

NOAA Technical Memorandum NMFS-PIFSC-35

November 2012

Institutional Analysis of Community-based Marine Resource Management Initiatives in Hawai‘i and American Samoa



Laurie Richmond and Arielle Levine

Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

About this document

The mission of the National Oceanic and Atmospheric Administration (NOAA) is to understand and predict changes in the Earth's environment and to conserve and manage coastal and oceanic marine resources and habitats to help meet our Nation's economic, social, and environmental needs. As a branch of NOAA, the National Marine Fisheries Service (NMFS) conducts or sponsors research and monitoring programs to improve the scientific basis for conservation and management decisions. NMFS strives to make information about the purpose, methods, and results of its scientific studies widely available.

NMFS' Pacific Islands Fisheries Science Center (PIFSC) uses the **NOAA Technical Memorandum NMFS** series to achieve timely dissemination of scientific and technical information that is of high quality but inappropriate for publication in the formal peer-reviewed literature. The contents are of broad scope, including technical workshop proceedings, large data compilations, status reports and reviews, lengthy scientific or statistical monographs, and more. NOAA Technical Memoranda published by the PIFSC, although informal, are subjected to extensive review and editing and reflect sound professional work. Accordingly, they may be referenced in the formal scientific and technical literature.

A **NOAA Technical Memorandum NMFS** issued by the PIFSC may be cited using the following format:

Richmond, L., and A. Levine.
2012. Institutional analysis of community-based marine resource management initiatives in Hawaii and American Samoa. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-35, 48 p. + Appendices.

For further information direct inquiries to

Chief, Scientific Information Services
Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
2570 Dole Street
Honolulu, Hawai'i 96822-2396

Phone: 808-983-5386
Fax: 808-983-2902

Cover: Photo courtesy of Arielle Levine, National Marine Fisheries Service



Pacific Islands Fisheries Science Center
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Institutional Analysis of Community-based Marine Resource Management Initiatives in Hawai‘i and American Samoa

Laurie Richmond^{1,2}
Arielle Levine^{1,3}

¹Joint Institute for Marine and Atmospheric Research,
University of Hawai‘i, 1000 Pope Road,
Honolulu, Hawai‘i 96822

²Current Address: Department of Environmental Science and
Management, Humboldt State University, Arcata, California 95521

³Current Address: Department of Geography, San Diego State University,
San Diego, California 92182

NOAA Technical Memorandum NMFS-PIFSC-35

November 2012

EXECUTIVE SUMMARY

This document provides an analysis of two fisheries policies designed to develop community-based marine resource management institutions in the Western Pacific Region of the United States as delineated in the Magnuson-Stevens Fishery Conservation and Management Act. The research was funded by NMFS Office of Science and Technology Community Data Collection Funds (NS8) to support social science and community-focused research initiatives. The views and analysis in this manuscript are solely those of the authors and do not necessarily reflect those of NOAA or National Marine Fisheries Service. The content of and findings within this document do not reflect NOAA policy.

(This page is left blank intentionally.)

CONTENTS

1.	Introduction.....	1
2.	Methods.....	3
2.1	Institutional Analysis	3
2.2	Frameworks for Assessing Community-based Management Institutions.....	4
3.	Analysis: Community-based Subsistence Fishing Area Legislation in Hawai‘i.....	7
3.1	Historical and Sociocultural Context of Hawai‘i.....	7
3.2	Development and Implementation of the CBSFA Legislation	10
3.3	Hawai‘i’s CBSFA Initiative as a Common-pool Resource Management Institution	13
3.3.1	Clearly Defined Geographic Boundaries and Membership Rights.....	13
3.3.2	The Development and Enforcement of Rules that Limit Resource Use	14
3.3.3	Congruence Between Rules and Local Conditions (i.e., Scale and Appropriateness)	14
3.3.4	Resource Users Have Rights to Make, Enforce, and Change the Rules	15
3.3.5	Individuals Affected by the Rules can Participate in Changing the Rules.....	16
3.3.6	Monitoring of the Resources.....	16
3.3.7	The Presence of Accountability Mechanisms for Those Monitoring the Rules.....	17
3.3.8	Sanctions that Increase with Repeat Offenses or Severity of Offenses (Graduated Sanctions)	17
3.3.9	The Presence of Conflict-resolution Mechanisms	17
3.3.10	The Degree to Which They are Nested within Other Institutions	17
3.4	Factors that Impede the Success of Community-based Natural Resource Management.....	18
4.	Analysis: American Samoa’s Community-based Fisheries Management Program.....	20
4.1	Historical and Sociocultural Context of American Samoa	20
4.1.1	Population and Economy	21
4.2	Nearshore Fishing in American Samoa	22
4.3	Community-based Fisheries Management Program.....	24
4.4	American Samoa’s CFMP as a Common Pool Resource Management Institution	29
4.4.1	Clearly Defined Geographic Boundaries and Membership Rights.....	29
4.4.2	The Development and Enforcement of Rules that Limit Resource Use	30
4.4.3	Congruence between Rules and Local Conditions (i.e., Scale and Appropriateness)	30

4.4.4	Resource Users Have Rights to Make, Enforce, and Change the Rules.....	31
4.4.5	Individuals Affected by the Rules can Participate in Changing the Rules.....	32
4.4.6	Monitoring of the Resources.....	32
4.4.7	The Presence of Accountability Mechanisms for Those Monitoring the Rules.....	33
4.4.8	Sanctions that Increase with Repeat Offenses or Severity of Offenses (Graduated Sanctions)	33
4.4.9	The Presence of Conflict-resolution Mechanisms	33
4.4.10	The Degree to Which They are Nested within Other Institutions	34
5.	Discussion	35
6.	Conclusions.....	39
7.	Literature Cited	41
8.	Appendices	

1. INTRODUCTION

Much attention in global fisheries management has recently been directed towards the need to actively involve local communities in managing nearshore coastal resources. The ability of communities to successfully manage their own small-scale fisheries resources has been previously documented on islands throughout the Pacific (Johannes, 1978; McClenachan and Kittinger, 2012). More recently, coastal nations throughout the Pacific and other parts of the world have worked to improve nearshore fisheries management through the devolution of authority from centralized government regulatory systems to decentralized, community-based, customary or co-management regimes (Christie and White, 1997; King and Faasili, 1999a; Christie et al., 2002; Johannes, 2002; Cinner et al., 2009). Measures have been taken in many regions to increase the involvement of local communities in the establishment and management of marine protected areas (MPAs) (Alcala and Russ, 2006). This interest in community-based marine resource management (CBMRM) has been fueled by a belief that CBMRM regimes have the potential to address both ecological and social concerns.

Research indicates that CBMRM can increase the sustainability of marine resource populations, particularly in developing countries where centralized forms of resource management have failed to achieve conservation successes. Recent interest in CBMRM has stemmed, in part, from concerns that top-down marine management strategies had proven ecologically ineffective in many regions of the world (Johannes, 2002; Christie et al., 2003; McClanahan et al., 2006). CBMRM can provide governments, many of which may lack technical and financial resources, an additional local partner to assist with conservation and management of marine resources (Techera, 2010). In addition, community-based management entities have the potential to develop regulations that are more culturally and ecologically relevant, in many cases contributing to increased compliance by resource users (King and Faasili, 1999b; Pollnac et al., 2001; Crawford et al., 2004). Researchers have described many cases in which the development of CBMRM has led to important ecological successes, including the revitalization of marine resource populations (Cinner et al., 2005; Pollnac et al., 2001; Thompson et al., 2003). A recent meta-analysis of more than 130 community-based, co-managed marine management arrangements throughout the globe found that with strong leadership and support, CBMRM can contribute to successful management and sustainability of aquatic resources (Gutiérrez et al., 2011). The authors go so far as to state that their “study offers hope that co-management, the only realistic solution for the majority of the world’s fisheries, can solve many of the problems facing global fisheries” (Gutiérrez et al., 2011, p. 386).

CBMRM has also been touted for its potential to introduce increased social justice and equity into marine management. CBMRM arrangements often devolve power to rural and indigenous groups who have been disenfranchised and marginalized. Some forms of CBMRM provide renewed recognition of customary forms of law and management that were displaced as a result of colonialism (Johannes, 2002; Johannes, 1978; Cinner and Aswani, 2007). In lieu of a top-down management structure where centralized bureaucratic agencies regulate resources, CBMRM can empower communities to manage local resources according to their unique cultural values and practices (King and Faasili, 1999a,b; Alcala and Russ, 2006; McClanahan et al., 2006). CBMRM arrangements can provide a means to confront the colonial legacy of fisheries

management by formally recognizing indigenous community claims to, and authority over, local marine resources.

While CBMRM has the potential to achieve biological and social successes, these successes are by no means guaranteed through the development of a CBMRM program, and there are many examples of programs that have struggled (Pomeroy et al., 2001; Christie et al., 2002; Thompson et al., 2003). While promising in theory, CBMRM programs can encounter a variety of political, ecological, and logistical challenges upon implementation. CBMRM involves novel institutional arrangements where certain kinds of power are devolved to community entities. These arrangements can be politically and legally challenging to develop, particularly in regards to questions of liability (Cinner and Aswani, 2007; Techera, 2010). Additionally, partnering with communities does not always guarantee sustainable management; communities may lack the capacity to effectively manage resources, or community ideas and interests may run counter to sustainable harvest of marine resources (McCay, 2001; Gutiérrez et al., 2011). Power can be divided inequitably within community entities, allowing for certain individuals and groups to remain marginalized in CBMRM processes (Agrawal and Gibson, 1999). Finally, conflict can arise when community ideas about management differ from government agency concepts and frameworks for management (Singleton, 2001; Higuchi, 2008). Given the potential for CBMRM intuitions to encounter significant challenges, it is important to assess CBMRM programs over time to explore their effectiveness in achieving biological and social goals.

In many ways, the Pacific region has been both the starting place and the hub for a global renaissance in community-based and customary marine management. In 2002, Johannes reported that “community-based marine resource management (CBMRM) may be more widespread in Oceania today than in any other tropical region in the world.” (Johannes, 2002, p. 318). There has been significant research describing and evaluating CBMRM programs throughout the Pacific; however, the majority of research has focused on CBMRM activities in developing countries within the region (King and Faasili, 1999a, b; King, 2000; Pollnac et al., 2001; Christie et al., 2002). Less attention has been given to efforts to introduce CBMRM in the U.S. states and territories of the Pacific region. The development of CBMRM programs in the United States can experience unique challenges because U.S. legal frameworks for marine management are more developed and less flexible and, in many places, customary forms of resource management have been significantly eroded.

This paper provides an analysis of two CBMRM initiatives in the U. S. Western Pacific Region: the 1994 State of Hawai‘i community-based subsistence fishing area (CBSFA) legislation and American Samoa’s Community-based Fisheries Management Program (CFMP) initiated in 2000. These cases provide two very different stories about efforts to develop CBMRM programs in the fisheries of the United States.

The CBSFA legislation in Hawai‘i established a mechanism that allows Native Hawaiian communities to designate marine spaces near their communities as CBSFAs and collaborate with the state of Hawai‘i to implement plans to manage those areas according to traditional Hawaiian practices. In the nearly 20 years since the legislation has passed only two CBSFAs have been designated and neither has an approved management plan. This means that there are no rules or

legally accepted management practices that distinguish designated CBSFAs from any other sections of Hawai‘i’s coast. Analysis of the CBSFA legislation focuses on the challenges that have so far impeded its implementation. However, under American Samoa’s CFMP, as of 2012, 12 different villages in the territory are formally involved in the program and in management of their near-shore marine resources. Analysis of the American Samoa CFMP explores how the program has evolved and the framework for community-based resource management that it has established.

2. METHODS

2.1 Institutional Analysis

This paper uses an institutional analysis approach to examine these two CBMRM initiatives in the western Pacific. An institutional analysis focuses on the ability of particular initiatives or policies to build functioning institutions with management capacity. The analysis takes a holistic view, incorporating perspectives, feedback, and assessments from a wide variety of individuals connected to the initiatives including community members, fishermen, policy makers, natural resource agency staff, nongovernmental organization (NGO) representatives, and researchers. This analysis draws from a variety of methods including 5 years of field work in the fisheries of Hawai‘i and American Samoa; semi-structured interviews with individuals involved in all aspects of the CBMRM initiatives including community representatives, policy makers, agency staff, and representatives of associated NGOs; and an extensive review of government, academic, and community materials surrounding the initiatives.

Marine resources are considered to be common-pool resources. Common-pool resources are characterized by two key attributes, “(1) the difficulty of excluding individuals from benefiting from a good and (2) the subtractability of the benefits consumed by one individual from those available to others” (Ostrom et al., 1994, p. 6). Subtractability means that use of the resource by one individual subtracts from the total amount of the resource available to others. Given competing individual and group interests, successful management of common-pool resources can be very challenging, often requiring the development of resource management institutions (Hardin, 1968; Ostrom, 1994). Extensive scholarship has explored the effectiveness of various institutions that have been developed to govern the use of common-pool resources. After examining a wide range of cases of common-pool resource management institutions, scholars in the “commons” field have developed frameworks or design principles that characterize successful common-pool resource management institutions. A central part of this institutional analysis is to examine these two CBMRM initiatives against the frameworks and design principles that have been established in the literature. This provides a common lens through which to assess the two initiatives as well as a means to identify potential design challenges in the two CBMRM institutions.

2.2 Frameworks for Assessing Community-based Management Institutions

After decades of commons research, scholars have developed some agreement about institutional design elements that can contribute to successful governance of the commons. This report will focus on commonly agreed upon design principles for success in common property resource management and will examine how these apply to the cases of community-based fisheries management in Hawai‘i and American Samoa.

Much literature has been devoted to trying to understand what accounts for the success or failure of community-based management of the “commons,” as well as what factors lead to stronger, more robust common property management regimes. Nobel prize winning author Elinor Ostrom devoted much of her career to understanding factors that contribute to the successful management of natural resource commons. She refutes the notion that either strong centralized government control or privatization are necessary to avoid what Garrett Hardin (1968) referred to as the “tragedy of the commons,” or the unchecked exploitation of open access resources (Hardin, 1968; Ostrom, 1990). Under ‘open access’ conditions, resources belong to no one and are available to everyone, and resources are not actually managed at all. Common or communal property, however, has been defined as a situation where “use rights for the resource are controlled by an identifiable group and are not privately owned or managed by governments; there exists rules concerning who may use the resource, who is excluded from the resource and how the resource should be used” (Berkes and Farvar, 1988, p. 10).

While private and government-controlled natural resource management regimes have proved to be appropriate for certain resource types in certain contexts, these types of regimes have frequently proven unsuccessful for the management of resources that are de facto used and managed by local resource users themselves (Murphree, 1991). This is the context for rural coastal resource management in most Pacific Island nations. Bromley and Cernea (1989) commented that, in many cases, governments attempt to take on more resource management authority than they are capable of carrying out effectively. These situations can have the unfortunate outcome of pitting government agencies and officials against local resource users. However, successful resource management requires exactly the opposite (Bromley and Cernea, 1989).

Several authors have conducted research related to common property and the design of community-based institutions for natural resource management. Marshall Murphree (1991) examined resource management regimes for African wildlife, claiming that not only can communities, under the right circumstances, be effective institutions for resource management, but that the management of common property resources can be a catalyst for the development of communal institutions to manage natural resources. Murphree (1991, p. 2) stated that “people seek to manage the environment when the benefits of management are perceived to exceed its costs,” and he explained that motivations for management fall broadly into two categories. First, because managing natural resources improves the condition of their livelihoods. Second, because environmental degradation is perceived to be threatening to community or individual livelihoods or aesthetic values.

Ostrom (1990) demonstrates with numerous case study examples that communities can, and do, successfully organize to manage common resources when natural resource and institutional conditions are conducive to collective organizing. She noted that, in many cases, individuals will expend considerable time and energy to develop workable rules that can be used for resource management, follow their own rules as long as they believe others will also follow them, monitor each other's conformance with these rules, and impose sanctions on people who break the rules, even at considerable cost to themselves.

By analyzing studies of multiple common property management systems, Ostrom (1990) developed eight core "design principles" that lead to more robust systems for the management of common pool resources. These principles include:

- Clearly defined boundaries
- Congruence between appropriation and provision rules and local conditions
- Collective-choice arrangements
- Monitoring
- Graduated sanctions
- Conflict-resolution mechanisms
- Minimal recognition of rights to organize, and
- Nested enterprises (for common-pool resources that are part of larger systems)

In examining community-based marine management in the Western Indian Ocean, Cinner et al. (2009) expand Ostrom's list to a total of 10 design principles found in the common-pool resource management literature. These are:

1. Clearly defined geographic boundaries and membership rights;
2. The development and enforcement of rules that limit resource use;
3. Congruence between rules and local conditions (i.e., scale and appropriateness);
4. Resource users have rights to make, enforce, and change the rules;
5. Individuals affected by the rules can participate in changing the rules;
6. Monitoring of the resources;
7. The presence of accountability mechanisms for those monitoring the rules;
8. Sanctions that increase with repeat offenses or severity of offenses (graduated sanctions);
9. The presence of conflict resolution mechanisms; and
10. The degree to which they are nested within other institutions.

