

Miloli'i

Community-Based Subsistence Fishing Area Marine Management Plan



This marine management plan has been developed over many years by members of the Miloli'i community that are striving to ensure that this and future generations have abundant marine resources for their use and well-being. This plan is backed by decades of careful observation, ongoing community-based management and education, and active fishing by Miloli'i residents and visitors (non-residents of Miloli'i) both in the nearshore and offshore areas.

Miloli'i is proud to be one of the last remaining fishing villages in Hawai'i. This plan promotes sustainable fishing by residents and visitors. According to the proposed rules and activities summarized in this document, all areas of Miloli'i's nearshore waters will be open to fishing using gear and approaches that have been carefully selected to provide a healthy balance between maintaining abundant catches for food and income and maintaining abundance in populations of key priority species.

Submitted by Kalanihale

To the State of Hawai'i Department of Land and Natural Resources, Division of Aquatic Resources

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I ka wā ma mua, ka wā ma hope

This phrase translates to “the time in front, the time in back” and is used to describe a Hawaiian traditional practice of looking to the time and people that have come before us as the sources of knowledge that will carry us into the future. Our ancestors held invaluable ‘ike and imparted that wisdom to the younger generation. These are our kūpuna and we are the families who remain committed to the cultural values and traditional practices they have taught us, that has sustained our community for generations, and that of which we carry the kuleana going forward. It is in their honor that we dedicate this management plan and our efforts to maintain our cultural resources and practices of Miloli’i.



* We also pay tribute to Melekule Calip, Kepāno Kuahuia and the numerous kūpuna who are responsible for the strong foundation upon which we stand. We recognize they are not all pictured above but we honor each of them, their legacies, and contributions to aloha ‘āina.

OLELO HO'OLAHA.

OWAWU O KA MEA NONA KA INOA MA-
lalo nei, ke ha'i aku au ma ke ākea. Ua lawe 'ia ke 'ahi
i lā koho na ke Konohiki,

Ma Honomalino, Kona, Hawaii

‘OLELO HO‘OLAHA.

‘O WAWU ‘O KA MEA NONA KA INOA MA-
lalo nei, ke ha'i aku au ma ke ākea. Ua lawe 'ia ke 'ahi
i'a koho na ke Konohiki,

Ma Honomalino, Kona, Hawai'i

nei. No ke komo 'ana mai ma loko o ka mile ho'okahi e like me
ka Kānāwai Kivila, 'ao'ao 62, paukū 387, a hiki i ka pau 'ana o ia
kānāwai, e pili ana i ka i'a koho a ke Konohiki; a no laila, 'o ka
po'e a pau e lawai'a 'ana ma kēia mau ko'a 'ahi,
'Āinahou a me Kamaua,
e ho'omana'o i ka māhele o ke Konohiki a me ka lawai'a. 'O ka
mea kū'e i kēia 'ōlelo ma luna, e lawe nō au i ka luna kānāwai, a
no ka 'oia'i'o o nā 'ōlelo ma luna, ke kau nei au i ko'u inoa.

D. W. Kaluailahawa.
Luna Mālama 'Āina.
Honomalino Kai, Kona, Hawai'i, 'Oka. 29, 1862.

Ka Nūpepa Kuokoa, 16 Nowemapa 1862

ANNOUNCEMENT.

I AM THE ONE WHOSE NAME IS LISTED BELOW,
I am making it known to the public. The konohiki's choice 'ahi fish was taken here
at Honomalino, Kona, Hawai'i.

To come into the 1 mile "boundary," like it states in
the Civil Code, page 62, paragraph 387, in perpetuity,
the choice of what fish to harvest belongs to the konohiki, and therefore, all the
people that are fishing/gathering at these 'ahi ko'a, (at)
'Āinahou and at Kamaua,
remember that the konohiki and the fishers who will portion (the catch). The one
who opposes this statement above, I will take (them) to the Judge,
and the facts in the statement above are left in truth, I pen my name.

D. W. Kaluailahawa.
Land Preservation Manager
Honomalino Kai, Kona, Hawai'i, Oct 29, 1862. 50-2t*

Ka Nūpepa Kū'oko'a: Book 1, Number 50 (8 November 1862)

TABLE OF CONTENTS

MILOLI'I CBSFA MARINE MANAGEMENT PLAN

Dedication	i
1. Executive Summary, Acknowledgements	1
2. Organization Information	3
3. A Brief History of Miloli'i	5
4. Nearshore Environment	9
5. Traditional and Customary Fisheries Practices	10
6. History of Marine Management Actions	12
7. Important Uses of Coastal and Marine Resources	15
8. Subsistence Resources Targeted, Status and Threats	16
9. Management Plan Goal, Objectives, Actions & Draft Work Plan	20
10. Proposed Boundaries and Regulations	35
11. Abbreviations, Definitions & Species Lists	43
12. Bibliography	45
13. Figures, Tables & Appendices	
Figure 1. Map of the Island of Hawai'i 1928 Walter E. Wall.....	8
Figure 2. Map of the entire boundary of the proposed Miloli'i CBSFA.....	35
Figure 3. Map of the four proposed Pu'u'honua located in the Miloli'i CBSFA.....	36
Figure 4. Map of the Pāku'iku'i Rest Area in orange and Puaka'a Miloli'i in blue.....	37
Figure 5. Map of the 'Ōpelu Traditional Management Zone outlined in yellow.....	39
Table 1. Fishing practices & types of species gathered.....	11
Table 2. Perceptions of the status of key resource species.....	17
Appendix 1: Miloli'i Interview Survey Results.....	49
Appendix 2: Miloli'i Community Based Stewardship Efforts Posters (2015-2018).....	52
Appendix 3: Miloli'i Community Based Stewardship Efforts Timeline Poster (1980-present).....	53
Appendix 4: Conceptual Model (May 6, 2017).....	54
Appendix 5: Miloli'i Biological Monitoring 2016.....	55
Appendix 6: Miloli'i 'Opihi Populations Summary Report.....	56
Appendix 7: Pāku'iku'i Summary Data	61
Appendix 8: ASU-DAR Shallow Water Resource Fish Report Cards.....	64
Appendix 9: Miloli'i Subdivision Sewage Effluent summary.....	70
Appendix 10: Mohala Nā Konohiki Program Poster & Website.....	73
Appendix 11: Invertebrate Life History Table.....	74
Appendix 12: Fish Life History Table.....	75
Appendix 13: Miloli'i Community Research Guidelines.....	76



Photo: Kēhau Springer

MILOLI'I CBSFA ~ **1. Executive Summary & Acknowledgements**

Executive Summary

This Marine Management Plan is the culmination of decades of work by dedicated community members from Miloli'i and the numerous organizations and individuals that have supported efforts to sustainably manage Miloli'i's marine resources. The Miloli'i community is proud that we have developed a set of regulations that will allow both residents and visitors (non-residents) to continue fishing in all areas of the CBSFA but at that same time will help reduce overfishing that has contributed to declines in populations of key species that are critical to the culture and socioeconomic well-being of all of Hawai'i's residents and visitors (non-residents).

The goal of these rules is to ensure abundant stocks of priority species and high-quality fishing now and in the future for the residents of and visitors to Miloli'i and to reaffirm and perpetuate fishing practices that were customarily and traditionally exercised for Native Hawaiian subsistence, culture, or religion.

The Miloli'i community of South Kona, Hawai'i Island is a fishing community. Comprised completely of native Hawaiian families, the people of Miloli'i village have long depended on fishing for food, income, and a source of cultural identity. Starting in roughly 1980, concern over the observed declines in the

abundance of important marine species prompted action. Systematic action to address these growing concerns continued in the early 2000s with the start of community-based marine monitoring, intergenerational fishing camps, Makai Watch and other programs dedicated to restoring and maintaining Miloli'i's fisheries resources and key habitats.

In 2005, a group of community members worked with the State Legislature to secure the designation of Miloli'i as a Community-based Subsistence Fishing Area (CBSFA). However, at that time community members did not advance a proposed rule package or management plan. Instead, they focused on activities to help maintain abundance in key subsistence species through active community stewardship that encouraged responsible fishing. This was reinforced through a series of projects and activities including practicing traditional 'ōpelu hānai and stewardship, Lawai'a 'Ōhana Camps that celebrated Miloli'i's fishing traditions, and ongoing resource monitoring.

Starting in 2017, several community members started to recognize that despite the efforts to manage populations through community action, the populations of priority species were still declining. As a result, a group came together under the leadership of the community-based non-profit organization, Kalanihale and started a systematic series of consultations to understand

MILOLI'I CBSFA ~ 1. Executive Summary & Acknowledgements

community concerns and desires related to management of Miloli'i's nearshore fisheries. Developing the management plan began with interviews of 65 community members representing 50 families. 97% of the interviewees said that the populations of most fish and other species are less abundant now than they were in the past. This included pāku'iku'i, uhu, 'ū'ū, kūmū, kole, and 'ōpelu. The majority of community members said they want to see some type of management in Miloli'i.

As a result, between 2017 and 2020, a small group of community members began a process to develop a draft management plan and proposed rule package to help address community concerns about declines in marine resources. The community group proposed that the CBSFA extend for 18.6 miles along the coastline from Kīpāhoehoe in the north to Kaunā in the south and out to a depth of 100 fathoms. This management plan includes both proposed marine resource management rules and actions to help restore and maintain abundance in Miloli'i's critical marine resources. The rules have been designed to help ensure that community members and visitors (non-residents) have abundant stocks of critically important species for subsistence catch, family events, and sharing. The rules and activities are designed to restore and maintain this abundance by addressing major threats and helping to ensure that critical ecosystems have every opportunity to recover and remain intact.

Acknowledgements

The Miloli'i CBSFA proposed marine management plan is the work of many hands. The efforts started in the early 2000's when 'ohana throughout the village of Miloli'i came together to share and discuss their efforts to mālama 'āina. We want to take this time to thank all those who participated in those gatherings

including, lawai'a, kūpuna, community residents, teachers, students, stewards of land and ocean, marine scientists, researchers, community organizers, elected officials, and agencies who supported our efforts in this process.

To our community of Miloli'i we thank you for sustaining and preserving our cultural practices and way of life. These customs, beliefs, and practices have afforded our community the ability to carry on the traditional fishing of Miloli'i. We want to thank Conservation International Hawai'i for technical guidance and support, The Harold KL Castle Foundation and other conservation programs for funding support. To our fishing communities throughout our pae 'āina who are living sustainably, we thank you for standing for your place and for the practices of your place, it is your work combined with the State of Hawai'i, that have sustained the health and wellness of our resources for today and for the days ahead. E alu pū kākou!

We would also like to acknowledge Hā'ena, Mo'omomi, Ka'ūpūlehu and Kīpahulu, who we've looked to for guidance and support to navigate this process and develop this management plan. This plan also fulfills the requirements set forth by the 2014 Designation Procedures Guide, developed by the Department of Land and Natural Resources, Division of Aquatic Resources (DLNR-DAR).



Photo: Kēhau Springer



MILOLI'I CBSFA ~ 2. Organization Information

Organization Name

Kalanihale

Date Group Established

2012

Mission Statement

To improve the educational, environmental, and cultural well-being of community members of Miloli'i and South Kona.

Vision Statement

Miloli'i and South Kona is a thriving Hawaiian fishing community with a healthy environment including abundant marine resources and successful and thriving families that have a strong sense of place and identity, pride in their Hawaiian culture, and a healthy quality of life socially, economically, and culturally.

Organization Background

Kalanihale came into existence through the needs of our people. Our initial focus was to provide access to high quality education for youth in Miloli'i. Kalanihale has been sponsoring several programs and through strong partnerships have been successful in pursuing our mission and vision. To provide educational opportunities for our community's youth, Kalanihale sponsors a Virtual Academy of the Kua o Ka Lā New Century Public School. Community families come together during annual Lawai'a 'Ohana (Fishing Family) Camps

to celebrate and share traditional Hawaiian fishing culture and stewardship practices. Kalanihale also supports the Miloli'i youth volleyball team, student media projects with the Hiki Nō program of Hawai'i Public Television, a partnership with Pa'a Pono Miloli'i on the Miloli'i 'ōpelu (mackerel scad) traditional fishing project, and a community hula program. The workforce of Kalanihale have been involved in marine resource management in Miloli'i for more than 10 years. They each participated in successful efforts to establish a Community-Based Subsistence Fishing Area (CBSFA) in Miloli'i and in various projects to improve sustainable management of marine resources including the traditional 'ōpelu fishing project, Makai Watch, and marine monitoring.

Main Program Activities:

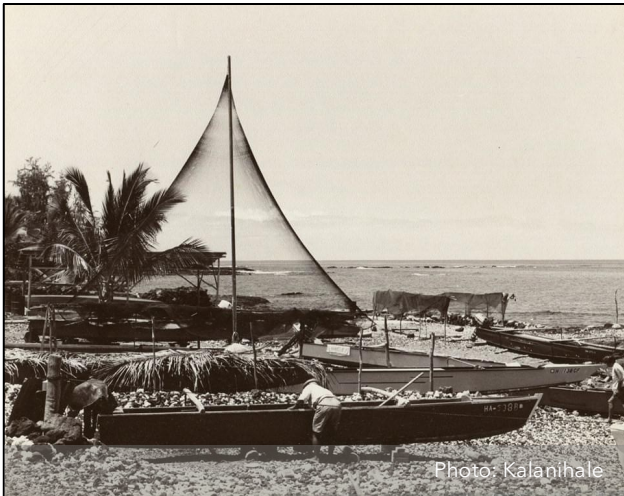
1. Advancing the management plan for the Miloli'i CBSFA.
2. Supporting the completion of the Miloli'i Community Center.
3. Operating the Hīpu'u Virtual Academy of the Kua o Ka Lā New Century Public Charter School.
4. Implementing the Mohala Nā Konohiki program to revitalize traditional Hawaiian monitoring and stewardship in collaboration with CI-Hawai'i.

Organization Membership

The organization includes 'ohana, stewards, and practitioners of Miloli'i and the surrounding communities. As we grew, our membership diversified to include all community residents from 'ōpio to kūpuna. Our organizational leaders have been doing community work for the past thirty years in Miloli'i to perpetuate the culture and practices of this place. We are excited to work together on creating a plan to mālama Miloli'i.

Board of Directors

- President: Ka'imi Kaupiko
- Vice President: Dayna Lupua Mora
- Secretary: Melveen Kawailehua Kaupiko
- Treasurer: Velma Maile Yamanaka



Staff and Contractors

- Gail Garoutte: Project/Financial Account Manager, Miloli'i Resident
- Leivallyn Kaupu: Project Coordinator, 'Ōpelu Project, Miloli'i 'Ohana Member, and Subsistence Lawai'a.
- Laila Kaupu: Project Outreach Specialist, Miloli'i 'Ohana Member & Subsistence Lawai'a
- Levi Kaupu: 'Ōpelu Cultural Practitioner, Miloli'i 'Ohana Member & Subsistence Lawai'a
- Ka'imi Kaupiko: Executive Director, Miloli'i 'Ohana Member & Subsistence Lawai'a
- Donna Kekoa: Project Specialist (Health Outreach), Pāhala Resident
- Healani Cahill: Project Specialist (Hōnaunau Project), Kahuku Resident
- Momi Subiono: Project Support (Hōnaunau Project), Pāpā Lani Resident
- Project Contractors: Melissa Waite-Crawford, William Mae Huihui, Nyles Martinez, Darrell Lopez, Wesley Basinga and Lisa Hua (Mohala nā Konohiki)

See the Administrative Record for additional information on Kalanihale's community consultation efforts in Miloli'i and its extensive outreach efforts, stewardship experience, and letters of support, etc. Visit

<https://www.kalanihale.com/> for more information.



Photo: Pa'a Pono Miloli'i

MILOLI'I CBSFA ~ **3. A Brief History of Miloli'i**

The nearshore ecosystems of the South Kona coasts of Hawai'i island teemed with life and abundance which supported pockets of human settlements over the last 500 years (Pa'a Pono Miloli'i, 1984). Resident oral histories within the larger Kapalilua region offer detailed descriptions of the deep pilina (relationships) between humans and nature, illustrating the intimate nature of connectedness between the 'ōiwi inhabitants of these lands and the 'āina that sustained their existence. These same family stories articulate the inter-community familial relationships that supported the coastal villages along the coastal plain of Kapalilua (Maly & Maly, 2003). Critical kai and uka resources moved through the ahupua'a by families ensuring the survival of community members as well as facilitating the transmission of place-based knowledge that remains a cornerstone of these same communities today.

The village of Miloli'i, commonly referred to as one of the few remaining traditional Hawaiian fishing villages in Hawai'i, is in the ahupua'a (land division) of Miloli'i in the moku (district) of Kona. Historically, Miloli'i was included among a network of interconnected coastal settlements at 'Alikā Bay in the north to Kapu'a Bay in the south.

Numerous archaeological features including house sites, altar stones, and hōlua slides give evidence that these lands supported sizable permanent and semi-permanent establishments

and activities (Pa'a Pono Miloli'i, 1984). Today, Miloli'i is the last permanent settlement of kanaka 'ōiwi from 'Alikā Bay to Kaunā who, like their kūpuna before them, live in sync and are dependent upon and responsible for the stewardship of the marine resources in the area.

Generations of family members lived and traversed between the coastal villages in the Miloli'i area as recently as the mid 1900's. Well established coastal as well as mauka-makai trails facilitated regular movement from permanent house dwellings to seasonal fishing and ocean gathering sites (Maly & Maly, 2003). Movements of families followed the seasonal changes and habits of key harvest (marine and terrestrial) species. This is a well-documented practice across the pae 'āina and was true in the Miloli'i region. Families still living in Miloli'i continue to access critical traditional fishing grounds at the bays of Pāpā, Honomalino, Okoe, and Kapu'a.

A series of lava flows originating from the south flank of Mauna Loa beginning in 1859 and culminating in 1950 influenced the connectivity between the established villages at each of the bays. These eruptions changed the settlement landscape along the coast, but never severed the reciprocal relationship families maintained with that 'āina. The 1926 Mauna Loa Ho'ōpūloa 'a'ā flow moved ominously down to the ocean covering the village at Ho'ōpūloa, adjacent to Miloli'i, on the morning of April 18th, forcing the

MILOLI'I CBSFA ~ 3. A Brief History of Miloli'i

final movement of families to Miloli'i and other upland settlements (Pa'a Pono Miloli'i, 1984). Despite the changes in permanent and semi-permanent settlement status of the Kapalilua flats in the 20th century, area families maintain their stewardship agency of critical marine resources and continue the mālama and harvest practices that sustained them for generations.



Today, Miloli'i is comprised of the historical village site located north of Omoka'a that includes the Hau'oli Kamana'o Congregational Church, one of the largest of the early churches of Kona to be established in the mid 1850's. Additionally the village includes the old village store and school sites, a community open-air hālau, a 1950's era wharf, a boat ramp, and several other historical features.

The more recent village housing was a result of the passage of Act 62 in 1982 by the State Legislature, in which residents were able to negotiate and enter into a long-term residential lease with the state (Pa'a Pono Miloli'i, 2011). The village's roughly 200 residents maintain a strong and distinct relationship with the environment and larger South Kona communities through their traditional and customary fishing practices.

Village residents and community leaders administer the Kua O Ka Lā Miloli'i Hīpu'u Virtual Academy enrolling an average of 40

DOE K-8 students per year. The Miloli'i Community Enrichment and Historical Center is the planned future site for expanded educational, entrepreneurial, and resource management initiatives and provides the necessary physical infrastructure to advance community goals beyond the 21st century.

North of the Miloli'i village and housing phases is the Miloli'i Beach Lots subdivision. This homeowner's subdivision consists of 915 lots stretching from the shoreline to an elevation of approximately 1200 ft. This subdivision is zoned Agriculture, and the properties range from 11,000 sq. ft. to 7,000 sq. ft. (Miloli'i Beach Community website n.d.)

Place Names

Native Hawaiians recognized the importance of names and the life and recognition they would bring to a person or a place (both on the land or in the ocean, like our ko'a or fishing grounds). Names were given to a particular landscape to document a historical event, acknowledge an honored chief, or recognize features, mana, or sources of life in a particular area. The following list of place names identified here document some of the many things that Miloli'i is historically known for.

Miloli'i

Sources (Pukui et al 1974 & Pukui 1983) note the village name of Miloli'i and its literal translation "first twist", as referencing the sennit expertly produced for cordage by fishers and family members used for shoreline and ocean harvesting. Miloli'i has also been known to reference the "small swirling" of the numerous ocean currents that run along the coasts of the village. Pukui also documents the pleasing nature and fighting spirit of early Miloli'i villagers in several 'ōlelo no'eau. Parker also references Miloli'i as the little milo tree.

MILOLI'I CBSFA ~ 3. A Brief History of Miloli'i

Land section and village in South Kona, Hawai'i.

The following list provides some of the important place names that are still currently used. Information on the place names come from various oral histories and accounts provided by Miloli'i 'ohana, ulukau, Pukui, Parker and Place Names of Hawai'i. There are many more names and references used, this list and is not meant to be exhaustive.

Āhole – Āhole Hōlua. Historic site in the ahupua'a of Kapu'a. Best-preserved sled ramp (*hōlua*) in Hawai'i, on the shore of Pu'u Hinahina Bay. The narrow, ski jump-shaped structure is approximately 105 feet long with a 25-foot runway and an 85-foot ramp, both constructed of rocks. Hawaiians covered the surface of the ramp with pili grass and *kukui* nut oil and then rode down it toward the ocean on narrow sleds with hardwood runners; *āhole* sled ramp.

'Ālikā – ahupua'a; dig, thrust

Anapuka – ahupua'a that doesn't reach the shoreline; the ahupua'a of Ho'opūloa surrounds it; gathering place; being in the hole or tunnel.

Helehele keiki – pali or cliff in the ahupua'a of Manukā with a mo'olelo only a few know of.

Honomalino – ahupua'a south of Omoka'a known to be a calm bay

Ho'opūloa – (also spelled Ho'opūloa) – ahupua'a (crown lands) once a thriving village until the April 1926 lava flow covered the village and harbor. It is now housing lots for the relocated families of the lava flow; To lengthen or expanse; put in together [for a] long [time]; (Omokaa and his wife Okoe lived here; any travelers entering their house were put into an oven, where they "stayed together a long time." Finally, Omokaa and Okoe were pushed into a net by Ka-miki and his brother.

They were spared when they promised not to harm travelers again. See Okoe, Omokaa.)

Kalanihale – (also known as Kalanihali) surf break, reef fronting the park; also, an "ili 'āina of Miloli'i

Kāki'o Point – point; on the south end of Kapu'a bay in the 'ili 'āina of Kaupō

Kapukawa'aiki – (also known as Kapukawa'a) islets; rock islands between Miloli'i and Ho'opūloa; the lighthouse is on the shore of these islets.

Kalapili – boundary at shore between Okoe and Kapua (marked by USGS)

Kalihi – 'ili 'āina south of Omoka'a; The edge or border

Kamoi Point – point; in the 'ili 'āina of Kaulanamauna in the moku of Manukā

Kapu'a – ahupua'a; The whistle

Kapulau – point; north end of Honomalino bay

Kaulanamauna – (also known as Red Hill) hill with a cove at its base; Mountain fame

Kaunā – (also known as Lae o Kaunā) point; so named because this point is where the trade winds of Ka'ū give way to the gentle breezes of Kona - Kau-ana-a-ka-makani. Cape in Ka'ū.

Kaupō – 'ili 'āina in the ahupua'a of Kapu'a (referenced back to Kāki'o)

Kīpāhoehoe – ahupua'a; Natural Area Reserve

Lae Loa – point; long point at the shoreline of the ahupua'a called Omoka'a



MILOLI'I CBSFA ~ 3. A Brief History of Miloli'i

Lae o Kamimi – point at the shoreline where the ahupua'a of 'Alika and Kīpāhoehoe meet

Makahiki Point – (also known as Namakahiki) point; Found in the ahupua'a of Pāpā 2,

Manukā – ahupua'a; blundering; Natural Area Reserve

Moku O Kahailani - 2 islands in the water off the shoreline of the ahupua'a of Omoka'a

Nalowale heiau; forgotten [name unknown] located in the ahupua'a of Manukā near the shore.

Nāpōhakuloloa – 2 Stones - Mo'olelo: It was said that Tūtū Pele came to visit a couple and asked for food and water. They turned her away several times and she warned them that something bad was coming. One day they noticed the sky above Mauna Loa turned dark red. They felt the earth tremble. Lava started running down the cliffs of Kapalilua. The couple saw the lava coming down and ran as fast as they could towards the ocean. But they could not outrun Tūtū Pele. She caught up with them and covered them with lava. There were two pinnacles that stuck out of the water creating an arch which represented the couple. Today, only one pinnacle stands.

Niuo'u – coconut grove near the shoreline in the ahupua'a of Kapu'a

Okoe – name of a bay, an ahupua'a, and a murderess in stories of old - see Ho'ōpūloa & Omoka'a.

