HOLOHOLO I KA LA‘I O MAKUA

COLLABORATIVE COMMUNITY CARE AND MANAGEMENT OF COASTAL RESOURCES:

CREATING STATE LAW BASED ON CUSTOMARY RULES TO MANAGE A NEARSHORE FISHERY IN HAWAI‘I

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ABSTRACT

Local level management can both conserve and provide for productive use of natural resources over long periods of time. However, natural resource management has largely shifted away from local communities to centralized government. In Hā‘ena, on the island of Kaua‘i, fishermen continue to catch dinner for their families, alongside over 750,000 tourists per year snorkeling the reefs of one of Hawai‘i’s most popular visitor destinations. Hā‘ena has the opportunity to create state sanctioned rules for local level fisheries management; providing a model for 20 other Hawai‘i communities pursuing similar efforts.

I evaluated property rights, responsibilities and rules regulating interactions between people and coastal resources as management shifts from local to state to collaborative partnership through four different mixed-method studies. First, I considered the concept of “community” by investigating how multiple diverse user communities interact with the same place. Through surveys conducted on the beach, I found significant differences in visitor and resident use and views of their responsibilities towards Hā‘ena. Second, I worked with one user community, Native Hawaiian subsistence fishermen, to track their catch and the customary practice of sharing fish. I found that sharing yields multiple benefits beyond providing food; these include cultural perpetuation; strong social networks; reciprocal exchange; collective insurance; and enhanced community resilience.

Third, I analyzed the unique, legislatively mandated rule-making process in Hā‘ena through meeting observations, interviews and analysis of six years of proposed rules drafts. This research highlights difficulties in creating state sanctioned rules based on customary management without enhanced flexibility to adapt these rules and work across government agencies. Nevertheless, communities find creative means to perpetuate customary rules within state constraints. Some examples are gear restrictions that limit fishing to a small user community while protecting public access, and education programs to fulfill social functions of customary rules outside formal regulation.

Finally, through interviews with participants in rule making, I illuminated new challenges to early phases of collaborative resource management. These include uncertain legal mandates, overreliance on third party facilitation, capacity needs within government agencies as well as within the community, cross-generational leadership development, and separation of the rule-making process from the target resources themselves. Based on these findings, I offer suggestions to improve other fledging collaborative management efforts. Models in which local users actively collaborate with government as care takers of resources, rather than mere targets of external regulation or professional management, offer potential to enhance communities’ – and society’s - ability to meet unprecedented environmental challenges.

This work is dedicated

to my father, Dr. Gary Loomis Blaich,
who worked to care for his family, the lands of Hawai‘i, and this earth
with infectious joy and gratitude;
while always taking time to listen.

And to my grandmother, Tūtū Amelia Ana Kā‘opua Bailey,
who shared generously, learned with enthusiasm,
and did the hard things first;
while always surrounding us with a *lei* of warmest *aloha*.

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Said when a warm day is relieved by a breeze.
(Pūkuʻi, 1983, p. 271)

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POEM[1]

*Holei ʻUpena (*Throw Net Fishing):

A Doctoral Program

1) *Kūpuna, Nānā i ke Kumu* (Look to the Source):
Know Who You Are and Where You Come From

This ʻ*upena* (net) took one *kupuna* (elder*)*, Uncle Charlie Pereira,
three weeks to make, all day, working on his porch in Anahola,
Overlooking the red dirt former pineapple field,
Arsenic hard pan sloping to windblown February sea,
Rumbling horizon,
an occasional humpback leaping from the whitecaps.

This ʻ*upena* is one of tens sprung from his calloused fingers,
Eight bamboo needles, *Suji* (nylon fishing) line,
and a cardboard spacer cut from the paper towel roll,
To keep the rows even, lined up, *maiau* (neat),
Just the way the *kūpuna* like it,
Each *maka* (eye) connected to one before,
He, to his wife's father who taught him,
her father, to the *kupuna* who taught him,
and back and back and on back,
To the *piko* (center, source).

2) *Nā Pono Hana* (Tools):
Tools and Approaches for Interdisciplinary Work

Always start from the *piko*, hold it *paʻa* (firm),
Lift the folds to your height, now *mahele* (divide)
One section on your left shoulder, elbow cocked to hold it *paʻa*
One measured out over your right thigh, heel up to hold it *paʻa,*
The last section in your left hand, no drop it, *paʻa*,
Now pick up the net on your thigh in your right hand, Get ʻem *paʻa*?
Each section has a function.
Left shoulder will open the net left, left hand will lift the net out ahead,
Right hand will open the net right, But no let go the last finger, holds the net back.
You get ʻem? *Paʻa*?

[1] This poem was written in 2005 while I applied to doctoral programs. I have found it to serve as a map of sorts over the past seven years. It equates the Hawaiian practice of throw net fishing studied in this dissertation, with the requirements for completing a PhD in interdisciplinary environmental studies.

3) Kau Li‘ili‘i i Ka Loa me ka Laulā (Scattered Far and Wide)*:*
Facility in Four Breadth Areas

When you let go your net,
Twist to wind up, then
Really let her go,
Extend your arms,
Like dancing *hula*, fluid, flow,
Nothing tight, no hold back,
Fling the net round, wide open,
Cover as much area as possible,
Soaring, suspended, over the ‘*ili kai* (surface of the sea)

4) E Lawe i ka Ma‘alea a Kū‘ono‘ono
(Take the Knowledge and Make it Deep)*:*
Mastery in Two Depth Areas

When she hit the ocean, the leads drop fast,
Hitting bottom, then bouncing, pulling the bag in on itself,
Wrapping under, still round, but closer,
Tightening when she lands, so the *i‘a* (fish) no can *pakele aku* (escape)
Slip
out,
underneath.

5) *Ma ka Hana, ka ‘Ike* (Learn by Doing the Work):
Conduct Innovative Dissertation Research. . .

When you pull your net in, always come from the *piko*, the source,
Hold that *pa‘a*, then *huk*i (pull), hand over hand
She come tighter, closing in on the *i‘a*,
The little fish, they’ll slip through the *maka*, swim away to grow more,
The big ones, the more they wriggle, the more they’re caught, *pa‘a*,
So when you lift your net from the water, it is full,
Heavy and dancing, shaking silver, threshing sunlight.

6) *Hānai Aku, Hānai Mai* (Feed and be Fed):
. . . That Makes a Difference

Main thing, no waste, take your time,
Walk your net to the *muliwai* (stream mouth),
gently remove each *i*‘*a*, one flapping fin at a time,
careful you no get cut,
Fill your backpack, *lawa* (enough), no take more than you need.
And always give back,
First fish, not for you, for *mahalo*, give thanks.
The *kūpuna* now, never ask them if they like fish,
Rude that, like you giving, but no like give,
You just give, no ask them how much, just let them take as much as they like,
If they shy take, you give, plenty, then give more,
The more you give, the more there is, *waiwai* (wealth),
How much can you share? How many can you feed?
Hānai me ke aloha (feed with love).