This list represents a fairly comprehensive assembly of the design principles found in most published literature to date. A number of other factors are discussed or subdivided within the literature on common property resource management. Agrawal (2002), for instance, reviews the literature to assemble a list of as many as 35 factors that may be critical to the organization, adaptability, and sustainability of common property. Some of these additional factors include considerations that contribute to the likelihood of a community crafting a working set of property rights or community-based management regime. Baland and Platteau (1996) discuss the role of small size, homogeneous groups, shared norms, and appropriate leadership in fostering common-

pool resource management. Gibson (2001) discusses the role that dependence on a resource plays in motivating community-based management. Tucker et al. (2007) review the importance of historical government policy and market integration in affecting the relative strength of common property management regimes. Berkes (2002) also discusses the importance of cross-scale linkages in facilitating common pool resource management.

Ostrom (2009), however, makes the important distinction that these factors are generally causal variables which contribute to the likelihood of the process of forming community-based management regimes, whereas the design principles, listed previously, are an effort to understand why community-based management institutions succeed in some cases and fail in others. Agrawal (2002) also points out that the narrow focus on studying institutions in common property management has been at the cost of a careful analysis of the contextual factors that frame these institutions, including an examination of biophysical, social, economic, and cultural contexts.

Not as commonly discussed in the literature are factors that impede the success of community-based natural resource management. Adams and Hulme (2001) are skeptical of the broad enthusiasm and faith placed by donors in the potential of community conservation to solve natural resource management problems. Examining programs in Africa, they look at factors that are likely to detract from the success of community-based conservation programs. These include situations where:

- Local community members hold strong resentment about loss of rights in a protected area
- Hopes are raised by donor investment that is not sustained
- Rhetoric of community conservation is not reflected in changed ideologies and practices on the part of the resource management agency
- A project fails to deliver on community hopes that have been raised by the rhetoric of community conservation
- The resource management agency sets unrealistic limits on the extent to which they will share power with local communities
- Local people do not share the nonmonetary values placed on species or ecosystems by conservation planners, and where conservation education cannot persuade them to do so

This research will provide a common framework which will allow analysis of the two community-based marine management initiatives in the western Pacific. Each analysis will first present background information on the historical and sociocultural contexts of Hawai'i and American Samoa. The analyses will then examine the history, development, and current state of each CBMRM initiative. Next, each initiative will be examined in light of the institutional design principles deemed necessary in common property literature to determine how well the program aligns with these critical principles. The primary design principles used will be the 10 principles enumerated by Cinner et al. (2009), but other variables discussed above will also be examined as relevant to the programs. Finally, effort will be made to compare the collective challenges and strengths of these two CBMRM initiatives and explore the contextual factors that have made the outcomes of these two initiatives so different. This comprehensive analysis can

generate insights for ways to improve and strengthen community-based marine management efforts throughout the U.S. Western Pacific Region.

3. ANALYSIS: COMMUNITY-BASED SUBSISTENCE FISHING AREA LEGISLATION IN HAWAI‘I

When the State of Hawai‘i passed legislation for the “designation of community-based subsistence fishing areas” in 1994, it gained a lot of attention from the marine management community worldwide. In his article on “The renaissance of community-based marine resource management in Oceania,” Johannes (2002) lists Hawai‘i’s CBSFA program as a key example of the revitalization of community-based marine management in the region. This attention highlights the promise of the legislation to develop, strengthen, and institutionalize community-based management in the fisheries of Hawai‘i. However, it is important to examine how the legislation has fared once it was implemented on the ground. This analysis explores the history of the CBSFA legislation, some of the challenges it has faced, as well as potentials for the legislation moving into the future. Parts of this assessment derive from a series of interviews we conducted with stakeholders involved in all aspects of CBSFA legislation between 2010 and 2012. Interview data are cited with the date an interview was given and, when relevant, the general stakeholder category of the respondent. The assessment also draws from academic and policy documents that have examined the efficacy of the program (Richmond, in review; Higuchi 2008; Komoto 2006)

3.1 Historical and Sociocultural Context of Hawai‘i

The State of Hawai‘i has a population of almost 1.4 million (2010 U.S. Census). Ethnically, Hawai‘i is very diverse; it has the highest percentage of Asian Americans (38.6%) and Multiracial Americans (23.6%) as well as the lowest percentage of White Americans (24.7%) among all the states. The 2010 Census reports 289,970 individuals identifying as either Native Hawaiian alone (209,633 people) or as Native Hawaiian in combination with some other race (84,480 people), which means that Native Hawaiians and part Native Hawaiians account for approximately 21% of Hawai‘i’s population.

The CBSFA legislation was specifically designed “for the purpose of reaffirming and protecting fishing practices customarily and traditionally exercised for purposes of native Hawaiian subsistence” (Hawai‘i Revised Statutes Chapter 188-22.6). Therefore, this section will focus primarily on the social and historical context of Native Hawaiians. Transfer of the authority over the Kingdom of Hawai‘i to the U.S. government took place against the wishes of the Hawaiian people by what has come to be called the “1887 Bayonet Constitution” because King Kalākaua was forced to sign the constitution amid fears that he and the Hawaiian government would be removed by force (Silva, 2004). The indigenous descendants of the Kingdom of Hawai‘i are commonly referred to as Native Hawaiians in policy language; however, many representatives prefer to use the terms Hawaiian or *kānaka maoli* to describe their people. Therefore, the term Hawaiian will be used throughout this paper, but it needs to be

clear that this refers to people who can trace their lineage to pre-contact Hawaii, not everyone who lives in Hawaii. Unlike their counterparts in Alaska and the continental United States, Hawaiians are not currently federally recognized. There has been an effort by some in Congress to bring about this recognition (Native Hawaiian Government Reorganization Act of 2009), but in the more than 12 years since this legislation was developed, no form of recognition has been enacted. In 2011, the State of Hawai‘i governor signed legislation into law giving state recognition to “Native Hawaiians.” As these developments indicate, the political status of Hawaiians continues to evolve.

Because Hawaiians lack federal recognition, they do not have a recognized sovereign government, they do not possess reservation lands over which to exert sovereign authority, and they are not protected by the federal “trust responsibility” which requires the federal government to oversee and protect American Indian interests. However, various provisions in the State of Hawai‘i constitution provide for Hawaiian interests, including the establishment of a branch of state government, the Office of Hawaiian Affairs (OHA), and a provisioning of lands for Hawaiians. The Hawai‘i State constitution also has a broad provision that directs the government to protect Hawaiian traditional and cultural rights including subsistence activities:

The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by Mil tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights. [Article 12, Provision 6: Add Const Con 1978 and election Nov 7, 1978]

Subsistence fishing has been and continues to be a central part of Hawaiian culture, diet, and economy (Moloka‘i Subsistence Task Force, 1994). Much of traditional Hawaiian subsistence is focused on nearshore marine resources, including reef fish, seaweed, and mollusk species. Traditionally, Hawaiians subsisted on the islands by instituting a set of cultural practices that emphasized “conservative use of the islands’ finite resources” (Carl, 2009, p. 203). Central to these practices was a form of land and marine tenure that is contemporarily referred to as *ahupua‘a*-based management (Chinen, 1958). Under this system, islands were divided into large parcels called *moku* (Fig. 1). These *moku* were further broken down into smaller tracts of land called *ahupua‘a* which were each overseen by a chief or *ali‘i*. Typically, *ahupua‘a* were thin strips of land that stretched from the top of the mountain to the sea and contained a stream (Fig. 1). *Ahupua‘a* supported the production of a variety of foods which were shared among its residents – agricultural production in the uplands and the harvest and cultivation of marine resources in the coastal areas (Carl, 2009).

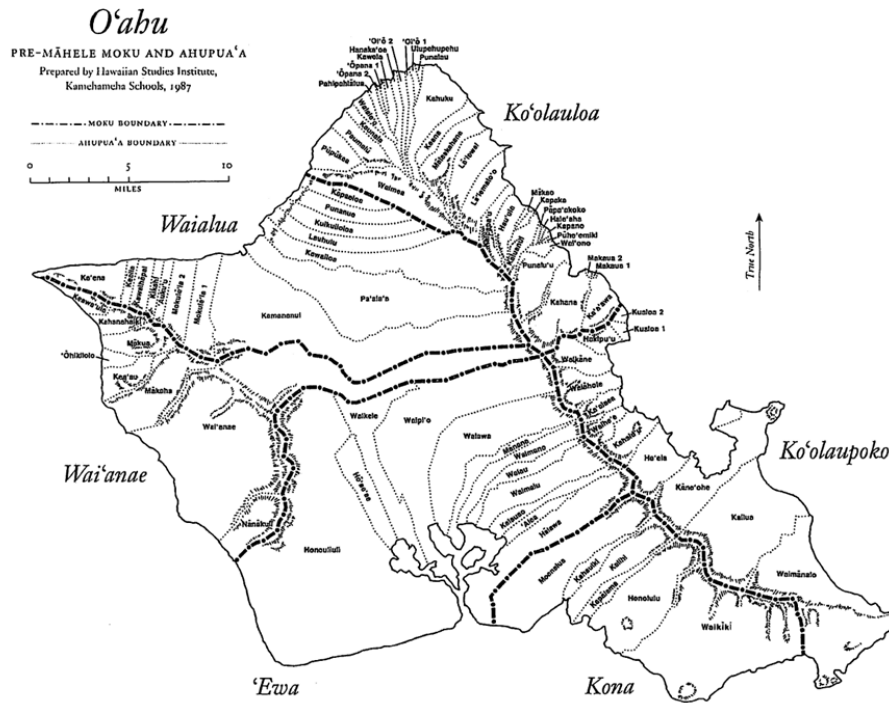


Figure 1.--Moku (thick lines) and ahupua'a (thin lines) boundaries on Oahu island from pre-māhele period. Prepared by Hawaiian Studies Institute, Kamehameha Schools, 1987.

Fishing played an important role in the culture and subsistence of Hawaiians. Fish resources were conserved through the institution of *kapu*. *Kapu* were part of a larger belief system and spiritual practice and they contained policies that dictated when resources could be gathered and included the establishment of closures of particular fisheries during spawning periods or times of overharvest; *kapu* were often linked to the lunar calendar (Poepoe et al., 2003). *Kapu* were strictly enforced by overseers (*konoiki*) and punishment for breaking them was severe, including execution (Poepoe et al., 2003; Carl, 2009). *Ahupua'a*-based management was also rooted in practices of exclusion; families that lived in one *ahupua'a* could not harvest resources from another *ahupua'a* without first receiving permission (Cordy, 2000; Carl, 2009).

This Hawaiian system of land and marine management was highly effective, persisting for more than 1500 years and supporting populations of 400,000–800,000 without the need for imported food (Carl, 2009; Kittinger et al., 2011). Captain Cook arrived in the Hawaiian Islands in 1778. Over a century following his arrival, shifts in economic and property systems, processes of colonialism, disease and displacement, and a number of other complex factors contributed to the decline of this traditional system of government and resource management. Introduction of imported diseases decimated the Hawaiian population, the influx of Westerners looking for lands encouraged the development of private property forms of land ownership, and an increased global presence contributed to the conversion from an economy of subsistence to one of international trade (Carl, 2009). The institution of private land ownership in 1848 was a critical point in this conversion.

The decline of the traditional system of marine tenure in particular had two important consequences for Hawaiians. First, without cultural protections in place, resources became overexploited leading to severe declines in the populations of marine resources that were important to Hawaiian culture and subsistence (DAR, 1988; Maly and Pomroy-Maly, 2003; Kittinger et al., 2011). Ecological reconstruction data reveal an average declining trend in main Hawaiian Island coral reef trophic guilds beginning in 1810, with a short-lived (and small) recovery period around 1940 presumably due to the prohibition of fishing related to World War II (Kittinger et al., 2011). Second, the loss of these traditional systems of tenure broke connections with the cultural and spiritual practices of subsistence and management that were important to Hawaiian people (Moloka'i Subsistence Task Force, 1994).

3.2 Development and Implementation of the CBSFA Legislation

Although the Hawai'i constitution specifically calls for the protection of Hawaiian traditional subsistence rights, by the 1990s there were increasing concerns that these protections were not being adequately implemented. In 1993, the Hawai'i governor appointed a Moloka'i Subsistence Task Force "to document how important subsistence is to Moloka'i families...to determine the problems that were making it harder to do subsistence hunting, fishing, and gathering on Moloka'i, and to recommend policies and programs to improve the situation" (Moloka'i Subsistence Task Force, 1994, p. 16). Moloka'i Island is very rural and has a strong Hawaiian presence as well as high levels of subsistence practice. The task force was spearheaded by Hawaiian practitioners, and recommendations resulted from surveys of and focus groups with Moloka'i residents and subsistence practitioners. The task force stated that "subsistence has also been critical to the persistence of traditional Hawaiian cultural values, customs, and practices." (Moloka'i Subsistence Task Force, 1994, p. 5).

The task force found that although subsistence activities were central to Moloka'i's economy, diet, and culture, the practice of these activities faced important threats including resource decline and loss of cultural continuity with traditional Hawaiian practices (Moloka'i Subsistence Task Force, 1994). In a survey of 256 Moloka'i residents, 76% stated that subsistence was either somewhat or very important to their family, and 51% specifically stated it was very important. In addition, those of Hawaiian descent who responded to the survey reported that, on average, 38% of their food was obtained from subsistence fishing, hunting and gathering (Moloka'i Subsistence Task Force, 1994).

The efforts and findings of the Moloka'i Subsistence Task Force led to the passage of groundbreaking legislation that would enable increased Hawaiian participation in the management and protection of subsistence resources important to their communities. The 1994 legislation allowed for designation of CBSFAs "for the purpose of reaffirming and protecting fishing practices customarily and traditionally exercised for the purposes of Hawaiian subsistence, culture, and religion" (Hawai'i Revised Statutes Chapter 188-22.6, Fig. 2). Once designated, the communities could work with agency officials to manage the areas according to traditional Hawaiian practices. The legislature also established the community of Mo'omomi on Moloka'i as a pilot project area. Eligible communities can achieve CBSFA through two

processes: either by seeking designation from the State of Hawai'i Department of Land and Natural Resources (DLNR) or through the passage of an act by the State legislature.

(a) The department of land and natural resources may designate community based subsistence fishing areas and carry out fishery management strategies for such areas, through administrative rules adopted pursuant to chapter 91, for the purpose of reaffirming and protecting fishing practices customarily and traditionally exercised for purposes of native Hawaiian subsistence, culture, and religion.

(b) Proposals may be submitted to the department of land and natural resources for the department's consideration. The proposal shall include:

(1) The name of the organization or group submitting the proposal;

(2) The charter of the organization or group;

(3) A list of the members of the organization or group;

(4) A description of the location and boundaries of the marine waters and submerged lands proposed for designation;

(5) Justification for the proposed designation including the extent to which the proposed activities in the fishing area may interfere with the use of the marine waters for navigation, fishing, and public recreation; and

(6) A management plan containing a description of the specific activities to be conducted in the fishing area, evaluation and monitoring processes, methods of funding and enforcement, and other information necessary to advance the proposal.

Proposals shall meet community based subsistence needs and judicious fishery conservation and management practices.

(c) For the purposes of this section:

(1) "Native Hawaiian" means any descendant of the races inhabiting the Hawaiian Islands prior to 1778; and

(2) "Subsistence" means the customary and traditional native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing. [L 1994, c 271, §1]

Figure 2.--[§188-22.6] Designation of community based subsistence fishing area.

Since the passage of the CBSFA legislation, there has been widespread interest by Hawaiian fishing communities in seeking CBSFA designation. Many communities had observed troubling declines in marine resources near their communities and were looking for ways to regulate overharvest of community resources by external pressures including aquarium collecting, recreational use, and overexploitation (Interviews, 11/5/10, 11/10/10, 7/18/11). However,

implementation of the legislation encountered a number of challenges. Despite interest from more than 19 communities, in the nearly 20 years since the legislation was passed only two communities (Miloli‘i on Hawai‘i Island and Ha‘ena on Kaua‘i; Appendix A) have been able to designate CBSFAs and none have an approved management plan (Higuchi, 2008). This means that there are no State-approved rules for the designated CBSFAs that make them any different from other sections of Hawai‘i’s coast. The community of Mo‘omomi experienced many frustrations with the state process and failed to achieve permanent designation after the pilot project concluded in 1997 (Poepoe et al., 2003). However, Mo‘omomi has been successful in revitalizing and implementing traditional practices outside of the state system, leading to conservation of reef habitat and resources in the area (Friedlander et al., 2002; Poepoe et al., 2003). A list of communities and their progress on CBSFA management as of February 2012 is included in Table 1.

