



FLASH Strategic Plan

December 07, 2011

Fisheries Local Action Strategy in Hawai‘i (FLASH):

Status:

This strategic plan was most recently updated with the FLASH Steering Committee in December of 2011. Specifically, the status of the FLASH activities were updated in order to give the Steering Committee an update on progress and to reprioritize priority activities on which to focus. Status updates for each activity were made on pages 11-18.

Problem statement

Introduction

Coral reef fisheries are an integral part of life in Hawai‘i, providing resources such as food, recreation, commerce, and culture. However, there is evidence from both researchers and resource users that coral reef fisheries have been steadily declining over the past century, a trend that threatens both the health of our nearshore marine environment and the well-being of present and future generations of our people. Urgent action is needed to address the increasing pressures and impacts on coral reefs in order to ensure sustainability of our fisheries and our lifestyle in the Hawaiian Islands. One action taken by the U.S. Coral Reef Task Force, in collaboration with the State of Hawaii, was to create the Fisheries Local Action Strategy for Hawai‘i (FLASH). The purpose of the FLASH is to develop viable fisheries management solutions, enhance public understanding of Hawai‘i’s coral reefs and facilitate public involvement in coral reef stewardship and supports projects by promoting collaboration, outreach, and engagement amongst stakeholders, offering technical support, and identifying funding opportunities.

Effects of increased fishing pressure

Increased fishing pressure not only results in less fish, but also fewer types of fishes and smaller fish. Fishing pressure can also make it more difficult for fish stocks to recover. Coral reef species are particularly vulnerable to fishing pressure, and stocks can be rapidly depleted, potentially to the point of no recovery.¹ The preference for larger and older fish has a disproportionately higher impact on the growth and replenishment of fish populations, since these fish produce more eggs and healthier offspring.² If the abundance of a species drops too low, a fish population may lose its ability to rebuild itself.³ As large, predatory fish species are targeted and depleted, fishers will “fish down marine food webs,” moving on to remaining smaller species which are then, in turn, depleted.⁴

Declining fish stocks on coral reefs in the Main Hawaiian Islands (MHI)

There is evidence of overall declines in abundance and size of fishes, as well as decreased numbers of key species in Hawai‘i. The combination of these signs is an indication of overfishing due to increased fishing pressure. There are two sources of evidence: quantitative (data from fisheries and research) and qualitative (surveys and interviews of resource users). The issue of overfishing can be presented in two ways: looking at changes in fisheries resources from past to present, and comparing data about resources in areas of high fishing pressure versus areas of low fishing pressure.

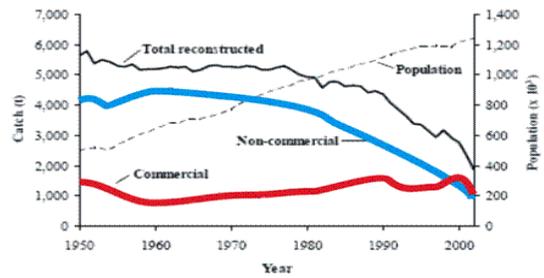


Figure 1: Total reconstructed catches of coral reef and reef-associated fisheries of Hawai‘i. Human population trend is also shown.

Quantitative evidence of declining fish stocks

A trend of declining catches despite increasing effort has been observed in several studies of time series data. A reconstruction of reef and bottomfish fisheries catches from 1950 to 2002 found that combined commercial and non-commercial catches for non-pelagic species peaked around the late 1980s at 10.09 million lbs, and declined by 2002 to 6.64 million lbs (see Figure 1).⁵

In a review of commercial landings data between 1980 and 1990, the Hawai‘i Division of Aquatic Resources (DAR) found that “while catch per unit effort (CPUE) was declining... an equivalent amount of landings was being shared among an increasing number of fishermen.”⁶ This indicated the decline was due to decreasing fish stocks and not decreased fishing effort. Also, CPUE for species that are harvested by recreational and subsistence users has declined dramatically over time, despite new developments in fisheries technology. *Moi* are a highly prized species that have shown signs of overfishing. The average

size of fish has declined since the 1960s with fewer females in the population. Over 40% of all the fish now harvested are below reproductive size (see figure 2).⁷ Similar studies of *omilu* have shown that only 2% of the population had reached reproductive size before harvest.⁸ In comparison, fisheries managers recommend at least 50% of the population reach reproductive size before removal.