Omoka'a – ahupua'a; named for the murderer who lived at Ho'ōpūloa. See Ho'ōpūloa & Okoe, his wife, the murderess. .

Pa'akai Point – point in the ahupua'a of Kīpāhoehoe; salt source

Pāpā – Pāpā 1 and Pāpā 2; ahupua'a north of Miloli'i; flat(s), level land.

Pu'u Hinahina Perhaps named for one of the several hinahina plants; bay, beach in the ahupua'a of Kapu'a. Calcareous sand, coral rubble beach at the head of Pu'u Hinahina Bay. Āhole Hōlua, the best-preserved *hōlua* (sled ramp) in Hawai'i, terminates at the beach; hill of the *hinahina* plant.

Pūke'oke'o – (also known as Pōhaku Ke'oke'o) landmark and ko'a (traditional fish aggregation areas) for the 'ohana of Miloli'i and the fishers of this area.

Waikini – stone; 'ili 'āina of Miloli'i; stone known for its supernatural powers of protection.

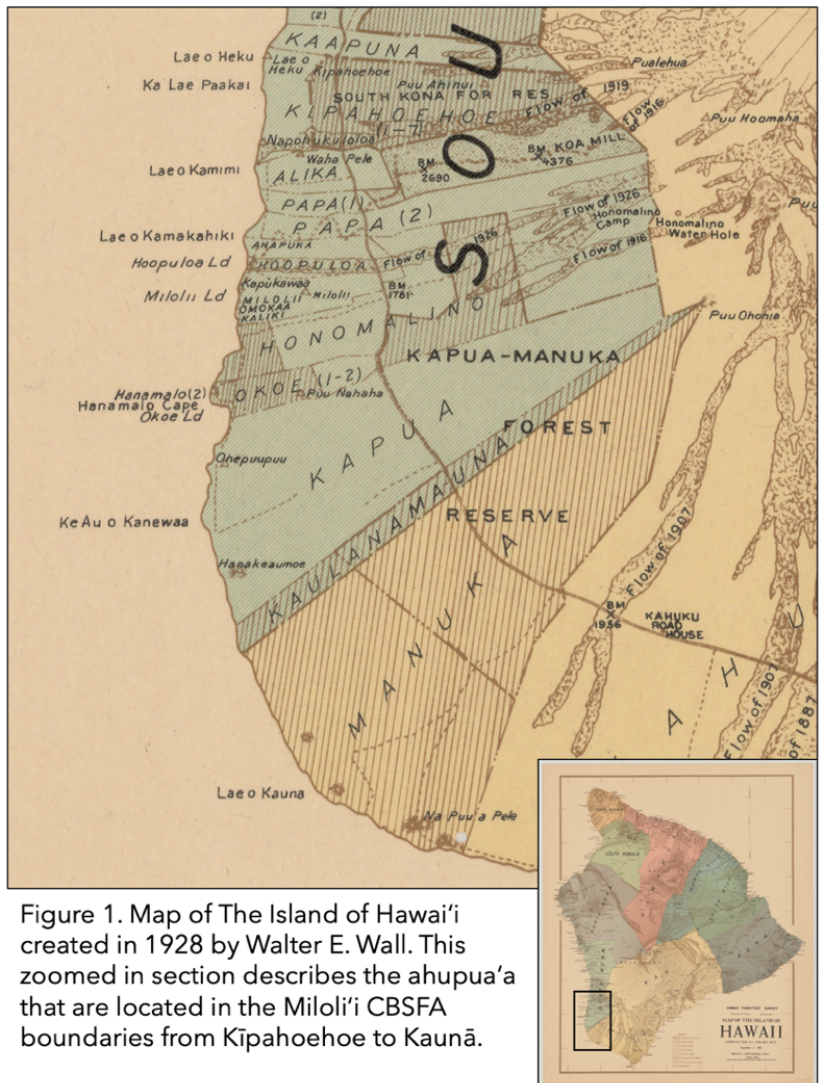


Figure 1. Map of The Island of Hawai'i created in 1928 by Walter E. Wall. This zoomed in section describes the ahupua'a that are located in the Miloli'i CBSFA boundaries from Kīpāhoehoe to Kaunā.



Photo: Kēhau Springer

MILOLI'I CBSFA ~ 4. Nearshore Environment

Miloli'i Nearshore Geography and Habitat

The Miloli'i coastal fishing village is located on a flat lava field with an offshore narrow coral reef. There are three embayments in the immediate vicinity of the Miloli'i village: Ho'ōpūloa Bay, Miloli'i Bay and Omoka'a loko i'a (fishpond). Shoreline features of Miloli'i include a black sand beach at Ho'ōpūloa, gently sloping lava flows that extend into the sea between Ho'ōpūloa and Miloli'i Bay, and shallow exposed lava platform reefs extending from Miloli'i Bay to Omoka'a Bay (Clark, 1985; Pa'a Pono Miloli'i, 1984).

The shoreline and waters adjacent to the Miloli'i Beach Community include Makahiki Point, which is part of the Ho'ōpūloa lava flow, pali (lava cliffs) that stretch from Makahiki point to Pāpā Bay, and an 'ili'ili and small boulder beach located at Pāpā. The abundance and diversity of coral present in Pāpā is extraordinary and the bay is considered one of the healthiest and most critical coral hotspots in the Hawaiian archipelago (Foo et al., 2020). North of Pāpā Bay is 'Alikā Bay which also consists of an 'ili'ili and small boulder coastline. Continuing north of 'Alikā Bay is an 'a'ā lava flow that shapes the cliff coastline with large boulders marking the shoreline. The tall sea cliffs of Nāpohakuloloa north of 'Alikā Bay give way to another small embayment just before the proposed northern boundary of Kīpāhoehoe (Clark, 1985).

South of Miloli'i Bay, additional 'a'ā and pāhoehoe lava flows create a rugged low-lying coastline made up of boulders and short cliffs. Several bays dot the shoreline including Honomalino, Okoe, Kapu'a, Kama'ohe and Manukā. Each of the bays are made up of different shoreline compositions, ranging from black sand, 'ili'ili, small boulder and coral rubble and housed permanent as well as seasonal human settlements up until the 20th century (Clark, 1985).

Common Miloli'i Marine Resources

South Kona is noted for its high coral reef and fish biodiversity (Walsh, 2013). Common nearshore fish species found within Miloli'i include pāku'iku'i, kole, manini, 'ū'ū, uhu, 'ōmilu, ulua, palani, kūmū, nabeta, weke, moi, 'āweoweo. Bottom fish species (ehu, gindai, hāpu'upu'u, kalekale, lehi, onaga, opakapaka, uku) and other common pelagic species (ahi, aku, a'u, mahimahi, ono, 'ōpelu, uku) are also regularly harvested by local fishers. Some of the common invertebrate species found and gathered include 'opihī, limu, 'a'ama, hā'uke'uke, wana, ula, and Kona crab. Some of the common limu species gathered include limu kohu and limu manaua. These are the most common species identified in numerous Miloli'i family interviews but do not include all the fish, invertebrate and limu species harvested.

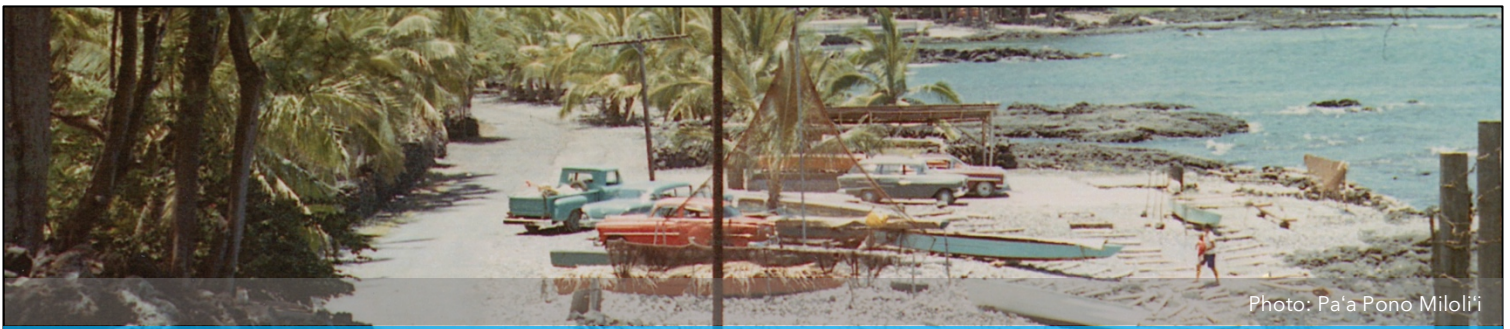


Photo: Pa'a Pono Miloli'i

MILOLI'I CBSFA ~ **5. Traditional & Customary Fisheries Practices**

The resident communities of Miloli'i and adjacent villages south (prior to 1926) remained small but consistent with general fluctuations throughout the 20th century. Fishing and gathering of nearshore and intertidal resources in the Miloli'i area was and continues to be conducted for subsistence, cultural, and religious purposes. Miloli'i residents represented a variety of rural occupations common during the late 19th century and into the 20th, including farmers, general laborers, and church and school-based positions (Pa'a Pono Miloli'i, 1984).

Unique to Miloli'i and other South Kona communities is the documented relatively high number of villagers who noted fishing as their primary occupation. Small scale pelagic commercial gathering was also done, and continues to be conducted, by a limited number of Miloli'i and South Kona community members. Specific fishing traditions have mainly focused on the practice of maintaining and caring for the ko'a and hānai 'ōpelu. These ko'a span the entire coastline from Kīpāhoehoe to Kaunā, where generations of Miloli'i families once resided. These practices have become synonymous with the village and greater South Kona and Kapalilua region and many families still have ko'a that they maintain.

Nearshore and intertidal species harvest also played a critical role in the subsistence

gathering and traditional management practices of Miloli'i. Key traditionally harvested and managed species include 'opihi, limu, 'a'ama, hā'uke'uke, wana, ula, and Kona crab. Traditional and customary fishing practices are important and make up the fabric of our Miloli'i lifestyle. Some examples are listed in Table 1.

In addition to the important species harvested and customary fishing practices, there are other important traditional practices that incorporate the ocean that families continue today. The practice of "kau ka piko ma ka pōhaku piko o kai," placing the umbilical cord of the newborn into a rock located in one of the bays that was designated for the babies of the village (Kaupiko 1999, Kahele 2006). Another tradition of returning a deceased family members ashes to Kanaloa (the ocean) or a specific family ko'a is still practiced today.



Photo: Pa'a Pono Miloli'i

Table 1. Examples of Fishing practices & types of species gathered

This table documents some of the practices that happened in the past with some needing careful consideration due to modern technology to gather, climate change, and land-based pollutions that have an effect on fish populations.

Fishing Practice or Species Gathered	Brief Description
‘Āhele	Gathering of ‘a‘ama crab using a long pole or bamboo pole with a fork coconut midrib attached to the end to snarl the ‘a‘ama
Ahi Ko‘a	Fishing for ahi on the ko‘a using pōhaku (drop stone) or make dog (dropping of a cone bag)
Boat	Fishing of pelagic by trolling and bottom fishing off boats
Diving	Divers gather using 3-prong, arbaletes, spear gun
Lawai‘a Pono ex.	No use of chop-chop on ‘ōpelu ko‘a, no fishing or gathering without permission
Hukihuki	Fishing w/ hook & line off a wa‘a or boat for ‘ū‘ū or ‘āweoweo by jigging up and down.
Hukilau	Ti leaf “net” to create a boundary and another fisher would throw net on fish
Ika Shibi	Ika (squid), Shibi (ahi), a Japanese term used to describe nighttime fishing of ahi using lights to bring up plankton to draw the squid and then the ahi to the surface
Kā‘ili	Bottom fishing using a sinker. Some species gathered are ‘ehu, uku, nabeta, moanakali, hinalea, Weke ‘ula
Lamalama	Use of kukuihelepō to go torching along the shoreline at night under careful consideration of the current condition of the resources.
Paipai	‘ohana participation for a family event
Umu	Care for umu in Omoka‘a pond
Hā‘uke‘uke	Gathering of this intertidal invertebrate for home consumption
‘Oama	Seasonal gathering of ‘oama along the shoreline
‘Ōpelu	‘Ōpelu hoop net off a wa‘a or boat. Care for the ‘ōpelu ko‘a through the practice of hānai and ceremonies. Gathered for drying, eat fresh and for bait for pelagic
‘Opihi	Gathering of this intertidal invertebrate for home consumption and for family & community gatherings
Kona crab	Setting traps for Kona crab. Refer to State regulations.
Limu	Gathering of limu kohu and limu manauea
Pa‘akai	Gathering salt along shoreline
Pāku‘iku‘i	Gathering of pāku‘iku‘i using 3-prong and favorite fish of Miloli‘i ‘ohana.
Ulua	Fished for ulua along the shoreline
Wana	Gathering of wana using hooks and baskets seasonally.



MILOLI'I CBSFA ~ **6. History of Marine Management Actions**

Pa'a Pono Miloli'i (PPM), a grassroots community-based organization, was formed in 1980 to convene community discussions around mālama 'āina activities and stewardship efforts. In 1984, PPM released the Miloli'i-Ho'opūloa Master Plan, a foundational community document, which outlined priority community, housing, and infrastructure development. Included in the plan were critical historical details providing the rationale for natural and cultural resource management including the revitalization of the traditional fisheries, mainly 'ōpelu, of Miloli'i (Pa'a Pono Miloli'i, 1984).

In the early 2000's, Miloli'i family members collaborated with the University of Hawai'i Sea Grant and The Nature Conservancy Hawai'i (TNC) to conduct biological monitoring of the nearshore environment and ocean resources. Sea Grant held nearshore monitoring training workshops focusing on benthic and fish snorkel surveys while TNC conducted scientific diving in 2003 and 2004. In 2003, Kepā Maly conducted extensive interviews with kūpuna from Miloli'i and the greater Kapalilua region to document oral history traditions with a focus on traditional fishing practices (Maly & Maly 2003). Of note in those interviews are numerous references to specific fishing traditions and place names of Miloli'i noted in this plan. In addition to those early collaborative monitoring efforts and the

publication of Maly's extensive work, community leaders also implemented youth development programs that continued the work of documenting Miloli'i oral histories passed down through numerous families specifically on fishing practices.

In 2003, the Miloli'i Makai Watch Program was developed by the community and in partnership with DLNR-DOCARE to conduct coastal fisheries education and outreach to local residents, malihini (visitors) and fishers that came to Miloli'i. That same year the Miloli'i community became involved in the "Managing Better Together Network" later becoming the statewide network E Alu Pū. Community members attended workshops and events facilitated by the network and hosted by communities aiming to share their experiences and lessons on marine stewardship. These gatherings ultimately fueled the community-based management movement that exists today.

In 2005, Miloli'i became the first permanent, legislatively designated Community Based Subsistence Area (CBSFA) in Hawai'i through [Act 232](#). Several years later, DLNR held a series of public meetings with the Miloli'i community to discuss proposed rules for the CBSFA. No fisheries rules, designation boundaries, or management plan were developed for the Miloli'i CBSFA at that time and the community instead shifted their focus

MILOLI'I CBSFA ~ 6. History of Marine Management Actions

towards education, youth, and community development activities.

PPM maintained its focus on youth education and community action through 2011 when they partnered with Conservation International (CI) to hold the first annual Miloli'i Lawai'a 'Ohana Camp. This intergenerational camp brought families from Miloli'i together to share pono fishing traditions and build strong relationships with each other and the various wahi pana along the Miloli'i coastline. Miloli'i just recently celebrated their 11th annual Lawai'a 'Ohana Camp (LOC) and safely and successfully held this community education event in 2020 & 2021 amid the COVID-19 pandemic. A second and complimentary Miloli'i grassroots organization, Kalanihale Foundation, was formed in 2012 to provide access to high-quality and culturally grounded education in Miloli'i. In partnership with Kua O Ka Lā, the Hīpu'u Virtual Academy was established and continues to serve Miloli'i and South Kona youth.



With thriving education efforts in place and growing community interest and participation in marine stewardship activities PPM and Kalanihale expanded their focus to include community-based and co-management actions, including marine monitoring and a process to develop a management plan for the Miloli'i CBSFA. In 2015, community members

gathered to map a way towards achieving their CBSFA goals. This community-driven process included a review of Hawai'i marine management area (MMA) designation types, existing Miloli'i marine resources data, major obstacles, concerns, and possible solutions. Community members agreed that further consultation with Miloli'i families and fishers was necessary to ensure draft rules and management plan objectives accurately reflected the Miloli'i community. Between 2015-2017, Kalanihale conducted 41 interviews with 65 individuals with genealogical ties to Miloli'i, ranging in ages 18-80 years (Appendix 1: Miloli'i Interview Survey Results). Interview results showed the majority of interviewees agreed to a much-needed pono code of conduct through regulation and management for Miloli'i.

With this information in hand, a core management planning hui was formed made up of Miloli'i community members (Kalanihale and PPM) and CI. Facilitated by CI, the hui went through a community-driven marine resource assessment process guided by interview results and constant Miloli'i family and fisher input. The assessment identified target management species, species health status, threats, and possible management solutions. Bi-monthly hui meetings were held in 2017 and 2018 (Appendix 2: Miloli'i Community Stewardship Effort Posters 2015-2018). Based on the assessment, a conceptual model (Appendix 4: Conceptual Model) was developed that provided the information and rationale for moving into the next phase of developing marine management plan objectives and a set of fisheries rules for the Miloli'i CBSFA.

Concurrent to the planning hui activities, Kalanihale and PPM also collaborated with CI, PlanB Consulting, and DLNR-DAR to conduct

MILOLI'I CBSFA ~ 6. History of Marine Management Actions

multiple biological monitoring activities focused on the Miloli'i nearshore, coral, and benthic habitats. Intertidal and in-water fish surveys as well as coral monitoring were conducted in 2016 and 2018 (Appendix 5: Miloli'i Biological Monitoring 2016). Data from these monitoring efforts compiled with other available DAR data have provided a general baseline on the status of the resources prior to the implementation of fisheries rules under the Miloli'i CBSFA.



In addition to contemporary scientific monitoring, apprentices from Miloli'i were invited to participate in the Mohala Nā Konohiki (MNK) training program hosted by CI from 2018 to the present. This experiential learning approach is led by konohiki and lawai'a practitioner, Mac Poepoe from Moloka'i who traveled to Miloli'i for in person quarterly workshops. Since COVID 19, workshops have been held virtually, with activities and "homework" being conducted in between the workshops. Unlike western academic systems, the learning through MNK is scaffolded and not linear. The discussions, lessons and activities build upon the kāhua foundations of mo'okū'auhau, kuleana, reciprocity, and balance. MNK is not a project, it is a lifestyle and kuleana, it is an investment into the next generation of ocean stewards for Hawai'i.

To provide more community outreach on marine resources, the Miloli'i Makai Watch program was reactivated in 2020 following an increase in shoreline access and harvest during the COVID-19 pandemic. A June 2020 community meeting provided updates on the Miloli'i CBSFA also highlighted Makai Watch. Additional Miloli'i community and subdivision residents also participated in DLNR-DAR and DLNR-DOCARE trainings held during the June 2020 meeting. This action led to the official designation and recognition of the Miloli'i Makai Watch program. Additional NOAA trainings on federal regulations and protections relating to marine mammals & protected species has increased the program's capacity to implement meaningful community-driven marine enforcement and education activities.



The documented work and commitment of the Miloli'i family and community members and their marine stewardship efforts since the early 1980s through today display the community's dedication and motivation to actively manage their resources. Miloli'i community leaders have extensive experience in collaborative resource management action and advocacy and community activation and are now prepared to navigate the chapter 91 process.



Photo: Para Pono Miloli'i

MILOLI'I CBSFA ~ 7. Important Uses of Coastal & Marine Resources

HERMAN APO - WALTER AKILO - DAVID KEMPA - EDWARD PAULO - JOHN APO - FRANK PAULO

Miloli'i is well known as one of Hawai'i's last fishing villages, where native Hawaiian families live together and depend on fishing and harvesting of marine resources for food, income, and overall social and cultural well-being. Fishing and gathering marine resources are at the heart of what it means to be a Hawaiian from Miloli'i. The marine and nearshore environments are interwoven into the fabric of the Miloli'i community and influence daily activity in the village. As a result, the health of the ocean is directly related to the health of the people. In particular, 'ōpelu fishing and collection of nearshore invertebrates to include 'opihi and wana are a deep part of the culture and identity of Miloli'i.

The kanaka testimonies revealed key indicators that support the need to better manage Miloli'i's marine resources and as a result justify the development and adoption of this management plan. Key points include:

1. The majority of Miloli'i families interviewed fish regularly in the Miloli'i area. This includes daily for several respondents and several times per week for many others and a minimum of once per month for other respondents. A small number of respondents no longer fished due to their advanced age.
2. Food is the most important subsistence use for Miloli'i's marine resources.

3. Economic livelihood is important to support small scale fishing.

A thriving ocean environment supports numerous important community activities, events, and benefits the broader Hawai'i Island community. Key activities include:

1. Miloli'i Canoe club activities
2. Annual fishing tournaments
3. Keiki holoholo fishing derby
4. Invasive fish species roundup/throwdown
5. 'Ohana Lawai'a Camps
6. 'Ōpelu Project
7. Lā 'Ohana
8. Hau'oli Kamana'o Church
9. County Park activities - Camping, and community events
10. Camping in the bays south of the village
11. Commercial pelagic fishing
12. Launching boats from Miloli'i Boat ramp
13. Kua O Ka Lā - Hīpu'u Virtual Academy project-based learning
14. Nearshore native Hawaiian gardening
15. Youth development and apprenticeship programs - Alu Like
16. Marine monitoring (ASU, CI, MERC)
17. Konohiki monitoring (Mohala Nā Konohiki)
18. Commercial tourism operations using nearshore waters
19. Day visitation to bays south of the village for beaching-going, snorkeling, and fishing.



Photo: Kēhau Springer

MILOLI'I CBSFA ~ 8. Subsistence Resources Targeted, Status, Threats

The lack of site-specific rules to replenish and sustain Miloli'i's marine resources increases the vulnerability of Miloli'i's families and community members. Without good management rules, enforcement, and education, priority resources will continue to decline. In 2015, after five years of delivering successful educational programs and in response to Miloli'i family and community calls to action around marine management, Kalanihale began its community-driven process to develop a marine management plan for the Miloli'i CBSFA.

An in-depth community consultation process began in 2015 to understand community sentiment towards collaborative marine management and to make sure all opinions, perspectives, and information are considered in the development of appropriate rules. Kalanihale conducted "kanaka testimony" interviews with 65 community members representing 50 families to understand their relationship to and perceptions of Miloli'i's marine resources.

Subsistence Resources Targeted for Management:

From the kanaka testimonies conducted in 2015-2017 (Appendix 1 Miloli'i Interview Survey Results), the following species were noted to be some of the most harvested species 'a'ama, ahi, aku, 'āweoweo, coral, goatfish, kole, kūpe'e, limu, manini, 'ōpelu, 'opihi, ono, pāku'iku'i, uhu,

'ū'ū, wana (in alphabetical order). When asked how important fish and other marine resources are to you and your 'ohana, the following words

were used to describe its importance: food, fish, subsistence, survival, resources, culture, village, quality of life, seasonal fishing, income, special occasions, childhood lessons. Like other rural coastal communities, Miloli'i relies heavily on the marine resources for a subsistence lifestyle.

Miloli'i can be regarded as a cultural kīpuka, an oasis of diversity that remains after destruction, "from which native Hawaiian culture" can be regenerated and revitalized in the contemporary setting" (McGregor 1995). For example, in Miloli'i, fishing traditions are interwoven within daily practice and community life. This cultural heritage is sustained by the continuation of this practice of subsistence gathering and reciprocity to allow for the perpetuation of Native Hawaiian cultural identity.

In Miloli'i, daily gathering of marine resources for home consumption is still common, however other mid to large-scale community gathering types that involved marine resource harvest were noted in kanaka testimonies. These included funerals, weddings, baby's first birthday, and graduation parties. Small-scale commercial fishing to support economic livelihood was also noted in the testimonies.

MILOLI'I CBSFA ~ 8. Subsistence Resources Targeted, Status, Threats

Resource Status:

Through kanaka testimonies and biological surveys, the community assessed key fish and invertebrate species, and identified potential threats that hinder their ability to replenish their sustainable numbers.

Kanaka Testimony: Kalanihale undertook detailed interviews with 65 community members from Miloli'i. Ninety seven percent of people interviewed indicated that marine resources were more abundant as compared to 20 years ago and earlier. These declined species include: 'a'ama, āholehole, akule, kole, limu, manini, moanakali, moi, nenu, 'ōpelu, 'opihi, pāku'iku'i, uhu, 'ulua (large), wana, and weke. For some species, such as pāku'iku'i, community members expressed major

concern about observed declines in populations. Marine monitoring over many years has also verified that several species such as pāku'iku'i, uhu, kole, 'ōpelu are less abundant than in the past. Most people interviewed recommended taking management action as soon as possible.