Table 1.--Key communities involved in the CBSFA process and their relative progress on designation and management in their coastal areas (as of February 2012).

Community (Island)	Progress on CBSFA Management
Mo‘omomi (Moloka‘i)	Pilot CBSFA established in 1994, sunset in 1997. Due to frustrations with the state process, the community dropped out of the CBSFA process. Established traditional Hawaiian and community-based management practices in the coastal area outside of the state process. Rules are enforced through community norms. This coastal area is rural with only one access road controlled by the community. This type of community-based management might not be an option in other communities who occupy coastal areas with high traffic from outsiders.
Miloli‘i (Hawai‘i)	Designated a CBSFA in 2005 through the Hawai‘i State Legislature. Developed a management plan in 2008; after a divisive community meeting the management plan was not approved – there are no state approved rules or management plan for this CBSFA.
Ha‘ena (Kaua‘i)	Designated a CBSFA in 2006 through the Hawai‘i State Legislature. Through extensive organizing, the community developed a management plan and proposed rules for the CBSFAs. The community submitted a CBSFA rule package to the Division of Aquatic Resources (DAR) in early 2012, hoping to initiate the Chapter 91 process. DAR has expressed reservations about many of their proposed rules. It is unclear whether the rules will go through the process or be approved. Any action will likely take a good deal of time.
Ho‘okena (Hawai‘i)	Community has organized and developed a management plan and rule package. Sought designation through the legislature in 2008 but the legislation did not pass. Have plans to submit paperwork to the DLNR to designate a CBSFA and establish rules through the internal process.
Additional Communities:	There are reports that at least 18 additional communities have been involved in the CBSFA process in some way, many expressing interest

Community (Island)	Progress on CBSFA Management
Kaua'i (2), O'ahu (5), Moloka'i (2), Maui (6), Hawai'i (2), Ni'ihau (1)	in CBSFA designation and beginning preliminary organizing to seek designation and develop management plans. Higuchi (2008) lists the following additional communities by island: <i>Kaua'i</i> : Waipa, Hanalei; <i>O'ahu</i> : Pipukea-Waimea, He'eia fishpond, Maunaloa, 'Ewa Beach, Wai'anae; <i>Moloka'i</i> : Kaloko'eli fishpond; and subsequently, the whole island; <i>Maui</i> : Honolulu Bay, Hana, Kipahulu, 'Ahihi, Kina'u, Kihei; <i>Hawai'i</i> : Kealahou Bay, Honaunau. <i>Ni'ihau</i> : whole island. These are communities that are known to be involved in CBSFA processes, there may be others.

3.3 Hawai'i's CBSFA Initiative as a Common-pool Resource Management Institution

This section examines the CBSFA legislation in light of the 10 core design principles for management of common-pool resources described by Cinner et al. (2009). Since 1994, the CBSFA initiative has encountered many challenges. Because the CBSFA legislation has not been fully implemented in even one community, it is difficult to assess the success of the CBSFA approach for common-pool resource management. We can, however, use the framework to evaluate management outlined in the CBSFA legislation and assess how, if implemented, it would compare to the design principles established by scholars of common-pool resource management. In addition, the design principles provide a useful framework from which to explore the challenges that have impeded successful implementation of the initiative.

3.3.1 Clearly Defined Geographic Boundaries and Membership Rights

Once designated, the CBSFAs have clear boundaries as indicated in the legislative language in Appendix A. However, which individuals have “membership rights” to resources in those areas is not clearly defined. The CBSFA legislation was succinct and gave very little guidance about how communities (i.e., membership in those communities) were to be defined. If community is defined too broadly, outside users and interest groups that have little investment in traditional management and protection of sites could influence the process. If it is defined too narrowly, small faction groups within the community could co-opt the designation and management of the CBSFA (Higuchi, 2008). The legislation did not establish a process for defining “community” and ensuring that all community members have an opportunity to participate in the CBSFA process, which has contributed to some procedural difficulties (Interviews, 10/7/10, 10/18/10, 11/10/10; Richmond, in review).

Several who attended a 2008 public meeting to solicit community comments on a proposed management plan for the Miloli'i CBSFA do not have fond memories of the proceedings (four meeting participants, pers. comm., 2011). A community leader developed a management plan that would ban several kinds of fishing in the CBSFA. He told the DLNR that the plan had broad support within the community. However, during the meeting, community members, fishermen, recreational operators, and others expressed outrage and surprise over the contents of the plan and the proceedings quickly deteriorated (Command, 2008). The West Hawai'i Today newspaper reported that, “following an emotional vetting, a consensus was reached: do nothing”

(Command, 2008). In the 4 years since this meeting, the Miloli‘i CBSFA remains without an approved management plan.

Challenges such as the difficult Miloli‘i meeting occurred because prior to the legislation, there were no pre-existing community institutions in place and the legislation did little to map a direction for how community-level institutions or governance structures would be developed. Even if communities were better defined, granting these community entities “membership rights” to particular resources in the CBSFA areas would be challenging. Aspects of Hawai‘i State law make it nearly impossible to grant exclusive or even priority rights to marine resources to a particular group of people. Constitutionally, all Hawai‘i residents have equal access to coastal areas and resources (*Public Access Shoreline Hawai‘i v. Hawai‘i County Planning Commission* No. 15460 Aug. 31, 1995) Rules regulating marine resources must apply to all state residents equally; preferential access for communities to harvest marine resources in their CBSFA is not allowable.

3.3.2 The Development and Enforcement of Rules that Limit Resource Use

The CBSFA legislation allows for management proposals that “meet community-based subsistence needs and judicious fishery conservation and management practices” (Hawai‘i Revised Statutes Chapter 188-22.6). These proposals would likely include rules to limit resource use. The proposed rule package from Ha‘ena contains several rules which seek to limit marine resource use. As yet, no rules have been passed in any CBSFAs so this criterion has not been met, but it is potentially achievable under the current legislation.

3.3.3 Congruence Between Rules and Local Conditions (i.e., Scale and Appropriateness)

The CBSFA framework requires that the CBSFA rules be developed and ratified through Hawai‘i’s Chapter 91 rule-making process. The few communities that have begun the process of developing CBSFA management plans and rule packages have encountered a lack of congruence between community concepts of management and the framework of management supported by the state’s rule-making process. In many cases, it has been difficult for communities to convert their ideas for the management of CBSFAs into a set of rules that would pass through the state’s process.

Many of the concepts of traditional Hawaiian resource management are not compatible with the state’s framework of laws. For example, many of the Hawaiian communities interested in developing CBSFAs were seeking a means to prevent outsiders from overharvesting community resources (Interviews, 11/10/10, 7/8/11). In *ahupua‘a*-based management, residents from outside the *ahupua‘a* were excluded from gathering resources in that *ahupua‘a* without first seeking permission. The State of Hawai‘i constitution, however, has an equal access clause, which means that all coastal regulations must apply equally to all state residents. Communities cannot develop rules that apply differently to outsiders than to community members and they cannot exclude noncommunity members from access to CBSFAs (Interviews 10/18/10, 11/10/10; Richmond, in review). It is important to note that while Hawai‘i’s equal access policy can prevent the development of *ahupua‘a*-like regulations that restrict use of particular areas by outsiders, this equal access clause has also provided important benefits to Hawaiian

communities. It has meant that no area of Hawai‘i’s coastline can be cordoned off from public access. This clause has meant that even as Hawaiian communities have lost control over important lands, they have not lost access to the coastline.

One community organizer stated that she generally has communities begin by listing their goals for management of their CBSFA, and then they work to turn those desires into a set of passable rules (Interview, 11/10/11). A community member from Ho‘okena said that this process led to a management plan that was “so watered down” from what the community actually desired (Interview, 11/10/11). The community of Ha‘ena worked to develop a creative set of rules that could also help them achieve their goals of limiting outsider use, including gear restrictions that only permit fishing gear used traditionally in the community (Interview, 11/10/11). These rules were recently submitted to the DLNR, so it is unclear how they will hold up through the process.

While the CBSFA process may not support the development of rules that reflect community concepts of management, the legislation does, in theory, provide the opportunity for the state of Hawai‘i and communities to develop rules that better reflect resource conditions in particular places. Staff working for or closely with the DLNR have indicated that traditionally the agency has been averse to place-based marine management, preferring to develop marine resource regulations that apply in all islands statewide (Interviews, 10/7/10, 10/18/10). However the State of Hawai‘i does have several designations for marine protected areas including Bottomfish Replenishment Areas (BRFAs), Marine Life Conservation Districts (MLCDs), and Fishery Replenishment Areas (FRAs). The CBSFA presents a unique opportunity for the state to develop additional avenues for a place-based approach to management, although this has not yet been achieved through the legislation.

3.3.4 Resource Users Have Rights to Make, Enforce, and Change the Rules

One of the most central difficulties of the CBSFA initiative is that the legislation does not propose “community-based management” in its purest sense. As it is written, communities can seek designation of a CBSFA. Once designated, communities can then develop a management plan and propose rules for those CBSFAs. But these rules are mere proposals; before they become legally binding, they must be “adopted pursuant to Chapter 91” (Hawai‘i Revised Statutes Chapter 188-22.6). Chapter 91 codifies a convoluted and slow process for how state agencies develop rules. Under the Chapter 91 process, the DLNR has enormous input into the types of rules that communities develop and can reject proposed rules or management measures. The rule-making process of Chapter 91 also requires agencies to consider broad public input. This means that individuals or stakeholder groups who are not from the community would also have the ability to influence the direction and content of rules in CBSFAs; interest groups could have the opportunity to block or modify community-proposed CBSFA rules. Additionally, Chapter 91 rule-making is a process that takes place in the bureaucratic structures of the State government, culminating with an appearance before the Board of Land and Natural Resources, all located in Honolulu. Therefore, under the legislation rules for these community-based areas are to be developed and approved in an urban area that is far (generally on an entirely different island) from the marine areas being regulated and from the communities proposing management of those areas.

Instead of community-based management, as written, the CBSFA legislation seems to more outline a form of collaborative management among communities, the DLNR, and other interested stakeholders (Interview, 10/18/10). This greatly dilutes the role of the community and local resource users in rule-making processes surrounding their CBSFA. This aspect of the legislation has also created confusion and misaligned expectations. While communities believed the legislation would give them greater autonomy and control over the management of local marine resources, the DLNR expected that they would remain primarily responsible for management and rule-making in all of Hawai'i's waters, including CBSFAs. The legislation does not devolve management powers to communities; rather, it gives them the ability to suggest rules and management practices that need to be approved through the conventional government process.

In addition, the legislation is unclear about mechanisms for enforcing CBSFA rules. It does not facilitate a legal mechanism that allows communities to legally enforce rules in their own CBSFAs. Under the legislation, enforcement authority and responsibility would likely remain with the DLNR's Division of Conservation and Resource Enforcement (DOCARE). DOCARE is notoriously underfunded and already has difficulties enforcing current fisheries regulations in Hawai'i; it is unlikely that they would have the means to effectively enforce CBSFA rules. The legislation does not appear to establish a mechanism that allows resource users to meaningfully make, enforce or change CBSFA rules.

3.3.5 Individuals Affected by the Rules can Participate in Changing the Rules

Language in the CBSFA legislation does not appear to support a framework for adaptive management of CBSFAs. All CBSFA rules must be developed through the Chapter 91 process and can take 2-3 years at a minimum (Interview, 10/18/10). The legislation was developed "for the purpose of reaffirming and protecting fishing practices customarily and traditionally exercised for the purposes of Hawaiian subsistence, culture, and religion." However, the rule-making procedures couldn't differ more starkly from Hawaiian traditions of management. In Hawaiian management *kapu* or closures were established adaptively based on resource conditions, spawning cycles, and other needs. Under the CBSFA legislation, the modification of rules would likely be a slow and onerous process. Individuals affected by the rules could work with community groups to propose new rules, but any individual involvement might not seem direct given the process rules must go through before they are approved. Traditional Hawaiian management was highly organized and overseen by traditional leaders: *ali'i* and *konohiki*. It is not clear how much resource users were able to participate in changing the rules under that system either.

3.3.6 Monitoring of the Resources

The legislation states that management plans attached to CBSFA proposals contain a description of "evaluation and monitoring processes." So, it appears that monitoring can potentially be an important part of the CBSFA process.

3.3.7 The Presence of Accountability Mechanisms for Those Monitoring the Rules

Under the CBSFA legislation, there is not a lot of clarity surrounding who would monitor or enforce rules. The legislation does not appear to provide an explicit mechanism that allows those who monitor the rules to be monitored and held accountable.

3.3.8 Sanctions that Increase with Repeat Offenses or Severity of Offenses (Graduated Sanctions)

There have been no rules passed for CBSFAs, but rules that proposed increased sanctions with repeat offenses and severity could potentially be developed under the legislation.

3.3.9 The Presence of Conflict-resolution Mechanisms

The CBSFA legislation did not establish a mechanism for conflict resolution. Conflict among communities and government agencies has likely contributed to slow implementation of the CBSFA legislation to date. The 2008 public meeting surrounding Miloli‘i’s CBSFA erupted in controversy and conflict that essentially halted the implementation of any management measures in that area and likely slowed the process of implementation in other areas. There have also been reports of conflict between different communities who seek CBSFA designation (Interview, 7/18/11) as well as within DAR, the agency charged with implementing the legislation – different staff members at DAR have different ideas about how the CBSFA legislation should be handled (Interview, 10/18/10). A mechanism to resolve these conflicts could greatly improve the success of the initiative.

3.3.10 The Degree to Which They are Nested within Other Institutions

Many reports, including conversations with staff affiliated with the DLNR, indicate that CBSFA legislation had not received strong or consistent support from the DLNR, which is the state agency charged with implementing the legislation (Interviews, 10/7/10, 10/18/10, 11/5/10, 11/10/10, 11/18/10, 7/18/11). The only existing CBSFAs were designated by the Hawai‘i State legislature rather than through the DLNR process. In 2008 a group of four communities, including Ho‘okena on Hawai‘i, proposed legislation to designate CBSFAs in each of their communities; however, in part due to apparent lack of support from the DLNR, this legislation did not pass (Interviews, 11/10/10, 7/8/11). A representative from a nonprofit that had been helping Ho‘okena organize said she had “never seen a community so defeated” as after the failure of this CBSFA legislation they had worked for years to develop (Interview, 11/10/10). Since the legislation requires the DLNR to participate in the CBSFA process by taking CBSFA designations as well as proposed rules through the Chapter 91 process, the lack of support from the DLNR means there has been almost no progress on implementation of the legislation (Richmond, in review).

The DLNR had logistical and constitutional reasons for resisting the development of CBSFAs. The legislation calls for the DLNR and communities to collaborate and develop rules and management plans for CBSFAs. However, DAR staff had little capacity to work with communities, and the legislature did not provide additional funding to hire personnel who could

coordinate with communities. A community organizer from Ho‘okena said that he felt the state did not want to open what he called “the Pandora’s box of the communities” (Interview, 11/10/10). By this he meant not that working with communities would bring bad outcomes, but that it could be a messy process. Based on experiences from the difficult 2008 Miloli‘i community meeting, and how unprepared they were for community division and dialogue, many DLNR staff may have been resistant to working any further on CBSFA processes (Interviews 10/18/10, 11/10/10).

Under the legal process established in the legislation, CBSFA communities must work with the DLNR’s Division of Aquatic Resources (DAR) to develop fishing regulations, while boating regulations must be coordinated with Hawai‘i’s Division of Boating and Ocean Recreation, thus adding increased confusion, workload, and wait time (Interviews, 10/18/10, 11/10/10). Since the goals of CBSFAs are linked to fishing, DAR has been the primary division involved in working on CBSFAs. DAR has undergone a few processes to develop better clarity on the CBSFA legislation and designation process. In 2006, they participated in a public process to “seek additional input, with significant stakeholder participation, into the proposed definitions and marine managed area framework” (Komoto, 2006). The process explored a number of Hawai‘i’s different types of marine managed areas, including CBSFAs, and developed a set of recommendations, goals, and criteria for each area type. The recommendations for CBSFAs are contained in Appendix B. These recommendations have not been formally approved by the DLNR, but they provide a starting place for considering CBSFA implementation. In 2011, a community conservation non-governmental organization (NGO) supported the development of a CBSFA manual to help guide communities through the process (Interviews, 10/18/10, 11/10/10). A systematic manual could help to codify a process for designation of CBSFAs. Although a draft of this manual has been developed, it has not been approved by the DLNR (Interview, 3/20/12). As a result, communities still do not have a clear understanding of how they can go about designating and managing CBSFAs.