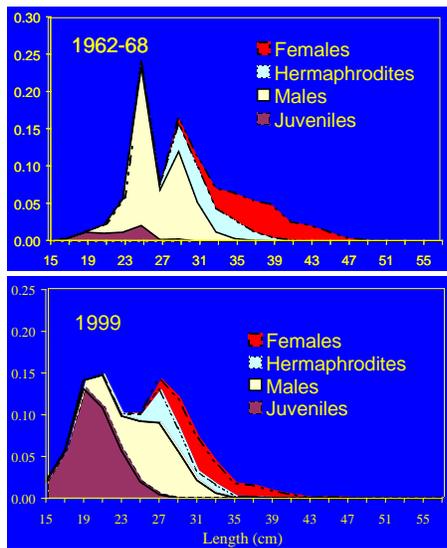


Figure 2: Comparisons of *moi* size and sex between the 1960s and 1999

Further evidence of overfishing impacts can be seen by comparing conditions in the MHI with the Northwestern Hawaiian Islands (NWHI). Due to relatively low levels of fishing pressure and other human impacts, conditions in the NWHI can serve as a baseline for “pristine” coral reefs. A comparative study in 2002 revealed “dramatic differences” in abundance, size, and species composition (see Figure 3):⁹

1. Standing fish stock in the NWHI was more than 260% greater than in the MHI.
2. More than 54% of the total fish biomass in the NWHI consisted of apex predators, compared to less than 3% in the MHI.

3. Most of the dominant species by weight in the NWHI were either rare or absent in the MHI, and the target species that were present, regardless of trophic level, were nearly always larger in the NWHI.

This study concluded that “the differences in fish assemblage structure in this study are evidence of the high level of exploitation in the MHI.” These results are also mirrored in many archipelagos in the Pacific (see CRED 2007 report).

Qualitative evidence of declining fish stocks

The quantitative evidence of declining reef fisheries is corroborated by qualitative information from public surveys, oral histories, and interviews with members of fishing communities. In 1997, DAR surveyed 863 fishermen and found reports of “a decline in the amount of fish that they’re able to catch now compared with what they were able to catch 20 or 30 years ago.” Consequently, more than half of the respondents rated nearshore fisheries as “poor” or “terrible.”¹⁰ These comments echoed an earlier DAR survey in 1988, in which respondents agreed that nearshore resources were in decline due to overfishing.¹¹

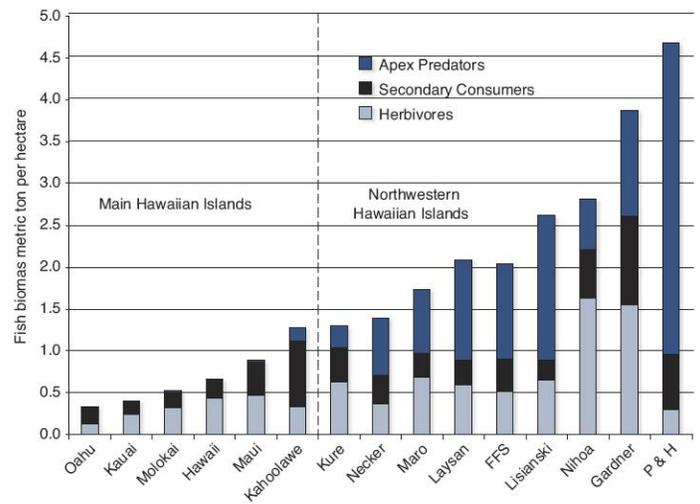


Figure 3: Comparison of coral reef fish biomass in MHI and NWHI

In a compilation of over 130 oral history interviews with *kupuna* (“elders”) and *kama‘aina* (Hawaiian residents; literally “those who are of the land”), the majority of interviewees reported changes in the quality of the fisheries as well as a significant decline in fish abundance, and they attributed these trends to overfishing.¹² One interviewee described the impact of intensively fishing a single spot, demonstrating how bigger fish are targeted first, followed by a decline in size:

“At first, I was catching like a twelve, fourteen pound fish [‘opakapaka]... and then started going down and then I started catching the seven, eight pounders. And then after about maybe a six to nine month period it was going down to like two or three pound fish. Just wiped the whole chain down, down to the bottom already.”

Another interviewee observed the effects of the fisheries closure during and after World War II, an example of how quickly fish populations can respond to the absence and presence of fishing effort:

“I went back fishing [around 1946] and it was unbelievable. Those years that the fish had reprieve... it was overwhelming in numbers... The [fish] population just exploded! ...it took about three to four years to begin to see the decline occurring again... the closure enforced in this case, was very, very obvious that human beings can really wreck havoc.”