Further in-depth discussions with Miloli'i fishers and other community members identified their perceptions of the status of key species. The status of each of these resources according to community members is summarized in Table 2 below and in the Conceptual Model created by community members, Appendix 4. The most severely depleted fish species in Miloli'i include: pāku'iku'i, 'ōpelu, uhu, and 'ū'ū.

Table 2. Perceptions of the status of key resource species

Species	Status
'A'ama - thin-shelled rock crab (<i>Grapsus tenuicrustatus</i>)	Abundant
Coral	Fair - High live coral cover but some spp. severely impacted by bleaching in 2015 & 2016
Goatfish (need to identify if individual species)	Depleted
Hā'uke'uke - helmet urchin (<i>Colobocentrotus atratus</i>)	Abundant
Kole - (<i>Ctenochaetus strigosus</i>)	Abundant
Limu (native)	Depleted
Manini - convict tang (<i>Acanthurus triostegus</i>)	Abundant
'Ōpelu - mackerel scad (<i>Decapterus macarellus</i>)	Depleted
'Opihi - limpet (<i>Cellana</i> spp.)	Fair - Abundant in some locations, but smaller in size than historically reported
Pāku'iku'i - achilles tang (<i>Acanthurus achilles</i>)	Severely depleted
Uhu - red-lipped: pālupaluka, 'ele'ele (<i>Scarus rubroviolaceus</i>) and spectacled: 'ahu'ula, uliuli (<i>Chlorurus perspicillatus</i>)	Depleted
Ula - spiny lobster (<i>Panularis</i> spp.)	Depleted
'Ū'ū - soldierfish (<i>Myripristis</i> spp.)	Depleted
Wana - sea urchin	Abundant

Biological Surveys:

Intertidal surveys conducted in 2016 & 2018 show a decline in all three species of 'opihi (*cellana spp*) in the proposed pu'uhonua locations and slight increase outside of the pu'uhonua (Appendix 6) More studies will be conducted to note changes in populations over time and at the various locations in the proposed CBSFA.

Biological surveys over several years have shown a steep decline in key fish species. Arizona State University and the Division of Aquatic Resources recently completed a ten-year study of Shallow Water Resource Fish (SWRF) for West Hawai'i from 2008 to 2018. The results show an average 45% decline in reef fish populations for all of West Hawai'i (Foo et al 2020).

"Total reef fish populations in the Miloli'i CBSFA area have declined by 57%, making it the area of worst decline on the west coast"

(SWRF Report Card Appendix 8). These are very strong Western scientific data that clearly demonstrate the timeliness and critical importance of implementing the proposed CBSFA Management Plan and Administrative Rules.



Threats to Subsistence Resources Targeted for Management:

During the interviews with community families undertaken by Kalanihale, community members were asked: "Have you noticed any changes that concern you (mention specific resources)? Why do you think the changes happened?"

Of the 65 kanaka testimonies, 97% noted significant and steep decline of key species for subsistence consumption. These include 'ōpelu, 'opihi, āholehole, uhu, pāku'iku'i, 'a'ama and limu were the top species noted multiple times by interview participants. The following species were also noted: akule, 'oama, kole, lau'ipala, manini, moanakali, moi, nenu, ulua, wana and weke (Appendix 1). It was also noted that 13% of the participants stated that reef fish (in general) has declined and less than 5% of the participants noted a decline in pelagic species (aku and ahi).

These community members, having generational knowledge, correlated cyclical observations and periodic anomalies to identify potential reasons for the decline. These include:

1. Climate Change which has caused the following impacts:
 - Warmer water temperatures changing fish behavior (i.e., 'ōpelu migration behavior affected, they don't come to the ko'a during their normal time, ahi/ono season is longer)
 - Coral bleaching events
 - Seasonal changes affecting spawning (ahi carrying eggs in June 2015).

MILOLI'I CBSFA ~ 8. Subsistence Resources Targeted, Status, Threats

2. Decreases in limu and invertebrate populations, which is often tied to changes in freshwater outflow. Water quality may be a cause for decrease in fish populations
3. Overharvesting of some species such as pāku'iku'i.
4. Additionally, there was significant concern expressed about the impacts of specific types of fishing, including the use of gill nets and the potential for overharvesting using spear guns and aquarium fishing.

Additionally, a team of researchers from Arizona State University and the Division of Aquatic Resources team was able to connect the alarming fish declines to wastewater pollution from land, spearfishing and aquarium collection (in combination). Studies by the State of Hawai'i Pacific Islands Ocean Observing System (PacIOOS) have shown that Miloli'i has a significant problem with land-based sources of sewage effluent. The studies showed that approximately 10,600 gallons per kilometer entered the ocean every day from the Miloli'i Beach Club Association II sub-division, making it one of the top sites on Hawai'i island for sewage effluent. (Appendix 8 Miloli'i Sewage Effluent summary) The Miloli'i Subdivision is reaching a level of sewage outfall that endangers the reef ecosystem of Pāpā Bay, which is located immediately adjacent to the subdivision and is currently one of the most intact reefs on Hawai'i Island.

The proposed fishing regulations and management actions are designed to help address the major threats to the priority species and habitats in the CBSFA.





Goal: Ensure abundant stocks of priority species and high-quality fishing now and in the future for the residents of and visitors to Miloli'i and to reaffirm and perpetuate fishing practices that were traditionally and customarily exercised for Native Hawaiian subsistence, culture, or religion.

The Objectives and Activities are designed to achieve this goal by encouraging pono practices and responsible resource use, directly addressing threats and their root causes, and implementing activities that perpetuate customary sustainable fishing practices.

By reducing these threats and their root causes, this Management Plan will provide ecosystems and resources with the opportunity to recover and sustain abundance, which will in turn greatly benefit the people of Miloli'i and Hawai'i.

This management plan has seven objectives:

- 1. Objective One: Responsible and respectful fishing practices and cultural resource use are consistently practiced within the CBSFA**
- 2. Objective Two: The Miloli'i CBSFA is an environment that hosts training of traditional and customary fishing**

practices to new generations of practitioners, residents, and visitors.

- 3. Objective Three: Increased support for the CBSFA as a result of raising awareness of outcomes and benefits that the CBSFA creates for people, ecosystems, and sustainable fisheries.**
- 4. Objective Four: Integrated contemporary and traditional Hawaiian (konohiki) monitoring provides an ongoing understanding of the abundance and condition of priority marine resources.**
- 5. Objective Five: Community-based subsistence fishing regulations are developed and adopted with a focus on perpetuating traditional & customary practice, increasing abundance of fish stocks, improving ecosystem condition, and encouraging sustainable harvesting.**
- 6. Objective Six: Increased compliance with the CBSFA regulations and decreased violations as a result of targeted outreach and enforcement action when needed.**
- 7. Objective Seven: Understand and develop programs to address land-based sources of pollution that are impacting the nearshore marine environment in Miloli'i.**

Key Activities by Objective:

1. Objective One: Responsible and respectful fishing practices and cultural resource use are consistently practiced within the CBSFA.

Ideally, fishers and users of ocean resources in Miloli'i will follow responsible and respectful fishing and resource use practices. These practices compliment the resource rules that are proposed by this Management Plan but can and should be pursued prior to passage of these rules to help ensure sustainability. These lawai'a pono practices include taking only what you need, never damaging coral or other key habitats, following traditional wisdom and practices in terms of when to fish for certain species, and many others. This is the best-case scenario - that people take it upon themselves to care for the vital resources of this important area.

Activities to achieve this objective include:

- a. Document traditional approaches that the people of Miloli'i and South Kona used to maintain abundance of key species and the health of their habitats. Compilation of lawai'a, kūpuna stories and accounts of traditional practices. Can be video, audio or written.
- b. Compile a set of pono practices that reflect the Hawaiian values of mālama 'āina and are specific to the traditional ways that the people of Miloli'i maintained abundance.
- c. Provide learning opportunities and workshops for teaching traditional and pono practices that promote stewardship of the CBSFA. Possible events to be shared at: Lawai'a 'Ohana Camps, Mohala Nā Konohiki, Annual Lā 'Ohana, etc. (linked with 3d).
- d. Integrate instruction on pono practices and how to provide outreach on these practices

into the Miloli'i Makai Watch Program (which is discussed in detail below under Objective Six).

2. Objective Two: The Miloli'i CBSFA is an environment that hosts training of traditional and customary fishing practices to new generations of practitioners, residents, and visitors.

Miloli'i is a fishing community that places significant importance on its fishing traditions. Many community members believe that one of the reasons that populations of key fish have declined is because of a decline in active practice of traditional fishing approaches that emphasized sustainability. Historically, people from Miloli'i observed the abundance and behavior of key species and fished accordingly. This included restricting fishing of key species during important life history stages, especially during the height of the spawning season for each species and before individuals of each species are large enough to reproduce.



Photo: Matt Ramsey

Traditionally, families and communities transferred knowledge of responsible fishing and resource management between generations by actively fishing and harvesting together. Young people learned by observing their elders over the course of years or decades. Unfortunately, decades of cultural suppression and changes in contemporary

community life, including the need to earn income and attend school, have greatly reduced this intergenerational transfer of knowledge and practice. However, the Miloli'i community still greatly values this knowledge and is actively working to revitalize intergenerational teaching. The community has and will continue to actively develop and offer programs for instruction on traditional responsible fishing and management methods. These activities are summarized below.

Activities to achieve this objective include:

- a. Host annual Lawai'a 'Ohana Camps that promote intergenerational knowledge exchange and celebrate the fishing traditions of Hawaiian communities. The program started in 2010 and camps have been hosted over several years by sixteen Hawaiian fishing communities. Miloli'i has hosted a camp every year since 2010 and will continue to host these camps in coming years.
- b. Promote other opportunities to learn traditional fishing through the year by having outreach booths at local fishing events, tournaments, competitions, and community celebrations as a way to survey and update participants about the Miloli'i CBSFA.
- c. Promote traditional 'ōpelu fishing practices that is central to the culture of Miloli'i and was traditionally practiced promoting sustainability by including it in formal instruction programs.
- d. Integrate intergenerational traditional fishing education into school and extracurricular activities and will continue to be taught both in class and through experiential 'āina-based learning opportunities. (Overlaps with 3e).
- e. Work with Uncle Mac Poepoe & Conservation International Hawai'i to teach konohiki practices of kilo (observation &

monitoring) and mālama (management approaches and principles) and share with community families and area youth to help them understand the cultural basis for traditional sustainable fishing practices. (Which is discussed in detail below under Objective Four)

3. Objective Three Increased support for the CBSFA as a result of raising awareness of outcomes and benefits that the CBSFA creates for people, ecosystems, and sustainable fisheries.

Long-term success in management is dependent on community members and other stakeholders being satisfied with the results of the management effort. This satisfaction can be realized through a combination of factors including success in reducing threats and building abundance and ecosystem health, community pride in management progress and success, and direct benefit to fisheries and families from increased abundance and catch.

Activities to achieve this objective include:

- a. Create and place both official and unofficial signage throughout the Miloli'i CBSFA boundaries to raise awareness of the regulations, pono practices, and the traditional place names and key features of the CBSFA area.
- b. Conduct Media announcements both when the management plans and regulations are officially adopted by the State and periodically, especially if violations are observed.
- c. Hold monthly individual consultations and talk story activities with residents and visitors to help ensure that all people living in and visiting Miloli'i know about the regulations, pono fishing recommendations, and how

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

the Miloli'i CBSFA will benefit residents and visitors to Miloli'i.

- d. Presentations, activities, signage, and outreach materials created to be shared at events: Lawai'a 'Ohana Camps, Mohala Nā Konohiki, Annual Lā 'Ohana, etc. (overlaps with 1c).
- e. Provide educational material and instruction about the Miloli'i CBSFA, its rules, and its cultural and environmental importance through key educational programs including: the Hīpu'u Virtual Academy of the Kua o Ka Lā Hawaiian Charter School in the community, Miloli'i Community Center events and Hawai'i Department of Education schools in the region.
- f. Host annual community meeting to seek community input, review the benefits that are being received and adaptively manage any activities to help ensure that people remain supportive of the CBSFA.
- g. Sustainably share fish and other culturally important subsistence species harvested in the CBSFA (following all regulations and pono practices) to kūpuna and other community members.

4. Objective Four: Integrated contemporary and traditional Hawaiian (Konohiki) monitoring provides an ongoing understanding of the abundance and condition of priority marine resources.

It is critical to monitor the abundance and condition of key resources and ecosystems to understand if the regulations and actions of the CBSFA are adequately protecting these critical resources. Monitoring provides the foundational knowledge for adaptive management to help ensure that the CBSFA is as effective as possible. This monitoring will include a combination of community-based monitoring of key resources using both

contemporary approaches and traditional Hawaiian observational approaches. It will also include periodic monitoring by the Division of Aquatic Resources. Additionally, the community will develop a research plan to identify priority research topics that it would like to pursue, including with the assistance of the State, Universities, and independent researchers.



Activities to achieve this objective include:

- a. Conduct semi-annual community-based biological monitoring of coral, fish, and marine and coastal invertebrates annually.
- b. Continue konohiki monitoring twice monthly (March- June) and periodically throughout the year to gather data and samples to support MNK monitoring using traditional Hawaiian observation systems under the Mohala Nā Konohiki Program (see Appendix 10 for more information).
- c. Support DAR with co-developing a sample design for periodic scientific monitoring conducted by the Division of Aquatic Resources (DAR)
- d. Finalize Guiding Principles for research document for researchers to follow (See appendix 13 for draft outline).
- e. Develop a community-based Research Plan to prioritize key research needed to support community stewardship of the CBSFA (in cooperation with the State).
- f. Encourage and support applied research by independent labs and University-based

scientists with a focus on the needs of the community and State (as expressed in the Community Research Plan) to understand and track changes in the CBSFA.

5. Objective Five: Community-based subsistence fishing regulations are developed and approved with a focus on perpetuating traditional & customary practice, increasing abundance of fish stocks, improving ecosystem condition, and encouraging sustainable harvesting.

The regulations that are proposed in this Management Plan were developed over several years using a combination of kama'āina testimony, local knowledge and fisher recommendations and the best available scientific guidance. These critical sources of information were integrated to develop proposed regulations that provide the best probability for population recovery and maintenance based on the life history of important species. They also deeply consider the needs of local fishers for consistent and abundant subsistence fishing. The regulations consider key factors such as the size of first reproduction for priority species, habitat needs and preferences for priority species, seasonal patterns in spawning and behavior, and community traditions and preferences for when and how to harvest key species. Consideration of these factors provide a balanced set of regulations that are designed to improve or maintain populations of key species and habitat conditions, while providing for active subsistence harvest.

Activities to achieve this objective include:

- a. Provide outreach and awareness on the draft regulations including the rationale for them with a focus on biological, cultural, and social considerations. Information

disseminated about how the regulations, if effectively implemented, should improve the abundance of key species and conditions of key ecosystems.

- b. Review and adapt proposed regulations based on stakeholder and public consultants and new biological knowledge as they become available.
- c. Support the State of Hawai'i as needed as the proposed regulations are translated into official rule language.
- d. During the Chapter 91 Administrative Rules development process, provide the state, stakeholders and the public with information and clarification on the rules, the reasons for them.



6. Objective Six: Increased compliance with the CBSFA regulations and decreased violations as a result of targeted outreach and enforcement action when needed.

For the CBSFA to be successful, people will need to comply with the regulations fully and, as possible, follow additional pono practices. To help ensure this, the community and our partners will focus on outreach to help people understand why the regulations and pono practices are important to the people of Miloli'i and Hawai'i and how they will benefit them in the long run. This will be done through several

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

means including several events and educational opportunities covered under Objective Three and through targeted programs like Makai Watch, which is explained below. Additionally, there will be situations where people will choose not to comply with the regulations and enforcement will be needed. In these cases, the community will work directly with the Division of Conservation and Resource Enforcement (DOCARE) to encourage enforcement surveillance and action.

Activities to achieve this objective include:

- a. Take proactive steps to encourage compliance and prevent violations before they happen. Consultations with families to help them understand the regulations especially in times of the year when it is likely that there will be a high level of resource harvesting for events.
- b. Implement a Makai Watch program at Miloli'i, by providing community members with periodic observation and reporting training on the rules and how to recognize if a violation is taking place. The individuals can then report to active Makai Watch members, who in turn can take action, including calling DOCARE when violations are happening. The Miloli'i community has long implemented Makai Watch, starting as early as 2002. However, at certain times the program has been more or less active. The intent with the passing of the rules package and management plan for the CBSFA is that Makai Watch implementation will be consistent in coming months and years. One approach that can be effective is to provide all community members with periodic observation and reporting training on the rules and how to recognize if a violation is taking place. The individuals can then report to active Makai Watch members, who in turn
- c. Track violations within all regions of the CBSFA as part of the Makai Watch Program. A key to understanding if the CBSFA rules are being followed is tracking the occurrence of violations. This will help to understand the significance and severity of violations and any additional actions that are needed to address them.



Photo: Greg Asner

7. Objective Seven: Understand and develop programs to address land-based sources of pollution that are impacting the nearshore marine environment in Miloli'i.

Recent studies by the State of Hawai'i PaclOOS have shown that Miloli'i has a significant problem with land-based sources of sewage effluent. The studies showed that approximately 10,600 gallons per kilometer entered the ocean every day from the Miloli'i Beach Club Association II sub-division, making it one of the top sites on Hawai'i island for sewage effluent. Compared to neighboring sites of Miloli'i Village (2,880 gal/day) and

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Honomalino (350 gal/day), the Miloli'i Subdivision is reaching a level of sewage outfall that endangers the reef ecosystem of Pāpā Bay, which is located immediately adjacent to the subdivision. This is particularly alarming since Pāpā Bay currently has one of most intact reef systems on Hawai'i Island. The solutions to this problem are likely to require action by the county to require homes to replace cesspools with septic systems and upgrade septic systems that are not up to current standards for control of effluent. In the time before these systematic changes in the sewage system can be accomplished, there are some actions that residents of the sub-division can take to help reduce the impact from sewage. These include not disposing of chemicals in the waste stream, using only non-toxic detergents and cleaners, pumping out septic tanks regularly to avoid excessive effluent, and voluntarily changing cesspools to septic tanks. Fortunately, there are Hawai'i State financial programs to help support changing to septic tanks.

Activities to achieve this objective include:

It is important to note that given the relatively recent effort to better understand the potential impacts of land-based pollution, additional actions may need to be developed over time:

- a. Conduct additional studies on land-based sewage effluent and other land-based sources of pollution if determined to be needed.
- b. Develop a strategy, working with the County of Hawai'i and the State to address land-based sewage and other pollutants.
- c. Work with government and private funding agencies to significantly advance a transition from cesspools to efficient septic systems.
- d. Pursue other key & innovative interventions as identified in the strategy development process.



Photo: Greg Asner

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Objective 1: Responsible and respectful fishing practices and cultural resource use are consistently practiced within the CBSFA				Total Approx Cost: \$16,000
Activity	Outcome	Who	When	Approx. Cost
Activity a: Document traditional approaches that the people of Miloli'i and South Kona used to maintain abundance of key species and the health of their habitats. Compilation of lawai'a, kūpuna stories and accounts of traditional practices. Can be video, audio or written.	Knowledge of traditional fishing and resource management practices unique to Miloli'i is passed on to future generations and are incorporated into contemporary approaches.	C, P	Sep-22	\$ 5,000.00
Activity b: Compile a set of pono practices that reflect the Hawaiian values of mālama 'āina and are specific to the traditional ways that the people of Miloli'i maintained abundance.	Compilation of pono practices that can be used for outreach as posters, handouts, stickers, etc.	C, P	Sep-22	\$ 3,000.00
Activity c: Provide learning opportunities and workshops for teaching traditional and pono practices that promote stewardship of the CBSFA. Possible events to be shared at: Lawai'a 'Ohana Camps, Mōhala Nā Konohiki, Annual Lā 'Ohana, etc. (linked with 3d).	Widespread knowledge and use of pono fishing practices in Miloli'i by community members and visitors resulting in greater marine resource abundance in Miloli'i.	C	Up to 3x / per year	\$5,000 / per year
Activity d. Integrate instruction on pono practices and how to provide outreach on these practices into the Miloli'i Makai Watch Program (which is discussed in detail below under Objective Six).	Increased knowledge and implementation of pono fishing practices by community members and visitors through the Miloli'i Makai Watch Program resulting in greater marine resource abundance in Miloli'i.	C, P	Nov-22	\$3,000 / per year

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Objective 2: The Miloli'i CBSFA is an environment that hosts training of traditional and customary fishing practices to new generations of practitioners, residents and visitors.				Total Approx Cost: \$28,000/yr
Activity	Outcome	Who	When	Approx Cost
Activity a: Host annual Lawai'a 'Ohana Camps that promote intergenerational knowledge exchange and celebrate the fishing traditions of Hawaiian communities.	Traditional and family fishing practices and pono values are passed down and critical cultural knowledge on resource stewardship ensures healthy marine systems for future generations.	C, P	Every summer	\$7,000 / per year
Activity b: Promote other opportunities to learn traditional fishing through the year by having outreach booths at local fishing events, tournaments, competitions, and community celebrations as a way to survey and update participants about the Miloli'i CBSFA.	Increased knowledge and use of traditional fishing practices by Miloli'i community members and visitors via multiple pono fishing events held throughout the year.	C	Up to 3x / year	\$3,000 / per year
Activity c: Promote traditional 'ōpelu fishing practices that is central to the culture of Miloli'i and was traditionally practiced to promote sustainability by including it in formal instruction programs.	Individuals and communities outside of Miloli'i are knowledgeable and supportive of traditional 'ōpelu fishing practices in West Hawai'i.	C	Up to 3x / year	\$3,000 / per year
Activity d. Integrate intergenerational traditional fishing education into school and extracurricular activities and will continue to be taught both in class and through experiential 'āina-based learning opportunities. (overlaps with 3e).	Increased K-12 student exposure to Hawaiian culture-based curriculum, specifically around traditional fishing practices. Students are able to articulate a pride of self and place relevant to their learning experiences.	C, P	Up to 9x / year	\$5,000 / per year

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Activity e. Work with Uncle Mac Poepoe & Conservation International Hawai'i to teach konohiki practices of kilo (observation & monitoring) and mālama (management approaches and principles) and share with community families and area youth to help them understand the cultural basis for traditional sustainable fishing practices. (which is discussed in detail below under Objective four)	Family and community members understand the cultural foundations of sustainable fishing within Miloli'i through their experience in the Mōhala Nā Konohiki program. Grow Miloli'i konohiki apprentice team by 1 every 2 years.	C, P	Up to 9x / year	\$10,000 / per year
Objective 3. Increased support for the CBSFA as a result of raising awareness of outcomes and benefits that the CBSFA creates for people, ecosystems and sustainable fisheries.				Total Approx Cost: \$25,500/yr
Activity	Outcome	Who	When	Approx Cost
Activity a: Create and place both official and unofficial signage throughout the Miloli'i CBSFA boundaries to raise awareness of the regulations, pono practices, and the traditional place names and key features of the CBSFA area.	Low number of violations due to the Increased knowledge of Miloli'i CBSFA regulations and pono practices	C, S, P	summer 2022	\$10,000
Activity b: Conduct Media announcements both when the management plans and regulations are officially approved by the State and periodically, especially if violations are observed.	Low number of violations due to the Increased knowledge of Miloli'i CBSFA regulations and pono practices and broad and increased knowledge of the Miloli'i CBSFA supports other community-based management efforts across the state.	C, S, P	when approved	\$500

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Activity c: Hold monthly individual consultations and talk story activities with residents and visitors to help ensure that all people living in and visiting Miloli'i know about the regulations, pono fishing recommendations, and how the Miloli'i CBSFA will benefit residents and visitors to Miloli'i.	Miloli'i family and community members are invested in and support the maintenance of the Miloli'i CBSFA.	C, S, P	Monthly	\$12,000 / per year
Activity d. Presentations, activities, signage and outreach materials created to be shared at events: Lawai'a 'Ohana Camps, Mōhala Nā Konohiki, Annual Lā 'Ohana, etc. (overlaps with 1c).	Widespread knowledge of and compliance with CBSFA rules and active use of pono fishing practices in Miloli'i by community members and visitors.	C	Up to 3x / per year	Already in budget 1c
Activity e. Provide educational material and instruction about the Miloli'i CBSFA, its rules, and its cultural and environmental importance through key educational programs including: the Hīpu'u Virtual Academy of the Kua o Ka La New Century Charter School,, Miloli'i Community Center events and Hawai'i Department of Education schools in the region. (overlaps with 2d).	Increased K-12 student exposure to Hawaiian culture-based curriculum, specifically around traditional fishing practices and integrated (traditional and contemporary) management approaches. Students are able to articulate a pride of self and place relevant to their learning experiences.	C, S, P	Up to 9x / year	Already in budget 2d
Activity f: Host annual community meeting to seek community input, review the benefits that are being received and adaptively manage any activities to help ensure that people remain supportive of the CBSFA.	The Miloli'i CBSFA is a successful and adaptive management effort that reflects the needs and interests of family and community members.	C, S, P	1-2 per year	\$1,000 / per year