Since 1994, many Hawaiian communities have worked to designate and develop rules for CBSFAs near their communities. A community organizer estimated that communities interested in CBSFA designation and planning have spent about 1500 hours per participant doing background research and work, 100 hours per participant in meeting, and 1000 hours of meeting and planning facilitation (Interview, 3/20/12). Most communities have partnered with NGOs to assist them with many parts of the process including administration, meeting facilitation, grant writing, and legal support. Two organizations that have been instrumental in working with communities include the Hawai‘i Community Stewardship Network and The Nature Conservancy. While the communities have been working to develop capacity to manage their subsistence resources through the CBSFA process, the DLNR has remained underfunded and has not substantively increased its capacity to work with communities (Interviews 10/18/10, 11/10/10).

3.4 Factors that Impede the Success of Community-based Natural Resource Management

Currently, the CBSFA legislation only partially exhibits one of the 10 design principles established by Cinner et al. (2009): Principle 1, CBSFAs have clearly marked boundaries. Adams and Hulme’s (2001) description of factors that impede the success of community-based

natural resource management can also be helpful in understanding the lack of progress on the CBSFA legislation. Although these factors are geared largely towards the context of programs in the developing world, three of the six factors appeared to play a role in the process of implementing the CBSFA initiative:

1. *Rhetoric of community conservation is not reflected in changed ideologies and practices on the part of the resource management agency:* CBSFA laws have been passed despite objections from the state's natural resource agency. Partly based on lack of funding, the DLNR has done little to better accommodate community-based natural resource management in their operations.
2. *A project fails to deliver on community hopes that have been raised by the rhetoric of community conservation:* Interest and efforts from more than 19 Hawaiian communities suggest there was widespread hope about the potential of the CBSFA legislation. However, after nearly 20 years with little progress, the state has failed to deliver on these hopes and expectations. Community hopes that the legislation would allow them greater autonomy and control over the management of local marine resources did not align with DLNR's expectation that the agency would remain primarily responsible for management and rule-making in all of Hawai'i's waters, including CBSFAs. Even when communities, such as Ho'okena, go through the cumbersome process of applying for CBSFA status, they are unable to successfully navigate the bureaucratic procedures to CBSFA designation.
3. *The resource management agency sets unrealistic limits on the extent to which they will share power with local communities:* Under the CBSFA legislation, the state and the DLNR still maintain primary control over the rule-making process for CBSFAs. The legislation severely limits in the extent to which the state shares power with communities.

Given the tremendous effort that communities have put into this process, the lack of progress in designation and management of CBSFAs is disappointing. However, as a result, many communities have self-organized, codified what they want out of resource management, and learned a great deal about the legislative process. As coral reef resources continue to decline and threaten the persistence or possibility for a revitalization of a Hawaiian subsistence way of life, interest in the legislation and pressure on the DLNR will likely continue to grow. Language in the CBSFA legislation was vague and created procedural challenges, but with DLNR's leadership, communities and the state have the potential to develop a network of managed CBSFAs that work, at least, in part, to protect subsistence resources and cultural practices vital to Hawaiian communities.

It is important to note that the CBSFA legislation is not the only initiative directed towards increasing community involvement in marine resource management in Hawai'i. In 1998, the State of Hawai'i developed a regional management body called the West Hawai'i Fisheries Council (WHFC), that convenes to propose management recommendations for the waters on the west coast of Hawai'i Island (like the CBSFA process, these rules must still be passed through the State's Chapter 91 rule-making process). The WHFC is made up of more than 20 community representatives and offers a way to involve communities from the region in management of their nearshore marine resources. There has also been a movement to revitalize traditional Hawaiian practices of environmental management by establishing an *'aha moku*

council made up of Hawaiian practitioners from each island and *moku* in the state. The council provides a means to incorporate community and place-based information into the state's system of environmental management. In 2007, the Hawai'i state legislature enacted legislation allowing for a 2-year trial development of the 'aha moku council system as a potential advisory body to the DLNR (Act 212), but a 2009 proposal to make the council permanent was vetoed by the governor for certain technical reasons. However, there continues to be progress on developing and formalizing the council system. Given the slow process to implement the CBSFA legislation, multiple initiatives at different scales and in different places will likely be central to making community and place-based management more central to Hawai'i's marine management programs.

4. ANALYSIS: AMERICAN SAMOA'S COMMUNITY-BASED FISHERIES MANAGEMENT PROGRAM

In 2000, the U.S. territory of American Samoa initiated a similar process to institutionalize community-based management of marine resources. Largely through the impetus of the American Samoa Department of Marine and Wildlife Resources, the territory developed a Community-Based Fisheries Management Program (CFMP). As of 2012, 12 villages are formally a part of this program, becoming actively involved in the management of their nearshore resources. The social and historical context of American Samoa differs in many ways from that of Hawai'i. In addition, the design, framework, and implementation of the CFMP differed in many ways from the development of Hawai'i's CBSFA initiative. This section includes an in-depth analysis of the American Samoa CFMP legislation.

4.1 Historical and Sociocultural Context of American Samoa

American Samoa, located 14 degrees south of the equator in the Pacific Ocean and approximately 2300 miles southwest of Hawai'i, is the only U.S. jurisdiction in the southern hemisphere. As an "unincorporated" territory of the United States, the territory is administered by the United States Office of Insular Affairs within the Department of the Interior. American Samoans have their own constitution, ratified in 1967, which mirrors the United States Constitution while also incorporating elements of traditional Samoan social structure. Executive and legislative power are exercised by a local governor and local legislature. Maintaining *fa'a samoa* or "the Samoan way" is recognized by the territorial constitution as a priority.

American Samoa is ethnically and culturally very homogeneous. Polynesians account for the vast majority (93%) of the territory's people, and the primary language spoken at home is Samoan (91%). Contemporary American Samoan culture is characterized by a combination of traditional Samoan values and systems of social organization, as well as the strong influence of Christianity. Sunday is observed as a day of rest, when most Samoans refrain from recreational and commercial activities, and many villages observe a nightly evening curfew or enforced prayer time.

Villages and families form the primary organizing unit in Samoan society. Under the *aiga* (extended family) social system, each family is headed by a *matai*, and the *matai* has control over the land and assigns holdings to family members on a lifetime basis. The *matai* of the village make up the decision-making and administrative group, called the village *fono*. *Matai* are also ranked according to local hierarchies, including levels such as chief, high chief, or talking chief, and the *fono* structure is reproduced again by village representatives (from *matai* ranks) at both a district and an island-wide scale (Revised Constitution of American Samoa, 1967). Traditionally, all village work, including fishing, was organized at the village and family level. The village *fono* decided, according to season, what sort of community fishing should take place. The *tautai*, or master fisherman, of the village was a key decision maker who was awarded higher status than other *matai* (who might otherwise outrank him) when it came to matters of fishing.

Land and natural resources are shared communally within each village in American Samoa, and it is estimated that 90% of all land in the territory is owned by *aiga* and passed on through generations (Osman, 1997). The existing laws regarding land tenure prohibit the transfer of land ownership, except freehold land, to any person who is less than one-half Samoan. Unless the Governor approves the transfer in writing, it is unlawful for any *matai* of a Samoan family to transfer any family lands to any person or to lease it for any term more than 55 years. The American Samoan government estimates that only about 2% of American Samoa's total land area is freehold (DOI Office of Insular Affairs, 2007).

Customarily, and still today, the village controls usage rights of nearshore marine resources. A non-village member must still gain permission from the mayor or village council to fish in an area adjacent to a village. Each village is also able to establish its own restrictions on fishing and access for the entire community, and community-specific restrictions on use of marine resources have been formalized in some cases through the government's Community-based Fisheries Management Program. An island-wide restriction, enforced in all areas adjacent to villages, is the prohibition of fishing on Sundays for religious reasons.

Previously, organized trips for specialized fishing were marked by much ceremony and tradition (Armstrong et al., 2011). Village-wide fish drives were timed with the tides and the spawning of certain species. Organized fishing efforts continue to take place in a few villages in American Samoa. For instance, the *tautai* of Fagasa and Ofu continue to organize village fishing efforts for *atule* (big-eye scad) (Levine and Sauafea-Leau, in press), and fishing activities remain under the control of the village *fono*. After these efforts, the fish are traditionally distributed to all village families who participated in the fishing.

4.1.1 Population and Economy

The population of American Samoa has grown rapidly, doubling in just more than 25 years from 32,297 in 1980 to an estimated 66,900 in 2006, then falling to 55,519 in 2010. Much of this population change is a result of in-migration, largely from neighboring Samoa for employment in the island's canneries, and subsequent departure after closure of one of the canneries. American Samoa's economy is dependent on two, primary externally funded income sources: the American Samoan government (ASG), which receives significant operational and

capital grants from the U.S. Federal Government, and the tuna cannery on the main island of Tutuila. These two sources account for more than 90% of American Samoa's economic base (Malcolm D. McPhee and Associates, 2008) and support a smaller services sector. Unlike independent Samoa, tourism does not play a large role in American Samoa's economy; periodic day visits by cruise ships provide only a small economic input to the islands. Subsistence activities also continue to provide a significant contribution to households (Kilarski et. al. 2006).

American Samoa's narrow economic base does not generate a level of local revenues adequate to provide essential public services to its citizens. To meet these needs, the U.S. Office of Insular Affairs (OIA) annually provides direct grant support for American Samoa's general government operations. In 2007, OAI allocated approximately \$23 million for operations, plus substantial additional funding for infrastructure and other types of support activities, including marine management (DOI Office of Insular Affairs, 2007a).

4.2 Nearshore Fishing in American Samoa

Nearshore fisheries, particularly coral reef-related fisheries, are of fundamental sociocultural and dietary importance to American Samoans. Traditionally, Samoans spent much of their time fishing on reef flats or near the reef edge. This practice provided food for the family and a source of recreation. Customarily, only men fished, and women and children waded on the reef at low tide with sharp sticks and knives to gather small fish and invertebrates. Women were not permitted, by Samoan custom, to fish outside the reef. Armstrong et al. (2011) describe traditional fishing practices in American Samoa; common fishing techniques included intertidal gleaning, diving, rod and reel, netting and trapping (including communal fish drives), and boat-based fishing. The authors note that the family, rather than the individual, was the central unit of society, and emphasis was given to reciprocity rather than individual accumulation. The authors also document a gradual shift from a heavy reliance on fishing to an increasing reliance on canned fish and other foods, even as early as the late 1930s (Coulter, 1941; Holmes, 1974).

Fishing was generally not conducted as a commercial activity until the introduction of modern technology in the 1950s and 1960s. The introduction of outboard engines allowed American Samoan boats to go farther and faster, but also made it necessary for boat owners and operators to sell a portion of their catch to pay for fuel and engine maintenance. The disruption of other traditional values over time, as well as the introduction of a cash economy based primarily on government jobs and cannery employment, contributed to a decreased reliance on traditional, subsistence fishing and allowed commercial fishing to develop on the islands (Levine and Allen, 2009).

Today, American Samoa's nearshore fishing is focused on the narrow fringing coral reef that partially surrounds the islands, the top of which is exposed in many areas at low tide throughout the year. A diverse array of fish and shellfish is harvested by local residents on an almost daily basis from the reeftop and adjacent shallow waters (Craig et al., 1993). Most fishing is accomplished by individuals on foot in areas adjacent to their village. While the gender division in fishing is not as strict as it was in the past, women predominantly engage in gathering shellfish and small fish in the intertidal zone, while men fish farther offshore.

Nearshore fishing in American Samoa is still largely for subsistence purposes, and most nearshore fishermen do not sell their catch. A 2005 survey of 425 people from 34 villages in American Samoa found that 55% of respondents fished for subsistence to some degree, although most people fished only infrequently¹ (Kilarski et al., 2006). Of those who did fish, 72% fished once a week or less (44% of these fished only 1–2 times per month), while 16% reported fishing 10 or more times per month. This means that approximately 9% of the population surveyed could be considered “frequent subsistence fishermen.” The study also found that American Samoans valued fish apart from their use as food; the majority of survey respondents indicated that fish were important not just for food and cultural use, but for maintenance of a healthy ecosystem.

The Kilarski et al. (2006) study also found that most fishermen do not sell their catch. Only 12% of interviewees sold fish, and more than half of those sold only once or twice a month. Only 10% of commercial sellers reported selling fish more than 10 times per month, suggesting a relatively low economic reliance on nearshore commercial fishing in the territory. However, most respondents (64%) reported that they buy fish, indicating that localized fishing activities supply only a portion of locally consumed seafood and that the supply of commercially sold fish likely comes predominantly from people from outside the territory (Levine and Allen, 2009).

A trend of decreasing reliance on local fish as a food source is one that might be expected from a society that has been undergoing a shift from a subsistence-oriented economy to a cash economy. Changes such as a decrease in leisure time, a shift in dietary preferences towards store-bought foods or a preference to buy fish at the market rather than expend effort in fishing may contribute to decreasing rates of subsistence fishing (Levine and Sauafea-Leau, in press). Imports of reef fish from Western Samoa and Tonga also increase the supply of inexpensive fish available in local stores on Tutuila (Craig et al., 1993).

In American Samoa, and throughout the Pacific, there is concern that nearshore marine resources may be overexploited in the narrow coastal zone as human populations increase and technology increases the fishing capacity of artisanal fishers (Dalzell et al., 1996; Craig et al., 2008). Given the limitations of available data, it is difficult to determine the precise long-term effects of fishing on American Samoa’s nearshore fish populations. Interviewing island residents has enabled assessment of changes in the fishery over time. A 1994–1995 study by Tuilagi and Green (1995) surveyed 100 residents in 50 villages on Tutuila; all respondents reported declines in the giant clam fishery, while nearly three-quarters reported a decline in reef fish and nearly half a decline in *palolo*. Levine and Sauafea-Leau (in press) conducted interviews with 78 elder fishermen throughout Tutuila and the Manu’a Islands in 2007–2008. Sixty percent of the fishermen interviewed perceived reef fishing to have gotten worse since they were young. This trend was more marked in Tutuila, which has a greater population and is much more developed than the outer Manu’a Islands.

¹ Approximately half of the respondents stated that they fished for recreation, although this was also fairly infrequent, with 71% of these individuals fishing once a week or less. Fishermen also fished infrequently for cultural purposes, although cultural, subsistence, and recreational fishing categories are difficult to distinguish as one fishing outing could be motivated by all three reasons.

4.3 Community-based Fisheries Management Program

American Samoa still retains a highly traditional social structure characterized by a tenure system in which villages have a great deal of control over use of land and marine resources in their village area. Thus, village cooperation and involvement is critical to any successful management program (Levine and Allen, 2009). In Levine and Sauafea-Leau's (in press) interviews with elder fishermen in American Samoa in 2008, fishermen were asked about marine management techniques previously used and their recommendations for the future. Common strategies mentioned included village-based regulation, banning of destructive fishing, banning outsiders from fishing in village areas, and prohibiting fishing on Sundays. When asked about recommendations for future management, the most frequent answer was establishing a village marine protected area (31%). Increased enforcement against illegal fishing was frequently recommended, as was stopping pollution and littering (particularly in Tutuila). Fishermen also mentioned the need to increase village collaboration and co-management with the government, develop size limits on fish caught, and promote greater community awareness. On Tutuila, the perceived need for additional management actions was greater than in the Manu'a Islands, where many fishermen stated that they had managed their resource well in the past and could continue to do so in the future.

To address threats to nearshore resources, the government of American Samoa has developed numerous programs for marine resource protection, one of which is the CFMP. The CFMP was initiated by the territory's Department of Marine and Wildlife Resources (DMWR) in 2000 to assist villages in managing and conserving their inshore fishery resources through a voluntary scheme of co-management with the government. The program's goal is to improve inshore fishery resources and enhance stewardship of marine resources by the village community (Amituana'i and Sauafea, 2005).

While some traditional village-based management systems are still practiced in American Samoa, the strength of many of these systems has weakened, and the ability of some villages to engage in management and enforcement activities is limited. The American Samoan government also has limited patrolling and enforcement capacity throughout the territory, due to staff and boat availability. The CFMP program allows DMWR to expand its own enforcement and surveillance capability, while also strengthening the capacity of village communities to protect their nearshore resources with government backing.

The goals of the CFMP program, as stated in American Samoa's Administrative Rule No. 01-2008, are:

- a. To promote the protection and preservation of the American Samoa's Marine environment;
- b. To provide the management, conservation and sustainable development of American Samoa's Coral Reefs and their supporting ecosystems;
- c. To enhance sustainable fisheries in American Samoa;
- d. To empower, allow and assist local Villages in all aspects of the Village Marine Protected Area management including, but not limited to designation, protection, monitoring and enforcement of the Village Marine Protected Areas; and

- e. The institution of management programs to ensure that the Territory and its surrounding waters are safe habitats for Fish, shellfish and other marine life to exist and propagate for the continued use and enjoyment for the people of American Samoa, its future generations and visitors.