There were also observations that the availability of desirable fish was diminishing, which illustrates how fishing down marine food webs forces economic preferences to shift: *“We just threw that stuff away, I see people selling that stuff now.”*

In 2005, the Fisherman Outreach Program (FOP) collected and analyzed interviews with 55 fishermen on Maui and the island of Hawai‘i.¹³ Fishermen’s responses revolved around three main themes:

1. declines in the numbers of fish or schools of fish;
2. changes in how readily fishers were able to find fish ; and
3. changes in the quality of fish fishers saw and caught.

These themes echo the quantitative evidence of decreasing abundance yet increasing effort, smaller fish, and loss of species. Many fishermen interpret these trends as less fish for the future: *“What about my grandchildren? Not going be able to catch fish. Going be all gone.”*

Conclusions

Both quantitative data from fisheries and research as well as qualitative information from surveys and interviews of resource users show clear evidence of overfishing of MHI coral reefs. Overfishing has contributed to trends of decreasing fish abundance, smaller sizes of fish, decreased capacity for replenishment of fish stocks, and loss of commercially valuable and ecologically important species. The impacts of overfishing not only endanger fisheries, but also threaten many aspects of daily life such as subsistence, health, recreation, tourism, and culture. Coral reef resources are an integral part of life in Hawai'i. The Fisheries Local Action Strategy was developed to address this concern and assist the State to ensure a sustainable coral reef fishery.

Vision Statement:

Developing a shared vision is one of the most important steps in developing a strategic plan. This vision is a statement of the preferred future for the coral reef fisheries in Hawaii and what we are striving to accomplish. We hope this vision will also help motivate and inspire the greater stakeholder community.

The Fisheries Local Action Strategy's Steering Committee envisions a Hawaiian Islands with a healthy nearshore marine environment that is maintained through effective management* for the benefit and appreciation of all generations.*

* Healthy nearshore marine environment and effective management are defined in Appendix 1.

Mission Statement:

Our mission statement sums up the FLASH steering committee's 'reason for being'. It defines our intentions, priorities, assumptions and values. This statement also helps explain to our stakeholder community what we do and why we are doing it. It will help determine what projects fall within the scope of the steering committee.

We believe the island way of life is important to defining who we are, that most people care about the environment, and that informed decision making and proactive stewardship will lead to improved and sustainable coral reef fisheries. By promoting collaboration, outreach, and engagement amongst stakeholders, offering technical support, and identifying funding opportunities, we will help create viable fisheries management solutions, enhance public understanding of Hawaii's coral reefs and facilitate public involvement in coral reef stewardship.

Prioritized threats:

To prioritize threats to coastal marine resources, we rated each identified threat under three category headings: area (the amount of area that could possibly be impacted by the threat); intensity (the strength of the impact); and urgency (the immediate necessity to address the threat). Each threat was rated on a scale of 1 to 3 for each category, with 3 the highest rating.