7) *Mahalo, Mālama* (Give Thanks, Take Care*)*:
Show Gratitude and Respect by Taking Care

This ‘*upena* (net), she goin feed you,
You come *ma*‘*a* (familiar), no need worry about nothing.
Me, almost everyday, I go *holoholo* (crusing around) with my ‘*upena*,
Hurricane come, barges stop, Foodland, Wal-Mart, Cost U Less close,
My life, no change, everyday, I go *holoholo* with my ‘*upena*,
me, no *pilikia* (trouble)
But you have to *mālama*, you no take care her, she no can take care you,
hang her from the *piko*, and fold her like this, so she no fray.
If you keep her in your *ka*‘*a* (car), you ready whenever get *i*‘*a* (fish),
But keep her out of the sun, in a soft pillowcase,
Call her by her name,
Rinse the salt, pick out every leaf, twig, bit of *limu* (seaweed),
but no just let her sit, use ‘em
or you, and she, goin forget, you gotta practice,
the only way to know you know something is to do it.

It is dusk when Uncle Charlie finishes the ‘*upena,*
clouds dropping to touch Kalalea mountain,
taking on the colors of the disappearing sun.
As he knots the last *maka* (eye) into place,
connected to the one before it, then the one before that,
row after row, back to the *piko,*
hanging from the nail, *the* ‘*upena* stretching full height,

taller than him,
Uncle Charlie wonders about his next net,
larger still, more rows,
who will he teach, the next *maka*,
to *mālama* (take care) and *ho‘omau* (carry on).

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Mana‘o Hua ‘Ōlelo: Glossary

E Lawe i ka Ma‘alea a Kū‘ono‘ono: Take the wisdom and make it deep.

Hānai aku, Hānai Mai: Feed and Be fed

Hānai me ke aloha: To feed, with love

hānai: to feed, to raise.[2]

Holei ‘Upena: Throw net fishing

Holoholo: cruising around[3]

Huki: pull

Hula: Hawaiian dance

I‘a: fish

I‘a li‘ili‘i: small fish

I‘a nui: big fish

‘Ili kai: surface of the sea

Ka‘a: car

Kaiāulu: Community, ocean until it grows

Kalo: Taro, Hawaiian staple food from which poi is made.

Kau Li‘ili‘i i Ka Loa me ka Laulā: Spread out, little bits, far and wide[4]

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[2] To chew up food in the mouth of a *makua*, before feeding it to the *keiki*

[3] A way to say you are going fishing, without actually saying it as the fish might hear you and you’d spoil your luck.

[4] *Mahalo* to *haku mele* (composer)and friend, Kainani Kahaunaele, for this line to describe *a‘ali‘i* seed capsules scattered by the wind in her *‘oli*, “Māewa i ka Hau mai a ka Makani.”

Ke ʻAla Hoʻi Mai: A Path Towards Home

Keiki: child

Ke Kahua Mua, A Laila Ke Kūkulu ʻAna: First make a strong foundation, from which to build.

Koa: A huge, native Hawaiian hardwood tree noted for the strength and beauty of its wood.

Kūpuna: Elder, One who stands at the spring or the source

Kuʻu Tūtū Wahine: My beloved grandmother

Lawa: enough, plenty

Limu: seaweed

Maʻa: familiar, used to, good at

Mahalo: Gratitude, respect, thanks, appreciation

Mahele: divide, divvy up, share

Maiau: Neat, precise, done well and carefully.

Maka: Eye, sprout, hole in net.

Makua: parent

Mālama: To care for, literally, shine light

Mālama ʻĀina: To care for the land.

Muliwai: river mouth

Nā Pono Hana: Tools and Materials to do Work

Nānā i ke Kumu: Look to the Source

Paʻa: tight, solid, steadfast, stuck, unmoving, remembered

Pakele aku: escape away

Piko: source, umbilical cord, first maka of the net, center, belly button

Pilikia: troubles

Suji: Japanese word for fishing line

ʻUpena: net

Wai: fresh water

Waiwai: wealth, literally, plentiful water

PROLOGUE:

Kaulana Kēʻē i ka nape o ka niu
Haʻa i ka ʻehu kai aʻo Hāʻena

ʻEnaʻena ʻōahi o Makana
Kanu ʻia Hāloa e nā lima huli

Huli aku mākou i wai a kane
Māpu ka lauaʻe i ka poli Waialoha

Puana ʻia ke aloha pau ʻole
No Hāʻena pili i ke kai

Kēʻē is known for its swaying palms
Rising and falling in the seaspray of Hāʻena

The soaring fires of Makana glow fiery hot,
Mountain before which hands turn down to set roots

We seek the waters of Kāne,
fragrance of lauaʻe fern at the spring Waialoha

Unceasing aloha is shared
For Hāʻena, nestled close to the sea

Haku ʻia me ke aloha no Hāʻena, Makahiki 2005
(Chant of aloha for Hāʻena, Fall 2005)

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INTRODUCTION

"What one can observe in the world...is that neither the state nor the market is uniformly successful in enabling individuals to sustain long-term, productive use of natural resource systems" (Ostrom 1990, p. 1).

"The challenge, therefore, lies in learning lessons from the past and in developing an adaptive management strategy that is . . . specific to the socio-ecological system in question" (de Groot and Ramakrishnan et al., Millenium Ecosystem Assessment, "Cultural and Amenity Services," p. 460).

"All of us are the manifestation of the places in which we live" Pualani Kanaka'ole Kanahele, Hawaiian Elder and Scholar.

This is a story about community; community that includes the people of a place, its surrounding land and ocean, and every living thing within. I explore the role of people who have long lived in close proximity to or regularly used natural resources, in caring for and making decisions about their management. As Fikret Berkes writes, "the term community in community based conservation is gloss for a complex phenomenon. . . . communities are elusive and constantly changing" (Berkes 2004, p. 283). For the purposes of this paper, community refers to those connected to, and by their relationship to, a particular place. It encompasses people who live, maintain family ties, advocate over long periods of time for, or regularly use natural resources in a specific place, as well as those resources themselves.

I study a case of collaborative management, or co-management, in which government and local users or community groups share authority to manage natural resources. In this case, the co-management effort focuses on collaborative creation of state law based on informal community rules, or norms guiding coastal use in a small Hawaiian nearshore

fishery. How do different communities interact with the same natural resources?[5] What community norms guide these interactions?[6] How are these informal community norms integrated into formal state-sanctioned management rules? What challenges are encountered in collaborative rule-making between government and community groups? And what lessons does this case offer for early phases of other co-management efforts? This research is valuable because long-standing, local-level, social-ecological systems offer a promising alternative to either government or private resource management, neither of which can be effective in all cases. Co-management models, in which local users are not mere targets of external regulation or professional management, but actively collaborate as caretakers and managers of resources, promise to enhance humanity's ability to meet current unprecedented environmental challenges.