The CFMP program in American Samoa was based largely on a similar Fisheries Extension Programme established in independent Samoa in 1995 (King and Fa'asili, 1999a,b; Fa'asili and Sauafea, 2001). The program was initiated with technical assistance from the Secretariat of the Pacific Community (SPC, 2001), and DMWR staff in American Samoa participated in an exchange visit to learn about the Samoa program. The cultural similarities between the two island groups made the program's structure and lessons learned highly applicable in American Samoa, where the program then was adapted and implemented, beginning with outreach and publicity activities on Tutuila. The CFMP was formally established in American Samoa in 2001.

DMWR's extension process for selecting and working with CFMP villages is laid out in Figure 3. Villages may approach DMWR to take part in the program, or DMWR may approach a village to determine their interest and suitability. There are three initial steps for selecting villages to take part in the CFMP (Sauafea-Lea'u, pers. comm., 2008). First is to examine the degree of organization of the village's various social groups, including the council of chiefs (*fono a matai*), women's groups, and the young men's group (*aumaga*). This indicates whether or not the village has the local capacity and social systems of organization necessary for village-based management. Second, a DMWR representative informally meets with the village mayor and leaders to explain the CFMP. If the mayor and other village leaders express interest in the program, the program organizers meet with the village's various social groups to assess the potential for village participation in the program by determining the significance of the marine environment to the village, the extent of problems in the local fishery, and the level of concern and willingness of village leadership to take action to address existing problems. Third, DMWR's extension staff and director review the assessment and decide on the village's potential for inclusion in the program.

Once DMWR determines that a village is suitable for the program, the department representatives work with the village to establish a fisheries management plan. DMWR has established a cooperative agreement which explains the obligations required by the government and the village under the CFMP program. The village is obliged to protect and manage its marine area, overseeing all actions agreed in its Fisheries Management Plan. The village also provides parallel support, voluntary participation in meetings, and voluntary commitment of labor for enforcement, monitoring, and review of activities (Sauafea-Lea'u, pers. comm., 2008). DMWR in turn provides technical assistance and advice, workshops and trainings to enhance community understanding of how to manage and protect the marine environment, assistance with development of the village Fisheries Management Plan, and other forms of support to assist with proper implementation of the program. The agreement is signed by leaders of the village and the DMWR director once the village officially accepts the program.

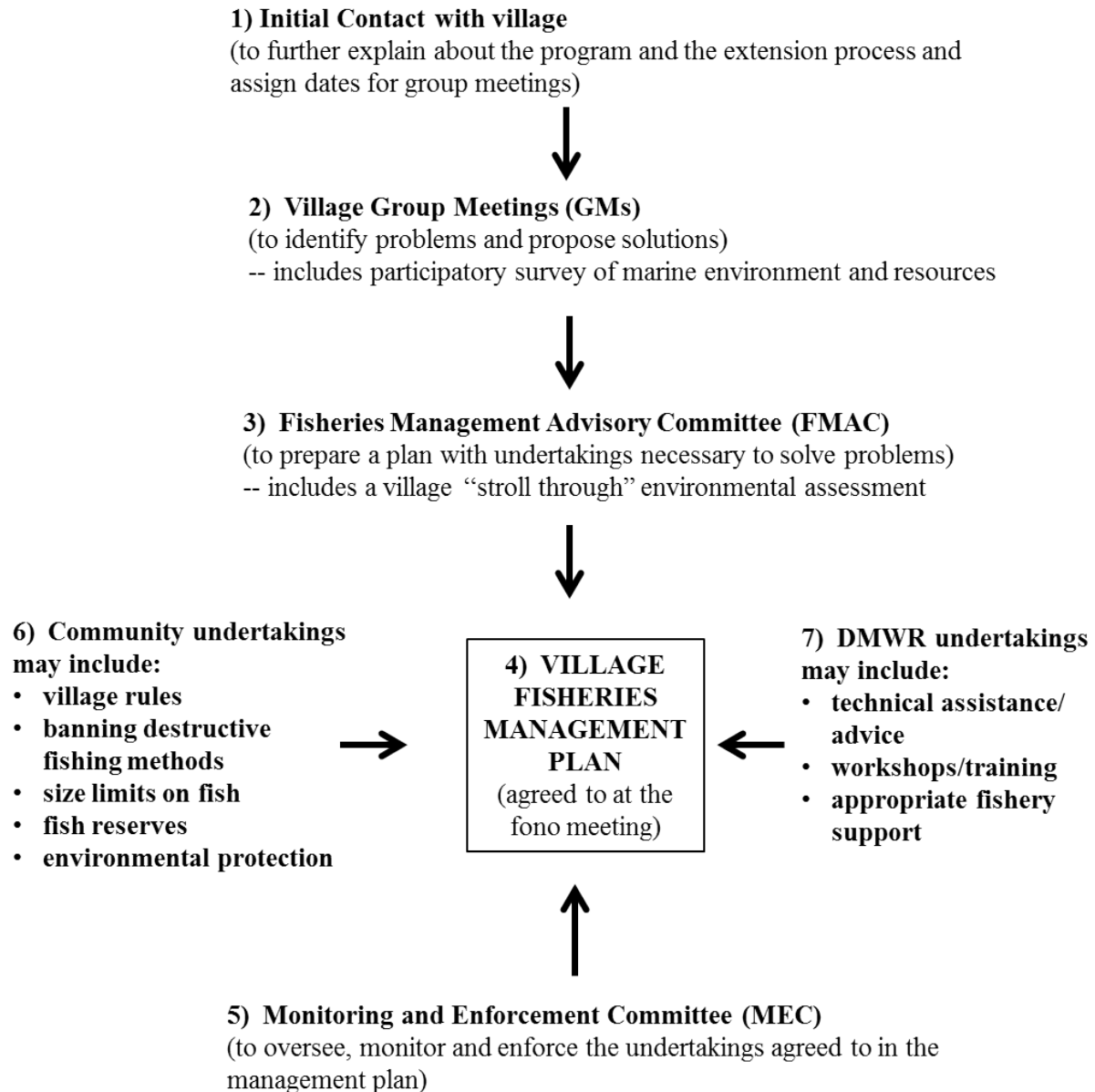


Figure 3.--Summary of the extension process for the CFMP in American Samoa developed by the Secretariat of the Pacific Community (SPC, 2001).

In general, villages manage their marine areas through establishment of village marine protected areas (MPAs) generally referred to as VMPAs (to distinguish this program from federal or territorial MPAs). VMPAs may close a portion of the reef area near the village or the entire village bay, and these areas may be closed on a long or short-term basis. DMWR assists villages in assessing the designated protected area, providing recommendations on the size of the VMPA and the time-frame for closure. Most village councils involved in the program have formally closed their reef areas to outsiders², and some have agreed to close their VMPAs to

² This restriction is not legally enforceable under territorial law, but locally acceptable under customary law.

fishing activities for up to 5 years, with exceptions for fishing conducted by elders or to provide fish for important village events (Selaina Vaitautolu, pers. comm.). These exceptions must be obtained through permission of the village council, under consideration of recommendations by the village monitoring and enforcement committee.

Because VMPAs are managed by local communities that have a direct interest in their success, compliance with bans on fishing is high within the village (Sauafea-Lea'u, pers. comm., 2008). Most villages with VMPAs actively enforce their own rules. Village social pressures are generally adequate to assure local compliance, and villages apply penalties for violations within their VMPAs, including traditional fines of pigs or canned goods for infringements.

However, until late 2008, village regulations were not formally recognized under American Samoan government law, so communities had little authority to enforce local rules if broken by outsiders, in some cases resulting in intervillage conflicts. For instance, in 2005, the *Pulenu'u* (mayor) of Fagamalo was charged with attempted murder when he confiscated a fishing boat that was within the village's VMPA boundaries, abandoning the fishermen who were diving underwater approximately 6 km offshore (Radio New Zealand International, 2005). To address the enforcement issue, DMWR worked with a legal advisor to develop legislation that incorporates village rules and regulations under the department statute, allowing penalties to be legally applied to people from outside the VMPA village. Table 2 details the types of village regulations that can be put into place under the jurisdictional legislation. This effort resulted in a 2008 law which allows DMWR's director to deputize the village *Pulenu'u* and one designated village policeman to issue citations under the CFMP program, strengthening the official enforcement capacity of the village.

Table 2.--Marine resource use restrictions allowed under CFMP legislation.

<p>Administrative Rule No. 01-2008</p> <p><i>Any Village may further restrict Fishing or the Taking of Fish or Shellfish on or in its designated Village Marine Protected Area by:</i></p> <ul style="list-style-type: none">(i.) Restricting all Approved Fishing Methods for a certain period of time;(ii.) Limiting the type of Approved Fishing Methods allowed to be used in a Village Marine Protected Area;(iii.) Banning all forms of Fishing in the Village Marine Protected Area;(iv.) Restricting the area or areas within a Village Marine Protected Area where Fishing is allowed;(v.) Restricting Fishing by declaring Open Seasons when Fishing is allowed;(vi.) Restricting the total number of all Fish and/or Shellfish that a Person is allowed to Take during one (1) Day or other specified Time Period(s);(vii.) Restricting the total number of a species of Fish and/or Shellfish that a Person is allowed to Take during one (1) Day or other specified Time Period(s);(viii.) Restricting a Time Period during a Day when Fishing is allowed;
--

- (ix.) Restricting the type or species of Fish that may be Taken;
- (x.) Restricting the size of Fish that may be Taken by instituting size limitations requiring Taken Fish to exceed an overall Length of Fish;
- (xi.) Banning all Night Fishing;
- (xii.) Allowing only Subsistence Fishing or the Taking of Fish or Shellfish for Subsistence Uses or Cultural Uses;
- (xiii.) Instituting harvest limits that limit the total amount of Fish or Shellfish or a type of Fish or Shellfish that can be Taken from the Village Marine Protected Area;
- (xiv.) Banning all Commercial Fishing;
- (xv.) Banning the Taking of Fish or Shellfish with the aid or use of lights; and/or,
- (xvi.) Restricting or banning other activities in a Village Marine Protected Area including, but not limited to, swimming, wading, and surfing.

The CFMP currently works with 11 communities on the island of Tutuila, as well as a community on the island of Tau. DMWR staff members assist with outreach and education in the participating villages. They also conduct biological monitoring of key fish species and are working to incorporate socioeconomic monitoring in villages. Each village has varying degrees of participation, and fisheries regulations also vary according to each village’s management plan. Table 3 lists the villages currently involved in American Samoa’s CFMP, the date when their involvement began, and the status of VMPAs in their waters. The table includes additional villages that are not formally part of the CFMP program, but that are engaging in some form of village management activity.

The CFMP structure is intended to strengthen both local and governmental capacity for fisheries management based on a community-based co-management regime, using both local participation and government support. The village fisheries management plans also assist with some of the federal laws of the Essential Fish Habitat identified pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, as well as the protection of turtle species recognized as threatened and endangered under the Endangered Species Act. These management plans identify local threats to coastal fisheries, including the use of destructive fishing methods, land erosion, pollution, overexploitation, and poor management of fishing practices. The CFMP aims to couple enforcement of fishing regulations and land management practices by government and village members to ensure a healthy coastal habitat (Sauafea-Lea’u, pers. comm., 2008).

Table 3.—Villages involved in community-based management in American Samoa (Selaina Vaitautolu, pers. comm., December 2009).

Village	CFMP process initiated	Management status
Alofau	2001	Open 1 day/week (Saturday) to villagers only.
Amaua & Auto	2003	No-take for 3 years, open again for 1 month, closed again. Currently open to villagers only to fish.

Village	CFMP process initiated	Management status
Aoa	2005	No-take as of early 2008. Previously only open 1 day/week (Saturday).
Aunu'u*	2009	Currently in discussion regarding whether or not to do complete no-take or zoning.
Aua*	2002	Undergoing discussion for inclusion in program.
Fagamalo	2003	No-take.
Masausi	2002	No-take until early 2008, now open to villagers only.
Matu'u & Faganeanea	2005	Closed for 3 years, now open periodically (at chief's discretion) to villagers only.
Amanave	2008	Closed to everyone. In the process of finishing management plan. Village wiped out by tsunami.
Maloata	2009	Currently closed – in the process of finishing management plan.
Poloa	2001	Only villagers allowed to fish.
Sa'ilele	2005	No-take.
Tau	2011	Officially a CFMP village in 2012 – a portion of their reef has been designated as a no-take area for 3 years.
Vatia	2001	No-take. Reserve was opened 1.5 years ago for 3 months, then closed again. Now open to villagers only.

* Not an official CFMP village.

4.4 American Samoa's CFMP as a Common Pool Resource Management Institution

This section will examine American Samoa's CFMP as a natural resource management institution, looking in particular at how the program incorporates the ten design principles laid out by Cinner et al. (2009), as enumerated in the introduction. A tabular summary of how these principles apply to American Samoa's CFMP program is laid out in Appendix C.

4.4.1 Clearly Defined Geographic Boundaries and Membership Rights

American Samoa has a strong history of customary land and marine tenure. Village boundaries (as well as marine areas within a village's jurisdiction) in American Samoa are based on traditionally recognized boundaries, which are commonly accepted by other island residents by tradition and custom. Membership in a village is also clear based on residence in the village, and potential conflicts or discrepancies would be clarified by the village council. The boundaries of the VMPA are also established by the village, and the MPA is required to be marked through visible means such as signs, posted notices, published notices or anchored floats (Administrative Rule No. 01-2008).

The CFMP program complies strongly with this design principle. The strength of customary tenure in American Samoa makes challenging of village-designated boundaries unlikely, and village membership is generally clear. However, the system of local management

may not work as well if applied to one of the more urbanized villages in American Samoa, where membership is more transient and residents are frequently immigrants rather than long-term Samoan inhabitants. The system would also not work in non-village areas, such as industrial zones or remote coastal regions with no adjacent village community.

4.4.2 The Development and Enforcement of Rules that Limit Resource Use

When the CFMP program was initiated, villagers were able to establish rules and boundaries for their local areas, but these rules were not legally enforceable beyond the village's traditional authority. Village members, who were also subject to village rules and regulations, complied with the rules, but outsiders could not be formally punished for violating village regulations. Customary authority over village waters is widely accepted by American Samoans, and outsiders generally ask village permission to fish in an area. However, enforcing village rules against violators from outside the village produced extreme conflict in some instances, such as the incident in Fagamalo in 2005 when fishermen were stranded in the water when village members enforced the VMPA regulations by confiscating their boat.

The development and enforcement of CFMP rules that limit resource use in the VMPAs has been strengthened by the enactment of village by-laws under Administrative Rule No. 01-2008. Table 2 lists restrictions that may be enacted within VMPA boundaries. These regulations, once formalized by the village and accepted by DMWR, are enforceable by territorial law.

One area where the CFMP program may fall short on this design principle is in whether or not the rules designed by the communities adequately restrict resource use. As seen in Table 3, only five of the CFMP villages have created MPAs that prohibit fishing for 3 years or more. Even the villages with permanent or long-term no-take reserves make occasional exceptions and allow fishing in their reserves for special occasions. Many coral reef biologists argue that permanent no-take MPAs are required to replenish fish stocks and ensure long-term viability of reef fish populations (Bohnsack, 1998; Lester et al., 2009). However, the effective enforcement (and village-wide acceptance) of a partially protected area may be more effective for fisheries management than designation of no-take MPAs that do not have real compliance or enforcement (a.k.a. paper parks). Biological monitoring is a part of the VMPA program, supported by DMWR, but current monitoring studies are inadequate to determine whether or not there has been a definitive impact of VMPA designation on the population of key coral reef species.

4.4.3 Congruence Between Rules and Local Conditions (i.e., Scale and Appropriateness)

The scale of the CFMP program, providing for village bay-scale management, is appropriate within the cultural context of American Samoa, where society is organized at the family and village level. Village marine boundaries are recognized customarily, and village councils serve as a pre-existing unit of civil society to engage in management decision-making and enforcement of village-level rules. In two of the program's VMPAs, two villages that are located in the same bay area have worked together to designate one VMPA. In these cases, the village's close proximity and history of working together regarding previous resource management decision-making also allows for effective collaboration in management.

While the scale of resource management under the CFMP program is socially appropriate, it is questionable whether or not designation of small village-scale MPAs is biologically adequate for coral reef resource conservation. Resource managers still debate the size necessary to provide a refuge for coral reef species or to allow for spillover of species to enhance nearby fisheries (Laurel and Bradbury, 2006; Mora et al., 2006; Moffitt et al., 2011). The resource protection provided under the VMPA system may contribute to an island-wide network of protected areas, making the total biological effect greater than the individual bay units. However, current biological monitoring in the territory remains inadequate to assess the full impact of the designated VMPAs or VMPA system.