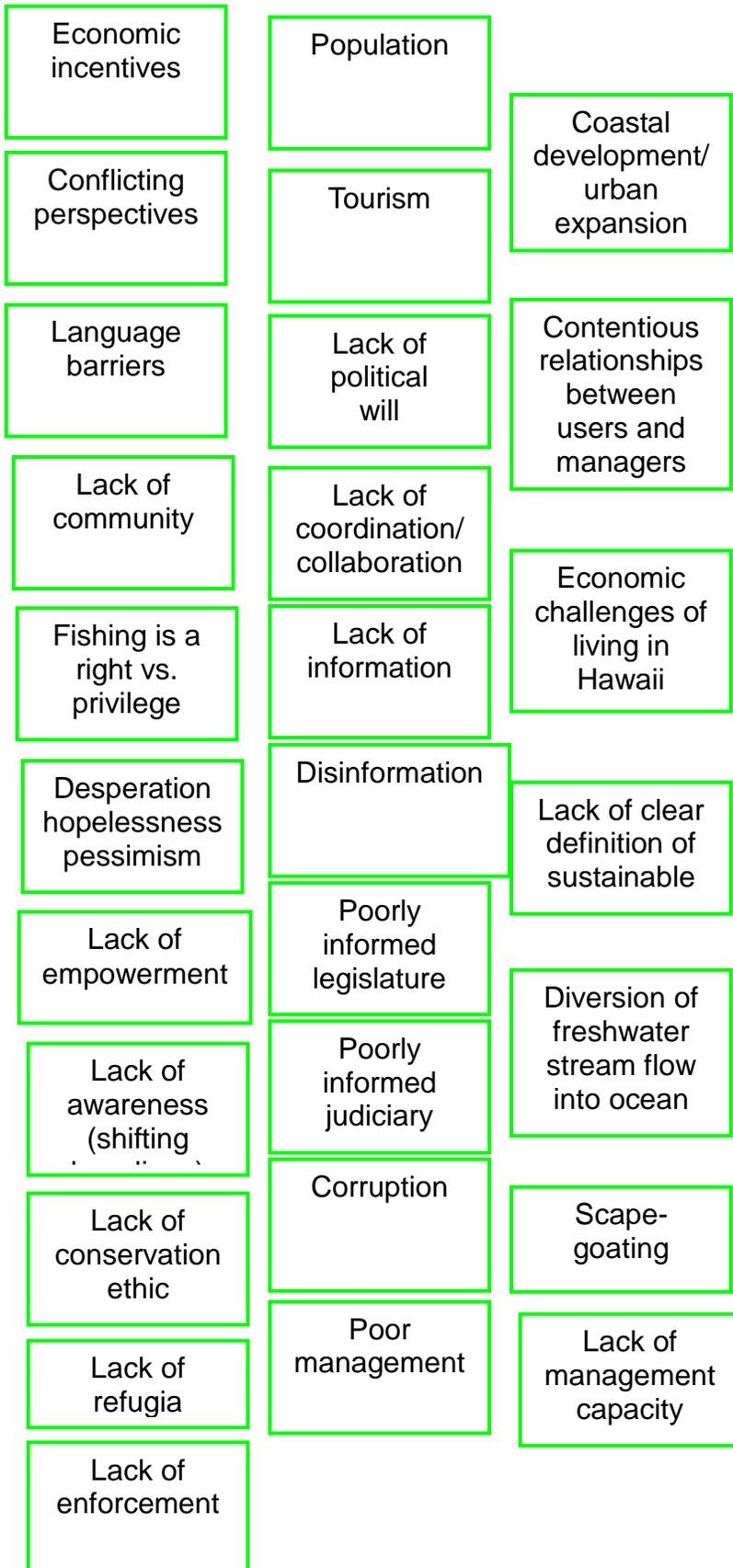
<i>Direct Threat</i>	<i>Area</i>	<i>Intensity</i>	<i>Urgency</i>	<i>TOTAL</i>
1. Increased fishing pressure	2.8	2.8	2.7	8.17
2. Overly efficient fishing gear	2.3	2.4	2.7	7.38
3. Shoreline development	2.4	2.3	2.5	7.21
4. Alien invasive species	2.4	2.3	2.4	7.08
5. Pollution	2.4	2.2	2.2	6.73
6. Destructive fishing practices	1.5	1.8	2.2	5.55
7. Recreation user impacts	1.8	1.7	1.8	5.25
8. Natural disturbance	1.8	1.6	1.1	4.42

Several indirect threats were also identified:

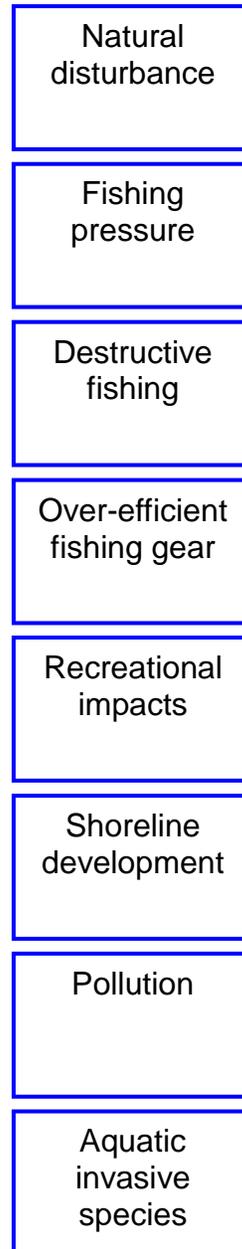
Indirect Threats:

1. Lack of information
2. Poorly informed legislature
3. Poor management
4. Lack of management capacity
5. Population increase
6. Lack of Enforcement
7. Coastal development/urban expansion
8. Contentious relationships between users and managers
9. Economic challenges of living in Hawaii
10. Lack of clear definition of sustainable
11. Diversion of freshwater stream flow into ocean
12. Scape-goating
13. Lack of empowerment
14. Lack of coordination and collaboration
15. Economic incentives
16. Conflicting perspectives
17. Language barriers
18. Lack of community
19. Lack of political will
20. Tourism
21. Poorly informed judiciary
22. Corruption
23. Lack of conservation ethic
24. Lack of awareness
25. Attitudes: right vs. privilege
26. Attitudes: desperation, hopelessness, pessimism
27. Lack of refugia
28. Disinformation

INDIRECT



DIRECT



TARGET CONDITION

Degradation
& loss of
habitat



Causes and Effects of Fisheries Resource Decline in Hawaii

A sub-committee of the Fisheries Local Action Strategy steering committee members was asked to identify the various causes and effects of nearshore fisheries decline. They produced the following output:

Causes:

1. Lack of responsibility/stewardship
 - a. Detached from the resource
 - b. Lack of will
 - c. “every man for themselves” mentality
 - d. “tragedy of the commons”; take before someone takes it from you
2. Sliding/shifting baselines
 - a. Lack of awareness of what is happening to the resource
3. Lack of enforcement
 - a. Some regulations may be too hard to enforce
4. Development of a commercial market
 - a. Technology – refrigerator/ice
5. Overly efficient fishing gear
6. Lack of knowledge of the regulations
 - a. “too many rules”
7. Lack of communication between managers and fishermen
 - a. Lack of mechanism for communication
8. Right vs. privilege to fish
9. Desire for bigger fish
 - a. Trophy fish, 100lb Ulua
10. lack of information
 - a. Language barrier
11. Legislature lacks knowledge of problem
12. Increased fishing pressure
 - a. Immigration - Different fishing values
 - b. Increased population
 - c. More concentrated population
13. Lack of refuge
 - a. Temporal
 - b. Spatial
14. Limited rules
 - a. Not stringent
 - b. Not based on science, based on public opinion
15. Bad information
 - a. Pushing culture of excess
 - b. Scientists pushing their own agenda
16. Scientists out of touch with the fishing community

Other possible causes of fisheries resource decline –

1. Recreational activities
 - a. Tourism
 - b. increased use
 - c. sunscreen
2. Habitat degradation
3. Invasive species

Effects of Overfishing:

1. Loss of Habitat
2. Too few fish
3. Fish are too small/ removal of big fish
4. Resource species depleted
5. Undesirable fish dominant
6. Change in trophic dynamics
7. Ecosystem function disrupted
 - a. Proliferation of invasive algae
8. Ecosystem services
 - a. Economic impact
 - b. Loss of income
9. Loss of resiliency
 - a. Exacerbated by global climate change
10. Fish evolving smaller
11. Removal of dominant contributing reproductive fish
 - a. Big fat fecund females
12. Loss of food resources
 - a. Public health (diabetes)
13. Reduced quality of life

Goals:

Goal 1: To restore and maintain healthy coral reef ecosystems by supporting effective fishery management approaches based on sound science, responsible practice, and stewardship.

Goal 2: To improve information exchange and communication amongst stakeholders to enhance collaboration and compliance.

Priority Objectives:

Objective 1:

For DAR/DLNR and resource users to have an understanding of the applicability of an MPA network in Hawaii, including data on its potential biological, social and economic effects by 2010.

Objective 2:

To have statistically valid and useful knowledge for management on all catch and effort for Hawaii's CR fisheries by 2012.

Objective 3:

3 communities are implementing pono practices and eliminating non-pono practices on each island by end of 2010.

Objective 4:

To have effective enforcement of marine resource rules by 2010.

Objective 5:

To have a process that more effectively collects and disseminates information between managers and resource users by December 2008.

Fisheries Local Action Strategy Activities:

A list of potential activities was developed to achieve the priority objectives that are identified above. These activities are inventoried on worksheet one provided by the Coral Reef Task Force and include management tool categories.