Literature Review:

In many parts of the world, local resource users have evolved social systems for sustainable ecological resource management within bounded geographical areas (Bhagwhat 2006, Ostrom 2010), particularly nearshore fisheries (Johannes 2002, Aswani 2006). These social-ecological systems of community based natural resource management (CBNRM)[7] are not static, but adaptive, resonding to changes in natural

[5] By "interact," I mean use, benefit from, learn about, and view their rights and responsibilities toward natural resources.
[6] "Norms" are customary rules of interaction (Duraluf and Blume, 1999). These are informal and long-standing.
[7] Community based natural resource management (CBNRM) is also referred to as community based resource management (CBRM) or community based resource governance (CBRG). I use the terms CBNRM, community based resource management and co-management. However, I acknowledge the inadequacy of the word "management" when referring to natural resources in Hawai'i and elsewhere, where members of the indigenous culture view these resources as manifestations of deities and as kin (Berkes 2012, Jones et al. 2010, McGregor 2007, Maly and Maly 2003, Andrade 2008). Hawaiians use the

resources as well as to changes in society (McCay and Jentoft 1998, Berkes et al. 2003, Olsson et al. 2004). Increasingly, however, the causes of local-level changes occur further and further from the resources themselves (Ostrom et al. 2002). To address these impacts, communities must collaborate with groups at other levels of resource management, including regional and local governments, as these groups may have legal jurisdiction to manage local resources (Ostrom et al. 2002, Berkes 2009). We need to understand how long-standing community based resource management systems — and more generally, the interactions between people and natural systems in particular places—change (McCay and Jentoft 1998, Agrawal 2003, Rose 1994). There is also need for research into the development of co-management partnerships, in which government and local users or community groups share authority to manage natural resources (Berkes 2010, Olson 2008, Young 2006, Ostrom 2005, Sterns 2002). How do co-management partnerships further change social-ecological relationships at the community level? How can co-management partnerships be improved at early phases of implementation?

Understanding the Evolution of Co-Management:

Co-management, also referred to as collaborative, or participatory management, emerges from three interwoven themes in the study of natural resource management over the past twenty years. The first is devolution of power to the local or community level after over a century of centralization and consolidation of management under government and "expert" authority. By the late 1980s, efforts at devolution were common in

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term “mālama,” which means to “take care of, protect, preserve, and serve” a place and its resources (Pūkuʻi & Elbert 1971).

international development, due to perceived failures in the ability of centralized governments to manage natural resources sustainably (Berkes 2010). Second is the recognition of cases of long-standing systems of community based natural resource management (CBNRM), or management of common pool resources by local (and sometimes indigenous)[8] groups of users who apply place-specific, adaptive knowledge to devising and enforcing rules within a set area (Ostrom 2005). One key strength of CBNRM is application of local and "traditional" ecological knowledge (TEK) (Berkes 2012). This knowledge, developed in relationship to specific natural resources, represents best practices and detailed knowledge transmitted between resource users, often over generations (Berkes 1998, Tipa 2006).[9] A third often cited advantage of CBNRM is the ability of local level systems to perceive changes in natural resources quickly, and to generate new management practices in response to ecosystem feedbacks in a process known as "adaptive management" (Berkes 2005).

CBNRM systems provide an alternative to both government and private management, and possible solutions to the well-documented challenges of common pool resource management (McCay and Jentoft 1998, Ostrom 1990). Research on common pool resource management has focused on understanding the conditions under which local users form "robust" institutions (those that endure for long periods of time without exhausting the resource) (Ostrom 1990). These conditions include monitoring (Dietz et al. 2003, Ostrom 2005), conflict resolution mechanisms, the ability of users to participate

[8] I use the word indigenous to refer to ethnic groups originating in a particular place, in this case Native Hawaiians. The word indigenous, "originating in and characteristic of a particular region," is also used to refer to groups of people with long-time connections to a particular place, not related by ethnicity (see for example Acheson 2008).

[9] In some cases, local ecological knowledge can develop over much shorter time periods (e.g., a decade (Ballard and Huntsinger 2006).

in modifying rules (Menzies 2007, Baland and Platteau 1996, Ostrom 1990), legitimacy of management institutions in the eyes of the wider community (Menzies 2007), and partnerships, or co-management arrangements that link community users with groups at multiple levels, including state and national governments (Ostrom 1990, Berkes 2003, Dietz et al. 2003).

Co-management partnerships involve sharing of authority and responsibility to manage natural resources between local user groups and government (Berkes 2010). While these partnerships may potentially strengthen community based resource management, they can also reduce adaptive capacity of local institutions (Gelcich 2006, Tipa and Welch 2006). Co-management can also fail to share power equitably (Nadasdy 2005), to engage indigenous communities effectively (Tipa and Welch 2006), or to improve either social (Olsen 2003) or ecological outcomes measurably (Koontz 2006, Wamukota 2010). It is difficult to assess whether co-management partnerships achieve desired social and ecological outcomes because they have multiple diverse goals (Cash 2006), many of which are affected by multiple variables besides the management partnership and have longer time frames than most research or funding cycles (Olsen 2003). There is a need for studies to focus not only on the outcomes of co-management, but on initial phases of implementation. In this dissertation, I investigate four early predictors of the success of co-management partnerships, or "success factors:"

1) Equitable power sharing (Menzies 2007, Berkes 2010, Olsson and Berkes 2004);
2) The ability of partners to learn from one another (Berkes 2010, Armitage et al. 2007,);
3) The degree to which rules reflect prior local systems (Wamukota et al. 2012), and
4) Leadership development (Olsson and Berkes 2004).

Other Foundational Concepts:

Much research on co-management treats individual partners, both government and community, as monolithic actors (McCay and Jentoft 1998). Instead, I consider groups of individuals with converging as well as conflicting goals and perspectives, each of which affect the development of the partnership. I focus my investigation mainly at the community level, seeking to differentiate multiple, overlapping communities and to understand their engagement in early stages of co-management. While many studies of CBNRM assume one fixed community, I consider relationships between multiple changing and diverse groups who use and manage a given natural resource. In order to characterize these relationships, I draw upon six concepts from a diversity of literatures considering social-ecological systems. These concepts are:

1) **Place attachments** are the personal, internal processes developed and maintained through contact with both the physical and social aspects of a place (Altman & Low 1992). These include people's emotions, beliefs, and actions or practices in relationship to a place.

2) **Traditional and local ecological knowledge** encompass users' **knowledge, beliefs, and practices** related to resource use and how these are transmitted or **learned** (Berkes 2012, Colding and Folke 2000)

3) **Rights, and Responsibilities** of people towards natural resources and the balance between the two (Rose 1994, Singer 2000, Verdery 2003).

4) Common property rights regulating common property systems include access (the right to enter), harvest (the right to use), management (the right to make decisions), exclusion (the right to determine who has access), and alienation (the right to sell) (Ostrom 1990; Ostrom 2003).

5) Non-economic **benefits** emanating from resource use (Teitelbaum and Beckley 2006, Brown 1998, (Chan et al. 2012).

6) Community norms, or "customary rules" (Duraluf and Blume 1999) are informal, and long-standing rules governing interactions, in this case, between people and natural resources.