4.4.4 Resource Users Have Rights to Make, Enforce, and Change the Rules

Under the CFMP program, VMPA rules and regulations are designed by the village fisheries management and advisory committee, together with the village management and enforcement committee (Selaina Vaitautolu, personal communication). Two individuals from each of the three primary village stakeholder groups (matai, women, and aumaga) made up these committees. After the management plan is created, the committee gives it to the high chiefs and village council, who examine it to determine if any changes are needed. Modifications after this point are at the village council level.

While the designation of village rules and regulations begins as a village-wide process, incorporating the needs and interests of a wide range of village stakeholder groups, the continuance and modification of village rules and regulations is in the hands of village leaders. Although modification of rules is not necessarily a democratic or highly participatory process, it is socially appropriate within the context of American Samoa, where most village decision-making regarding resource management is conducted at the village council level, which is made up of titled village representatives.

The fact that ongoing enforcement and modification of rules and regulations lies with the village leaders underscores the importance of strong village leaders or a well-organized village council to the success of a VMPA. The CFMP program takes into account the organization of the village council and strength of other social units within the village to determine if a village should take part in the program. However, village leaders change over time as elders pass away, and the loss of strong village leaders has contributed to the weakening of VMPA rules and regulations. The VMPA in Matu'u and Faganeanea, for example, was created and closed for 3 years under the leadership of a strong village matai. When the matai passed away, village leadership weakened and the VMPA has been periodically opened and closed, at the discretion of the village mayor.

Regarding enforcement, the CFMP program has become stronger as the rights of the village to enforce rules and regulations were codified in American Samoan law. Although only the village mayor and one designated enforcement officer have official legal authority to issue citations to offenders, anyone within the village can monitor the VMPA and report violations that take place. This provides incentive for villagers (and outsiders) to comply with the local regulations as most of the VMPAs lie within sight of shore and monitoring by local residents is easy.

4.4.5 Individuals Affected by the Rules can Participate in Changing the Rules

As described in the previous section, while creation of VMPA rules is a highly participatory process, modification of rules is entirely at the village council level. While this does not allow for the direct participation of all individuals affected by the rules, the village council system itself is intended to represent all village families. This allows the potential for those affected by the rules to have their voice heard in the decision-making process; however, whether or not this happens depends largely on the strength and representation of the village council, which varies by village, and is dominated by strong leaders in some situations. Those who live outside the village and who are potentially affected by VMPA regulations (if they rely on fishing in the area) have no voice in the codification or modification of rules and regulations. However, under Samoan custom, outsiders must always comply with village rules and regulations. Providing outsiders with a voice in rule-making would not be culturally accepted or appropriate.

Under territorial law, any regulations determined for the VMPA must apply to all people equally. This poses a potential challenge in American Samoa where, traditionally, village residents have preferential rights of access to their own bay for fishing and other types of use. As seen in Table 2 (previous section), more than half of the villages retain preferential access for villagers under their VMPA rules, allowing only villagers to fish in their VMPA (whether for limited periods or every day). Even the closed VMPAs allow periodic exceptions for harvesting activities by village members. While this is commonly accepted by American Samoan custom, it is not legally enforceable at the territorial level. This might pose problems for villages that continue to allow villagers access rights to their waters, as they would be unable to enforce this regulation with support from the territorial government. It could also provide an opening in the future for an outsider to challenge village laws if prevented from fishing there. If this were to happen, it would pose a test to the long-term strength and direction of the CFMP program.

4.4.6 Monitoring of the Resources

VMPA areas are generally within view of each village, enabling all village members to participate in monitoring compliance with VMPA rules and regulations. Village residents generally comply with VMPA rules because of social pressure and the high likelihood of being caught. However, monitoring of the VMPA remains challenging at nighttime, when some infractions of VMPA rules are said to occur because people can fish without being detected by the village residents (Fagamalo Mayor, American Samoa Fisheries Management Workshop, Oct. 2008). The ability to enforce the rules against outsiders also varies by village, and proves challenging in villages that do not have access to boats. Enforcement boats were provided to the CFMP by the Western Pacific Regional Fishery Management Council, but they have been of limited utility because they are based at the DMWR office, seat only two people, and are challenging to use; village enforcers have yet to complete a training in use of the boats, and serious safety issues show that these boats have been found to capsize easily (Selaina Vaitautolu, pers. comm.).

4.4.7 The Presence of Accountability Mechanisms for Those Monitoring the Rules

This design principle involves whether there is monitoring of those who monitor the rules. Within the CFMP program, monitoring is village-wide, and most violations would be open for all to observe. In American Samoa more generally, however, enforcement officers from DMWR have stated that it can be a problem trying to enforce territorial regulations against their own relatives or people from their own villages (Peter Eves, American Samoa Fisheries Management Workshop, Oct. 2008). This is less the case when the village has agreed on their own regulations, and violations occur within village boundaries. The CFMP has no formal “monitoring of monitors,” but village-level violations must be brought before the village council, and violations by outsiders brought to the DMWR, to ultimately enforce punishments.

4.4.8 Sanctions that Increase with Repeat Offenses or Severity of Offenses (Graduated Sanctions)

Sanctions for violations of village regulations take place at two levels: the village level and the territorial level. At the village level, the village determines its own system of fines or punishments that do not need DMWR approval and thus can be enforced locally. Generally, villagers who violate VMPA regulations are not fined on the first violation, but are warned not to engage in the illegal activity again. Village sanctions may be monetary (such as paying a fine to the village council or making a contribution to a village institution) or traditional (such as providing a pig or canned goods as food for a village event). Someone sanctioned at the village level cannot be charged to face additional punishment (double jeopardy) under territorial laws.

Territorial sanctions are determined by territorial law according to Administrative Rule No. 01-2008, which lays out a system of fines for various offenses (Appendix D). Territorial punishments include up to 30 hours of community service plus mandatory environmental education classes and go up to \$500 and/or a prison term of 15 days to 6 months. Those punished under territorial law cannot be punished by village sanctions simultaneously. Both the village sanctions and territorial fines are graded according to severity and frequency of offense. Generally, a village member who violates a regulation for the first time is reprimanded by the village council and told not to engage in the activity again. Fines or punishments are administered after the second offense, and a village member who engages in repeated violations will likely be prosecuted under government law (although this has yet to happen). The territorial laws are new enough that no one has yet been prosecuted or fined under these laws (Selaina Vaitautolu, pers. comm.), however, territorial sanctions increase with the severity of offense and the number of times an individual engages in the illegal activity.

4.4.9 The Presence of Conflict-resolution Mechanisms

Village-level violations are generally dealt with by the village council. However, punishments depend on the severity of the offense. As described above, most villages are lenient with first-time offenders, but they are more likely to enforce fines or sanctions with increased violations. Outsiders who violate village regulations are brought to the territorial government to determine sanctions.

4.4.10 The Degree to Which They are Nested within Other Institutions

The CFMP program is composed of a set of nested enterprises. Ostrom (1990) lists key activities that should be nested and supported at different institutional levels to facilitate program sustainability and durability. These include the appropriation, provision, and monitoring of resources, enforcement of rules and regulations, conflict resolution, and governance activities. The nesting of multiple levels of hierarchy in rule-making and social activities is inherent within Samoan societal structure through the *matai* system, the village *fono* (council), and the territorial Office of Samoan Affairs.

In the CFMP villages, resource access rights and restrictions are determined at the village level. The process for determining rules and regulations is also a nested enterprise within the village. Key village social groups meet to discuss village needs, representatives from each group comprise a village fisheries management and advisory committee which designs the VMPA management plan, and final decisions are confirmed by the village council, which also provides village-wide legitimacy to the rules and rule-making process.

Monitoring of resources and resource use is also conducted at the village level by the village community. Biological monitoring is also supported by DMWR CFMP program staff, who work to monitor VMPA sites on a quarterly basis. Regular biological monitoring has proved challenging for a number of reasons (weather, safety, access), but biological assessments by DMWR take place in most villages at least once a year (Selaina Vaitautolu, pers. comm.). Socioeconomic assessment and monitoring has been initiated in some villages, and this program is anticipated to expand in the near future.

Enforcement of regulations takes place at multiple levels within the CFMP program. Enforcement generally takes place at the village level by the village council if a village member is caught violating a VMPA regulation. As described under principle number eight above, violators are generally not fined on their first offense, but the severity of penalty increases with the severity or frequency of violations. Enforcement of regulations against outsiders is nested at multiple levels; the local mayor and one other designated village enforcement officer have the authority to issue citations to those who violate VMPA rules. Villagers can also call on the assistance of DMWR enforcement staff to issue citations. If rules are challenged, they are legitimate under the American Samoan territorial legal system.

Conflict resolution is also a nested enterprise, and the method with which conflicts are resolved depends on the severity of offense and whether the offense is committed by a community member or outsider. Community-level conflicts are resolved within the village, by the traditional means of the village council. Conflicts with outsiders are arbitrated with the assistance of the government. The DMWR CFMP program serves as a bridge to deal with inter-village conflict, and ultimately conflict is resolved through the territorial courts.

Governance activities within the CFMP are nested across multiple levels, both within the village and across governance institutions. Village fisheries management and advisory committees devise local-level regulations, and input to these committees is provided by key village social groups (*matai*, women, and young men). The village council must approve

committee rules and regulations, and future changes to regulations also take place at the village council level. However, village committees receive guidance and recommendations from the territorial government through the DMWR CFMP program. Guidance comes both in the form of legal guidelines, as well as biological input regarding size, scope, and status of the VMPA. The DMWR CFMP program also provides institutional support in navigating territorial legislation and bureaucracy to develop and finalize village management plans. If a VMPA violation is severe enough to be taken to court, the territorial government provides the highest level of authority to back village rules and enforce sanctions.

5. DISCUSSION

This paper has focused on the processes to implement community-based marine resource management in two regions of the Western Pacific United States: Hawai‘i and American Samoa. There has been significant literature evaluating the ecological effectiveness of CBMRM programs throughout the globe. However, before the ecological effectiveness can be assessed, a functioning community-based institution must be in place. As these two cases demonstrate, the process to develop a functioning and legally recognized community-based resource management institutions can be politically, socially, and practically challenging.

Both Hawai‘i and American Samoa proposed initiatives to develop frameworks for CBMRM; however, the success of these initiatives – in terms of developing functioning CBMRM institutions – has been quite different. While American Samoa has developed a functioning network of 12 different villages, as well as a framework that legally recognizes community regulations, the Hawai‘i initiative has struggled with only two designated CBSFAs and no approved community fishing rules. Examining these initiatives through a common framework – design principles for successful governance of the commons – provided a means to compare their unique challenges and strengths. This comparative analysis can offer insights into why the success of these two programs was so divergent. Both contextual and program design factors can help explain why the American Samoan CFMP has been successful in implementation and why Hawai‘i’s program has so far failed to be meaningfully implemented.

Table 4 outlines the extent to which the 2 community-based marine management initiatives achieve the 10 design principles outlined by Cinner et al., (2009). In its current state the Hawai‘i CBSFA partially achieved 1 of the 10 design principles – principle one: the designated CBSFAs have clear boundaries although they do not have clear membership rights. Since it has not been implemented beyond the designation of 2 areas, no other principles have been achieved. But, if the legislation were to be implemented as written, it has the potential to fully achieve four of the principles and could partially meet three other principles (Table 4). The American Samoa CFMP, however, fully or partially complies with all of the design principles. As the summary in Appendix C indicates, the program’s compliance with 8 of the principles is either strong or very strong, and its compliance with 2 of the principles is moderate or weak (Table 4). Many factors can explain the different levels of compliance and success of these 2 initiatives.

Table 4.--Cinner et al.'s (2009) guiding principles and the extent to which the Hawaii CBSFA initiative and the American Samoa CFMP achieve those principles. Since the Hawaii CBSFA has yet to be fully implemented, the table addresses whether the principle is currently being met and whether the principle could potentially be met if the legislation were implemented as written.

Guiding Principles for Community-based Management of Common Pool Marine Resources (Cinner et. al., 2009)	Hawaii CBSFA Initiative	American Samoa CFMP
1. Clearly defined geographic boundaries and membership rights	Current state: Partial If Implemented: Partial	Yes
2. The development and enforcement of rules that limit resource use	Current state: No If Implemented: Yes	Yes
3. Congruence between rules and local conditions (i.e., scale and appropriateness)	Current state: No If Implemented: Partial	Yes
4. Resource users have rights to make, enforce, and change the rules	Current state: No If Implemented: No/Partial	Partial
5. Individuals affected by the rules can participate in changing the rules	Current state: No If Implemented: No/Partial	Partial
6. Monitoring of the resources	Current state: No If Implemented: Yes	Yes
7. The presence of accountability mechanisms for those monitoring the rules	Current state: No If Implemented: No/Partial	Yes
8. Sanctions that increase with repeat offenses or severity of offenses (graduated sanctions)	Current state: No If Implemented: Partial	Yes
9. The presence of conflict resolution mechanisms	Current state: No If Implemented: No	Yes
10. The degree to which they are nested within other institutions	Current state: No If Implemented: Yes	Yes

One stark difference between the Hawai'i and American Samoa contexts is the relative level of cultural and ethnic diversity. The population of American Samoa is relatively homogenous, with 93% reporting Polynesian ethnicity. Hawai'i, however, is one of the most diverse states in the United States; no one ethnicity represents more than 40% of the population and 23.6% of the population reports to be of mixed-race ethnicity. There has been some debate among commons scholars about homogeneity as a potential factor for success in the development of common-pool resource management institutions (Basurto and Ostrom, 2009; Ostrom, 2002). Culturally homogenous groups may have increased success in developing and enacting a common set of standards for limited resources use, but this is not a prerequisite for success. The different levels of cultural diversity may have played a role in the different outcome of the two programs but not entirely as described by the commons scholars.

Hawai‘i’s CBSFA legislation was specifically aimed at protecting “native Hawaiian subsistence” practices, yet Hawaiians and part Hawaiians make up only 21% of the state’s population. Under the program, Hawaiian communities can organize and designate CBSFAs. They can also propose fisheries regulations for those CBSFAs rooted in traditional Hawaiian practice. However, the CBSFA rules would ultimately apply to everyone who uses the marine space, including many outsiders who have limited orientation towards Hawaiian traditions of marine management. Part of the challenge of the CBSFA program has been its attempt to revitalize a traditional Hawaiian system of resource use and management within a state that is ethnically diverse and functions under a very Western system of governance.

In American Samoa, however, more than 90% of the population is Polynesian and speaks the Samoan language. Village-level systems of governance and resource tenure are still largely intact, and Samoan cultural systems and representation are formally incorporated into the territorial government through the *fono*. Given the cultural homogeneity, nearly everyone in American Samoa accepts and complies with Samoan traditions of land and resource tenure. Community or village systems of marine management have the potential to be, and in practice have been, fairly well respected among both insiders and outsiders of particular villages. A village-based system of marine management did not differ greatly from American Samoan traditions that are still practiced by the majority of the population.

Both initiatives had certain challenges meeting part of principle one - *Clearly defined membership rights*. American Samoan territorial and Hawai‘i State law cannot recognize community-based regulations that apply differently to outsiders compared to community members. Equal protection under these constitutions means that all community regulations must apply equally to all state and territorial residents. This means that a key component of traditional marine tenure throughout the Pacific region – membership or resource rights to a place based group and the exclusion of outsiders – cannot be legally recognized in a U.S. legal framework. In American Samoa, this has proven less of a challenge because village-based systems of governance and management are still largely intact, and customary restrictions on outsiders are generally accepted by residents. But in Hawai‘i, this has meant that communities will not be able to achieve what they had hoped in the development of CBSFAs – to the exclusion of outsiders.

An important factor in the successful implementation of the American Samoa CFMP was its implementation on top of community institutions and village-level systems of governance that were already in place. Villages have a formal leadership structure, and these leaders have the capacity to work with the territorial government as well as their own community members. To implement the program, the DMWR was able to reach out to these existing village leaders and help them to develop management plans.

In Hawai‘i, no such formal community structures still exist. The Hawaiian system of land and marine tenure has been largely eroded as a result of colonial processes. As a result, an important challenge of the legislation lies in defining “community” as well as developing community capacity for leadership and marine management. The disastrous results of the Miloli‘i CBSFA meeting came about because a community member that the DLNR perceived as a leader who represented community interests proposed a plan that did not, in fact, have full support from the community. Miloli‘i had no established community institution with which the

DLNR could collaborate with confidence – no leader or institution that formally spoke for the community as a whole. Prior to and since that meeting, communities interested in CBSFAs worked hard to organize and develop capacity. But, because no such community institutions were in place when the CBSFA legislation passed, numerous delays and confusion have contributed to slow implementation of the policy.