Threat / Focus Area: Coral Reef Fishery Management										
GOAL: <i>To restore and maintain healthy coral reef ecosystems by supporting effective fishery management approaches based on sound science, responsible practice, and stewardship.</i>										
Indicator:										
Objective 1: For DAR/DLNR and resource users to have an understanding of the applicability of an MPA network in Hawaii, including data on its potential biological, social and economic effects by 2015 .										
Indicator: Needed										
Proposed Activities / Projects	Management Tools							Current Status		Status Update
	Developing policies/laws	Enforcement	Monitor/survey	Marine managed areas	Outreach/education	Research	Other	Unfunded	Funded (f), partial (p)	
Quantifying the benefits of MPAs in terms of population fecundity and reproductive output				X		X			X	In progress. Submitted to as The Meta Analysis Project for the 2013-2014 Hawaii Grant. Identified as the top priority project by the FLASH Steering Committee Dec. 7 th 2011

Conduct a socio-economic assessment on value and potential impacts of a range of MPA Networks in Hawaii				x		x			x	In progress: Knowledge Attitude and Perception Surveys are planned for the two Priority sites with CRCP funding. Mike Lameier will work with PIFSC to PI.
Conduct benefits/costs analysis of area management vs species specific management				x		x		x		Committee felt this activity is not currently a priority and should be considered in the future
Classify habitat types and identify areas socially, economically, and culturally appropriate for area management; Prioritize sites based on output			x	x		x			x	Work in progress is currently taking place at Kahekili.
Quantify and characterize public opinion on MPA's in Hawaii				x		x		x		Committee felt this activity is not currently a priority. Opinions on MPAs are very evident and well know through past surveys.
Develop a comprehensive marine zoning plan for West Hawaii.				x		x		x		Committee felt this activity is not currently a priority and should be considered in the future
Assessment of biological, social, and economic (BSE) effectiveness of community based marine co-management / ahu-moku council (select pilot area);				x		x		x		Committee felt this activity is not currently a priority and should be considered in the future
Develop a roadmap to establish ecologically integrated coastal management in Hawaii (upland SMA adjacent to MPA)?				x		x			x	CZM is working on Coastal Marine Spatial Planning which will address this
Assess the recovery process of MPAs impacted by natural and anthropogenic disturbance? Is it				x		x			x	Work in progress is currently taking place at Kahekili.

possible to compare to a non-protected area?										
Assess the scope of marine managed areas to restore herbivore stocks and effect on ecological processes.				x		x			x	Work in progress is currently taking place at Kahekili.
Assess the ecosystem services of marine protected areas				x		x		x		Committee felt this activity is not currently a priority and should be considered in the future
Assess the effects of de-establishing a MPA – West Hawaii and Waikiki				x		x		x		Committee felt this activity is not currently a priority

Threat / Focus Area: Coral Reef Fishery Management										
GOAL: <i>To restore and maintain healthy coral reef ecosystems by supporting effective fishery management approaches based on sound science, responsible practice, and stewardship.</i>										
Indicator:										
Objective 2: To have statistically valid and useful knowledge for management on all catch and effort for Hawaii's CR fisheries by 2015.										
Indicator: Needed										
Proposed Activities / Projects	Management Tools							Current Status		Status Comments
	Developing policies/laws	Enforcement	Monitor/survey	Marine managed areas	Outreach/education	Research	Other	Unfunded	Funded (f), partial (p)	
Analyze and validate the existing commercial coral reef fisheries data and produce a report detailing coral reef fisheries catch, effort and economic information either by island or for the state as a whole. 2009-2011						x		x		Sam Kahang submitted a LOI to CRWG in March 2013. FLASH Committee expressed interest in addressing this
Conduct cost/benefit analysis of fishing license in Hawaii, comparison among states	x					x			x	CI Hawaii Fish Trust will likely be funding projects to address this in 2012
Revamp HMRFS Analysis of HMRFS data, descriptive reports			x						x	Work in progress with MRIP by NOAA.

Data on effort and catch broken down by location How do other countries (Australia) conduct and deal with creel surveys?									
Revising commercial catch reports to be more spatially explicit			x					x	Could be connected with first objective
Collect information on the catch and bycatch of certain gears and CPUE (recreational)			x			x		x	CI Hawaii Fish Trust will likely be funding projects to address this and Fish Flow Studies, something the Kohala Center has also funded (Marah .Hardt@gmail.com). FLASH Committee expressed interest in addressing this.
Collect information on the commercial export of near-shore fishes from Hawaii			x			x		x	CI Hawaii Fish Trust will explore funding.
Develop simplified and/or online reporting system			x					x	This has already happened for some fisheries, pelagic and aquarium. It is likely that eventually all will be converted.