I contribute to knowledge in these key areas through a case study of one rural fishing community in Hawai‘i and the nearshore marine ecosystems that have fed local families for generations. In particular, I examine how different user groups use, benefit from, learn about and view their rights and responsibilities towards nearshore marine resources. How do these interactions change under different systems of management—shifting from the local level, to state government, to a new partnership in which a government agency and the inhabitants of the area share in co-management. This study also considers rules guiding use of these resources, comparing informal, customary rules, with formal rules co-created with government resource management agencies, with the intent that they become law. By considering how Native Hawaiian customary norms are articulated within a diverse community which is rapidly changing ethnically, socio-economically, and by length of residency, I contribute to an emerging body of indigenous scholarship that complicates and nuances portrayals of indigenous ecological knowledge and collaboration in co-management partnerships (Tipa and Welch 2006, Nadasdy 2003).

Ahupua‘a: Community Based Natural Resource Management in Hawai‘i

One of the key tenets of community based resource management literature is the importance of clear boundaries of the social-ecological system, so that individuals with rights to use certain resources, as well as the resources themselves, are clearly defined (Ostrom 1990). *Ahupua‘a* are one level of traditional land division used by Native Hawaiians to delineate rights to utilize natural resources (McGregor 1996, Beamer 2012).[10] Historically, in Hawai‘i, each island (*mokupuni*), was divided into districts

[10] The name *ahupua‘a*, includes the idea of *hō‘ahu*, meaning, “to set aside for the future” (Andrade 2008). Ahu also refers to the stone ahu, or platforms for offerings (*ho‘okupu)*, that marked the boundary of each

(moku), which were in turn divided into *ahupua'a* (Beamer 2012). While *ahupua'a* often stretch from the mountains out into the ocean, encompassing a variety of useful natural resources, their size and configuration varied substantially across the island chain (McGregor 2007, Beamer 2012). Residents knew the boundaries of their *ahupua'a* because these boundaries delineated the areas within which they had rights to gather natural resources such as timber, thatch, medicinal plants, or seafood (Beamer 2012, McGregor 2007).[11] These exclusive gathering rights provided both responsibility and incentive for residents of a given *ahupua'a* to sustainably manage the resources they and their *'ohana* (families) depended upon for survival (Andrade 2008; Kelly 1982; McGregor 1996).

In many parts of Hawai'i, individuals known as *konohiki*, often representatives of ruling chiefs, worked with residents to set rules for resource management at the *ahupua'a* level (McGregor 2007). Rules included seasonal *kapu* (closures) on certain species of fish and alternating *kapu* by section of shoreline (Higuchi 2008).[12] The earliest recorded Hawai'i kingdom law, codified in 1839, protected *ahupua'a* based fishing rights including the exclusive rights of *ahupua'a* residents to harvest resources from the shoreline to the outer edge of the coral reef, and the right of the *konohiki* to exclusive harvest of one marine species per *ahupua'a* (Andrade 2008, Maly 2003). These laws remained in effect until Hawai'i was annexed by the U.S. and Hawai'i's Territorial Legislature opened all fisheries to public access in 1900 (Higuchi 2008).

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ahupua'a. *Pua'a*, (pig) refers to the pig heads carved of *kukui* wood, often placed upon each *ahu* (Pūku'i and Elbert 1971). The *pua'a* is a symbol of Lono, Hawaiian God of the harvest, and these altars were used particularly during the makahiki season honoring Lono. The significance of *ahupua'a* as collection sites of *ho'okupu* added to their importance as a land division (Beamer 2012).

[11] In cases where *ahupua'a* lacked specific resources required by residents, gathering rights to just these resources extended to other areas where they were plentiful.

[12] The word *konohiki*, frequently translated as "headman or landlord," literally means to invite (*kono*) willingness or ability (*hiki*) (Pūku'i and Elbert 1971).

Until recently, the majority of literature published on *ahupua'a*-based resource management and the *konohiki* system was general in nature, describing these important social-ecological systems across Hawai'i as a whole without documenting specific practices or variation between different places (Kelly 1982, Kirch 1997). Recent advances in Hawaiian scholarship, including increased access to Hawaiian language newspapers of the 19th century, are paving the way for more nuanced and place specific accounts of *ahupua'a* level management and the *konohiki* system (Beamer 2012, McGregor 2007, Andrade 2008).

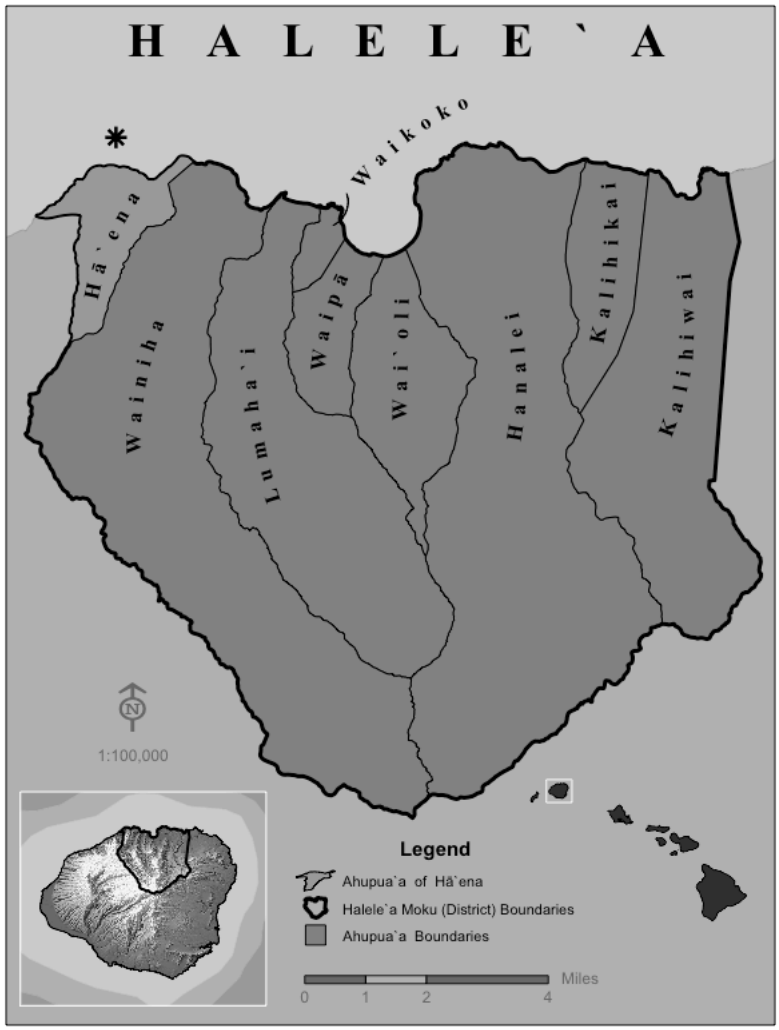

Figure 1: Location of Hā'ena, Kaua'i, Hawai'i

***Kaiaulu*: Study Site**

This study takes place in the *ahupua'a* of Hā'ena, located on the Northwest coast of the island of Kaua'i, Hawai'i. Hā'ena, meaning "the intense breath of the sun," falls within the *moku* (district) of Halele'a, which means "house of joy" (Wichman 1998). Hā'ena marks the end of the state highway, and the beginning of the *moku* of Nā Pali where steep cliffs plunging into the ocean are interspersed with weathered valleys accessible only by boat and a narrow trail.[13] Encompassing approximately 1800 acres, Hā'ena stretches from the back ridges of two valleys, Mānoa (vast) and Limahuli (turning hands), to a large coastal plain and fringing reef.