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Activity g. Sustainably share fish and other culturally important subsistence species harvested in the CBSFA to kupuna and other community members.	Family and community members maintain their connections to Miloli'i fishing traditions and the marine resources that support them and benefit directly from the CBSFA .	C	1	\$2,000 / per year
Objective 4. Integrated contemporary and traditional Hawaiian (konohiki) monitoring provides an ongoing understanding of the abundance and condition of priority marine resources.				Total Approx Cost: \$18,500
Activity	Outcome	Who	When	Approx Cost
Activity a: Conduct semi-annual community-based biological monitoring of coral, fish, and marine and coastal invertebrates annually.	Adaptive management actions are taken within the Miloli'i CBSFA and informed by real time data collected by community members and partners.	C, P	2x / per year	\$3,000 / per year
Activity b: Continue konohiki monitoring twice monthly (March- June) and periodically throughout the year to gather data and samples to support MNK monitoring using traditional Hawaiian observation systems under the Mōhala Nā Konohiki Program (see Appendix 10 for more information).	Adaptive management actions are taken within the Miloli'i CBSFA and informed by real time data collected by community members and partners.	C, P	Up to 8x / per year	\$10,000 / per year
Activity c: Support DAR with co-developing a sample design for periodic scientific monitoring conducted by the Division of Aquatic Resources (DAR)	Adaptive management actions are taken within the Miloli'i CBSFA and informed by real time data collected by community members and partners.	C, S, P	1-2x per year	\$1,000 / per year
Activity d: Finalize Guiding Principles for research document for researchers to follow (See appendix 13 for draft outline).	Research efforts and partnerships within the Miloli'i CBSFA reflect the values and principles of the community and research products support the goals of the Miloli'i CBSFA.	C, P	As needed	\$500 / per year

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Activity e. Develop a Community-based Research Plan to prioritize key research needed to support community stewardship of the CBSFA (in cooperation with the State).	Research efforts and partnerships within the Miloli'i CBSFA reflect the values and principles of the community and research products support the goals of the Miloli'i CBSFA.	C, S, P	Dec-22	\$3,000
Activity f: Encourage and support applied research by independent labs and University-based scientists with a focus on the needs of the community and State (as expressed in the Community Research Plan) to understand and track changes in the CBSFA.	Research efforts and partnerships within the Miloli'i CBSFA reflect the values and principles of the community and research products support the goals of the Miloli'i CBSFA.	C, S, P	As needed	\$1,000 / per year

Objective 5. Community-based subsistence fishing regulations are developed and approved with a focus on perpetuating traditional & customary practice, increasing abundance of fish stocks, improving ecosystem condition, and encouraging sustainable and productive fishing.	Total Approx Cost: \$16,000
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Activity	Outcome	Who	When	Approx Cost
Activity a: Provide outreach and awareness on the draft regulations including the rationale for them with a focus on biological, cultural and social considerations. Information disseminated about how the regulations, if effectively implemented, should improve the abundance of key species and conditions of key ecosystems.	Community members and stakeholders are informed of proposed Miloli'i CBSFA regulations and participate in the feedback and review process. Community members and stakeholders form a supportive opinion of the effort.	C, P	On going	\$5,000 / per year
Activity b: Review and adapt proposed regulations based on stakeholder and public consultants and new biological knowledge as they become available.	Miloli'i CBSFA draft regulations reflect the suggestions and concerns of family and community members and additional stakeholders and the best available scientific information.	C, P	Sep-21	\$5,000 / per year

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Activity c: Support the State of Hawai'i as needed as the proposed regulations are translated into official rule language.	The Miloli'i CBSFA proposed rules are translated into the required legal and administrative rules language.	C, S	Dec-21	\$1,000
Activity d: During the Chapter 91 Administrative Rules development process, provide the state, stakeholders and the public with information and clarification on the rules, the reasons for them.	Community members and stakeholders are informed of proposed Miloli'i CBSFA regulations and participate in the feedback and review process. Community members and stakeholders form a supportive opinion of the effort.	C, S, P	Dec-21	\$5,000 / per year
Objective 6. Increased compliance with the CBSFA regulations and decreased violations as a result of targeted outreach and enforcement action when needed.				Total Approx Cost: \$11,000
Activity	Outcome	Who	When	Approx Cost
Activity a: Take proactive steps to encourage compliance and prevent violations before they happen. Consultations with families to help them understand the regulations especially in times of the year when it is likely that there will be a high level of resource harvesting for events.	Within 6 months of acceptance of rules 90% compliance and pono practices exhibited through social encouragement by community members for others to comply with the rules and pono practices.	C	On Going	\$1,000 / per year
Activity b: Implement a Makai Watch program at Miloli'i, by providing community members with periodic observation and reporting training on the rules and how to recognize if a violation is taking place. The individuals can then report to active Makai Watch members, who in turn can take action, including calling DOCARE when violations are happening.	Established Makai Watch program with strong relationship with DOCARE. Periodic joint patrolling efforts with DOCARE to demonstrate that the CBSFA rules are being enforced. Community members participate in a robust Miloli'i Makai Watch program	C, S, P	On Going	\$5,000 / per year

MILOLI'I CBSFA ~ 9. Management Plan Goal, Objectives & Activities

Activity c: Track violations within all regions of the CBSFA as part of the Makai Watch Program. A key to understanding if the CBSFA rules are being followed is tracking the occurrence of violations.	Violations tracked every quarter in a systematic way to understand the significance and severity of violations and any additional actions that are needed to address them.	C, S, P	On Going	\$5,000 / per year
Objective 7: Understand and develop programs to address land-based sources of pollution that are impacting the nearshore marine environment in Miloli'i.				Total Approx. Cost: \$45,000
Activity	Outcome	Who	When	Approx. Cost
Activity a: Conduct additional studies on land-based sewage effluent and other land-based sources of pollution if determined to be needed.	Increased knowledge of land-based pollutions sources and impacts to critical marine resources. Management and/or mitigation strategies are informed by empirical data.	P	Mar-22	\$ 10,000
Activity b: Develop a strategy, working with the County of Hawai'i and the State to address land-based sewage and other pollutants.	Community, County, and State stakeholders and management agencies agree on solutions to address existing pollution and prevent future sources.	C, S, P	Jun-23	\$ 10,000
Activity c: Work with government and private funding agencies to significantly advance a transition from cesspools to efficient septic systems.	Updated solid waste and wastewater systems are installed as many buildings as possible within the Miloli'i CBSFA boundaries, with a goal for complete transition by 2025.	C, S, P	Dec-23	\$ 5,000
Activity d: Pursue other key & innovative interventions as identified in the strategy development process.	Additional innovative land-based pollution interventions contribute to marine abundance within the Miloli'i CBSFA.	C, S, P	Jun-23	\$ 20,000



These regulations have been designed based on kanaka testimony, best available science, and life history information (see Appendices 10 & 11) of priority species to enhance fishing for this and future generations by:

- Allowing fishing in all areas of the Miloli'i CBSFA. There are no full, no-take areas in the proposal.
- Managing the types of fishing to limit fishing approaches that can tend to overharvest or take fish that are not yet large enough to reproduce.
- Providing for the best opportunity for key habitats and populations of important species to recover and remain in good condition.

The Miloli'i community is proud that we have developed a set of regulations that will allow both residents and visitors to continue fishing in all areas of the CBSFA but at that same time will help reduce overfishing that has contributed to declines in populations of key species that are critical to the culture and socioeconomic well-being of all of Hawai'i's residents and visitors.

Boundaries for the CBSFA

The proposed boundaries for the Miloli'i CBSFA are from Pa'akai Point, Kipāhoehoe in the north to Kaunā Point, Manukā in the south approximately 14.98 miles or 12.48 sq. Miles and to a depth of 100 fathoms. The proposed boundaries cover the traditional, nearshore, fishing area of the Miloli'i community and includes all reefs and 'ōpelu ko'a which are important for subsistence fishing and to the cultural practices of the community.

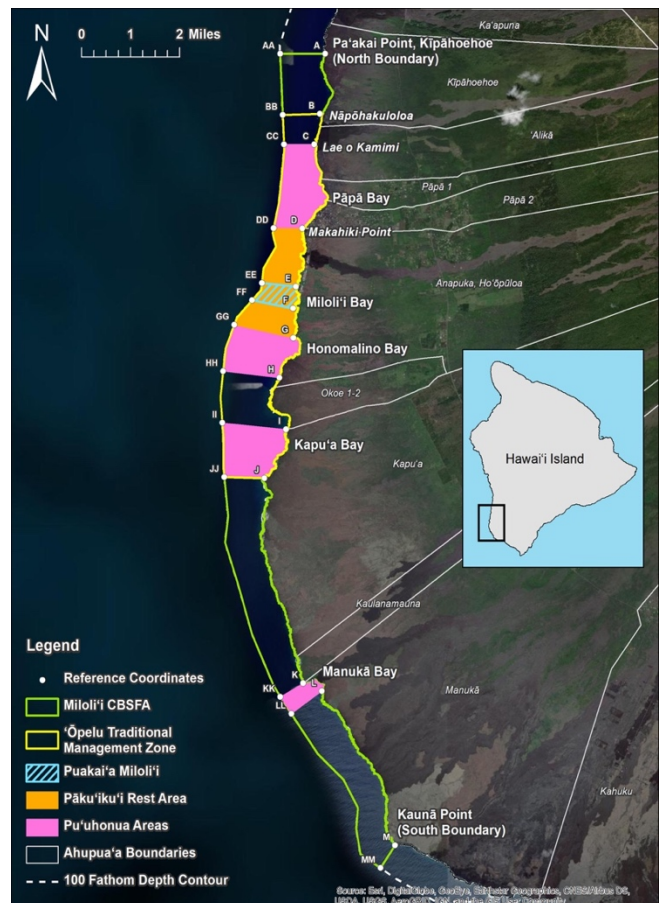


Figure 2. Map of the entire boundary of the proposed Miloli'i CBSFA.

Proposed Zones

Pu'uhonua:

Also known as rest zones to replenish fish populations, pu'uhonua are distributed along the coast to allow populations of key species to grow in abundance and spill over to other areas to support abundant fishing catches.

In these areas the following will be allowed:

- Fish with throw net and scoop net from shore;
- Fish with hook-and-line from shore or from a vessel; and
- Fish with 3-prong

In these areas, the following will not be allowed:

- No take of 'opihi of all 3 species; and
- No use of fishing gear other than throw net and scoop net from shore and hook and line from shore or from a vessel
- No fishing using speargun or arbaletes; and
- No use of gill or cross net

The four proposed Pu'uhonua are:

- **Pu'uhonua Pāpā:** From Lae o Kamimi to Makahiki Point
Approx. 1.60 miles or 1.18 sq. miles
- **Pu'uhonua Honomalino:** From Kapulau to Pūke'oke'o
Approx. 0.80 miles or 1.04 sq. miles
- **Pu'uhonua Kapu'a:** From Kalapili to Kāki'o Point (Kaupō)
Approx. 1.01 miles or 1.07 sq. miles
- **Pu'uhonua Manukā:** From Kamo'i Point to South Manukā Bay
Approx. 0.39 miles or 0.25 sq. miles

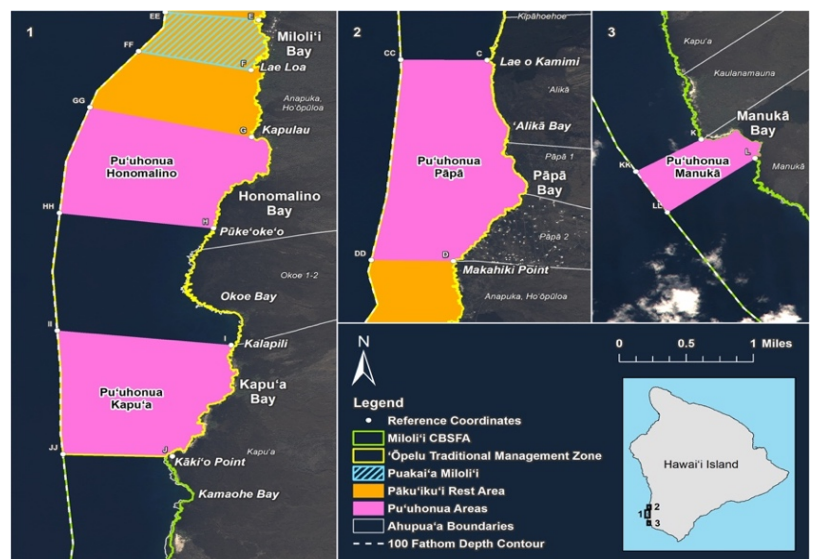


Figure 3. Map of the four proposed Pu'uhonua located in the Miloli'i CBSFA.

Rationale for Pu'uhonua:

1. Of the 65 kanaka testimonies, 97% noted significant and steep decline in populations of nearshore marine species that are important for subsistence consumption.
2. Zones that reduce the number of fish caught by restricting the gear that is used, such as the proposed pu'uhonua, have been shown to replenish populations of important species resulting in larval, adult, and young fish spilling over into adjacent areas to support good fishing outside the zones (Stamoulis 2012,).
3. The species of concern to the Miloli'i community, including food fish that are important for subsistence purposes and according to community member testimony have lower populations now than they did in the past, are found within the proposed pu'uhonua. These include: pākū'iku'i, kole, and uhu. For some species the proposed pu'uhonua areas are particularly good habitats, providing a likelihood that the populations of these species will grow within the pu'uhonua zones providing larval and adult spill over to support fishing outside the zones (Stamoulis 2012).

MILOLI'I CBSFA ~ 10. Proposed Boundaries & Regulations

- Given how important fishing is to local families and Hawai'i residents, the proposed pu'uhonua zones allow low impact fishing (throw netting and scoop netting from shore, hook and line and 3-prong fishing from shore and from vessels).
- This region is known for their surface slicks, and each of these pu'uhonua have documented slicks that are known to be pelagic nurseries for diverse ocean fauna which will allow replenishment of marine populations (Whitney 2021).

Pāku'iku'i Rest Area:

From Makahiki Point, Pāpā to Kapulau, Honomalino. Approximately 2.07 miles or 1.54 sq. miles. There would be a rest area where take of pāku'iku'i would not be allowed. Prohibited gear and restricted species may be possessed while onboard a vessel in active transit through the Pāku'iku'i Rest Area, provided that no prohibited gear is in the water during the transit. Boats that are adrift, anchored, or moored are not considered to be in active transit with the exception of vessels in line for the boat ramp and vessels actively loading and unloading at the wharf or on shore.

Rationale for Pāku'iku'i Rest Area:

- Pāku'iku'i is a very important food fish for community families, and according to community member and fisher interviews, the population is extremely low compared to 20 years ago and earlier.
- According to biological surveys, the population is in significant decline (estimates up to -81%) in West Hawai'i, even after the establishment of FRAs (Walsh 2010, Foo et. al 2021).
- There seems to be lower recruitment than in the past, based on community member and fisher testimony that they rarely see young fish of this species.
- The proposed no take rest area, provides a large area where this fish will not be taken, to cover the estimated range of this species based on home range studies in other surgeonfish (Marshall et al. 2011). This should allow populations to rebuild and possibly spill over to fishing areas.
- There are no existing State rules to manage this species.

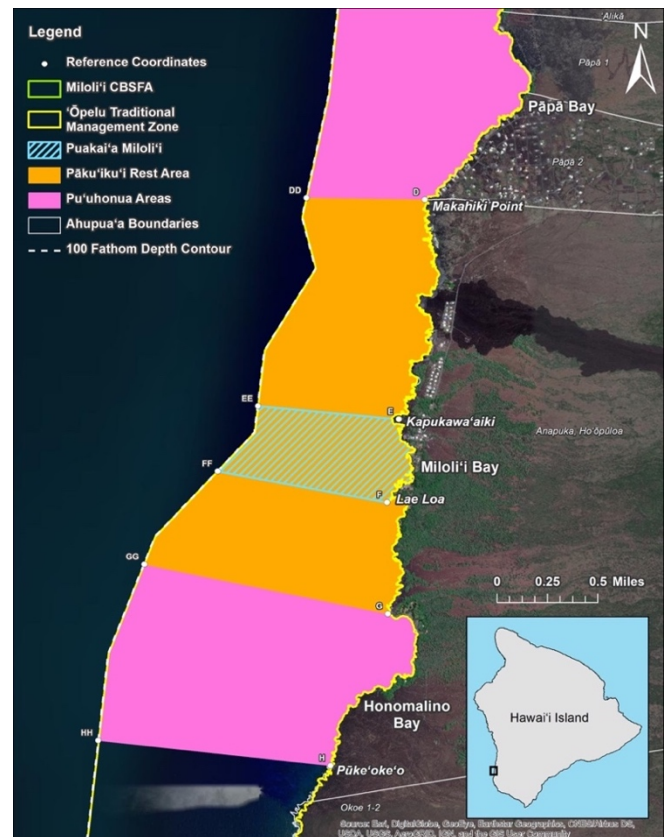


Figure 4. Map of the Pāku'iku'i Rest Area in orange and Puakai'a Miloli'i in blue hashtag lines.

Puakai'a Miloli'i Bay Community Fishing Area:

Establish Puakai'a Miloli'i as an ocean classroom where the community can continue to impart intergenerational knowledge of traditional cultural ocean practices to future generations while maintaining crucial ocean entry points for the community. This area spans from Kapukawa'aiki to Lae Loa - approximately 0.39 miles or 0.19 sq. miles.

The following will be allowed:

- Use 3-prong to spearfish non-regulated species
- Use hook-and-line from shore or vessel
- Use throw net or scoop net from shore
- Use lay or gill net - daytime use only from shore (See existing state rules.)

The following would not be allowed:

- No use of arbaletes or speargun; and
- No Spearing (with any gear) of uhu, pāku'iku'i, weke 'ula, moanakali, 'ū'ū (menpachi).

Rationale for Puakai'a

1. Miloli'i Bay is a special place given its location in the center of community life and its ease of access. This is a place where families teach their children to fish and where community members visit quickly to harvest fish for a meal. To serve these community uses while working to restore populations of priority species, some additional types of fishing will be allowed in Miloli'i Bay that are not allowed in the other pu'uhonua of the CBSFA.
2. Pua is the term used to describe the offspring or young and i'a is the term for fish. So, this name, Puakai'a was given to not only reference the fish that would grow and flourish in this area, but where the youth would start to learn fishing practices.
3. This is Miloli'i's ocean classroom where keiki develop kinship with the kai, learning traditional practice, pono harvesting skills and literally becoming the pua i'a, our baby fish that we nurture.
4. According to kanaka testimonies, Miloli'i Bay has experienced similar declines in populations of important fish as the rest of the coastline of the Miloli'i CBSFA. As a result, the community wants to put rules in place that will help to replenish stocks in this Bay.

'Ōpelu Traditional Management Zone:

Establish the 'Ōpelu Traditional Management Zone to ensure local 'ōpelu fish stocks are maintained according to traditional practices as an essential resource for the Miloli'i community and to honor the rich heritage and generational practice of 'ōpelu fishing in Miloli'i. This area spans from Napohakuloloa, Kīpāhoehoe to Kāki'o Point, Kapu'a. Approximately 8.11 miles or 6.29 sq. miles.

Closed to fishing for 'ōpelu during the traditional 'ōpelu kapu or closure time (February 1 - August 31 annually). Take of 'ōpelu by hook-and-line only is allowed.

Rationale for 'ōpelu Traditional Management Zone:

While generally the fishery is considered to be sustainable statewide, local fishermen in Miloli'i, and South Kona have noted cyclical changes in seasonal migration and that 'ōpelu stocks have declined in the last 20 years.




MILOLI'I CBSFA ~ 10. Proposed Boundaries & Regulations

1. Miloli'i is known for our traditional practice of 'ōpelu fishing by following seasons of when to harvest and when to hānai (feed).
2. The proposed closed season was traditionally practiced by villages along the Kona coast and is believed by local fishermen to have contributed to the maintenance of the stocks.
3. As a result, the fishing effort reduction that will be achieved through a seasonal closure is considered important to help replenish the stocks.
4. The community has selected 10 ko'a (aggregation sites) in the area from Nāpōhakuloloa, Kīpāhoehoe to Kāki'o Point, Kapu'a to include in the seasonal closure. This will allow for fishing in other ko'a since this fishing is important to the livelihoods of several South Kona residents. The community will continue its current practice of hānai ko'a or feeding the 10 ko'a with vegetable matter to encourage schooling during the closed and fishing seasons.
5. As funding allows, the community will continue to implement the 'Ōpelu Project to teach the traditional 'ōpelu fishing practices of Miloli'i and to collect data on the abundance and behavior of fish in these managed ko'a and fish in unmanage ko'a.








Figure 5. Map of the 'Ōpelu Traditional Management Zone outlined in yellow


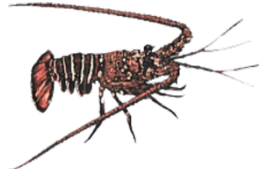

Proposed Species Regulations

Species	Proposed Rule	Rationale
Pāku'iku'i achilles tang <i>Acanthurus achilles</i> 	<ol style="list-style-type: none"> 1. Minimum Size: 5 inches (Fork Length) 2. Bag limit: No more than 5 fish per person per day 3. Prohibited from taking in the Pāku'iku'i Rest Zone (Makahiki Point to Kapulau Point) 	<ol style="list-style-type: none"> 1. Important food fish for community and families 2. Significant decrease in population (up to 81% in West Hawai'i) 3. Rest Area will provide a large range for this species and spill over to adjacent "open" areas 4. Currently no existing State rule to manage this species
Kole goldring <i>Ctenochaetus strigosus</i> 	<ol style="list-style-type: none"> 1. Minimum size: 5 inches (Fork Length) 2. Bag limit: No more than 20 fish per person per day 3. No take during spawning season (March – June) 	<ol style="list-style-type: none"> 1. Important food fish for family gatherings. 2. Although populations are in relatively good condition, the proposed bag limit of 20 fish per day will still allow harvest and ensure fish for the future. 3. Minimum size is to allow for significant reproduction before fish are caught 4. Currently no existing State rule to manage this species
'Ōpelu mackerel scad <i>Decapterus macarellus</i> 	<ol style="list-style-type: none"> 1. Open Season: September-January 2. Closed Season: February-August in the 'Ōpelu Traditional Management Zone (Nāpōhakuloloa to Kāki'o Point) 3. No take of 'ōpelu using net 4. Hook-and-line allowed 	<ol style="list-style-type: none"> 1. 'Ōpelu populations have declined in the last 20 years 2. These proposed rules (seasonal closure, vegetable matter to feed ko'a) have been part of traditional practice for this community for generations. 3. Seasonal closure will contribute to the maintenance and replenishment of stocks for future (Hurt et al. 2019).
Uhu parrotfish all other species	<ol style="list-style-type: none"> 1. Bag limit of 1 blue and 2 red per person per day 5. No night spearfishing of uhu 	<ol style="list-style-type: none"> 1. See rational below

MILOLI'I CBSFA ~ 10. Proposed Boundaries & Regulations

Species	Proposed Rule	Rationale
<p>Uhu parrotfish</p>  <p>'ele'ele pālupaluka Red-lipped <i>Scarus rubroviolaceus</i></p>  <p>uliuli 'ahu'ula Spectacled <i>Chlorurus perspicillatus</i></p>	<ol style="list-style-type: none"> 1. Minimum Size 14 inches 2. Maximum Size 20 inches 3. Bag Limit: 1 red uhu (female) per person per day 4. No take of blue uhu 5. No harvest during spawning season (March-May) 6. No night spearfishing of uhu 	<ol style="list-style-type: none"> 1. Populations have declined according to kanaka testimonies. 2. Interviews revealed that kūpuna would teach them not to harvest blue uhu because they are the breeders and reproductive males, and removal slows the overall reproduction cycle. 3. Plays a critical ecosystem function creating settlement areas for coral larvae and producing sand. 4. Best available science shows that March-May is when uhu spawn and aggregate so they will be vulnerable. 5. Uhu sleep at night making them easy to spear and vulnerable. 6. The 14-inch minimum size will allow uhu to reproduce more before caught.
<p>‘Ū‘ū soldierfish <i>Myripristis spp.</i></p> 	<ol style="list-style-type: none"> 1. No take during spawning season (April-June) 	<ol style="list-style-type: none"> 1. Populations have declined according to fisher and community interviews 2. Kūpuna and fisher knowledge shows females w/eggs in Apr & May 3. Seeing a lot of under size (babies) being commercially sold in stores
<p>‘Opihi limpets</p>  <p>Makaiāuli 'Ālinalina</p>  <p>Kō'ele</p>	<ol style="list-style-type: none"> 1. Makaiāuli (blackfoot / <i>Cellana exarata</i>) and 'Ālinalina (yellowfoot / <i>Cellana sandwicensis</i>) - 1-gallon size Ziplock bag per day/ per person (with shell) 2. Kō'ele (<i>Cellana talcosa</i>): No take in entire CBSFA. 3. No take of any species of 'opihī from any Pu'uhonua Zone (Pāpā, Honomalino, Kapu'a, or Manukā) 	<ol style="list-style-type: none"> 1. 'Opihī are very important food for community members 2. Populations and average size of 'opihī have declined in the last 10-20 years according to community/fisher interviews 3. 'Opihī life history allows for rapid restoration of populations through application of no harvest zones. The pu'uhonua are spaced along the shoreline to allow areas to populate, recover and seed harvest areas.