Threat / Focus Area: Coral Reef Fishery Management										
GOAL:										
<i>To restore and maintain healthy coral reef ecosystems by supporting effective fishery management approaches based on sound science, responsible practice, and stewardship</i>										
Indicator:										
Objective 3:										
3 communities are implementing pono practices and eliminating non-pono practices on each island by end of 2015.										
Indicator: Needed										
Proposed Activities / Projects	Management Tools							Current Status		Status Comments
	Developing policies/laws	Enforcement	Monitor/survey	Marine managed areas	Outreach/education	Research	Other	Unfunded	Funded (f), partial (p)	
Identify five <i>pono</i> and 5 non- <i>pono</i> fishery management practices for each island based on guidance from cultural experts, kupuna and other culturally recognized sources of information	x				x	x			x	Current being address through Fish calendars. The Council is also working with members of the Native Hawaiian Community through the Puwalu Councils who could provide recommendations.
Assess the (BSE) impacts and benefits of implementing these practices						x		x		There is interest in addressing this

Threat / Focus Area: Coral Reef Fishery Management										
GOAL:										
<i>To restore and maintain healthy coral reef ecosystems by supporting effective fishery management approaches based on sound science, responsible practice, and stewardship</i>										
Indicator:										
Objective 4:										
To have effective enforcement of marine resource rules by 2015.										
Indicator: Needed										
Proposed Activities / Projects	Management Tools							Current Status		Status Comments
	Developing policies/laws	Enforcement	Monitor/survey	Marine managed areas	Outreach/education	Research	Other	Unfunded	Funded (f), partial (p)	
Quantify resource violations in representative areas		X			X				X	Funding was applied for from the CRWG and CRCP in 2011, but none awarded. CI was considering the proposal. FLASH Committee expressed interest in addressing this. DOCARE Maui Fisheries Enforcement Unit is addressing this in North Maui.
Develop enforcement plan	X	X							X	DOCARE has a strategic plan. Puako Community will be working with DOCARE and DAR to develop a site specific enforcement plan.
Summarize of what has been done		X			X				X	Committee felt this activity is not currently

already on public trust and respect for DOCARE										a priority
Evaluation of DOCARE' s compliance with legislative audit		x				x		x		FLASH Committee expressed interest in addressing this
Quantify and qualify presence of DOCARE officers at key sites.		x				x		x		FLASH Committee expressed interest in addressing this and suggested it be paired with the first activity listed.
Analyze DOCARE' s volunteer program, what were the pitfalls, what happened to the program, are there volunteer programs in other states, are they successful?		x				x		x		Committee felt this activity is not currently a priority
Look into DAR being able to issue violations like in Alaska, deputize volunteers/citizens.	x	x						x		DOACARE used to have a volunteer program but currently lack the resources and political support to make it happen
Develop consultation process between DAR, DOCARE, and judicial system on rules and all things enforcement	x	x							x	Wayne Tanaka is currently acting as a liaison. Castle is funding a legal fellow for DOCARE
Establish a natural resource court (land board) – administrative fines, no DOCARE involvement	x	x								There is currently work progressing in the area. Wayne is facilitating.
Translate rules into more than one language – priority Pacific Island languages, Filipino, Samoan, etc.		x			x				x	Matt Ramsey is working with Sea Grant to get Fish Guides printed in Micronesian Languages
Develop an education and outreach program on what the public can do. What are the rules? Who can they call? What can they expect? Etc		x			x				x	There is currently work progressing in the area with DOCARE and Makai Watch.

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Threat / Focus Area: Coral Reef Fishery Management										
GOAL:										
<i>To improve information exchange and communication amongst stakeholders to enhance collaboration and compliance.</i>										
Indicator:										
Objective 5:										
To have a process that more effectively collects and disseminates information between managers and resource users by December 2015.										
Indicator: Needed										
Proposed Activities / Projects	Management Tools							Current Status		Status Comments
	Developing policies/laws	Enforcement	Monitor/survey	Marine managed areas	Outreach/education	Research	Other	Unfunded	Funded (f), partial (p)	
Increase # of extension/outreach officers (possible volunteer program)		x			x			x		Would be ideal. NMFS, S.F. hired Dave Itano as a Recreational Fisheries Coordinator and Sea Grant has several staff that work with the Fishing Community. Need to explore the possibility of establishing a volunteer program, similar to Protected Resource's. More Extension Agents needed.
Determine the most effective and					x				x	Accomplished: Fisheries Extension