Hā'ena is an ideal place to investigate co-management of marine resources because it has a: 1) rich heritage of indigenous ties to land, 2) tradition of local level decision making about resource management and efforts to maintain that in face of rapid demographic and land tenure change, 3) abundant and ecologically diverse marine resources, 4) ongoing subsistence fishing practices, and 5) one of the first officially sanctioned opportunities to make resource management laws at the *ahupua'a* level in Hawai'i in over a century.

1) Indigenous Ties to Land:

Archaeological evidence suggests habitation of this area before 1200 AD, primarily centered on fishing, with taro cultivation and other forms of farming well established by

[13] Many of the Hawaiian families of Hā'ena have ancestral ties to the district of Nā Pali where they moved from in the early 20th century to be closer to wage labor and medical care (Andrade 2008). Accounts from the 1960s and 70s record Hā'ena residents continuing to live seasonally in Kalalau and other valleys, sending fish, goats and other food home to families in Hā'ena by horseback (Andrade 2008, Maly and Maly 2003).

1400 AD (Griffin 1980, Andrade 2008). Hā‘ena is home to many *mo‘olelo* (Hawaiian stories) and *wahi pana* (storied sites) including a *hēiau* (temple) dedicated exclusively to the art of hula (Wichman 1998, Hooulumahiehie 2008). Hā‘ena is the site of volcano goddess *Pele*’s initial arrival in Hawai‘i, traveling with her siblings by canoe from *Kahiki* (Tahiti). *Pele* is said to have dug caves in Hā‘ena to house her fires, but each proved too wet, and she moved on to settle at Kīlauea on the island of Hawai‘i. Years later, *Pele* sends her youngest sister, *Hi‘iaka-i-ka-poli-o-pele*, back to Hā‘ena to fetch the handsome local chief *Lohi‘au* (Ho‘oulumahiehie 2010). *Hi‘iaka*’s adventures on her journey to Hā‘ena inspired numerous hula and chants still performed in Hawai‘i today. Hā‘ena is also famous for the practice of *ō‘ahi*, or *ke ahi lele* (the soaring fires). Hollow logs, lighted at both ends, were launched off the steep cliff of mount *Makana* at night into winds which tossed them, spiraling sparks, out to sea (Wichman 1998, Andrade 2008).

2) History of Efforts to Retain Local Level Decision-Making:

Hā‘ena has a long history of local level decision making about resource management and efforts to maintain that in face of rapid demographic and land tenure change. The Great *Mahele* of 1848 and *Kuleana* Act of 1850 privatized land ownership in Hawai‘i, and re-divided land amongst ruling *ali‘i* or chiefs. Hā‘ena was awarded to the O‘ahu chief Abner Paki, and later conveyed to his wife Konia, then to her heir, Bernice Pauahi Bishop (Maly and Maly 2003). Only ten parcels of land within the *ahupua‘a* were awarded to 13 different *maka‘āinana* (*ahupua‘a* residents) (Andrade 2008). However, in 1875, under the name *Hui Kū‘ai ‘Āina o Hā‘ena* (association to purchase land of Hā‘ena), 37 different Hawaiian residents collectively bought back all the un-awarded

land in the *ahupua'a* (Andrade 2008).[14] The *Hui* (association) held these lands in common, creating by-laws based on the *ahupua'a* system. Each member was allocated two, two and a half acre parcels, one *lo'i* (taro patch), and one *kula* (flat land for a house site), and guaranteed access to use the resources of all other parts of the *ahupua'a,* from the mountains to the sea. *Hui* members' land allocations and associated rights were renewed every five years and required $50 per year in rent (*Hā'ena Hui* Bylaws 1875).

Over the next seventy-five years, individual *Hui* shares grew smaller, divided amongst increasing numbers of descendants of the original Hawaiian members. Meanwhile, Caucasian residents of the area, many of them descendants of missionary families, bought up more and more shares, with one family owning nine shares by 1900 (Andrade 2008). Despite a 1923 law ordering privatization of Hui lands held in similar cooperatives throughout the state of Hawai'i, the *Hā'ena Hui* continued to manage lands in common until 1955 when two Caucasian *Hui* Members, John Gregg Allerton and Paul G. Rice, sued for partition of the *Hui*. The partition process to allocate private ownership of each share and its water rights took twelve years, three commissioners, legal representation of each *Hui* member, and multiple court cases. In 1967, more than one hundred years after the *Mahele*, the 1400 acres of remaining *Hui* lands in Hā'ena were formally divided between the county, the state, and descendants of *Hui* members. The lands of Hā'ena were privatized once and for all, and valued at approximately $11,600 per share (Andrade 2008*)*.

Today, few Hawaiian families continue to own land within the *ahupua'a*, and over the last century, the percentage of Hā'ena's population who are Native Hawaiian has

[14] The land was purchased from then owner William Kinney who had purchased the entire *ahupua'a* for $1200 from the estate of W.H. Pease, a surveyor of the period who purchased the land from Pauahi and her husband Charles Reed Bishop (Andrade 2008).

declined from 97% in 1910, to 23% in 2010 (Table 1). A recent increase of coastal luxury development doubled the number of houses in Hā‘ena in the last ten years, adding 166 units, while the number of occupied homes (households) increased by only 50, (43%) (see Table 1). More than half of the houses in Hā‘ena today are not permanent residences, but luxury vacation rentals owned out of state, many with lot prices upwards of one million dollars. Escalating property taxes continue to drive Hā‘ena's few remaining Hawaiian families to move away from the area (Andrade 2008), while over half of area residents have moved to the Hā‘ena within the last ten years (Census 2010).

YEAR	**1910**	**2000**	**2010**
RESIDENTS	67	300	431
HOUSEHOLDS	15	116	166
HOUSING UNITS	NA	166	332
HAWAIIAN	65 (97%)	109 (36%)	98 (23%)
OTHER	2 (3%)	191 (64%)	333 (77%)

Table 1: Changing Demographics In Hā‘ena
Source*:* US Census, as tabulated from Census block data and interpolated for changes in Census boundaries by Ken Stokes of The Kauaian Institute.

