of Architecture	National Wildlife Refuge System, U. S. Fish & Wildlife Service
University of Hawai'i at Mānoa, School of Ocean and Earth Science and Technology, Department of Oceanography	Pacific Islands Fish and Wildlife Office, U.S Fish and Wildlife Service
University of Hawai'i Botany Department	US Fish & Wildlife Service, Ecological Services
University of Hawai'i- Kauai	US Geological Survey
University of Hawai'i- Maui	Pacific Island Ecosystems Research Center, US Geological Survey
University of Hawai'i- Moloka'i	US Department of Housing and Urban Development
University of Hawai'i West O'ahu	US Job Corps
University of Hawai'i, Hilo	US National Park Service
Ulupalakua Ranch	Rivers, Trails, and Conservation Assistance Program, National Park Service
Ulupono Initiative	Veterans Administration
University of Manchester (UK)	Vets of Foreign Wars
US Army Garrison, Hawai'i	Voyager Public Charter School
US Army Natural Resources Program on Oahu	Malama Wahi Pana O Waimanalo
Hawai'i US Congressional Delegation	Nā Wai 'Ekolu: Stream Outreach Education Activities in the Ala Wai Watershed
US Air Force	Waihe'e Limu Restoration
US Coast Guard	Waikalua Loko I'a
Animal and Plant Health Inspection Service, US Department of Agriculture	Waikiki Aquarium
Agricultural Research Service, US Department of Agriculture	Waikiki Business Improvement District Association
US Department of Agriculture	Waikiki Improvement Association
US Department of Defense	Waikoloa Land Company
"U.S. Department of Education, Native Hawaiian Career and Technical Education Program"	Waikoloa Dry Forest Initiative
	Wai Lan Preservation Group LLC
	Wailuku CMMA

Waimanalo Homestead Association	Wildlife SOS Elephant
Waimanalo Houseless Community	Windward Academy for CTE
Waimanalo Public and School Library / Hawai'i State Public Library System	Wetland Management and Educational Services Inc.
Waimanalo Market Co-op	Waimanalo Agricultural Association
Waipā Foundation	Waimanalo Health Center
County Water Departments	Waimanalo Elementary & Intermediate
Watershed Partnerships	Waimanalo Limu Hui
Windward Community College	Waimanalo Neighborhood Board
Waianae Coast Comprehensive Health Center	Waianae Mountains Watershed Partnership
Western Pacific Regional Fishery Management Council	WWI Centennial Commission
Waimanalo Hawaiian Homestead Association	YoGarden Hawai'i
Whole Foods	YWCA Kokokahi
G.N. Wilcox Trust	Zero Waste Oahu
Wild Kids Hawai'i	Zoological Society of San Diego
	Honolulu Zoo Society

Appendix F: Follow-Up Interview Guide

STEW-MAP O'ahu Semi-structured Interview Guide

Group Name:

Individual Name:

Title:

Date:

Time:

I. Spatial Area

You might remember that part of the STEW-MAP survey involved describing the places that you care for. Here is the map of the area your group described within our project area (Kona and Ko'olaupoko) in 2018- [ask whether participant has map open, wants to open it, or if they want you to just share your screen].

1. Can you talk about why your organization works where you work? [*Prompts: landmark, area provided to lease, wahi pana*]

II. Recent Changes

Now I would like you to think about recent changes that have occurred in your organization since March of this year. These changes we are referring to have resulted from local, national, and worldwide events, and are not just a result of the COVID-19 pandemic, but also the growing awareness of and response to institutionalized racism and social injustices. In the following questions, when I say “since March”, I am referring to these shifts.

2. Has your group been impacted by the events since March? If so, how?
 1. Probe for programs, priorities, or goals? If so, what are those?
 2. Probe for how work with volunteers/members has changed (e.g. canceled events, physically distanced, more interest from new volunteers)
 3. Probe for virtual content/engagement
 4. Probe for change of area [change in access, physical sites closing, moving meetings or fundraisers online, needing to accommodate people spending more time in outdoor spaces]
 5. Probe for changes to staff, interns, field work
 6. Probe for funding (loss or gain), probe for adaptation

7. Probe for mutual aid/ community relief work
 8. Probe for knowledge network--where have you been getting ideas for the new programs? *[note: this may be repetitive of network questions below]*
 9. Probe for any comments on working in communities that are particularly impacted by (or not) to COVID-19.
3. *[If new programs/activities are mentioned]*, Why has your organization taken this on?
 1. Probe for if and how needs of the community changed
 4. These changes within your organization that you've mentioned, do you see them as long term changes or short term responses to recent events?
 5. Do you think the current context (i.e., since March) has shifted how people understand and value stewardship and the groups that engage in stewardship? If so how?

III. Networks

Ok, now we're going to think more broadly and not focus on recent changes. You might remember in the STEW-MAP survey—that we asked you to list organizations that you collaborate with. We're going to look at the social network map of your regular collaborator network based on your responses to the survey [ask whether participant has map open, wants to open it, or if they want you to just share your screen].

Let me explain a couple of things to help you interpret this diagram. This is what is considered a visualization of your organization's ego network. You'll see your organization in big letters with lots of arrows around it. The blue arrows point to the organizations that you named as regular collaborators. The orange arrows come from organizations that named you as a regular collaborator. Orange arrows also connect your collaborators if they named each other as collaborators. The full names of these abbreviated organizations can be found on the second page.

6. Is this what you would have expected your network to look like? Are there any surprises here?
7. Now think about your group's strongest collaborations in this network. What makes them strong? How did they come to be?
8. How long have you worked for *[organization name]*? Do you have a sense for if and how the network has changed over the last 10 years? *[If yes,]* Please explain.
9. Has your group's network of key collaborators changed since this March? Have you begun new or different kinds of collaborations?
 1. Probe for sector (public, civic, private) if unclear

2. Probe for type of collaboration regular collaboration/resources/knowledge-data-expertise
3. Probe for if the connection is entirely new or pre-existing
4. Probe for the WHY they think networks are changing

IV. Successful collaborations and the future of mālama 'āina

Thanks so much for reflecting on your group's networks. We have found that the networks in which stewardship groups work are very large and include organizations across a variety of sectors and scales. We are interested in hearing more of the stories about strong collaborations.

10. Can you think of a memorable time when your organization has collaborated with other groups particularly well to meet shared goals? How did it work, why was it so successful?
 1. Probe for what could have improved collective efforts
11. What are the major limitations your group faces in pursuit of your mission? [*clarify: does not have to be related to recent events*]

[*If funding is mentioned*] The results from our survey show that funding is a top need for organizations that mālama 'āina. Beyond securing funding, are there other challenges that your group faces in pursuit of your mission?

12. What is your hope for the future of stewardship or mālama 'āina in Hawai'i?