MILOLI'I CBSFA ~ 10. Proposed Boundaries & Regulations

Species	Proposed Rule	Rationale
'A'ama thin-shelled rock crab <i>Grapsus tenuicrustatus</i> 	1. No take of females with eggs in entire CBSFA	1. Current population status is considered good, however there have been fewer crabs observed and average size has also been decreasing 2. Community wants to prevent further decline.
Ula spiny lobster <i>Panularis spp.</i> 	1. Bag limit: 2 per person per day	1. The population appears to be in moderate condition and community wants to prevent further decline 2. The bag limit and gear type restrictions will focus on subsistence rather than commercial use.
Aquarium Fishing 	1. No aquarium fishing in the entire CBSFA	1. This is a culturally important subsistence fishing area. Commercial harvesting of fish for ornamental purposes is counter to the traditional cultural practices of our community. 2. All take of marine life for commercial aquarium purposes is currently illegal

Abbreviations

ASU - Arizona State University
AQ - Aquarium Collecting
BLNR - Board of Land and Natural Resources
CBSFA - Community-Based Subsistence Fishing Area
CI Hawai'i - Conservation International Hawai'i
DAR - Division of Aquatic Resources
DLNR - Department of Land and Natural Resources
DOCARE - Division of Conservation and Resources Enforcement
DOE - Department of Education
EAP - E Alu Pū (network)
FRAs - Fish Replenishment Areas
KUA - Kua'āina Ulu 'Auamo
LOC - Lawai'a 'Ohana Camp
MCC - Miloli'i Canoe Club
MERC - Marine Education Resource Center
MMA - Marine Management Area
MMP - Marine Management Plan
MNK - Mohala Nā Konohiki
MW - Makai Watch
NOAA - National Oceanic and Atmospheric Administration
PPM - Pa'a Pono Miloli'i
PacIOOS - Pacific Islands Ocean Observing System
TNC - The Nature Conservancy
WHFC - West Hawai'i Fisheries Council

Definitions

Āina - Land (lit. that which feeds)
Akua - Divine manifestations
Ahupua'a - Land division
Aumakua - Defied ancestral manifestations
Hānai - to nourish, feed
Honua - Earth
Hiki nō - Can do, but used to refer to the
Iwi Kūpuna - Ancestral bones
'Ili'ili - pebble, small stones

'Ili 'āina - land division whose chief pays directly to the chief of the ahupua'a which it is a part of, rather than directly to the king.
Kai - Ocean
Kanaka Maoli - Genealogical descendants born of Ka Pae 'Āina Hawai'i
Kama'āina / Kanaka Testimony - testimony from a Native Hawaiian person who is familiar from childhood with a particular locality. Testimony from kama'āina is recognized as the appropriate method to determine the nature of Hawaiian traditional and customary practices in general, and also specifically describing the customs exercised in a given area.
Kumulipo - Cosmogonic genealogy chant of creation
Kūpuna - Kanaka Maoli elders, existing both physically and spiritually, who possess traditional knowledge and serves as conduits ensuring the present and the future of ka lāhui Hawai'i.
Ko'a - fishing grounds
Lā'au lapa'au - Traditional process of Hawaiian healing incorporating the gathering, preparation, and use of Native plants in conjunction with prayer and the Kanaka Maoli worldview.
Lāhui - Collective being of Kanaka Maoli expressed through land, natural resources, and institutions
Kapu - forbidden, prohibited, sacred
Mo'okū'auhau - inherent Ancestral Genealogy
Makai - To the ocean
Mana - Spiritual strength
Mauka - To the uplands
Mauna - Mountain
Nā Mea Hawai'i - All things Kanaka Maoli
'Ohana - Traditional system of familial relations
Pali - cliffs

MILOLI'I CBSFA ~ 11. Abbreviations, Definitions, Species List

Pu'uhonua – In the context for this MMP and CBSFA, it will be referred to as a rest zone to replenish fish populations.

Subsistence – In the context for this MMP and CBSFA, the customary and traditional native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing.

Wahi pana – Sites of significance and importance to Kanaka Maoli

Species

Akule (Bigeye Scad, *Selar crumenophthalmus*)

'A'ama crab (Rock Crabs, *Grapsus tenuicrustatus*, *Pachygrapsus plicatus*)

Āholehole (Flagtails, *Kuhlia sandvicensis*, *Kuhlia xenura*)

'Ama'ama (Striped Mullet, *Mugil cephalus*)

Awa (Milkfish, *Chanos chanos*)

Hā'uke'uke kaupali (Helmet Urchin, *Colobocentrotus atratus*)

He'e maui (Day Octopus, *Octopus cyanea*)

He'e (Octopuses, *Octopoda* spp.)

Hinālea lauwili (Saddle Wrasse, *Thalassoma duperrey*)

Kala (Bluespine Unicornfish, *Naso unicornis*)

Kāhala (Greater Amberjack, *Seriola dumerili*)

Kole (Goldenring surgeonfish, *Ctenochaetus strigosus*)

Kūmū (Whitesaddle Goatfish, *Parupeneus porphyreus*)

Kūpe'e (Polished Nerite, *Nerita polita*)

Kūpīpī (Blackspot Sergeant, *Abudefduf sordidus*)

Limu Kala (*Sargassum echinocarpum*)

Limu Kohu (*Asparagopsis taxiformis*)

Loli (Sea Cucumbers, *Aspidochirotida* spp.)

Mamo (Hawaiian Sergeant, *Abudefduf abdominalis*)

Moi (Pacific Threadfin, *Polydactylus sexfilis*)

Moano kea also known as moano kali, moano ukali, moano ukali ulua, moana kali (Goldsaddle Goatfish, *Parupeneus cyclostomus*)

'Ō'io (Bonefish, *Albula* spp.)

'Ōmilu (Bluefin Trevally, *Caranx melampygus*)

'Ōpae (Shrimps, *Malacostraca* spp.)

'Ōpelu (Mackerel Scad, *Decapterus macarellus*)

'Opihi (Limpets, *Cellana* spp.)

'Opihi makaiāuli (Blackfoot 'opihi, *Cellana exarata*)

'Opihi 'ālinalina (Yellowfoot 'Opihi, *Cellana sandwicensis*)

'Opihi kō'ele (Giant 'Opihi, *Cellana talcosa*)

Pāku'iku'i (Achilles Tang, *Acanthurus achilles*)

Pipipi (Black Nerite, *Nerita picea*)

Po'opa'a (Hawkfish, *Cirrhitis pinnulatus*)

Uhu (Parrotfishes, *Scaridae*)

Uhu 'ele'ele male (Red-lipped, *Scarus rubroviolaceus*)

Uhu pālukaluka female (Red-lipped, *Scarus rubroviolaceus*)

Uhu uliuli male (Spectacled parrotfish *Chlorurus perspicillatus*)

Uhu 'ahu'ula female (Spectacled parrotfish *Chlorurus perspicillatus*) (Parrotfishes, *Scaridae*)

Uku (Blue-Green Snapper, *Aprion virescens*)

Ula (Banded Spiny Lobster, *Panulirus marginatus*, Green Spiny Lobster, *Panulirus penicillatus*)

Ulua (Jacks, *Carangidae*)

Ulua Aukea (Giant Trevally, *Caranx ignobilis*)

Uouoa (Sharpnose Mullet, *Neomyxus leuciscus*)

'Ū'ū (Soldierfishes, *Holocentridae* spp.)

Wana (Sea Urchins, *Echinoidea* spp.)

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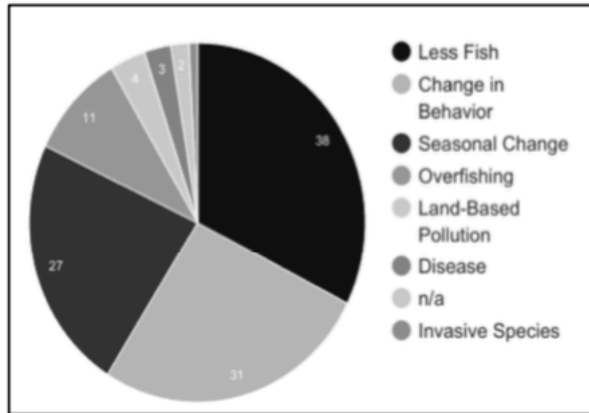
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Q5: What were the marine resources like in Miloli'i when you were younger?

97% of the responses (63 people) said the resources were **better in the past**.

Q6: Have you noticed changes that concern you (specific resources)? Why do you think?



Change in Behavior (31 or 26.5%)

- New generation not from here, more outsiders
- More human activity (diving, fishing)
- Need to travel farther
- Too many boats
- Nobody respecting fishing traditions
- More commercial catch
- Everyone for themselves
- No attention to ecology
- Don't listen to kupuna, elders passing
- Western lifestyles
- Disconnected to old ways
- Use of chop-chop

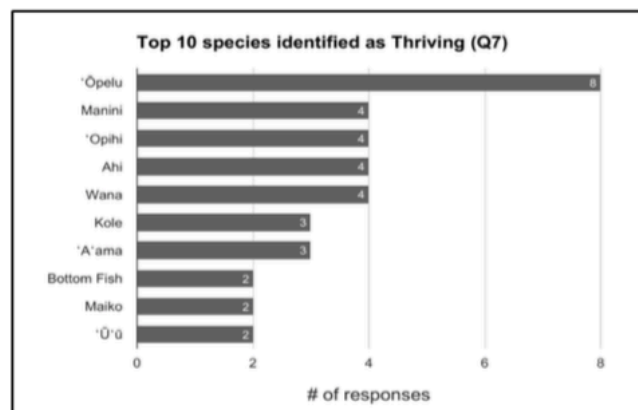
Less Fish (38 or 32.5%)

- | | |
|----------------|------------------|
| • Moanokali | • Akule schools |
| • Aholehole | • Pāku'iku'i |
| • Yellow tang | • Kole |
| • Uhu | • Near shore |
| • Manini | • Smaller 'a'ama |
| • Pelagic fish | • Smaller 'Opihi |
| • 'Opihi | • On ko'a |
| • 'Ōpelu | • Limu |
| • Wana | |
| • Moi | |
| • Weke | |
| • Nenu | |
| • Fatter Aku | |
| • Larger 'Ulua | |

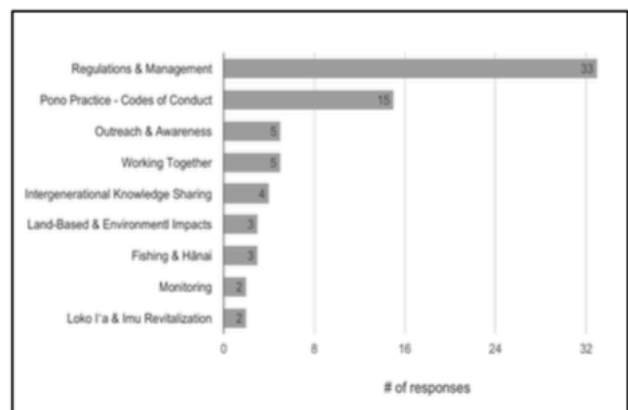
Seasonal Change (27 or 23.1%)

- Warmer water temperature
- Summers are hotter
- Coral changing, erosion & bleaching
- Seasons longer (ahi, ono)
- Spawning different (ahi, pāku'iku'i)
- Fish behavior different
- Higher surf
- Shoreline changes
- More stenosis now
- Global warming
- More of certain types of fish in certain areas
- No balance of nature

Q7: What resources are thriving and why?



Q8: What do you think should be done to address change to Miloli'i's marine resources?



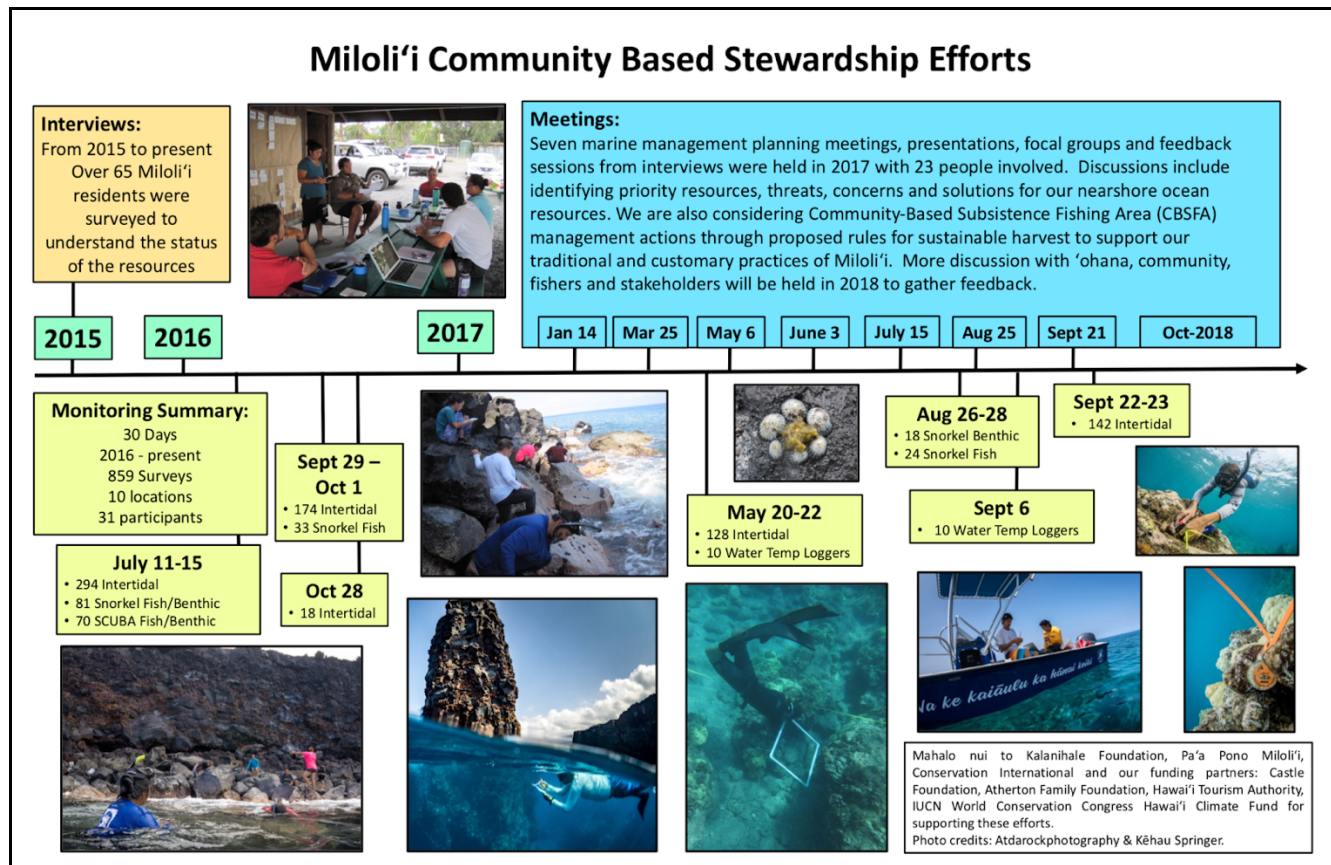
**Q8/9 Comparison:
What Should Be Done & What People Practice Now**

Regulations & Management	
What Should Be Done	
<ul style="list-style-type: none"> No fishing on Sunday 'Opihi - silver dollar size Management Plan Rest area / Pu'uhonua Size Limits <ul style="list-style-type: none"> Don't take small fish Only take bigger fish Ahi, ono No selling / no commercial <ul style="list-style-type: none"> 'Opihi, 'a'ama, ono Rest other fish like 'ōpelu No cross or throw net Take weke, uhu, manini only when needed 	<ul style="list-style-type: none"> Create bag limits Manage by spawning seasons Remove Invasives (roi, ta'ape, to'au) Speak to those with heaviest resource use Users make the rules Gear limits Old style bait Consider CBSFA 100-150 ft. zone Subsistence use
What People Practice Now	
<ul style="list-style-type: none"> No sell ono, only family eats Conserve wherever fish Don't harvest small 'opihi Catch only what we eat Kapu near fresh water 	<ul style="list-style-type: none"> No surround fish Makai Watch Respect of the kapu seasons

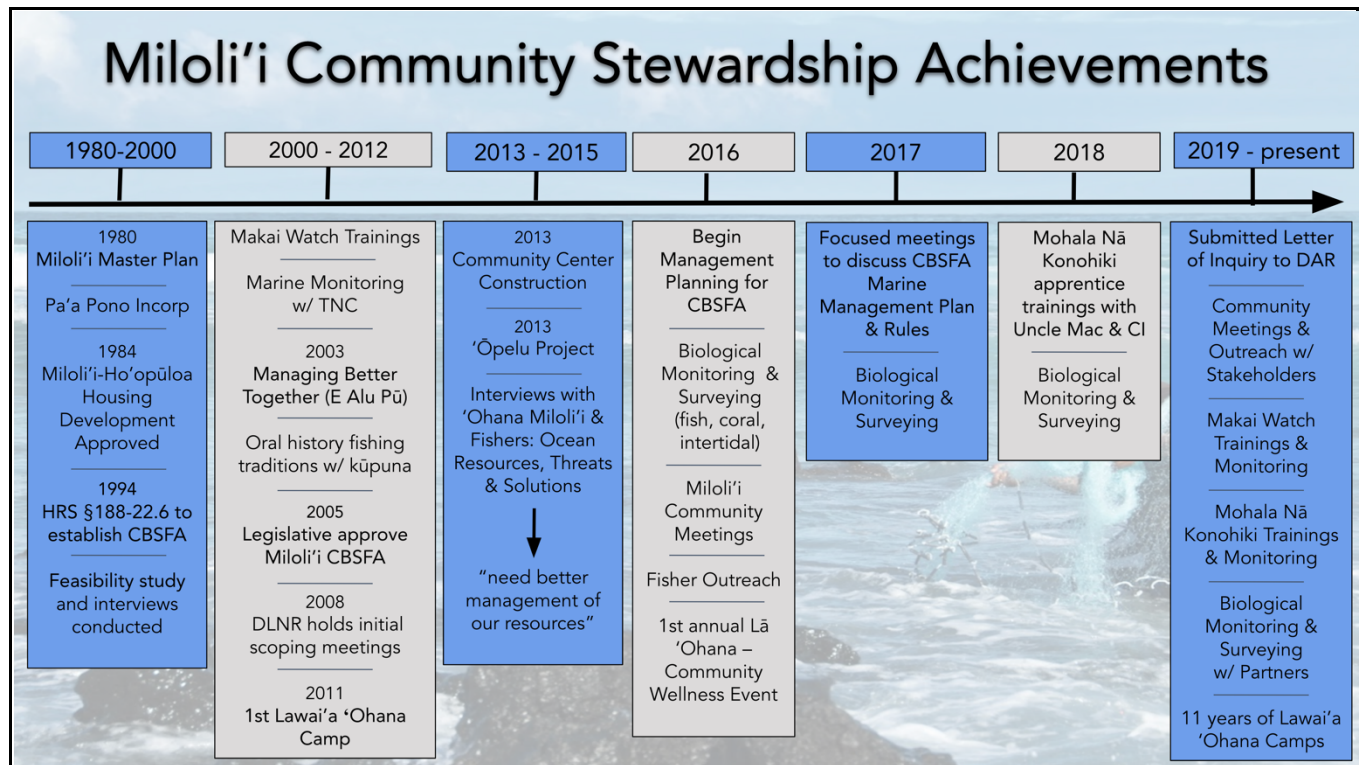
Pono Practice – Codes of Conduct	
What Should Be Done	What People Practice Now
<ul style="list-style-type: none"> Self policing Allow fish to spawn Don't take too many of one kind of fish Take only what you need to eat Mutual agreement Don't go every day Share catch Take kuleana into your own hands Clean 'ōpala & rubbish Don't harvest small 'opihi 	<ul style="list-style-type: none"> No take on Sunday (day of rest) If catch a lot, throw back Return 2 live 'ōpelu to ocean Take care of certain places Honor system Rotate areas of harvest Don't harvest small fish Rest periods Share with 'ohana

Intergenerational Knowledge Sharing	
What Should Be Done	What People Practice Now
<ul style="list-style-type: none"> Lawai'a 'Ohana Camps Kūpuna sharing knowledge Teach youth how to throw net (No Cross Net) Practitioners teach kids about the resources 	<ul style="list-style-type: none"> Talk to the fish (cultural practice) Pule for everything Ahele Style of fishing Canoe fishing

Appendix 2: Miloli'i Community Based Stewardship Efforts Posters (2015-2018)



Appendix 3: Miloli'i Community Stewardship Achievements Timeline Poster (1980-present)

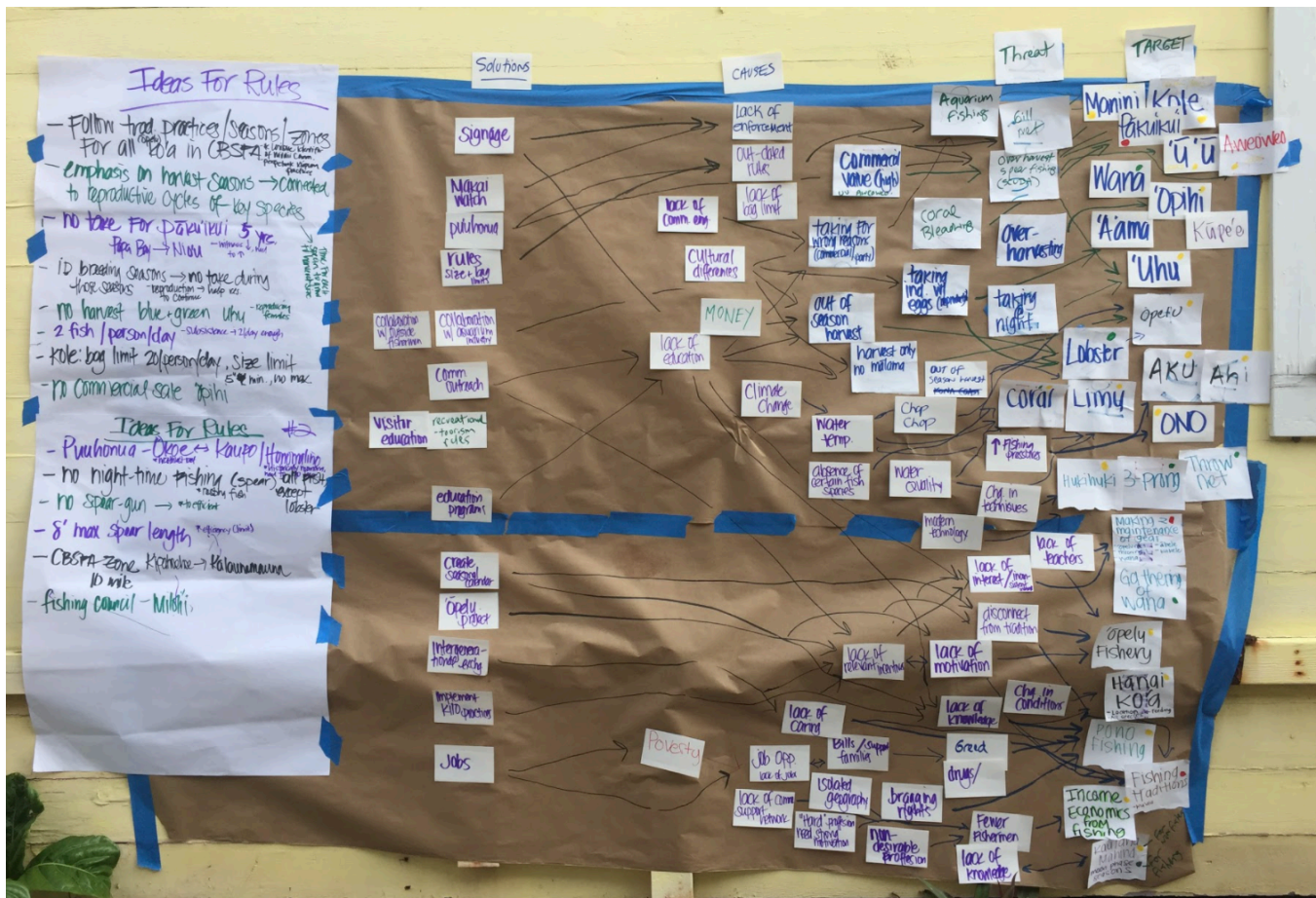


Appendix 4: Conceptual Model (May 6, 2017)

Background:

The Conceptual Model or Problem Solution Model was used to look at what the long-term vision is for the Miloli'i area. It identifies important species and resources that the community would like to manage. This process then walks participants through assessing the current condition, threats for each of those species and resources and identifying solutions that will help address the threats or problems.