Despite these demographic and land tenure changes, Hā‘ena remains a model of local level efforts to perpetuate traditional use and management of natural resources. Descendants of the Hawaiian families of the area still maintain strong ties to the lands and resources of Hā‘ena, including continued subsistence farming and fishing practices. In 1985 descendants formed the non-profit *Hui Maka‘āinana o Makana*, to perpetuate Hawaiian culture as a way of life through the practice of and participation in *ahupua‘a*

based management in Hā‘ena.[15] Activities initiated by the *Hui Maka‘āinana* over the last twenty years include working with Hawai‘i’s Division of State Parks to develop a Master Plan for the 40-acre Hā‘ena state park, restoration of *lo‘i kalo* (taro terraces) within the park, caring for cultural sites, and monitoring health of the area’s coral reef. In 1998, Hā‘ena was one of four communities in the U.S. selected for the Indigenous Community Mapping Initiative. This project enabled the *Hui* to conduct mapping of Hawaiian place names, 20 oral histories with area *kūpuna* (elders), and archival research into fisheries management and land tenure within the *ahupua‘a* (Maly and Maly 2003; Andrade 2008). Through these efforts, community leaders gained valuable relationships and experience which helped them to shape Hā‘ena’s opportunity to co-manage its nearshore fishery with the state.

3) Hā‘ena’s Rich Marine Resources:

Hā‘ena is known for its rich marine resources, including the second largest fringing coral reef in Hawai‘i. Reef and benthic marine habitat of Hā‘ena consists of sand and reef pavement between Kē‘ē Beach and Maniniholo Bay, then aggregate reef, scattered coral and rock, and rubble with small patches of reef pavement from Maniniholo west to Hā‘ena Point (Center for Coastal Monitoring and Assessment 2003 and 2007). The reef pavement is covered with a high percentage of crustose coralline algae, turf algae, macro-algae, and corals (CRAMP Jokiel and Brown 2000); however, the sandy lagoon floors and channels are uncolonized (SWCA report). Over eighty species of 26 different families of fish have been observed in the area, with biomass at one Hā‘ena study site

[15] The name *Hui Maka‘āinana o Makana* means “Organization of *Maka‘āinana* of the cliff *Makana*.” *Maka‘āinana*, frequently translated as “commoner” literally means “ eyes or sprouts of the land” (Pūku‘i and Elbert 1971, Andrade 2008).

among the highest in the state of Hawai‘i (Friedlander 2000). Outer reef areas appear to support more diversity and biomass of fish than nearshore reefs (Stepath 1999, Jokiel and Brown 2000) likely due to less impact from surf and fishing, with certain in shore areas appearing damaged from human trampling (Juran 2007). The reef structure is mainly affected by natural impacts including low tide periods of sun exposure and wave action from North Pacific storm swells which buffet the area between October and May (Clark 1992, Friedlander and Brown in Juran 2007). These winter swells, with wave faces reaching as high as twenty feet, are described by marine ecologists as creating a *de facto* marine preserve, reducing fishing for part of the year (Clark 1992, Friedlander interview 2007, Brown interview 2007 in Juran 2007). Dominant north-east trade winds and strong currents in reef channels (Clark 1992) also contribute to dangerous ocean conditions and the difficulty of fishing in this area. Marine surveys have found herbivorous fish populations to be relatively healthy (Jokiel and Brown, HCSN monitoring 2009). Impacts from sunscreen, commercial activities, and fishing pressure are minimal compared to other parts of the state (Brown and Friedlander in Juran 2007).

4) Fishing in Hā‘ena:

Hā‘ena is an important fishing area, particularly for subsistence harvest. In Hā‘ena, as in many other parts of Hawai‘i (Cesar and Van Beukering 2004), subsistence take from the nearshore fishery is larger than either commercial or recreational harvest. Community studies identified no commercial fishing and a catch per unit effort of only .35 kg of fish per hour for the average fisher (Hā‘ena CPUE Survey, Unpublished Report 2011), 4.5 times less than in nearby Hanalei Bay, a “small, multi-gear, multispecies

fishery with fairly low yield" (Friedlander and Parish 1997). Catch rate was six times greater (2.1 kg of fish per hour) among regular Hā‘ena area subsistence fishers, most of whom use throw or surround (gill) nets (Hā‘ena CPUE Survey, Unpublished Report 2011). Throw nets are funnel shaped, opening fifteen to twenty feet in diameter. They are furled over one shoulder while the fisher stalks a school feeding on the reef, then flung open on top of the fish. Surround nets join hundreds of feet of straight net lengths to encircle a school of fish in sand bottom lagoon areas. Surround net requires a *kilo* (spotter) high on land directing individuals in a row boat where to set the net, divers maintaining the net under water, and many people to pull the net and school of fish, hand over hand into shore, then extricate each fish. Other gears regularly used in Hā‘ena by recreational, and less frequently, subsistence fishers include spear guns, Hawaiian sling or three prong spears, rod and reel, lay net, and spearing while on scuba.

5) Model Co-management Opportunity:

Hā‘ena represents one of Hawai‘i's first legislatively mandated opportunities to formally manage a nearshore fishery at the *ahupua‘a* level in over a century. In 2006, Hā‘ena community leaders worked with Kaua‘i's legislators to pass a bill establishing a community based subsistence fishing area (CBSFA), "wherein the inhabitants of the *ahupua‘a* develop and assist in development and enforcement of traditional regulations" for the entire coastline fronting the *ahupua‘a* of Hā‘ena, from the shoreline to a distance of one mile out to sea or the outer edge of the coral reef *(S.B. 2501, 23rd Leg., Reg. Sess. (HI 2006).* The law, Act 241, calls for a rule making process to be initiated by the

community in partnership with the Hawai‘i State Department of Land and Natural Resources (DLNR).

With assistance from a non-profit, the Hawai‘i Community Stewardship Network (HCSN), Hā‘ena community members have worked for six years (2006-2012) to create draft *ahupua‘a* level rules in collaboration with DLNR, based on traditional and customary management practices for the area. These rules, formally submitted to DLNR in the summer of 2011, currently await approval to undergo Hawai‘i's administrative review process and become law.[16] At least twenty other Hawai‘i communities are interested in engaging in rule making for their own *ahupua‘a* based fisheries. Eight communities, including three entire islands, submitted bills for CBSFA designation similar to Hā‘ena's in the 2007 and 2008 legislative sessions (Higuchi 2008, COS and Kittinger et al. 2012), but only one passed. Of the only two Hawai‘i communities which have achieved permanent CBSFA designation, Hā‘ena is the first to create and submit rules.

Organization of the Dissertation:

I utilized mixed methods to study Hā‘ena's CBSFA rule making process. I employed quantitative techniques, including surveys, alongside qualitative methods including document analysis, participant observation, focus groups, and interviews. My dissertation consists of four separate articles or chapters, each of which includes methods particular to that portion of the study[17].

[16] This includes a public hearing and approval by the Small Business Commission, governor and the State Attorney General, a lengthy process described more explicitly in Chapters 2 and 4.