Another important factor in the success of the American Samoa CFMP has been consistent support from the territory's natural resource agency, DMWR. When the DMWR initiated the program, they actively sought out villages to be included in the program, and they have consistently provided assistance to the villages in the development and implementation of management plans. The program has also sought legislative changes to help formalize community rules in the territorial legislature, has sponsored workshops to assist villages in enforcing VMPA regulations, and has conducted regular monitoring of marine resource conditions in program villages. In Hawai'i, in contrast, the CBSFA legislation was passed in spite of objections from the DLNR. Additionally, the DLNR has not supported any additional CBSFA designations proposed to the legislature. In part, because of staff limitations and lack of funding, they have done little work to help communities develop capacity and to develop management plans and rule packages. They have not yet brought any CBSFA designation proposals or rule packages through the Chapter 91 rule-making process. Since the DLNR was so integral to the framework established by the CBSFA legislation, lack of support from the agency has severely impeded any movement towards implementation of the legislation.

The American Samoa CFMP also benefited from the development of a clear protocol for how communities were to be approached and how villages could be incorporated in the program and has been communicated orally by program leaders. In contrast, the Hawai'i CBSFA legislation, which is only 260 words long, did not establish a protocol for defining communities, working with communities, or developing management plans. In the years since the legislation, the DLNR has not made the protocol for designating CBSFAs any more lucid or standardized. A manual has been planned to assist communities in the CBSFA process, but this still has not been approved by the DLNR. With the lack of protocol, many communities have had to feel their way through the process at a frustratingly slow pace. They have submitted proposals or rule packages to the DLNR, only to discover that they do not meet particular standards and thus are insufficient.

An aspect of the American Samoa CFMP that stands out when compared to the Hawai'i CBSFA legislation is the program's measures to legally recognize community-based rules as well as community-level enforcement authority. In 2008, the American Samoan government enacted legislation that would allow for the legal recognition of certain kinds of CFMP rules. Additionally, the government allowed for the deputization of the village mayor and one designated village policeman to issue citations for marine resource violations. In contrast, Hawai'i's CBSFA legislation does not explicitly outline a plan to authorize community-level enforcement of resource violations. Even if CBSFA rules are developed through the state's rule-making process, communities still may experience challenges getting those rules enforced.

American Samoa's 2008 administrative rule that established a framework to legally recognize community-based rules and enforcement highlights another important element of the

implementation of the CFMP—adaptability. A key component of community-based marine resource management is the development of new institutional arrangements. This process will likely include challenges and surprises, and success in implementation of these types of resource institutions will require creativity and flexibility. Since 2000, American Samoa’s program has evolved significantly, adapting to new needs and challenges. The DMWR has developed workshops and trainings for communities as gaps in capacity are recognized. When lack of formal recognition of village laws became a problem, the DMWR worked with the legislature to develop a mechanism for recognizing village laws and enforcement. The ability of the DMWR and villages to adapt and make changes to the CFMP as necessary has been important to its success.

In Hawai‘i, the DLNR has appeared less adaptive in the face of challenges when attempting to implement the CBSFA legislation. For the most part challenges, such as the difficult Miloli‘i meeting, have led to increased hesitancy within the DLNR to support CBSFA legislation. A natural resource agency that is both committed to making the program work and flexible to changes and new issues arising appears to be central to success in CBMRM.

6. CONCLUSIONS

The story of these two initiatives highlights the important role of context in the establishment of CBMRM programs. Aspects of Hawai‘i’s social and political terrain including the erosion of traditional resource tenure systems, high ethnic diversity, a centralized approach to government, and a highly politicized environment surrounding fishing regulations of any kind suggest that the development of a successful CBMRM would be inherently more challenging than it is in the context of American Samoa, with its high ethnic homogeneity, intact traditional cultural structures, and supportive government initiatives. However, these analyses reveal that program design and follow-through may be equally important factors in successful implementation of CBMRM. In addition to the contextual factors, Hawai‘i’s CBSFA was encumbered by programmatic and design challenges. The Hawai‘i DLNR did not take the same initiative as American Samoa’s DMWR to support and follow-through with implementation of CBMRM programs. In addition, Hawai‘i’s initiative lacked a clear protocol for defining communities, working with communities, and bringing community designations and rules through the state’s process. Even with Hawai‘i’s contextual difficulties, improved program design and increased support from the State government and natural resource institutions could potentially have allowed the CBSFA initiative to move forward to be implemented in several communities.

Many examples of successful CBMRM can be seen in the developing world, where legal structures are more flexible in incorporating local tenure systems. Analysis of these two U.S. initiatives reveals that the revitalization of community-based management and local systems of marine tenure can be difficult under U.S. law. This does not mean that community-based marine management is not possible in a U.S. context, but that communities and program designers may need to be innovative in how they establish programs. Additionally, some aspects of marine tenure may only be able to persist in an informal or extralegal context as is the case in American

Samoa and to some extent in the informal management conducted by the Hawaiian community at Mo‘omomi on the island of Moloka‘i.

The design principles outlined by Ostrom, Cinner, and other scholars have resulted from decades of research and analyses of thousands of institutional frameworks and case studies in both the developing and the developed world. They represent a rigorous assessment of qualities necessary for robust management of common pool resources. When held up to the standards of Cinner et al.’s (2009) framework, the CBSFA legislation looks weak. Even if implemented, it would not achieve many of those principles. This analysis reveals that as it was written, the CBSFA was, in many ways, doomed to fail. Although the legislation title contains the phrase “community-based”, the policy language does not set up an institutional framework that would make true and effective community-based management possible. The shortcomings of the CBSFA legislation become particularly stark when compared with the success of the American Samoa CFMP, which has been able to achieve greater success even though it has been in existence for a shorter period of time and has lacked the assistance of supportive NGO partners for implementation.

Despite the imperfect nature of the program, Hawaiian communities across the state have continued to devote tremendous time and resources towards gaining inclusion in the CBSFA program. These communities still view the legislation as a tool that can provide relief from overexploitation of local resources, particularly given the perception that the State government has been slow to respond to resource declines. While the legislation may never achieve true community-based management, as it is written it still does have the potential to give communities a more central role in marine management discussions as well as contribute to increased marine conservation in areas of interest to communities. The potential of the CBSFA legislation has mobilized many local communities towards improving resource management, even without formal legal designation as a CBSFA. However, it is important that communities enter the CBSFA process with a leveled set of expectations regarding what they can achieve. The process will be slow and bureaucratic and community entities will only be granted limited authority over management of their local resources.

While some Hawaiian communities work within the CBSFA legislation, they are also thinking beyond its constraints. Aligning with communities, legislators, policy-makers, agency staff, and NGOs to design new legislation for community-based marine management in Hawaii could have a better chance of achieving success. Lessons from the shortcomings of the CBSFA legislation as well as the successes of American Samoa’s CFMP and other more successful community-based programs could guide their thinking. Additionally, the insights gained through decades of commons research regarding important “design principles” for successful common pool resource management can help communities and policy-makers throughout the Western Pacific Region to develop new institutions – new vessels of potential – for successful marine resource management that both involve communities and achieve marine resource sustainability.

7. LITERATURE CITED

Adams, W. H., and D. Hulme.

2001. If community conservation is the answer in Africa, what is the question? *Oryx* 33(3) p. 193-200.

Agrawal, A.

2002. Common resources and institutional sustainability. *In: The Drama of the Commons*, National Research Council, Committee on the Human Dimensions of Global Change, ed. Elinor Ostrom, Thomas Dietz, Nives Dolšak, Paul Stern, Susan Stonich, and Elke Weber, 41–85. Washington, DC: National Academy Press.

Agrawal, A., and C. C. Gibson.

1999. Enchantment and disenchantment: the role of community in natural resource conservation. *World Development* 27(4):629–649.

Alcala, A. C., and G. R. Russ.

2006. No-take marine reserves and reef fisheries management in the Philippines: a new people power revolution. *Ambio* 35(5):245–254.

Amituana'i, A., and F. Sauafea.

2005. Improving community skills and knowledge to build, enhance and promote environmental stewardship. *Proceedings of the 2004 National Environment Forum*. Samoa Ministry of Natural Resources and Environment, No. 4.

Armstrong, K., D. Herdrich, and A. Levine.

2011. Historic fishing methods in American Samoa. U.S. Dept. of Commerce, NOAA Tech. Memo. NOAA-TM-NMFS-PIFSC-24, 70 p. + Appendices.

Baland, J.-M., and J.-P. Platteau.

1996. Halting degradation of natural resources: is there a role for rural communities? Oxford: Clarendon Press.

Basurto, X., and E. Ostrom.

2009. Beyond the tragedy of the commons. *Economia delle fonti di energia e dell'ambiente* 52(1):35–60.

Berkes, F.

2002. Cross-scale institutional linkages: perspectives from the bottom up. *In: The Drama of the Commons*, National Research Council, Committee on the Human Dimensions of Global Change, ed. Elinor Ostrom, Thomas Dietz, Nives Dolšak, Paul Stern, Susan Stonich, and Elke Weber, 293–321. Washington, DC: National Academy Press.

- Berkes, F., and M. T. Farvar.
1988. Introduction and overview. *In*: F. Berkes (ed). *Common Property Resources*. London, Belhaven Press.
- Bohnsack, J. A.
1998. Application of marine reserves to reef fisheries management. *Aust. J. Ecol.* 23(3):298–304.
- Bromley, D. W., and M. M. Cernea.
1989. The management of common property natural resources and some conceptual and operational fallacies. Washington: The World Bank. World Bank Discussion Papers, No. 57.
- Carl, A. R.
2009. Method is irrelevant: allowing native Hawaiian traditional and customary subsistence fishing to thrive. *University of Hawai‘i Law Review* 32:203–513.
- Chinen, J. J.
1958. *The great mahele*. University of Hawai‘i Press, Honolulu, HI.
- Christie, P., and A. T. White.
1997. Trends in the development of coastal area management in tropical countries: from central to community orientation. *Coastal Management* 25:155-181.
- Christie, P., et al.
2003. Toward developing a complete understanding: A social science research agenda for marine protected areas. *Fisheries (Bethesda)* 28(12):22–26.
- Christie, P., A. White, and E. Deguit.
2002. Starting point or solution? Community-based marine protected areas in the Philippines. *J. Environ. Manag.* 66(4):441–454.
- Cinner, J. E., et al.
2009. Toward institutions for community-based management of inshore marine resources in the Western Indian Ocean. *Marine Policy* 33(3):489–496.
- Cinner, J. E., M. J. Marnane, and T. R. McClanahan.
2005. Conservation and Community Benefits from Traditional Coral Reef Management at Ahus Island, Papua New Guinea. *Conserv. Biol.* 19(6):1714–1723.
- Cinner, J. E., and S. Aswani.
2007. Integrating customary management into marine conservation. *Biol. Conserv.* 140(3–4):201–216.
- Command, B.
2008. No consensus of Miloli‘i fishing rules. *West Hawai‘i Today*. April 4, 2008.

- Cordy, R.
2000. Exalted sits the chief. Mutual Publishing, LLC, Honolulu, HI.
- Coulter, J. W.
1941. Land utilization in American Samoa. Bishop Museum Bulletin 170.
- Craig, P., B. Ponwith, F. Aitaoto, and D. Hamm.
1993. The commercial, subsistence, and recreational fisheries of American Samoa – Fisheries of Hawaii and U.S. – associated Pacific Islands. Marine Fisheries Review, Spring.
- Craig, P., A. Green, and F. Tuilagi.
2008. Subsistence harvest of coral reef resources in the outer islands of American Samoa: modern, historic and prehistoric catches. Fish. Res. 89(2008):230-240.
- Crawford, B. R., et al.
2004. Compliance and enforcement of community-based coastal resource management regulations in North Sulawesi, Indonesia. Coastal Management 32(1):39–50.
- Dalzell P., T. J. H. Adams, and N. V. C. Polunin.
1996. Coastal fisheries in the Pacific islands. Oceanogr. Mar. Biol. 34:395–531.
- DAR.
1988. Main Hawaiian Islands - Marine Resources Investigation 1988 Survey. State of Hawai'i Division of Aquatic Resources. Honolulu, HI
- DOI Office of Insular Affairs.
2007a. FY 2008 Budget Justification.
http://www.doi.gov/oia/budget/FY2008_Budget_Justifications.pdf.
- DOI Office of Insular Affairs.
2007b. American Samoa. <http://www.doi.gov/oia/Islandpages/asgpage.htm>.
- Fa'asili, U., and F. Sauafea.
2001. Technical input into the community fisheries management program of American Samoa. Secretariat of the Pacific Community. Field Report No. 5.
- Friedlander, A., K. Poepoe, K. Poepoe, K. Helm, P. Bartram, J. Maragos, and I. Abbott.
2002. Application of Hawaiian traditions to community-based fishery management. *In*: Proceedings of the Ninth International Coral Reef Symposium, Bali, 23-27 October 2000, p. 813–815.

- Gibson, C.
2001. "Forest Resources: Institutions for Local Governance in Guatemala." *In: Protecting the Commons: A Framework for Resource Management in the Americas*, Joanna Burger, Elinor Ostrom, Richard B. Norgaard, David Policansky, and Bernard D. Goldstein, 71–89. Washington, DC: Island Press.
- Gutiérrez, N. L., R. Hilborn, and O. Defeo.
2011. Leadership, social capital and incentives promote successful fisheries. *Nature* 470(7334):386–389.
- Hardin, G.
1968. The tragedy of the commons. *Science* 162(3859):1243–1248.
- Higuchi, J.
2008. Propagating Cultural Kipuka: The Obstacles and Opportunities of Establishing a Community-Based Subsistence Finishing Area. *U. Haw. L. Rev.*, 31, p.193.
- Holmes, L.
1974. Samoan village. *Case Studies in Cultural Anthropology*, Stanford University, 108 pages.
- Johannes, R. E.
2002. The renaissance of community-based marine resource management in Oceania. *Annu. Rev. Ecol. Syst.*, pp. 317–340.
- Johannes, R. E.,
1978. Traditional marine conservation methods in Oceania and their demise. *Annu. Rev. Ecol. Syst.* 9:349–364.
- Kilarski, S., D. Klaus, J. Lipscomb, K. Matsoukas, R. Newton, and A. Nugent.
2006. Decision support for coral reef fisheries management: community input as a means of informing policy in American Samoa. A Group Project submitted in partial satisfaction of the requirements of the degree of Master's in Environmental Science and Management for the Donald Bren School of Environmental Management. University of California, Santa Barbara.
- King, M.
2000. Fishers management by communities: a manual on promoting the management of subsistence fishers by Pacific Island communities. Secretariat of the Pacific Community, New Caledonia. 87 pp.
- King, M., and U. Fa'asili.
1999a. A new network of small, community-owned village fish reserves in Samoa. *SPC Traditional marine resource management and knowledge information bulletin No.11*, September 1999, p. 2-6.

- 1999b. Community-based management of subsistence fisheries in Samoa. *Fish. Manag. Ecol.* 6(2):133–144.
- Kittinger, J. N., et al.
2011. Historical reconstruction reveals recovery in Hawaiian coral reefs. *PloS one* 6(10):e25460.
- Komoto, J.
2006. Revised recommendations to integrate and improve Hawaii’s marine managed areas for the conservation of aquatic resources: recommendations from Division of Aquatic Resources.
- Laurel, B. J., and I. R. Bradbury.
2006. Big concerns with high latitude marine protected areas (MPAs): trends in connectivity and MPA size. *Can. J. Fish. Aquat. Sci.* 63(12):2603–2607.
- Lester, S. E., et al.
2009. Biological effects within no-take marine reserves: a global synthesis. *Mar. Ecol. Prog. Ser.* 384:33–46.
- Levine, A., and F. Sauafea-Leau
In Press. Traditional knowledge of marine use and management in American Samoa: Documenting changes over time through interviews with elder fishers. *Pac. Sci.*: In Press
- Levine, A., and S. Allen.
2009. American Samoa as a fishing community. U.S. Dep. Commer., NOAA Tech. Memo., NOAA-TM-NMFS-PIFSC-19, 74 p.
- Malcolm D. McPhee and Associates with Dick Conway and Lewis Wolman.
2008. American Samoa’s economic future and the cannery industry. Report prepared for the American Samoa Department of Commerce, under a grant from the U.S. Department of Interior, Office of Insular Affairs. February 2008.
- Maly, K., and O. Pomroy-Maly.
2003. Ka Hana Lawai ‘aa me na ko ‘ao na kai ‘ewalu: A history of fishing practices and marine fisheries of the Hawaiian Islands. Kumu Pono Associates LLC, prepared for The Nature Conservancy.
- McCay, B. J.
2001. Community and the commons: romantic and other views. *In: Communities and the Environment: Ethnicity, Gender, and the State in Community-based Conservation.* Agrawal, A. and Gibson, C.C. eds. New Brunswick, N.J.: Rutgers University Press, pp. 180–191.