Picture of Conceptual Model Diagram (May 6, 2017)



Huli 'la - Environmental



WHY: understanding relationships between our ma kai and ma uka resources are important and how they change throughout different seasons.

METHODS:

- Make observations of what is happening in the ocean, land and atmosphere
- Record and document these patterns and connections
- Share with 'ohana & friends



Intertidal survey datasheet

- 58 'opihi/'a'ama/wana surveys
- Huli 'la discussions



Mahalo nui loa to the Māori 'ohana & Community, Kāhāhale, Pū'a Pono Māori and Conservation International for leading these monitoring efforts. To all that participated and lent support: Imaka Yeaman, Justin Kāhale, Lani Hua, Kami/Willy/Anita Kaupio, Will, Lei, Laila Kaupio, Kuakahi Kaupio-Cahue, Kuku Kaupio, Amoe Teina, Ana & Mike, Courtney Hunt, Monika Frazier, John Burns, Eue Schemmel, Makani Grey, Nakoa Goo, Scott Atkinson, Kihau Springer, James Aulau, Paul Cox, Lauren/Noia Kaupio, Moani Pū, Laurel, Austin, Shari & Kua to Ka Ika Charter School.

Appendix 6: Miloli'i 'Opihi Populations Summary Report



Miloli'i 'Opihi Populations

Data in this report was collected from July 2016 – September 2019 from Intertidal areas from Napohakuloloa – Niuo'u. This document summarizes the results from these surveys to be included in the Miloli'i Marine Management plan.

Contributors (alphabetical by last name): Surveyors: James Akau, Scott Atkinson, Makani Gregg, Nākoa Goo, Monika Frazier, Lisa & Melissa Hua, Courtney Hurt, Aloha & Lauren Kapon, Cherie Kauahi, Ka'imi Kaupiko, Laila & Leivallyn Kaupu, Amoe & Kukulu Kuahuia, Will Ma'e Hu'ihu'i, Moani Pai, Laurel Shultz, Phoenix Spencer, Kēhau Springer, 'Ilima & Naile'a Vannatta, Imaika Yeaman

Analysis & report prepared by: Kēhau Springer, Conservation International
Updated: July 17, 2021

Intro & Background

Intertidal Rapid Assessments:

Brief Description:

Intertidal rapid assessments look at the population size and class structure of the three different types of endemic 'opihi (Makaiauli¹, 'Ālinalina² & Kō'ele³), hā'uke'uke⁴ and 'a'ama⁵ crabs along the shoreline within a given site. It is used to get a quick baseline population of these species within an area.

Rationale:

These monitoring methods will help to gather information that can help inform management decisions of coastal intertidal harvesting areas. It will help communities evaluate the population health of these important intertidal species and if it is sustained or increasing. By collecting information about intertidal areas, it can inform fishers and gatherers to adapt harvest actions (locations, time, harvest methods) that is in alignment with local management and pono practice. The information will also help to explain seasonal spawning cycles by looking at population size class estimates at the beginning and end of the spawning/harvest seasons.

Question it will answer:

1. What is the average number of 'opihi per transect at a given sites, during different times of year and among years?
2. What is the difference in the average number of 'opihi inside and outside of the proposed Miloli'i Pu'uhonua?



¹ Makaiauli – *Cellana exarata*, black foot 'opihi

² 'Ālinalina – *Cellana sandwicensis*, yellow foot 'opihi

³ Kō'ele – *Cellana talcosa*, giant 'opihi

⁴ Hā'uke'uke – *Colobocentrotus atratus*, helmet urchin

⁵ 'A'ama – *Grapsus tenuicrustatus*, thin shelled rock crab

Methods

Equipment needed for:

Data Collection

- GPS, slate, datasheet
- Plastic rulers to measure 'opihi
- 2-meter rope (or arm span)
- Clicker/counter/counter app (optional)
- Snorkel equipment (to view kō'ele species located below wash/surge zone)

Data Entry & Analysis

- Computer
- Microsoft Excel

Data Collection

- The core monitoring group selected the various sites based on fisher and community knowledge of the most important 'opihi and intertidal habitat that falls within their customary gathering areas from (Napohakuloloa to Niuo'u).
- At each site, surveyors conducted anywhere from 5-74 transects, depending on the shoreline habitat and accessibility.
- Each transect is approximately 2m wide and stretches from the highest high-water mark to approximately 3m below the water line. The transects are repeated consecutively one after another and parallel to the previously laid transect throughout the entire survey area.
- Our survey team consisted between of 4-10 people. One person would be the data recorder/GPS, then the others would be surveyors.
 - Surveyors used a flexible ruler to count and determine the population size-class of the three 'opihi, and counted the number of hā'uke'uke, wana and 'a'ama on their transects.
 - When we had a larger group, we would split the group in two teams with one data recorder for each.
 - The recorder collected date, moon phase, season, GPS points and site information for the different locations, and the number of 'opihi (makaiauli, 'ālinalina, kō'ele) counts for each size category and total count for hā'uke'uke, wana and 'a'ama.

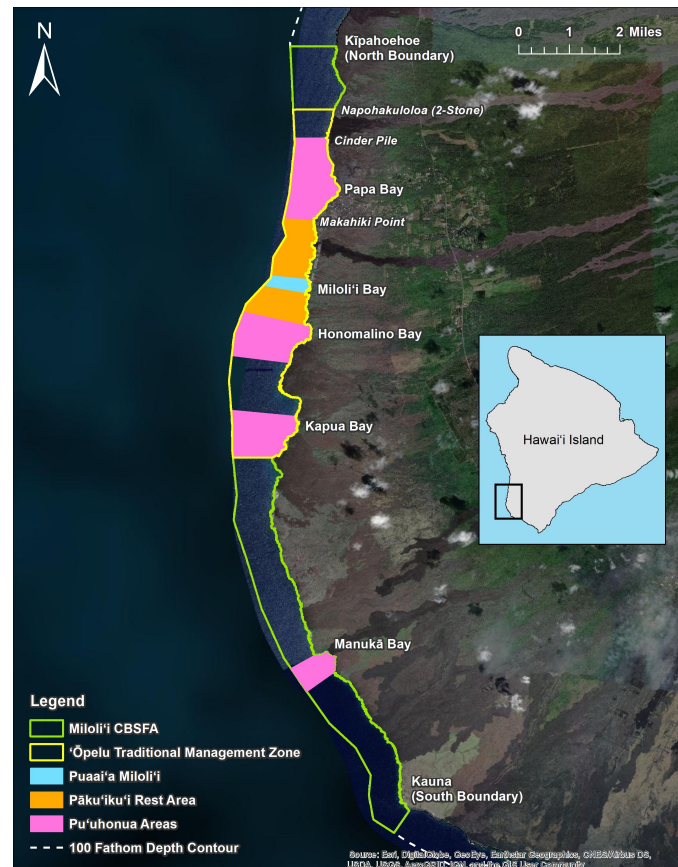
Analysis

- Data were entered immediately after surveys into an EXCEL data base.
- Pivot tables were created to gather the average number for each population size class for 'opihi, and population for the other species per transect. These data compare averages among sites, season, years, inside and outside of the proposed Pu'uhonua.
- Graphs were then generated to compare the averages inside and outside of the proposed Pu'uhonua

Intertidal Monitoring Sites

Pu'uhonua Status	Site Name	# of transects
Outside	Total	573
	Laeloa	47
	Niuo'u	105
	Okoe	16
	Miloli'i Bay	27
	Kanaka Pond	39
	Honomalino/Okoe - South	39
	Miloli'i	51
	Napohakuloloa North	181
	Napohakuloloa South	68
Inside	Total	446
	Alika	75
	Papa	29
	Makahiki	5
	Kaupo	32
	Honomalino/Okoe - Middle	87
	Honomalino	35
	Honomalino/Okoe - North	183

This table shows the number of transects surveyed based on location: inside and outside of the proposed Miloli'i CBSFA Pu'uhonua areas



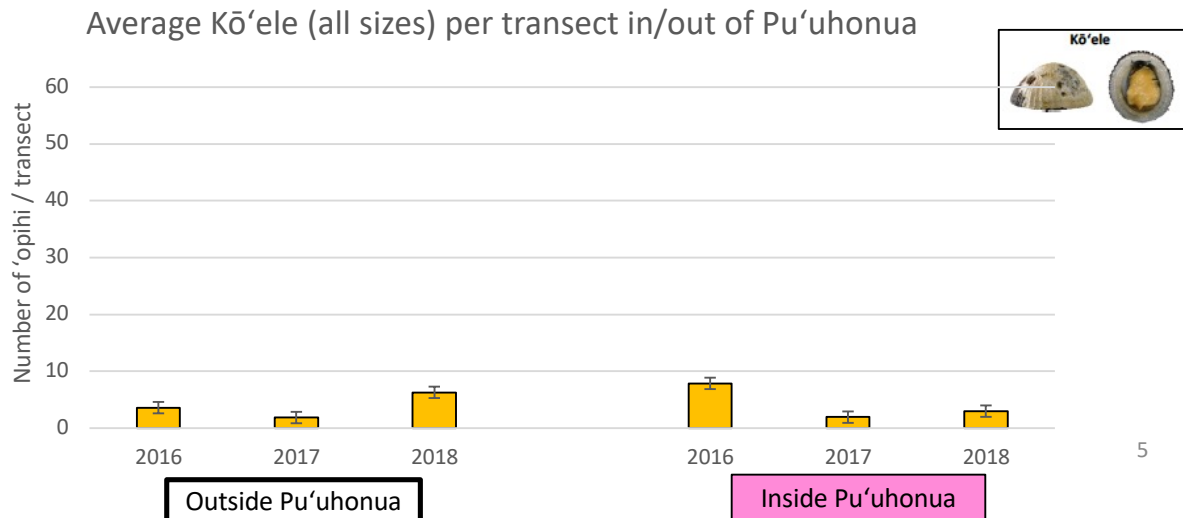
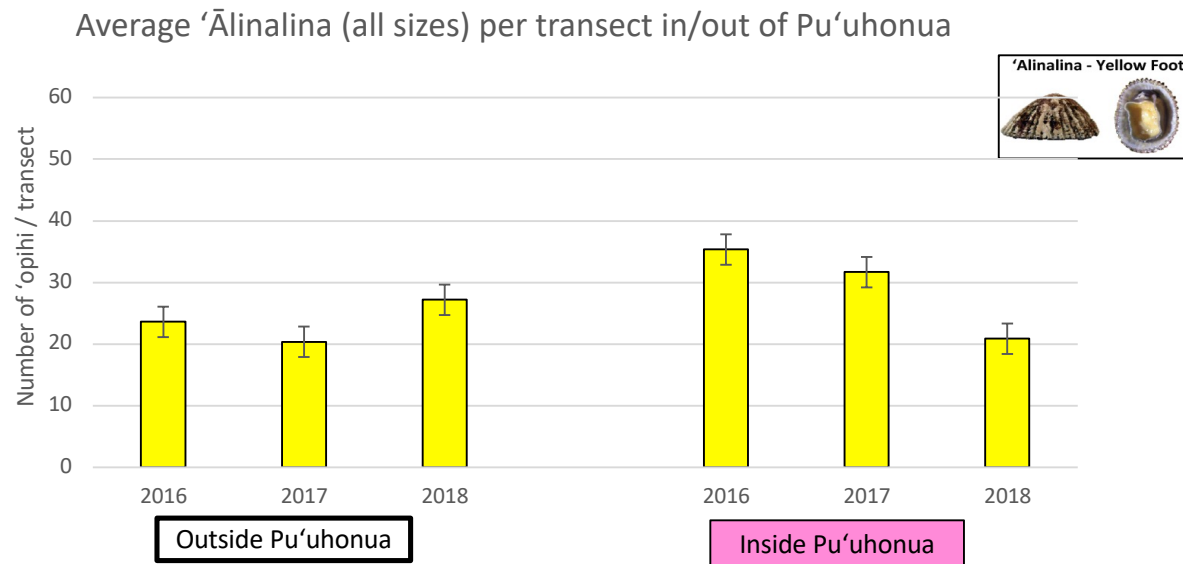
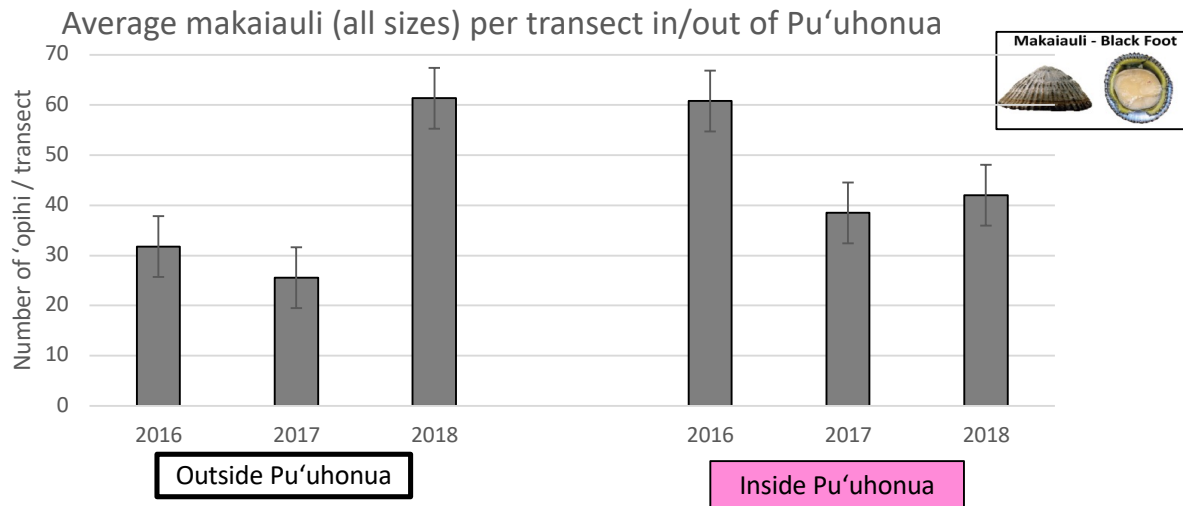
This map shows the boundaries of the CBSFA outlined in green and the locations of the Pu'uhonua in pink.

Summary of Results

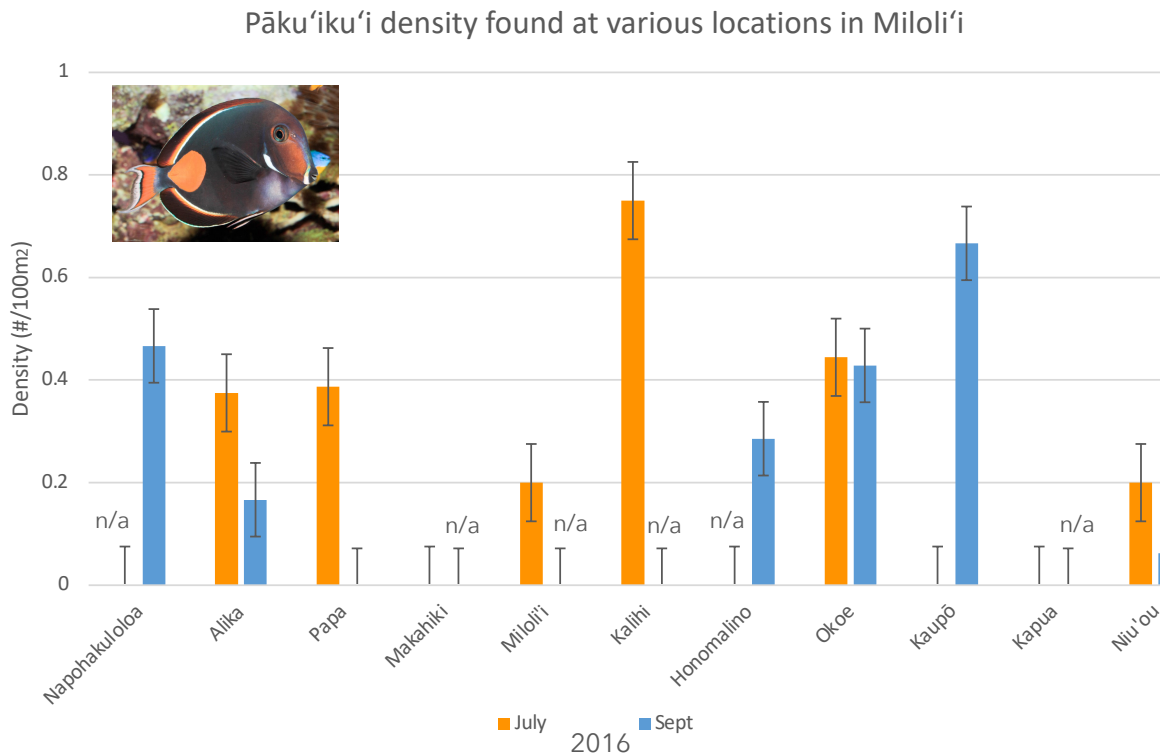
There were 573 transects surveyed at various sites that are located outside of the four proposed pu'uhonua and 446 transects surveyed at various sites that are located within the four proposed pu'uhonua. This summary will only discuss the results for the three 'opihi species as these are species that have proposed rules in the Miloli'i Marine Management Plan for their Community Based Subsistence Area.

Makaiauli (*Cellana exarata*) showed an increase in average number per transect at all sites located outside of the pu'uhonua from 2016 to 2018. However, there was a decrease in average number of makaiauli in the sites inside the proposed pu'uhonua from 2016-2018. For 'Ālinalina (*Cellana sandwicensis*) and kō'ele (*Cellana talcosa*) we see a similar trend of a little more per transect at the sites outside of the proposed pu'uhonua and less at the sites inside the proposed pu'uhonua. However, it wasn't as notable as the number of makaiauli per transect. Refer to the following page with graphs that show the average number of 'opihi per transect for each of the three species.

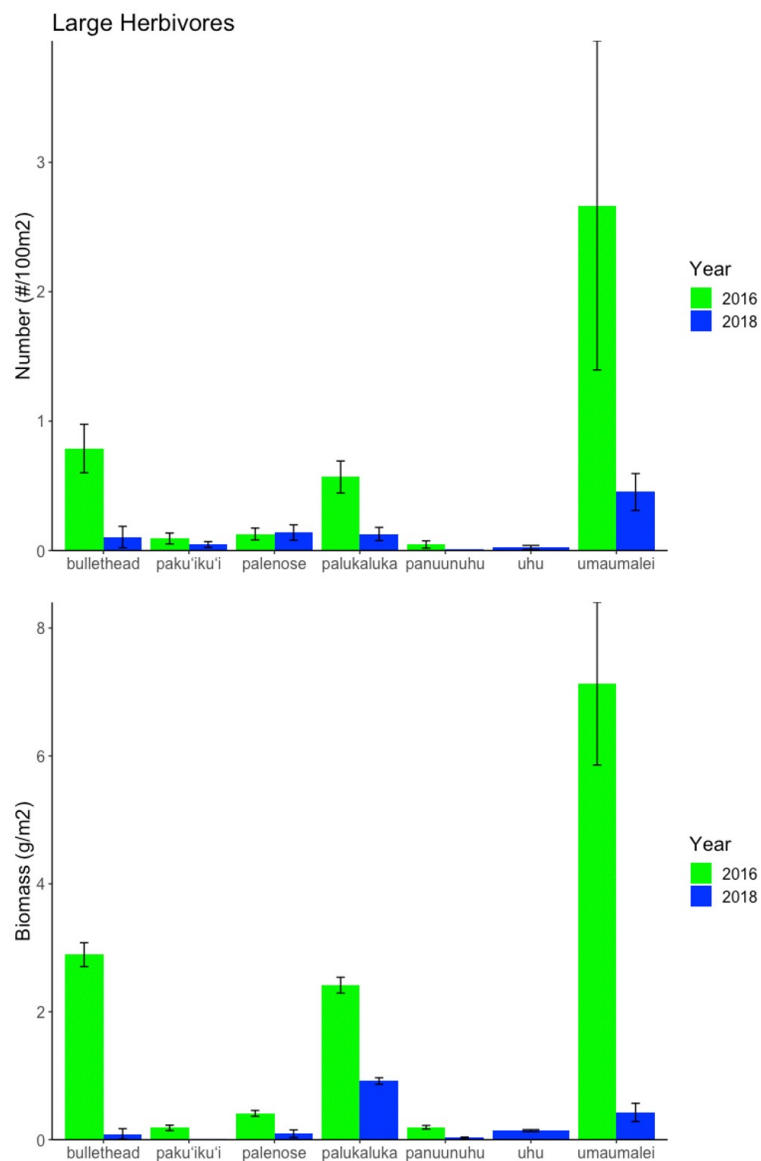
Results from Intertidal Surveys



Appendix 7: Pāku'iku'i Summary Data

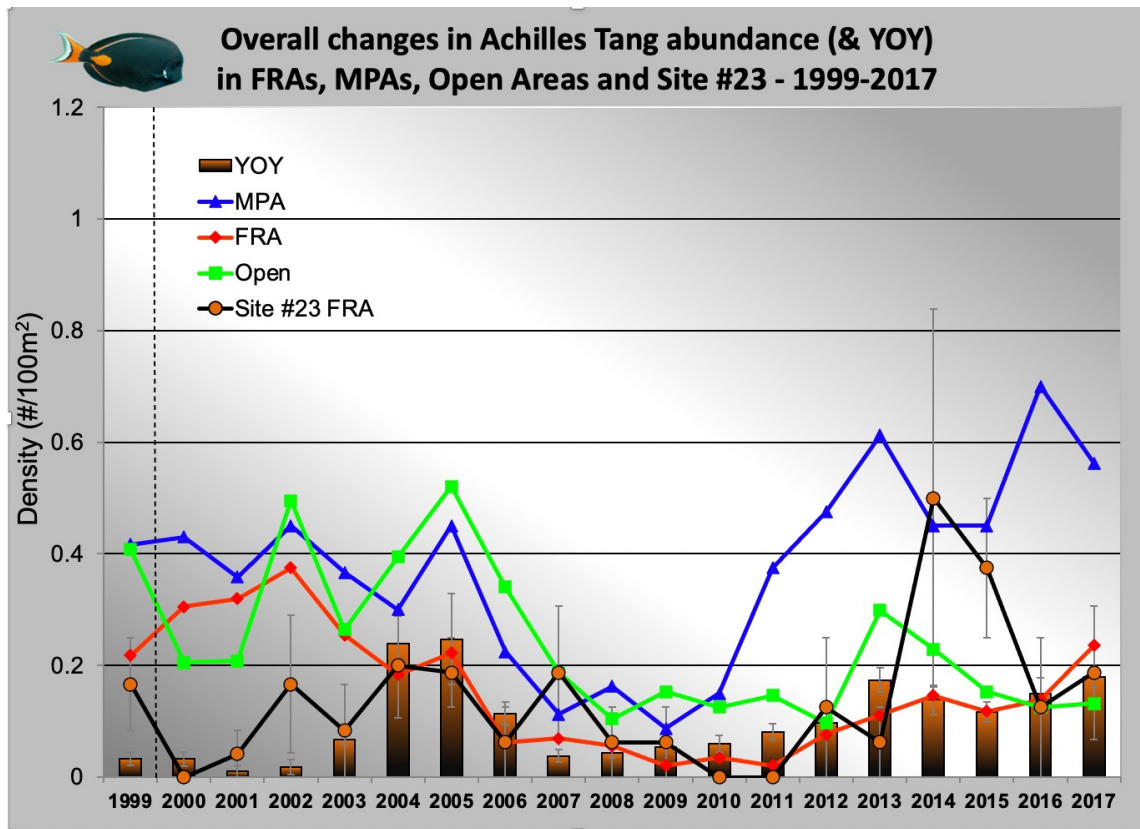


These data were collected using snorkel timed belt transect surveys. The graph above shows the densities of pāku'iku'i found in 2016 (July in orange, Sept in blue) at various locations in the proposed Miloli'i CBSFA. All sites had less than 1 pāku'iku'i per 100m² with some locations not having any pāku'iku'i found on the transects. The graphs that have n/a means that no surveys were conducted at that location during that sample period.



These data were collected using SCUBA timed belt transect surveys. The graph to the left shows the densities of large bodied herbivores, including paku'iku'i found in 2016(green) and 2018 (blue) at all locations combined in the proposed Miloli'i CBSFA. Paku'iku'i had an abundance of 0.1 fish per 100m² and biomass of 1.8 in 2016 and in 2018 the biomass and abundance was undetectable (less than 0.1).

Year	Species	Biomass (g/m2)	Abundance (#/100m2)	Biomass SE	Abundance SE
2016	Paku'iku'i	1.8	0.1	1.5	0.0
2018	Paku'iku'i	0.0	0.0	0.0	0.0



These data were collected and analyzed by DAR Kona to describe overall changes in pāku'iku'i in the West Hawai'i FRAs, MPAs, Open Areas and site #23 (Miloli'i) from 1999-2017. The data is variable and shows how trends increase in 2004-2005, then sharply decrease in years following, then slowly increase in 2013-2017. Although the data is variable, the huge takeaway is that there is less than 1 pāku'iku'i per 100m².