[17] This dissertation includes four chapters intended as ready-for-publication articles or papers. As of the date of submission, none has been published or copyrighted. Each of these four paper chapters is co-

Table 2 provides a brief description of how each article relates to five research questions:

Research Question	Article
1) How do different communities interact with the same natural resources?	1, 2
1a) In particular, how do different communities use, benefit from, learn about, and view their rights and responsibilities toward natural resources?	1, 2
1b) What is the contemporary significance of customary sharing from subsistence harvest of natural resources?	2
2) What community norms guide these interactions?	1, 2, 3
3) How are these informal community norms integrated into formal management rules intended to become state law?	3
4) What challenges are encountered in collaborative rule-making by government and community groups?	3, 4
5) And, what lessons does this case offer for early phases of other co-management efforts?	3, 4

Table 2: Research Questions and Articles

In articles One and Two, I investigate social ecological relationships of particular present day communities of use through two different lenses. First, I consider all users of in shore marine resources in Hā‘ena by conducting surveys of beach users. This article compares how tourists and residents use and learn about the coast of Hā‘ena; how they perceive resource health, caretaking, and their own responsibilities to the place; and considers implications of these differences for restoration of local-level resource management. Article Two considers a smaller community, people connected to Hā‘ena by fishing or eating fish from the *ahupua‘a*. This article uses catch-tracking surveys, mapping, and interviews to understand sharing networks, or *mahele*, and the multiple benefits they provide to this community.

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authored with a committee member. For each chapter, Mehana Blaich Vaughan completed all the data collection and analysis. She also had the primary role in writing.

In articles Three and Four, I focus more specifically on lessons learned from the six year process of co-creating rules. Methods include meeting observations, document analysis, and interviews with both community and government participants. Article Three investigates integration of informal community norms into formal state management rules. I focus on underlying norms to illuminate challenges and lessons of integrating customary, in this case Native Hawaiian, norms into law. This research analyzes **the rules themselves**, comparing how community norms are articulated across twelve sets of rules drafts. Article Four focuses on **the process** of rules co-creation. I investigate challenges encountered in rule making, and seek to draw lessons from this process for other cases. Article Four relies primarily on interviews supplemented by document analysis, while in Article Three document analysis is supplemented by interviews.

Co-management agreements are widely seen as a necessary alternative to solely government or market-based tools for addressing a range of pressing environmental problems. I use a broad lens to consider one early phase co-management effort based on Native Hawaiian customary management of a nearshore fishery. Here, co-management is not static, but viewed in light of historical context, present patterns of use by multiple communities, and creation of rules to govern resource use in the future. By situating co-management within broader relationships between people and place, this research stands to contribute to our understanding of how such collaborative resource management partnerships develop, how they build on prior local management systems, and their potential as a tool for enhancing social-ecological sustainability.

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Title:

Hā‘ena i ka ‘Ehu Kai: Survey of Visitor and Resident Perspectives on Hā‘ena

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Hā‘ena i ka ‘Ehu Kai: **Implications of Differing Tourist/Resident Perceptions for Community based Natural Resource Management in a Hawaiian Coastal Area**

Despite globally increasing interest in restoring local-level management of natural resources, few studies examine differences between residents' and tourists' place connections and implications for community based natural resource management. This article reports findings from a survey (n = 264) conducted in Hā‘ena, Kaua‘i, Hawai‘i, where resource management is shifting from state-level government to local residents. Tasked with creating new, local-level rules governing use of coastal resources, Hā‘ena community members must consider perspectives, use, and values of residents as well as of multiple, diverse user groups including the burgeoning tourist population. We found significant differences in how residents and tourists learn about the area; the activities in which they engage; their perceptions of resource health; who they think is responsible for caretaking of resources; and their views of personal responsibilities to the place. The findings have implications for local-level resource management and use of popular tourist destinations including the importance of guidebooks in mediating visitor perceptions of a place, the possibility of concurrent but separate visitor and resident use of the same area, visitors' and residents' sense of responsibility to mitigate impacts of their actions, and the potential of engaging residents' place caretaking preferences towards more organized community based natural resource management efforts.

Keywords: community based natural resource management; indigenous; sense of place; sustainable tourism; Hawai‘i

Introduction

Many researchers and natural resource professionals postulate that residents of an area may be well positioned to manage local resources (Olsson, Folke, & Berkes, 2004; Menzies, 2007; Ostrom, 2009; Poteete et al. 2010; Berkes, Colding, & Folke, 2003; Scott, 1998). In much of the world, natural resources were once managed collectively at the local level and, though much formal management responsibility has since moved to government or private entities, local, community based solutions are widely seen as a key component in addressing environmental issues (Ostrom et al., 2010; Berkes 2009; Poteete et al. 2010).

However, restoration of local management is challenging. The groups of people using the resources—and how they use those resources—may be altered because of changing environmental and economic conditions, global tourism, or the passage of time (Ostrom et al., 2002). Often users have grown in number and shifted in character from small, homogenous resident populations using resources for subsistence, to transient, global tourist populations using the same resources for recreation (Berkes, Olsson & Folke, 2003).

This study explores implications of changes in the users of in-shore marine resources in the *ahupua‘a* of Hā‘ena on the island of Kaua‘i.[19] *Ahupua‘a* are traditional Hawaiian land divisions that typically stretched from the mountains to the ocean,

[19] Hawaiian language includes two diacritical marks guiding pronunciation: a macron over vowels to lengthen them and an okina between vowels, which causes a break in the voice. For example, if using diacriticals, Hawaii would be Hawai‘i. The place name Hā‘ena should be pronounced with a long vowel sound on the first A, and a slight break in the voice between that A, and the E.

encompassing a range of natural resources necessary for their residents to survive (McGregor, 1996). In Hawai‘i, natural resource management once occurred at the local *ahupua‘a* level, with residents devising community-specific rules and limiting harvest to the resources of their own *ahupua‘a* (McGregor, 2007; Jokiel et al., 2011). However, natural resource management gradually shifted from the local level to centralized governance as land was privatized beginning in 1848, and Hawai‘i became a territory of the United States in 1898, and today the state Department of Land and Natural Resources (DLNR) holds formal management authority for all of Hawai‘i’s natural resources (Jokiel et al., 2011; Higuchi, 2008). However, in the twenty-first century, many communities in Hawai‘i, including Hā‘ena, are advocating to return resource management to the *ahupua‘a* (Higuchi, 2008).

Hā‘ena encompasses a three-mile stretch of coast including beach areas, coral reef, and accompanying fisheries. Over the past century, the population of resource users in Hā‘ena has grown from 60 Native Hawaiian residents—primarily depending on the *ahupua‘a’*s coastal resources for subsistence—to over 400 residents and nearly one million tourists per year (Hawai‘i DLNR, 2001; Stokes, 2005; U.S. Census, 2010). Against this backdrop of shifting demographics, changes in landholding, and increasing tourist traffic, the state of Hawai‘i is returning some management of Hā‘ena’s in-shore marine resources to the community. Collaborative management agreements between the state’s DLNR and Hā‘ena community groups provide for new local level policies for use of in-shore marine resources and a coastal public park (Vaughan and Caldwell, in preparation).