appreciated ways to contact or communicate with fishermen										Agent address this regularly.
Develop and implement a decentralized and consistent communication process/plan					x				x	FLASH Committee expressed interest in addressing this. Matt can work on a communication plan and post things on the new HCRS website.
Determine top subjects/issues that fishermen/stakeholders are interested in and develop outreach information and materials.					x				x	In progress and Matt will formalize a list.
Set up kiosk at different fishing tournaments (information can be provided and collected)					x				x	Part of Matt's regular duties
Pre-introduction consultative process between DAR and legislature for potential bills on marine resource related topics.					x				x	Wayne is addressing this
Identify and support a place/agency for resource users to obtain reliable, credible, and unbiased information on fisheries related issues within Hawaii by 2009.					x					The new HCRS website can be used for this
Support translation (from scientific jargon) and synthesis of information of key topics related to the fisheries LAS, production of master document.					x				x	Abstracts can be sent to Malama Hawaii through Momi Musick momidesign@gmail.com
Semiannual fishers forum for consistent reliable information exchange					x				x	Matt will be starting the SAFE meetings again shortly

Appendix 1: Definitions

Healthy nearshore marine environment – an environment where ecological and genetic diversity is maintained, reef fish populations are at levels that can be sustainably harvested for recreational, commercial, subsistence, and cultural use. All trophic groups and size classes are adequately represented, and the impacts to the habitat are minimized allowing for an increase in standing stock and recruitment.

Effective Management – Effective management balances stakeholder use, including extractive activities, cultural practices, economics (tourism, ecosystem services, etc.), and conservation, and prohibits destructive and indiscriminate fishing methods. Resource management decisions are supported by the public (including fishermen), considerate of traditional values and based on science, enforceability, and results. It also allows for and/or encourages community-based stewardship and managed areas. Effective management requires considering an entire ahupua'a when addressing cause and effects on a coastal marine ecosystem.

Appendix 2: Draft SMART objectives suggested by FLASH steering committee

FLASH Objectives for Goal 1:

O₁: To have useful life history data on a majority (15 out of top 30) of primary target species by 2013.

O₂: To have DOCARE in compliance with Act 226 by 2009. (Prioritize environmental enforcement activities)

O₃: (Zoning) To have 100% of W. Hawaii coastline in a pilot comprehensive zoning plan, including x, y, z, by 2012.

X,y,z, etc. are example of different kinds of zones.

O₄: Have protected 20% of critical/sensitive habitats by 2020.

O₅: (Recreational fisheries) To have statistically valid and useful knowledge for management on all catch and effort for Hawaii's CR fisheries by 2012.

O₆: (Rules and regulations) To have rules and regulations on bag and size limits that are based on DLNR's priorities (in order of priority) and consider human sustenance needs, species (vulnerability, abundance, ecological service, and reproductive contribution), and sound science for a majority of primary resource species by 2012.

Suggested:

By 2012, to have sufficient understanding for management to be able to draft appropriate rules, of the significance and nature of cascading impacts of fishery depletion on other components of reef ecosystems.

To have useful data on status and trends of stocks of a majority (15 out of top 30) of 'resource' species, including food, sport, and aquarium species by 2013.

Implement an effective fishery monitoring regime that captures both the recreational and commercial landings by the end of 2009

Establish and implement within three years, a scientifically acceptable methodology for collecting non-commercial fisheries information appropriate for each island area.

DLNR will have dedicated marine enforcement agents (variable number per island) by the end of 2009.

Determine every three years, the status of two key reef fish species utilizing nationally accepted stock assessment methodologies.

Need to determine what we will define as "healthy" vs. unhealthy ecosystem. For fish, this means determining what population is a sustainable population. We should focus on the top 10 harvested coral reef fish species.

Identify within two years, five *pono* fishery management practices for each island based on guidance from cultural experts, kupuna and other culturally recognized sources of information

SMART objectives for Goal 2:

Suggested:

Improved capacity for local management and enforcement of fisheries regulations.

By March 2009, a council of Oahu? fishermen that represent the various in-shore fishing groups (spear, aquarium, pole & line, gillnet), and government managers & scientist is established and meets quarterly to exchange information and discuss pressing issues.

By January 2009, a 3 year communications plan is developed that outlines a plan on how to collect and disseminate the most up to date scientific (biological & social) information.

By August 2009, an enforcement plan is developed that guides DOCARE officer's activities (i.e. enforcement, outreach, community support) and includes a capacity assessment.

Appendix 3: References

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