- McClanahan, T., M. Marnane, J. Cinner, and W. Kienne.
2006. A comparison of marine protected areas and alternative approaches to coral-reef management. *Curr. Biol.* 16(14):1408–1413.
- McClenachan, L., and J. N. Kittinger.
2012. Multicentury trends and the sustainability of coral reef fisheries in Hawai‘i and Florida. *Fish and Fisheries*. Available at:
<http://onlinelibrary.wiley.com/doi/10.1111/j.1467-2979.2012.00465.x/full> [Accessed April 4, 2012].
- Moffitt, E. A., J. W. White, and L. W. Botsford.
2011. The utility and limitations of size and spacing guidelines for designing marine protected area (MPA) networks. *Biol. Conserv.* 144(1):306–318.
- Mora, C., et al.
2006. Coral reefs and the global network of marine protected areas. *Science (Washington)* 312(5781):1750–1751.
- Moloka‘i Subsistence Task Force.
1994. Governor’s Moloka‘i Subsistence Task Force Final Report for the Moloka‘i Subsistence Task Force and The Department of Business, Economic Development & Tourism State of Hawai‘i. Honolulu, Hawai‘i.
- Murphree, M.
1991. Communities as resource management institutions. International Institute for Environment and Development. Gatekeeper Series No. SA36
- Osman, W. M.
1997. American Samoa Economic Report, Bank of Hawaii. Pacific Business Center Program. American Samoa: Economic Environment.
<http://www.hawaii.edu/pbcp/services/servicearea/asamoa.htm>. Accessed 4/25/08.
- Ostrom, E.
1990. *Governing the commons: The evolution of institutions for collective action*, Cambridge University Press, Cambridge, UK.

2002. *The drama of the commons*, Natl. Academy Pr.

2009. Design principles of robust property-rights institutions: what have we learned? *In: Property Rights and Land Policies*, ed. K. Gregory Ingram and Yu-Hung Hong. Cambridge, MA: Lincoln Institute of Land Policy.
- Ostrom, E., R. Gardner, and J. Walker.
1994. *Rules, games, and common-pool resources*, Univ. of Michigan Pr.

- Poepoe, K., P. Bartram, and A. Friedlander.
2003. The use of traditional Hawaiian knowledge in the contemporary management of marine resources. *Putting Fishers Knowledge to Work*:328–339
- Pollnac, R. B., B. R. Crawford, and M. L. G. Gorospe.
2001. Discovering factors that influence the success of community-based marine protected areas in the Visayas, Philippines. *Ocean Coast. Manag.* 44(11–12):683–710.
- Pomeroy, R. S., B. M. Katon, and I. Harkes.
2001. Conditions affecting the success of fisheries co-management: lessons from Asia. *Marine Policy* 25(3):197–208.
- Radio New Zealand International.
2005. American Samoa Chiefs Charged with Attempted Murder. November 4.
<<http://www.rnzi.com/pages/news.php?op=read&id=20291>>.
- Richmond, L.
In review. Incorporating Indigenous Rights and Environmental Justice into Fishery Management: Comparing Policy Challenges and Potentials from Alaska and Hawai‘i. *Environmental Management*.
- Sauafea-Lea’u, F.
2008. Village Communities in American Samoa. Unpublished summary report of the CFMP program.
- Secretariat of the Pacific Community (SPC).
2001. Community-based fisheries management in American Samoa. 2nd SPC Heads of Fisheries Meeting. Working Paper No. 9. Noumea, New Caledonia, 23–27 July.
- Silva, N. K.
2004. Aloha betrayed: native Hawaiian resistance to American colonialism. Duke University Press Books, Raleigh, NC
- Singleton, S.,
2001. Communities, states, and the governance of Pacific Northwest salmon fisheries. *In: Communities and the Environment: Ethnicity, Gender, and the State in Community-based Conservation*. Agrawal, A. and Gibson, C.C. eds. New Brunswick, NJ: Rutgers University Press, pp. 180–191.
- Techera, E. J.
2010. Customary law and community-based fisheries management across the South Pacific region. *Journal of the Australasian Law Teachers Association*, 2(1&2):279–292.
- Thompson, P. M., P. Sultana, and N. Islam.
2003. Lessons from community based management of floodplain fisheries in Bangladesh. *J. Environ. Manag.* 69(3):307–321.

Tucker, C., J. C. Randolph, and E. J. Castellanos.

2007. Institutions, biophysical factors and history: an integrative analysis of private and common property forests in Guatemala and Honduras. *Human Ecology* 35(3):259–74.

Tuilagi, F., and A. Green.

1995. Community perception of changes in coral reef fisheries in American Samoa. Report prepared for FFA SPC Workshop on the Management of South Pacific Inshore Fisheries, June 26–July 7, New Caledonia.

APPENDIX A: Language from Legislative Acts Designating CBSFAs for Miloli'i and Ha'ena

[\$188-22.7] Miloli'i fisheries management area.

The Miloli'i fisheries management area, as defined in the administrative rules of the department of land and natural resources, shall be designated a community based subsistence fishing area, as provided in section 188-22.6. The department of land and natural resources shall adopt management strategies and other rules consistent with section 188-22.6 that:

- (1) Ensure long-term sustainable populations of fish and other marine species; and
- (2) Encourage the scientific study and understanding of subsistence fishing management. [L 2005, c 232, §2]

[\$188-22.9] Ha'ena community-based subsistence fishing area; restrictions; regulations.

(a) There is designated the Ha'ena community-based subsistence fishing area on the northwestern coast of Kauai, which shall consist of all state waters and submerged lands bounded by:

- (1) The shoreline of the Ha'ena district;
- (2) A line that follows an imaginary extension of the boundary between Hae'na state park and Na Pali state park that extends seaward for one mile from the shoreline;
- (3) An irregular line one mile offshore that is parallel to the contours of the shoreline; and
- (4) A line that follows an imaginary extension of the boundary between Hae'na and Wainiha, as specified in the tax map of the county of Kauai, that extends seaward for one mile from the shoreline.

(b) In addition to the provisions of this chapter, the following uses or activities shall be regulated in the Ha'ena community-based subsistence fishing area:

- (1) Any activities with a commercial purpose, as defined in section 187A-1;
- (2) The issuance of any commercial marine license, as defined in section 187A-1;
- (3) The issuance of any aquarium fish permits, pursuant to section 188-31;
- (4) Fishing with the use of gill nets;
- (5) Fishing with self-contained underwater breathing apparatus and spears; and

(6) Any other use or activity that the department of land and natural resources, in consultation with the inhabitants of the ahupua'a of Ha'ena and other interested parties, deems appropriate.

(c) The department of land and natural resources, as soon as practical, shall consult with as broad a base as possible, group of inhabitants of the ahupua'a of Ha'ena and other interested parties to establish rules for the Ha'ena community-based subsistence fishing area, to include but not be limited to:

(1) A determination of fishing practices that are customarily and traditionally exercised for purposes of native Hawaiian subsistence, culture, and religion in the fishing area;

(2) A management plan recognizing existing marine activities permitted by the department of land and natural resources and containing a description of specific activities to be conducted in the fishing area, including evaluation and monitoring processes and methods of funding and enforcement;

(3) Limits on the harvest of aquatic life, as those terms are defined in section 187A-1, in the fishing area;

(4) The establishment of no harvesting zones within the fishing area without depriving ahupua'a inhabitants of access to traditional sources of subsistence; and

(5) A process for the expansion of the fishing area to include other ahupua'a.

The department of land and natural resources shall adopt rules pursuant to chapter 91 necessary for the purpose of this section. [L 2006, c 241, §3]

APPENDIX B: CBSFA Framework for Goals, Objectives, and Site Suitability Criteria Developed through A Statewide Review Process. Note that these recommendations have not been formerly adopted by DLNR. Source: (Komoto, 2006)

<p>Community Subsistence Fishing Area <i>Community Subsistence Fishing Areas(CSFAs) are specially managed areas in which to the degree possible, traditional and customary Native Hawaiian gathering and harvesting practices are maintained or restored</i></p>
Goals
<ul style="list-style-type: none"> • Promote cultural and historical value of areas. • Promote sustainable use. • Provide opportunities for cultural use. • Provide opportunities for education and outreach. • Recognize the historical uses of the area that makes it unique.
Objectives
<ul style="list-style-type: none"> • Allow for customary and traditional Native Hawaiian gathering and harvesting practices • Limit or restrict commercial and recreational fishing and non-fishing activities. • Restore native aquatic species. • Restore and maintain traditional fish ponds. • Encourage the scientific study and understanding of subsistence fishing management. • Develop Kupuna advisory group(s). • Develop and support community involvement in management of the area.
Biological criteria
<ul style="list-style-type: none"> • Human impacts to habitat and/or species pose a substantial and present risk of reduced sustained yield of one or more species important for traditional and customary Native Hawaiian practices or cultural activities. • Presence of species important for traditional fisheries or cultural activities. • Specialized local area regulations are necessary to sustain aquatic resources or prevent damage to habitat in the area based on declining populations, low numbers of large individuals, declining catch per unit effort by fishers, or fishing damage to habitat. • Foreseeable future risk of impacts to marine species or habitats due to ease of public access, fragility of the environment, and/or types and increases in public use are potentially high. • Area is highly productive for one or more harvested species. • High potential for mitigation of anthropogenic threats to marine species and/or habitats.
Socio-economic criteria
<ul style="list-style-type: none"> • Area is of cultural importance for traditional and customary Native Hawaiian practices. • Suitability for community-based, traditional resource management and cultural education. • Presence of known archeological sites. • Local attitudes and beliefs regarding marine resources and the likely effectiveness of community-based resource management. • Degree of legal public access to area (e.g., unrestricted shoreline access; pedestrian shoreline access only; boat access; etc.) • Ensure consistency of other local and state agency rules with the goals and objectives of the CSFA, to the extent practicable. • Extent to which human threats to marine species and/or habitats can be mitigated with special rules.

(This page is left blank intentionally.)

APPENDIX C: The American Samoa CFMP in relation to CBMRM Guiding Principles.

Guiding Principles for Community-based Management of Common Pool Marine Resources (Cinner et. al., 2009)	Strength of CFMP under Principle	Brief Summary Explanation
1. Clearly defined geographic boundaries and membership rights	Very Strong	Clear customary rules, clearly marked boundaries
2. The development and enforcement of rules that limit resource use	Strong	Rules enforced at village level and codified in American Samoa law; limitation of resource use varies by village and over time
3. Congruence between rules and local conditions (i.e. scale and appropriateness)	Strong	Village-level management is a culturally appropriate scale for American Samoa; size of MPAs (village bays) may not be biologically adequate for species enhancement
4. Resource users have rights to make, enforce, and change the rules	Moderate	Creation of laws is highly participatory; monitoring and enforcement of rules takes place at village level; modification of laws is done by village leaders
5. Individuals affected by the rules can participate in changing the rules	Weak	Modification at the village council level; non-village resource users have no voice in the process; by territorial law, CFMP rules must apply to villagers and non-villagers equally
6. Monitoring of the resources	Strong	VMPA within sight of village, making monitoring easy; monitoring at nighttime remains a challenge
7. The presence of accountability mechanisms for those monitoring the rules	Very strong	Monitoring and enforcement within view of entire village
8. Sanctions that increase with repeat offences or severity of offences (graduated sanctions)	Very strong	Both village-level and territorial sanctions increase with severity and frequency of offense
9. The presence of conflict resolution mechanisms	Strong	Village-council level for village offenses; territorial-level for infractions by outsiders
10. The degree to which they are nested within other institutions	Very strong	Nested at village committee, village council, and territorial government levels

(This page is left blank intentionally.)

APPENDIX D: Fines and Penalties Allowed Under Territorial Law for Violation of CFMP Regulations (Administrative Rule No. 01-2008)

The following penalties may be assessed by the Department against a Person who is issued a citation by the Department for violation of the Village by-laws or a violation of these regulations:

- a) A warning may be issued, at the discretion of the person authorized to issue citations for violations of the Village by-laws or these regulations.
- b) Require a Person to perform up to thirty (30) hours of community service and participate in Coral Reef Classes given at the Department. Community service includes, but is not limited to, assisting Department staff and participating Villages with shoreline, beach and Marine Protected Area cleanup, installing signs for Village Marine Protected Areas and participating in Village monitoring activities.
- c) Pursuant to A.S.C.A. § 24.312(a) the Department may fine any Person who violates any provision of Department regulations and the Person fined shall be guilty of a class B misdemeanor punishable by a fine not to exceed five hundred dollars (\$500.00) or by a prison term in excess of fifteen (15) days but not to exceed six (6) months, or by both.

OFFENSE	1st Violation	2nd Violation	3rd Violation
Fishing activities conducted with gear deemed illegal under American Samoan law	100.00	200.00	300.00
Regulations determined by the village for the VMPA, including: - fishing in an area deemed off-limits to fishing for a period of time - use of gear deemed off-limits in the VMPA - fishing in an area where all fishing is banned - fishing in a no-take zone within the VMPA - fishing during a non-open season - violation of night fishing ban	100.00	200.00	300.00
Regulations determined by the village for the VMPA, including: - exceeding specified catch limits - fishing during a time of day when fishing is not allowed - taking of species deemed off-limits to fishing - violation of size regulations for fish caught - violation of a “subsistence-only” or “cultural use only” fishing rule - violation of ban on commercial fishing - violation of ban on use of lights - violation of other restricted activities, including	50.00	100.00	200.00

swimming, wading, surfing, etc.			
Taking fish or Shellfish with the use of or aid of a bow and arrow or crossbow and bolt or arrow	50.00	100.00	200.00
Sand mining in Village Marine Protected Area without DMWR permit	Individual: 100.00 Corporatio n: 200.00	Individual: 200.00 Corporatio n: 300.00	Individual: 300.00 Corporatio n: 500.00
Dumping/discarding trash on the shoreline beach or Reef of a Village Marine Protected Area	100.00	200.00	300.00
The collection of any Fish or Shellfish or any marine organism for research unless a collection permit issued by the Department	Individual: 50.00 Corporatio n: 100.00	Individual: 100.00 Corporatio n: 200.00	Individual: 200.00 Corporatio n: 300.00
The dumping of trash or garbage into a VMPA, including shoreline, beach or reef of a VMPA	100.00	200.00	300.00
The discharging of pollutants or Wastewater into a VMPA	100.00	200.00	300.00
The discharging of pollutants into any stream, creek, ava (break in reef), river, estuary, swamp, water source, or upon the ground if there is a substantial likelihood that the pollutant will enter the VMPA	100.00	200.00	300.00
The act of Sand mining	100.00	200.00	300.00
No living Coral or Live Rock may be Taken or removed from a VMPA	50.00	100.00	200.00
No Marine Mammals or any part of a Marine Mammal may be taken or removed from a VMPA	25.00	50.00	100.00

Availability of NOAA Technical Memorandum NMFS

Copies of this and other documents in the NOAA Technical Memorandum NMFS series issued by the Pacific Islands Fisheries Science Center are available online at the PIFSC Web site <http://www.pifsc.noaa.gov> in PDF format. In addition, this series and a wide range of other NOAA documents are available in various formats from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, U.S.A. [Tel: (703)-605-6000]; URL: <http://www.ntis.gov>. A fee may be charged.

Recent issues of NOAA Technical Memorandum NMFS–PIFSC are listed below:

- NOAA-TM-NMFS-PIFSC-30 Spillover effects of environmental regulation for sea turtle protection: the case of the Hawaii shallow-set longline fishery.
H. L. CHAN, and M. PAN
(January 2012)
- 31 The sociocultural importance of spearfishing in Hawai‘i.
B. W. STOFFLE, and S. D. ALLEN
(March 2012)
- 32 A workshop on methods to estimate total and natural mortality rates using mean length observations and life history parameters.
J. BRODZIAK, T. GEDAMKE, C. PORCH, J. WALTER,
D. COURTNEY, J. O’MALLEY, and B. RICHARDS
(June 2012)
- 33 Status of coral reef fish assemblages and benthic condition around Guam: a report based on underwater visual surveys in Guam and the Mariana Archipelago, April–June 2011.
I. WILLIAMS, J. ZAMZOW, K. LINO, M. FERGUSON, and
E. DONHAM
(August 2012)
- 34 Report of the Sea Turtle Longline Fishery Post-release Mortality Workshop, November 15–16, 2011.
Y. SWIMMER, and E. GILMAN
(August 2012)