Appendix 8: ASU-DAR Shallow Water Resource Fish Report Cards



These outreach report cards are derived from the 2020 report on changes in resource fish stocks for 70 common fish species counted at 349 different sites along the 180 km coastline of Hawai'i Island from 2008 to 2018.

Related references:

Foo, S. A., W. Walsh, J. Lecky, S. Marcoux, S., & G.P. Asner (2020). Impacts of pollution, fishing pressure, and reef rugosity on resource fish biomass in west Hawai'i. Ecological Applications. doi:[10.1002/eap.2213](https://doi.org/10.1002/eap.2213)

Walsh, W. J., et al. (2019). A report on the findings and recommendations of effectiveness of the West Hawaii Regional Fishery Management Area. Report to the Thirtieth 2020 Hawai'i Legislature Regular Session.

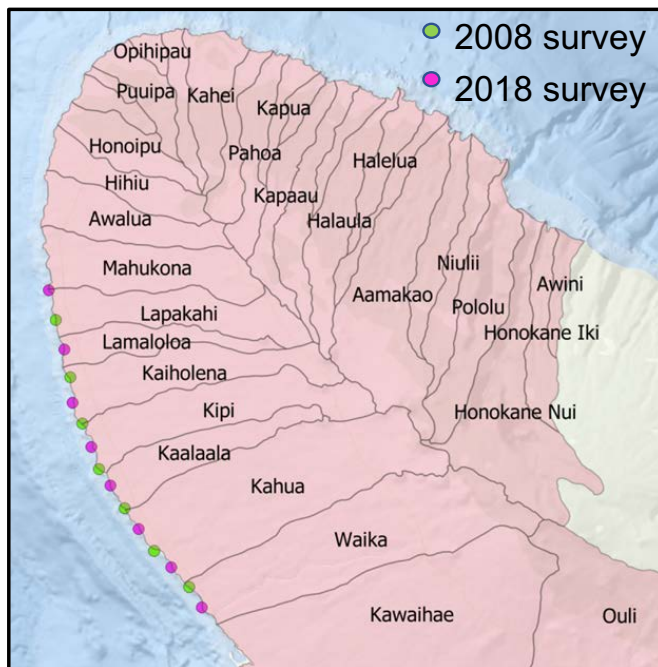
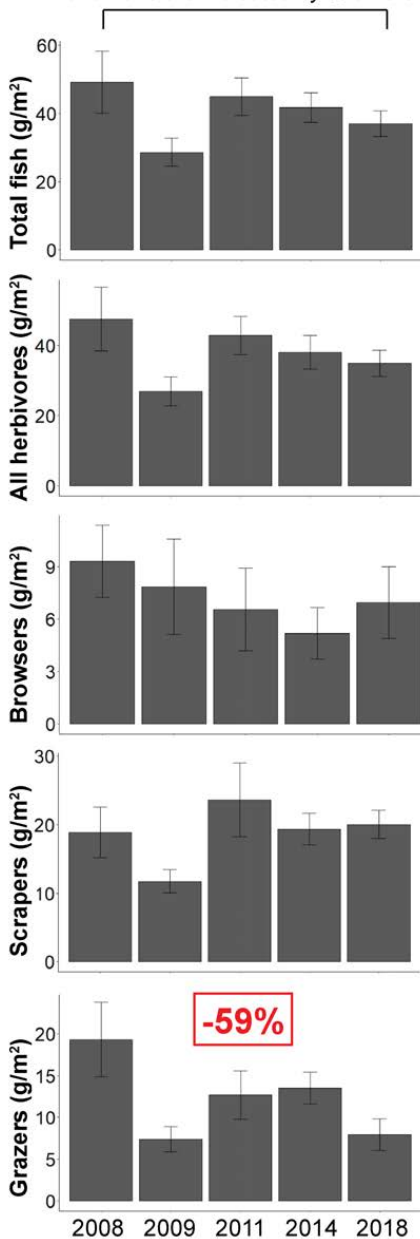
Shallow Water Resource Fish Report Card

2008 to 2018

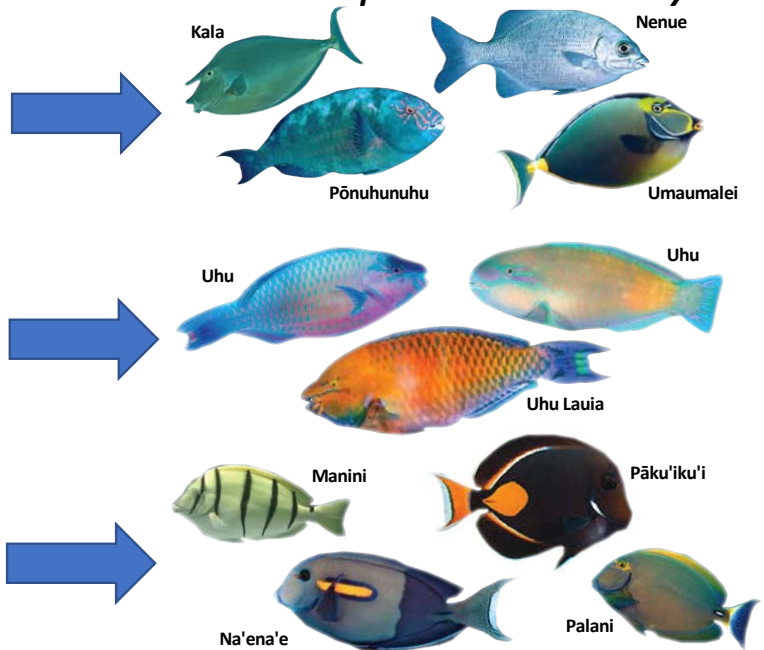
North Kohala

Average values across all sites per year are shown \pm standard error

Significantly different changes between 2008 and 2018 are indicated by % difference



Some Example Fish in the Surveys



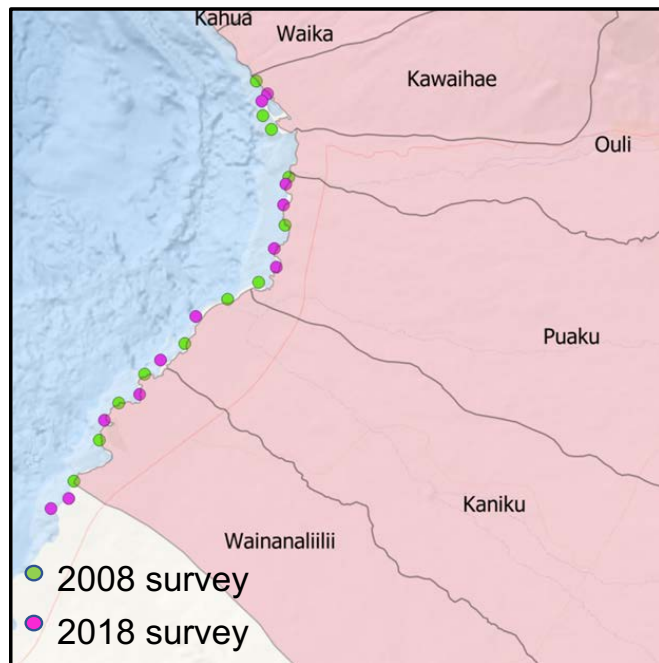
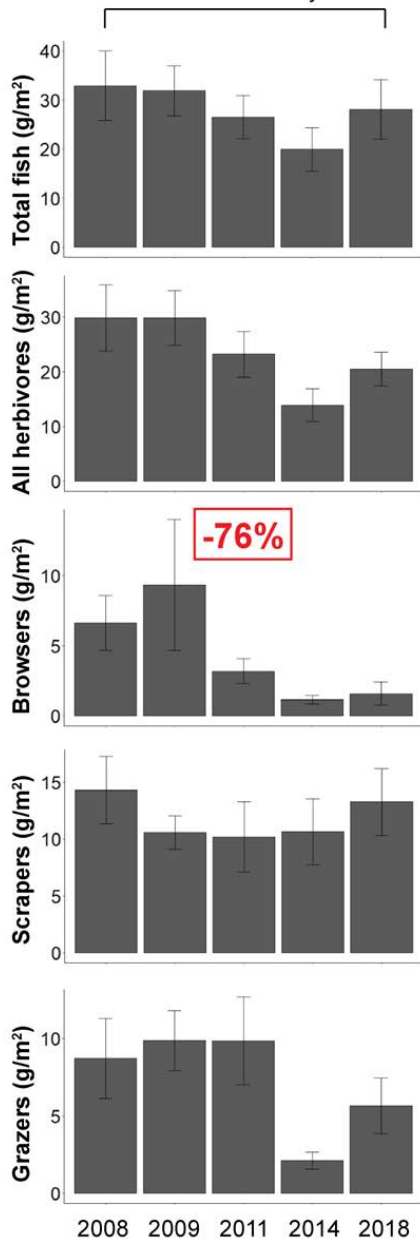
Shallow Water Resource Fish Report Card

2008 to 2018

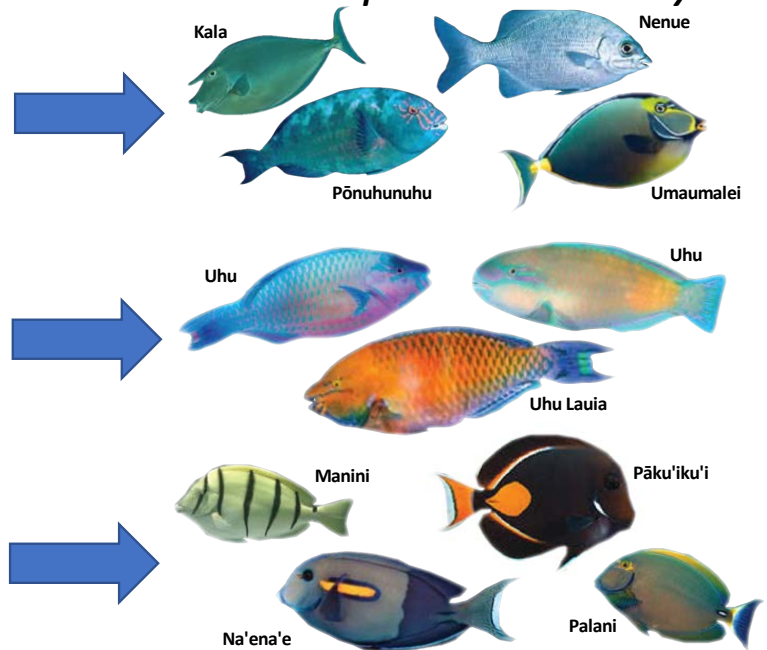
South Kohala

Average values across all sites per year are shown \pm standard error

Significantly different changes between 2008 and 2018 are indicated by % difference



Some Example Fish in the Surveys



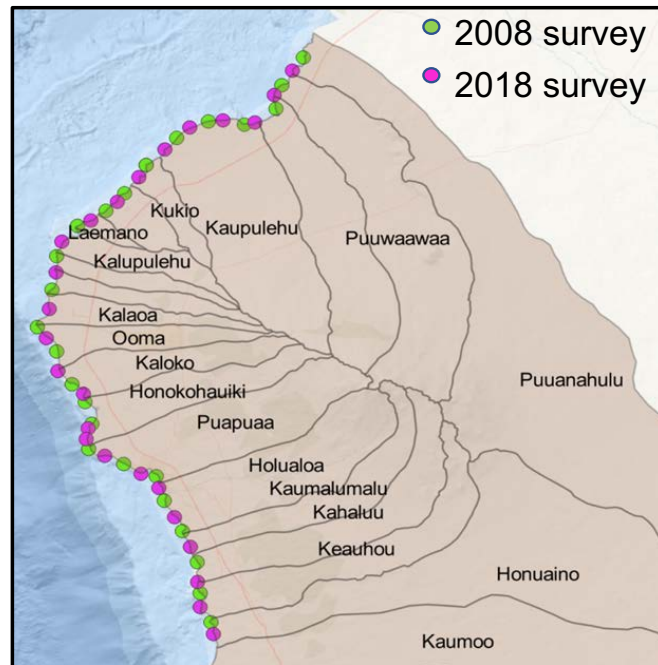
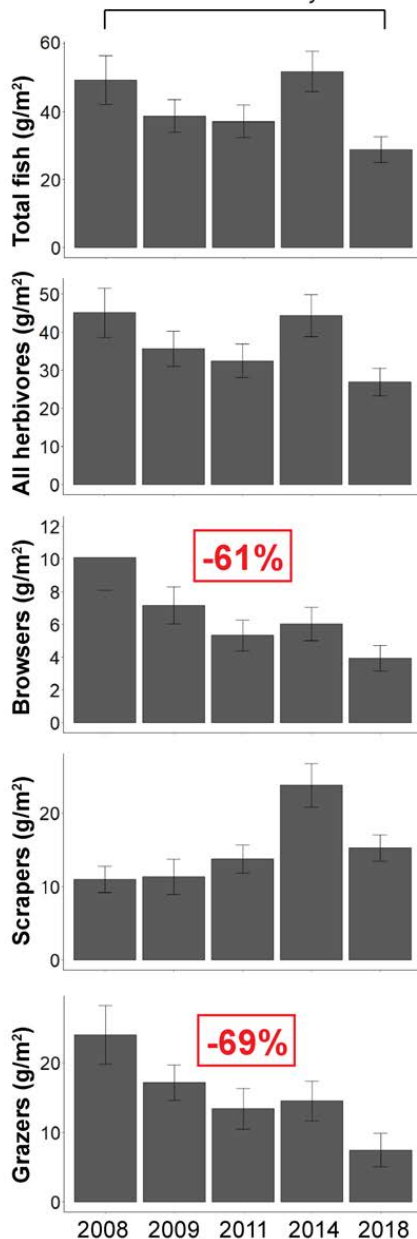
Shallow Water Resource Fish Report Card

2008 to 2018

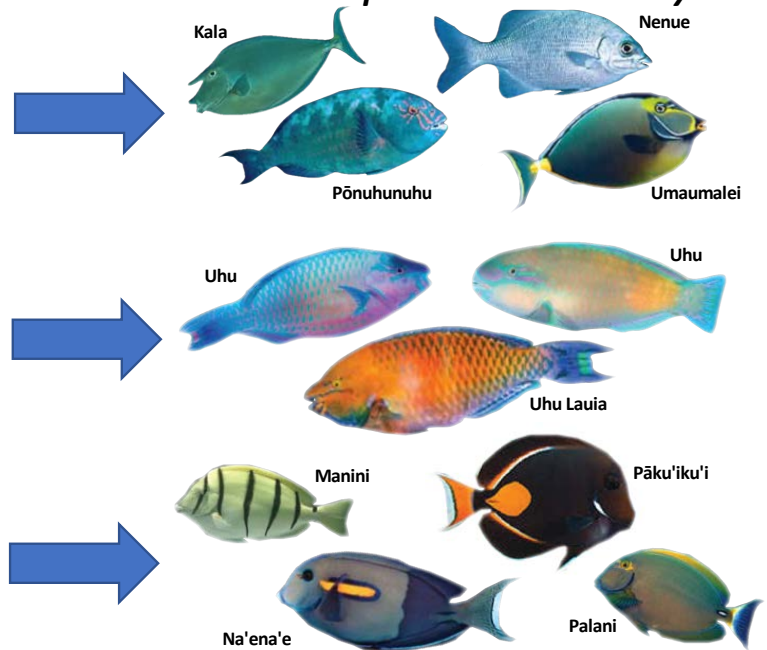
North Kona

Average values across all sites per year are shown \pm standard error

Significantly different changes between 2008 and 2018 are indicated by % difference



Some Example Fish in the Surveys



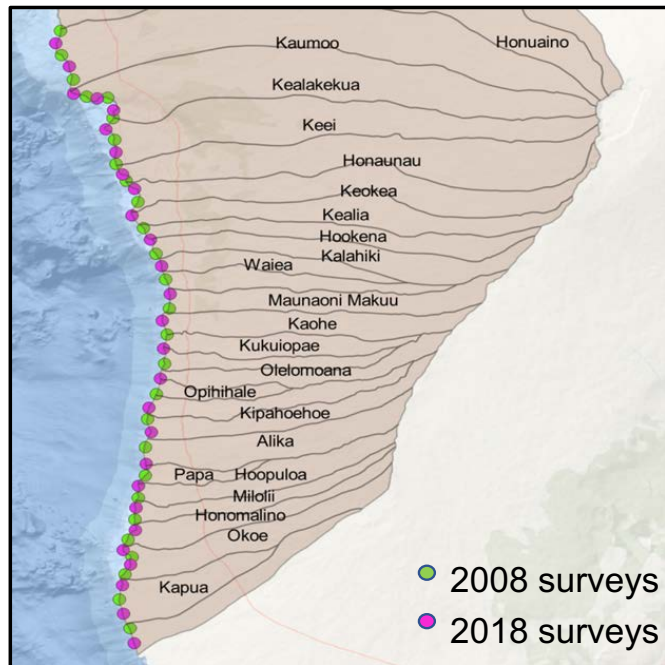
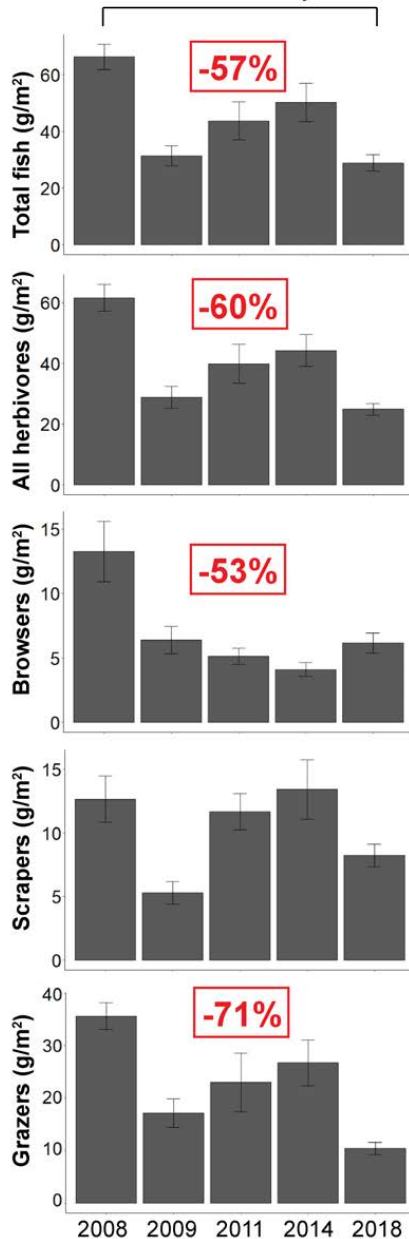
Shallow Water Resource Fish Report Card

2008 to 2018

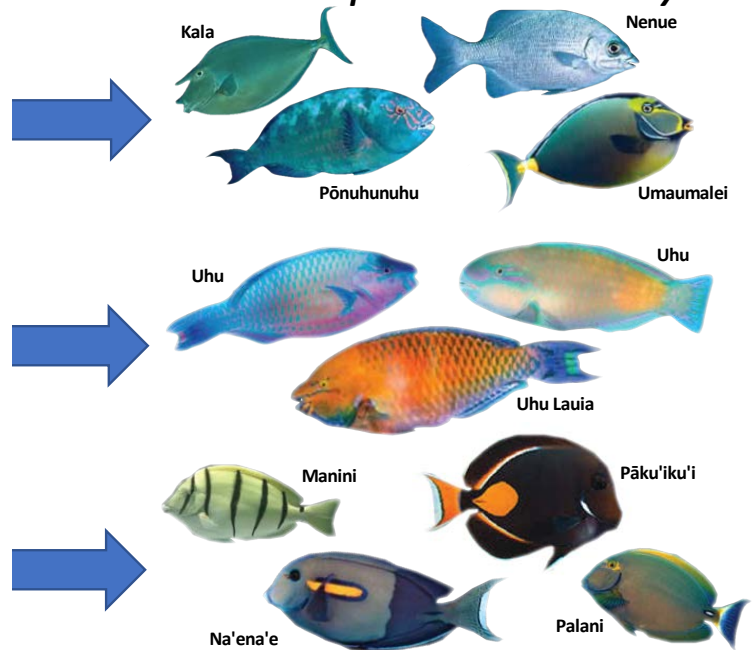
South Kona

Average values across all sites per year are shown \pm standard error

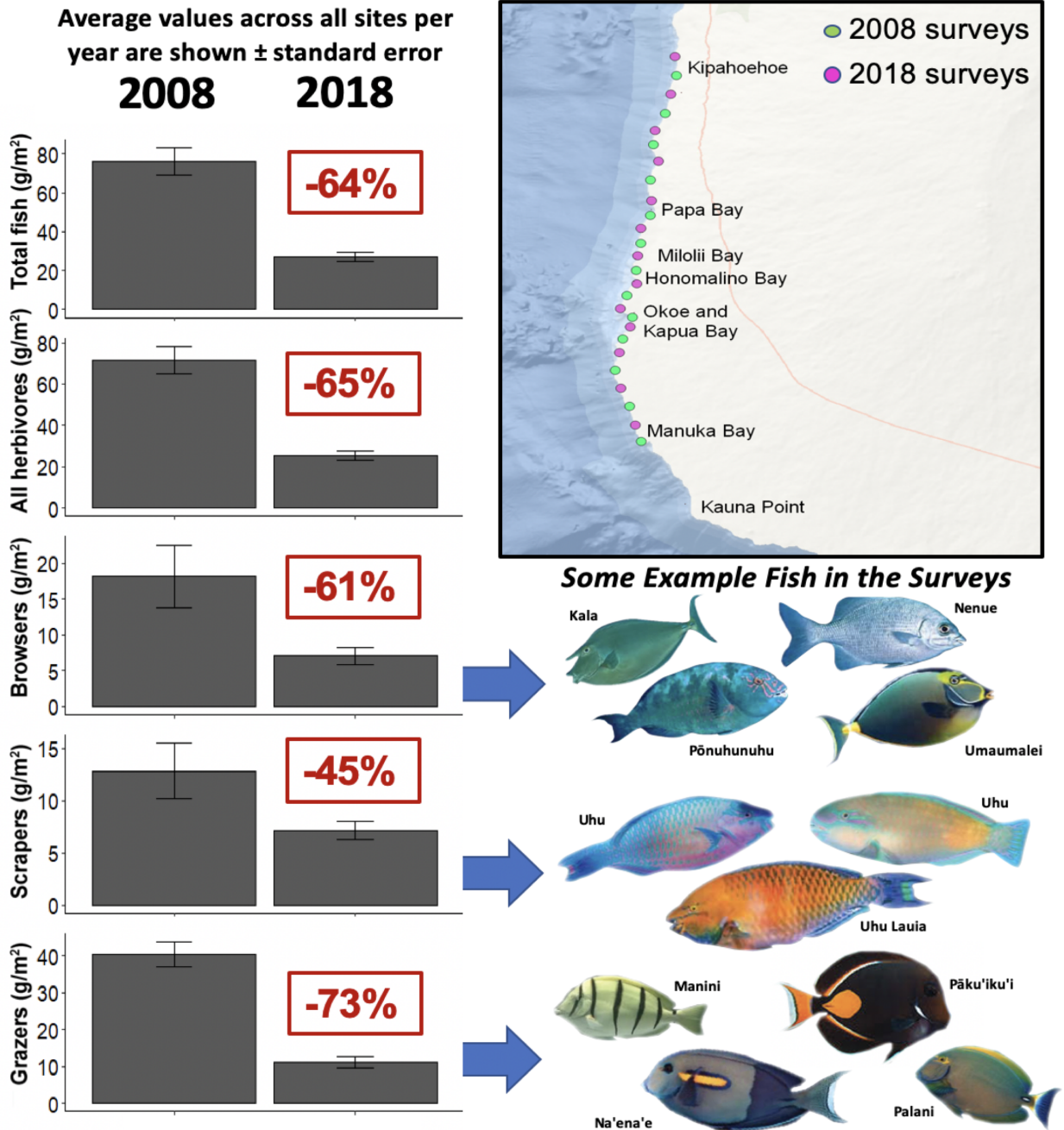
Significantly different changes between 2008 and 2018 are indicated by % difference



Some Example Fish in the Surveys



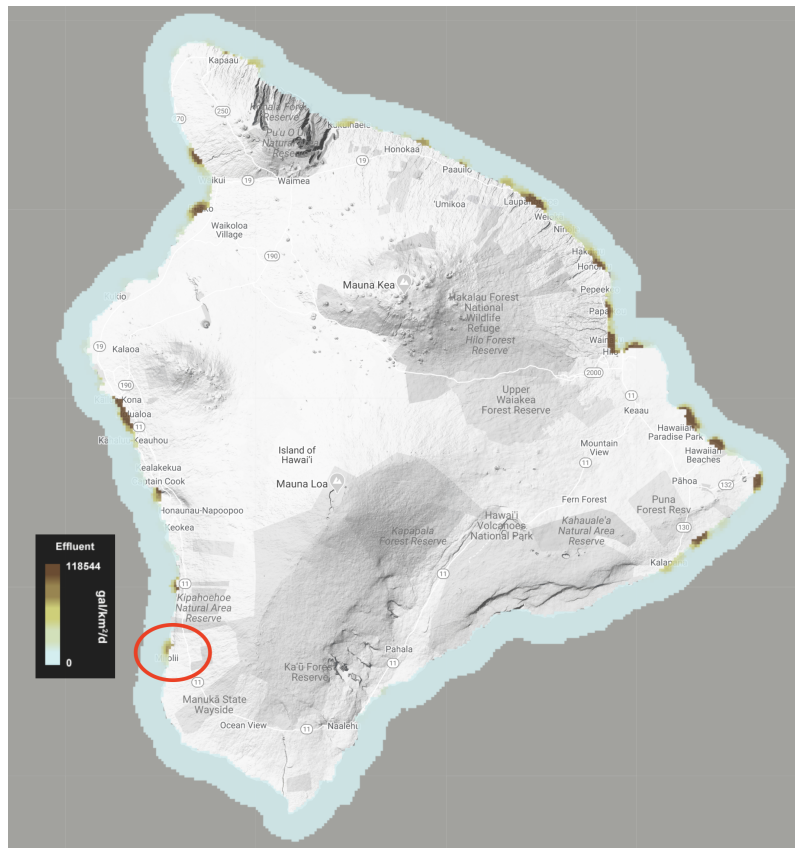
Shallow Water Reef Fishery, 2008-2018 in the Proposed Miloli'i CBSFA Area



Appendix 8: Miloli'i Subdivision Sewage Effluent summary

**Miloli'i Subdivision Breaks 10,000 gallons per day
in Sewage Effluent
2 April 2021**

The latest available data on sewage effluent indicates an alarming estimate for the Miloli'i Beach Club Association II, also known as the Miloli'i Subdivision. Approximately 10,600 gallons of sewage are entering the ocean per day per km sq. from the Miloli'i Subdivision, placing it in the list of top sewage effluent sites on Hawai'i Island. For context, this amount of sewage is equivalent to one Olympic size pool entering the ocean every month. Compared to neighboring sites of Miloli'i Village (2,880 gal/day) and Honomalino (350 gal/day), the Miloli'i Subdivision is reaching a level of sewage outfall that endangers the reef ecosystem of Pāpā Bay, which is located immediately adjacent to the subdivision.

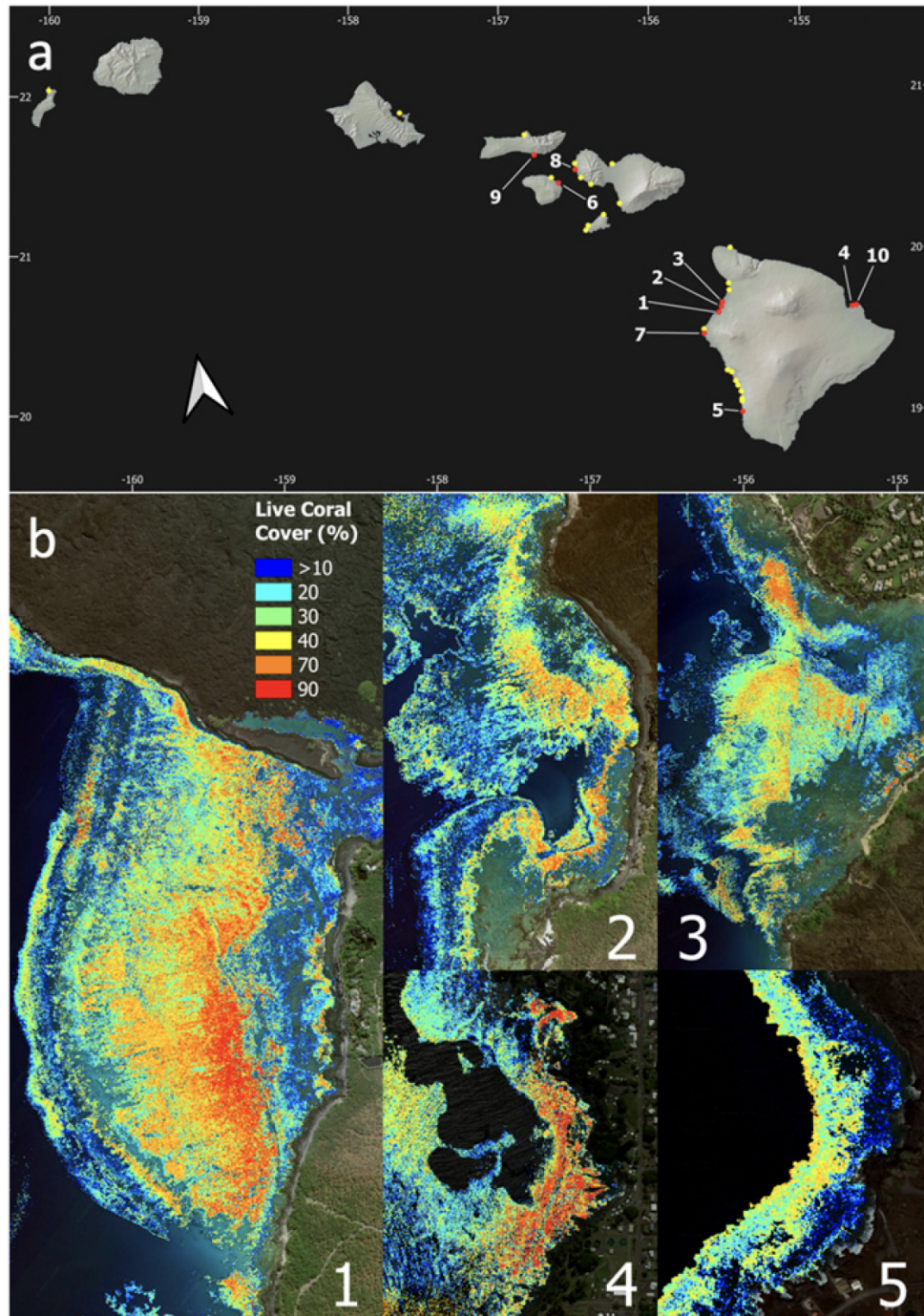


*Most polluted sites on Hawai'i
Island (State of Hawai'i PacIOOS).
Units are gallons per day per
square kilometer of development.*

LOCATION	TOTAL EFFLUENT
Kailua-Kona	52,000
Hawaii Paradise Park	32,000
Laupahoehoe	30,300
Hilo	27,000
Kawaihae	18,000
Puako	16,800
Kealahou Bay	14,000
Kona Paradise	13,900
Pāpā Bay (MBCAII)	10,600
Miloli'i Village	2,800
Hōnaunau	1,000
Kīholo Bay	800
Honomalino Bay	350

*Brown spots indicate areas of sewage outflow from Hawai'i Island.
Red circle shows Miloli'i Subdivision (State of Hawai'i PacIOOS).*

In 2020, Pāpā Bay was determined to be the fifth most intact reef in the entire State of Hawai'i.



Top 10 reefs in terms of live coral. Reef 5 is Pāpā Bay, the site of the Miloli'i Subdivision (ASU-Hawai'i Division of Aquatic Resources, NOAA Fisheries).

Additional 2020 reports, co-authored by state and federal scientists, indicate that land-based sewage and nearshore development are the top drivers of coral and fish decline along the west coast of Hawai'i Island.

CORAL REPORT SUMMARY

Which top 3 human-driven factors influence WHERE corals survive in the Hawaiian Islands?

- 1 Nearshore development & water quality**
Nearshore development fundamentally changes the coastline and alters the natural landscape. Sediments and toxins from tires, oil spills, and other pollutants more easily enter coastal waters during rain events, leading to poor water quality, coral disease and bleaching. Sediments also block sunlight, starving the symbiotic algae living on corals, causing them to die. **This outcome can be prevented by reducing use of chemicals on grounds and containing waste.**
- 2 Sea-surface temperature**
Rising sea surface temperatures are becoming more frequent each year due to climate change. When temperatures become too hot, corals expel their symbiotic algae, turning corals white. If corals are bleached for prolonged periods, they eventually die. **This outcome can be prevented by getting climate change under control.**
- 3 Non-commercial fishing**
Unsustainable fishing practices deplete both the abundance and diversity of fish from coral reef ecosystems, where they play an important role in keeping reefs healthy and resilient to climate change. When fish are depleted, Hawaii's local food resources are compromised and coral reefs are ultimately harmed. **This outcome can be prevented by reducing non-essential catch.**

<https://www.pnas.org/content/117/52/33711>

Logos: ASU Center for Global Discovery and Conservation Science, Hawaii Coral, NOAA Fisheries

WHAT CAN MILOLI'I DO TO HELP?

- Do not flush anything more than human waste and simple toilet paper.
- Use certified non-toxic detergents in clothes and dish washers.
- Have your septic tank pumped out before it fills up (ideally, every year)
- Convert cesspools to septic tanks. Hawai'i provides financial relief for conversion.

Appendix 9: Mohala Nā Konohiki Program Poster & Website

Link to Mohala Nā Konohiki website:

<https://storymaps.arcgis.com/stories/d33202f1516346f8beb6d6efa50e9ba5>

Mohala Nā Konohiki

For over a millennium, Hawaiians implemented cultural resource management practices that sustained a large population without imported goods. These practices hold the key to sustainability; however, many have been lost. In 2018, CI Hawai'i worked with one of the few remaining Konohiki (headman of an ahupua'a land division), Uncle Mac Poepoe, to document and share traditional Hawaiian resource monitoring and management practices with trainees from Mo'omomi, Miloli'i, Hōnaunau, and Kāwā.

Mohala Nā Konohiki was given to signify the blossoming, or unfolding of our remaining Konohiki in Hawai'i so this program can perpetuate these important practices and continue Uncle Mac's legacy.



Mo'okū'auhau:
Who are you, who do you descend from, what is your kuleana? 'Auamo that inherit knowledge.



Pono:
Maintaining balance within the system, the community & oneself is key to ensure righteousness.



Group Discussions:
Lessons shared by Uncle Mac & discussions with group about experiences, observations allows the group to pass on 'ike with each other and further develop insights together.



'Ike Maka:
Understanding the environment through first hand experiences of our kupuna.



Wahi Pana, Mo'olelo:
Learning stories, chants and names of your place & Use them!



Ka Pō'āiapuni:
Looking at spawning and life cycles of resources by tracking them during various seasons and moon phases.



Lawai'a, Kilo & Place-Based Experiences:
Learning about the physical landscape through fishing practices, monitoring and being in ones' place. Taking the time to kilo, look at behavior and interactions between resources within the system.



Knowledge Acquisition:
Learning, practicing, teaching & sharing the 'ike demonstrates competence and builds confidence to holomua.



'Ai Pū Kākou:
Preparing & eating food together is so important to continually maintain relationships with kanaka, the resources & each other.



AT A GLANCE:
100% of participants are Native Hawaiian
11 Males & 5 Females
4 Communities (Mo'omomi, Miloli'i, Hōnaunau & Kāwā)
3 workshops in Miloli'i
Monthly experiences at Mo'omomi
2 Exchanges: 1 in Miloli'i & 1 in Mo'omomi



"I have committed to monitoring the marine life through managing what I harvest and what I see others harvest. Mohala Nā Konohiki has awakened my love to seeing and being a part of solutions to issues that can be resolved if we all continue to work together."
Darrell Lopez, 2018 Mohala Nā Konohiki participant

Acknowledgements: Kelson "Mac" & Kamalu Poepoe, Hu Maikama o Mo'omomi, Kulanika'e Foundation, Na Mamo o Kawa, Conservation International, Kamakee Han, Kavalatona Han-Krael, Ke'ani Krael, Kel' Krael, James Akau, Wesley Basinger, Heslani Cahill, Melissa Lani Hui, Taha'a Kahale, Ka'imi & Willy Kaupiko, Laila & Levalyn Kaupu, Daniel "Bobo" & Polina Lopez, Will Ma'e-Huihu, U'u Ching, Kehau Springer
Funding Support: Harold K.L. Castle Foundation, Dorrance Family Foundation, Atherton Family Foundation, Lakeside Foundation
Photo Credits: Atlandrick Photography Paul Cox, Matthew Ramsey & Kehau Springer




Appendix 10: Invertebrate Life History Table

Species	Life Cycle	Reproduction Age & Size	Peak Spawning Season	Ecological Role	Habitat Needs	What they eat and what eats them.
'A'ama thin shelled rock crab <i>Grapsus tenuicrustatus</i>	reproduction = spring/early summer to fall, community/family members to specify when eggs are present. Need to know when the molt? = bad time for harvest? Is it related to spawning periods?	Smallest 32cm, 38cm (Luszeck)	Early Summer - Fall; Dec-Jan, Mar-Apr (Luszeck)	Scavenger/clean papa.	Basalt rock substrate (including papa or boulders)	Food for he'e, tidepool fish, puhi.
Hā'u'ke'u'ke helmet urchin <i>Colobocentrotus atratus</i>	Larval cycle can last two weeks to a month. They are broadcast spawners like 'opihi and reproduce throughout the year with peak spawning during Fall and Spring months. They may have gonads in the summer months but they do not spawn.	Size of reproductive maturity is approximately 40mm	Peaks in Fall (October-December) and Spring (March-May) though the seasons are different in some places. Reproduction coincides within a window of cooler temperatures between Fall and Spring.	Cleaners of the intertidal area. Important key grazer of macroalgae and maintains habitat space for 'opihi. Can outcompete 'opihi if found in high densities (Bird). They can dominate habitat if 'opihi are not present.	Basalt rock substrate with CCA on wave exposed shore (including papa or boulders)	Grazes on macro and micro algae, crustose coralline algae, periwinkles. Predators include small snails, tidepool fish, he'e.
'Opihi limpet <i>Cellana spp</i>	18 day larval duration period (Corpuz). Spawning on Hilo to Kupau moons (new moons). Eggs vary in color from dark yellow to brown and the pigment may be based on diet. Moreover, immature ovaries were observed to be much lighter in hue than mature ovaries (Mau).	Makaiauli & 'Ālinalina grows approx 4-5 mm per month till about 20 mm; then 2-3 mm per month till about 30mm. Size at maturity for 'ālinalina is approx 22-25mm (or around 6 months). Kō'e'e size at maturity is approximately 50mm. (Corpuz, Mau).	Varies species to species but there are 2 distinct periods between Oct-April and June-August (Mau).	Cleaners of the intertidal area. Important relationship and balance with hā'u'ke'u'ke and micro/macro algae	Basalt rock substrate with CCA on wave exposed shore (including papa or boulders)	They are herbivorous grazers that feed on benthic diatoms and micro algae (Mau) and CCA (Bird). Some known predators are: Neothais harpa, Pupu 'Awa (Purpura aperta); Makaloa (Drupa Morum, Drupa ricina); Thais intermedia.
Ula spiny lobster <i>Panularis penicillatus</i>	Bi-phasic - benthic adult, pelagic larvae; both adults and larvae grow by molting - they outgrow their current body, and cast off the exoskeleton (outer shell) and then they are soft tissue and vulnerable for up to a week, so they hide in shelters. They will eat crustose coralline algae to increase calcium to harden a new shell. Adults will molt on average once a year, more frequently when younger and less frequency when older. To reproduce, males place a sperm packet (called a spermatophore) on the female's abdomen which the female can scrape to fertilize her eggs when she chooses. For <i>P. penicillatus</i> , these larvae are feeding larvae (likely feeding on soft-bodied organisms like appendicularians, salps, and cnidarians) out in the open ocean for ~9 months until the final molt stage they change (metamorphose) into a different type of larvae, known as a puerulus. The pueruli look like clear-colored baby lobster, and are non-feeding larvae, but extremely fast swimmers to enable them to cross the shelf and settle into adult habitat and molt to the juvenile stage and feed.	Spiny lobsters generally reach maturity in 3-7 years, but it's difficult to get exact ages since they grow via molting. Females, Carapace length (CL) = 56mm, ~3 years old where 50% of females are physiologically mature and 66mm where 50% are functionally mature - bear eggs; Males, CL=72-74mm CL; from Lobsters in Taiwan (Chang et al. 2007)	Year-round, but peaks in May-September, correlated with warmer water temperature. Females can have multiple broods of eggs in a year. Eggs are incubated for 1-4 months depending on spiny lobster species, and then phyllosoma larvae are released into the water column. (Chang et al. 2007)	Nocturnal omnivore and possibly scavenger on coral reefs, shallow scoured basalt rock reefs, and intertidal habitats	Coral reef habitat, mostly on forereef or scoured shorelines in windward surf zones, as they require clear, clean and highly oxygenated water; Shallow: 0-10m depth;	Eat: In general, spiny lobsters are known to be omnivorous, with a preference for gastropods, bivalves, chitons, and crustaceans, as well as crustose coralline and fleshy algae. <i>P. penicillatus</i> will move into the intertidal zone and is thought to also feed on echinometra urchins. Eat them: he'e (octopus), ulua, and when they're at smaller sizes, likely other fish that eat invertebrates

Appendix 11: Fish Life History Table

Species	Life Cycle	Reproduction Age & Size	Peak Spawning Season	Ecological Role	Habitat Needs	What they eat and what eats them.
Kole Golden eye surgeonfish <i>Ctenochaetus strigosus</i>	Spawning can be in pairs or groups where eggs are released into the water column. Juvenile stage is yellow, may utilize deeper coral reef habitats as juveniles, spawn as early as 6-8 months old and 6.5 cm, can live to 18 years old or older; Larger ones are mostly males	6.5 cm (2.5 inches) and <1yr; females are smaller than males typically	Feb-July (annual variability can protract or extend the spawning season), sunset and moon phase (new and full) is spawning cue	Detritivore, recycles nutrients	Coral reefs, deep mesophotic reefs and shallow reefs.	They eat detritus with comb like teeth. Eaten by other fish. Like the sand and turf areas
Manini convict tang <i>Acanthurus triostegus</i>	larval duration~55 days, move inshore into tide pools (more juveniles seen May - September), spawning around 1-1.5yrs, can live 3-5yrs.	Size at maturity is variable by location from 12 cm (5 inches) to 16.5 cm (6.4 inches).	Feb-June, but can spawn all year and varies by location, peak during March-May	Herbivore, important grazers for maintaining coral and limu balance on coral reefs	intertidal areas, tide pools, reef flats, coral reefs, good indicator for other species spawning	They eat limu and they are food for many fishes, especially when they are larvae.
Ōpelu mackerel scad <i>Decapterus macarellus</i>	Pelagic spawners, juveniles form schools inshore, migrate to deeper water to spawn, spawning capable at around 5-6 months, can live to 14 months or just over a year.	~25.5 cm (10 inches) for D. macarellus and 19.7 cm for D. macrosoma (~5months old)	Peaks during April-Sept	Important food source for many predators including fish, mammals, and birds.	bays, areas of upwelling and plankton aggregation sites	They eat plankton and small crustaceans. They are eaten by larger fish, dolphins, mammals, sharks. Important food for ulua and jacks.
Pāku'iku'i achilles tang <i>Acanthurus achilles</i>	max length 24 cm, settles on reefs at 6 cm size, sometimes hybridizes with A. nigriscans, suggested to be monogamous (one mate), variable and low recruitment. Larger ones are males, like the medium size ones (softer ones)	Not available	Observed spawning in March	Grazer, maintain limu coral balance especially for filamentous red and green algae	shallow high wave habitats and coral reefs, juveniles like the boulder habitat, maybe linked to the fresh water and the types of limu, less on reef	Fleshy and filamentous limu. Fishes eat them.
Uhu (palukaluka-female, 'ele'ele-male) red-lipped parrotfish <i>Scarus rubroviolaceus</i>	Hermaphroditic, changing sex from female (red) to male (blue). Can have some red males in the population (sneaker males).	Size at female maturity = 35.0 cm (13.8 cm), Size at sex change = 47.3 cm (18.6 inches); 3 years to reproduce	February-June, peak March-April	Coral reef regeneration, bioeroder, clean coral and open for recruitment, make sand	Coral reefs, deeper water	They eat limu, coral, and coralline algae. They are eaten by larger fish
Uhu ('ahu'ula-female, uliuli-male) Spectacled parrotfish <i>Chlorurus perspicillatus</i>	Hermaphroditic, changing sex from female (red) to male (blue). Can have some red males in the population (sneaker males).	Size at female maturity = 34.5 cm (13.6 inches), Size at sex change = 46.4 cm (18.3 inches); 3 years to reproduce	March-April	Coral reef regeneration, bioeroder, clean coral and open for recruitment, make sand	Coral reefs, deeper water	They eat limu, coral, and coralline algae. They are eaten by larger fish
Ū'ū soldierfish <i>Myripristis spp.</i>	3 month larval duration, high connectivity among reefs and islands, can live to 14 yrs old	First reproduction: Male 14.9 cm (6yrs), Female 15.4cm (6yrs) ~ 6 inches	April - June	Plantivore and piscivore	Caves, rock, and reef structures, boulders	They eat crab larvae, shrimp, and fishes. Feeding is nocturnal.

Appendix 12: Miloli'i Community Research Guidelines

MILOLI'I COMMUNITY RESEARCH GUIDELINES

This document is a guide for interested and potential research partners who seek to contribute to the health of Miloli'i and adjacent land and ocean areas. This guide reflects our values around knowledge production, communicates the important role community members and partners have in this space, and the kuleana attached to acquired knowledge and its use. It also articulates our priorities, requirements, restrictions on the collection, analysis, storage and use of data as well as the intended beneficiaries of research conducted in Miloli'i. It is to ensure that our landscapes and natural resources along with kūpuna 'ike and kanaka testimony are protected and secure and to ensure the pono use of the data for the purpose of mālama 'āina and sustainable interactions. Like our cultural practices, the process of intentional inquiry is dynamic and reflects the larger context in which is conducted; therefore, we believe this guide to be a living document that, while rooted in 'ōiwi values and methodologies, will evolve to ensure equitable experiences and outcomes for all.

Questions for Researchers:

1. Who are you?
2. Where are you from?
3. What is the research you wish to conduct?
4. How does the research you wish to conduct support previous community-driven inquiry in Miloli'i?
5. How does the research you wish to conduct support community-driven and collaborative stewardship efforts in Miloli'i and neighboring communities?
6. What is your affiliation?
7. Why do research in Miloli'i?
8. What are your research priorities?
9. What data are you trying to gather and for what purpose?
10. What will be the end products or results of your research (for example, publications, rule changes, development, etc.)?
11. To your knowledge, how will this research affect our community?
12. To your knowledge, how will this research affect the environment?
13. What is the infrastructure or platform that will be used in the data storage, analysis process?
14. Explain how will this data be made to accessible to the community in a fashion and format that is of use and benefit to the community?
15. Are you required to make the data you collect publicly available and accessible to anyone or are there reasons to keep it confidential, or under an embargo?

Guidance for Researchers:

- Build relationships with community members and leaders that focus on introductions, trust development, intention setting, and reciprocity.
- Discuss your research background and previous experiences in Hawai'i (or other locations) with Miloli'i community members and leaders. Ask Miloli'i community members and leaders about their previous and current inquiry-based activities to understand how your research efforts may support and be enhanced by ongoing community-driven and collaborative research.
- With input from community members and leaders, create a plan to be implemented well in advance of the start of your research that shares how you will engage and respond to questions and concerns from the broader community.

- Arrange and hold a community meeting to discuss concerns. Expect multiple meetings to be conducted over the course of the research project.
- Incorporate ways for the community to become co-researchers in the effort and participate in the co-development of the research plan, sample design, data collection, and publications.
- Plan for the inclusion of community members (advisory and direct engagement) in the data collection, analysis, and interpretation phases. When completed, circle back to the community to review the draft outputs.
- The community needs to agree to what can be published.
- Any external documents (publications, media releases, etc.) should be vetted by the community.
- The community should be cited in any publications, media releases etc.
 - Example: "This publication is based on research gathered with the kind permission and collaboration of the Miloli'i community in the _____ [area/region]"
- Any samples should only leave Hawai'i if the researcher can present official permission from the State of Hawai'i indicating it has agreed to such removal.

The Miloli'i Community embraces the following values that you are requested to bear in mind when gathering research:

- | | |
|--|--|
| • Compassion | • Communication |
| • Understanding of 'ohana values in the community | • Laulima - working together in partnership |
| • Heart of the community is 'ohana - Hānai ke keiki i ke kaiāulu | • Open mindedness and willingness to learn from each other |
| • Aloha & Mālama 'Āina | • Respect the traditions and cultural practices |
| • Transparency & Reciprocity | • Growing environmental relationship to place AND people |
| • Honesty | |

By adding my signature below, I acknowledge and accept the Miloli'i Community Guiding Principles for Research commitments

ACKNOWLEDGED AND ACCEPTED ON THIS ____ DAY OF _____, _____

(signature)

Name and title Organization

Address, phone and email

References:

Kulana Noi'i

<https://seagrant.soest.hawaii.edu/kulana-noii/>

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