Because local management of natural resources no longer affects only residents, differences in resident and tourist perspectives—particularly in highly trafficked tourist destinations with a history of deep local ties and resource dependence—are essential to understanding whether and how local management schemes, including proposed community rules to regulate coastal use of Hā‘ena, will be effective. To that end, we investigate differences in how residents and tourists develop and strengthen connections with Hā‘ena, specifically by considering several key aspects related to the formation of place attachments: we examine the type of activities in which respondents engage in Hā‘ena, how they learn about the place, perceptions of resource health and care taking, and sense of responsibility to the place.

Because of links with environmental behavior and stewardship, we view place connections—and in particular, perceived responsibility to a place—to be a critical precursor to effective community based natural resource management (CBNRM).[20] Differences in how these place connections develop and manifest among user groups can affect implementation and success of CBNRM. Our research addresses three questions: (1) How do residents and tourists learn about and use the coast of Hā‘ena? (2) How do residents and tourists perceive resource health and caretaking, and what do they see as their own responsibilities to the place? (3) If differences exist between resident and tourist perspectives, what are the implications of those differences for restoration of

[20] Community based natural resource management (CBNRM) is also referred to as community based resource management (CBRM) or community based resource governance (CBRG). We use the term CBNRM, but acknowledge the inadequacy of the term "management" when referring to natural resources in Hawaii, where members of the indigenous culture view these resources as kin (Andrade, 2008; McGregor, 1996; Poepoe et al., 2006). When referring to natural resources, the Hawaiian use the term "*mālama*," which means to "take care of, protect, preserve, and serve" a place and its resources (Pūku‘i & Elbert, 1971).

local-level resource management? We address the first two questions using survey data. We address the third question through analysis and discussion of those survey results.

Theoretical Framing and Review of Related Literature

This study draws on existing literature in two areas: place connections and community based natural resource management (CBNRM). First, we consider the development of connections, or attachments, to place through length of residence, activities, and environmental learning, and examine how place connections among residents and tourists may differ. We also examine how place connections might influence pro-environmental behavior. Second, we address common property and CBNRM, and the potential of place connections to influence the participation of various user groups within a CBNRM scheme.

Place Connections: Place Attachment, Responsibility, and Behavior

This study explores people-place relationships (Lewicka, 2011), or place connections, through the frame of place attachment, the personal, internal processes developed and maintained through contact with both the physical and social aspects of a place (Altman & Low, 1992; Hidalgo & Hernández, 2001). Attachment to place can be a powerful emotional sentiment that influences how people perceive, experience and value physical resources of a place (Cheng, Kruger & Daniels, 2003). Therefore, understanding how place attachments differ among user groups helps contextualize the management implications of community-level governance.

A number of scholars have reported that lengthy or meaningful associations among residents as well as visitors may foster deep place attachments (Hay, 1998; Lewicka, 2011; Stedman, 2003; Theodori & Luloff, 2000; Tuan, 1977). For scholars who emphasize the importance of residency as a significant variable in developing place attachments, the role of place meanings, neighborhood ties, and cultural capital, among others, have been found to be key (Beckley, 2003; Lewicka, 2005; Klanicka et al., 2006). In one example of resident place attachments, (Kerstetter and Bricker, 2009) found that Fijian residents expressed the importance of protecting the physical environment as central to continued maintenance of their traditions and lifestyle as well as tourism. Given these findings, we postulated that residents might be more likely than tourists to engage in caretaking, or place-protective, behavior in Hā‘ena.

However, other studies suggest avenues other than residency through which people, and particularly tourists, may develop strong place attachments, such as through frequent recreational use (Williams, Patterson, Roggenbuck, & Watson, 1992; Moore & Graefe, 1994; Moore & Scott, 2003). Viewing a particular place as important to engaging in certain activities is critical to developing place attachment through use (Hwang, Lee, & Chen, 2005; Kyle, Graefe, Manning, & Bacon, 2004; Williams & Vaske, 2003; Stokols & Shumaker, 1981). The social aspect of interacting with family and friends in these places can also be important to developing place attachment (Hidalgo & Hernández, 2001; Eisenhauer, Krannich, & Blahna, 2000; Ardoin, 2009). Environmental learning and education may also provide influential avenues toward place attachment, helping people better understand the ecological and sociocultural aspects of a place (Ardoin, 2006; Kudryavtsev, Stedman, & Krasny, 2011).

The literature suggests that positive place attachments correlate with engagement in pro-environmental and place-protective behaviors (Lee, 2011; Ardoin, 2009; Vaske & Kobrin, 2001; Vorkinn & Riese, 2001; Lukacs & Ardoin, in review). In particular, sense of responsibility is an important antecedent to taking action (Hungerford & Volk, 1990). Researchers (e.g., Moore & Scott, 2003; Vorkinn & Riese, 2001) suggest that this sense of responsibility can be enhanced by perceived threat to a place or resources with residents more likely to become politically activated if they perceive risk to that place (e.g., Lukacs & Ardoin, 2012; Gustafson, 2009; Ardoin, 2009).

Studies also document ways that place attachments and sense of responsibility correlate with resident engagement in community-level decision making and caretaking of resources. Kaltenborn (1998) found that people with stronger place attachments were more likely to be active in addressing environmental issues at a community level. Moore and Scott (2003) suggested that residents' proximity to a nearby park, and the resulting sense of ownership, provided an opportunity and motivation for taking on volunteer roles as interpreters, educators, or wildlife monitors. In contrast, Ballantyne, Packer and Hughes (2009) found that tourists are more frequently engaged in individual conservation actions (e.g., recycling) than community-level conservation actions (e.g., volunteering).

In summary, the literature suggests that residents and tourists develop place connections based on a variety of factors, including length and frequency of interaction, recreational use, shared experiences with family and friends, and learning about the place. Furthermore, one manifestation of place connection is a sense of responsibility, which may encourage resource users to become involved in place protection and resource management, particularly when there is a sense that that place may be under threat.

Community-Based Natural Resource Management (CBNRM)

CBNRM describes collective management of common pool resources by local resource users who apply place-specific, adaptive knowledge to devising and enforcing rules within a set area (Ostrom, 2005). CBNRM systems, sometimes referred to as common property regimes, provide an alternative to either government or private management. In CBNRM, local users collectively devise and enforce rules to govern resources that none own, but all share. Research documents the ability of CBNRM systems to manage resources sustainably for long periods of time across a range of contexts across the globe from forests (Agrawal et. al, 2008; Persha et al., 2011), to farmland (Verdery, 2003), to fisheries in the Pacific (Cinner & Aswani, 2007), including Hawai‘i (Poepoe et al., 2006). The literature also highlights instances where local systems were ineffective, unable to sustain either themselves or the natural resources they were meant to protect (Berkes & Folke, 2000; Ostrom, 2005).

Many factors impact effectiveness and implementation of CBNRM schemes. These may include, but are not limited to: the characteristics of natural resources themselves; the degree to which resource users depend on the resource; the types of rules users create to regulate them; the degree of recognition of CBNRM by external authorities such as government; and how representative those involved in CBNRM may be of wider groups of users (Ostrom, 1990, 2009; Menzies, 2007; Poteete, 2010; Gruber, 2010). In the past decade, the presence of shared perspectives about resources and opportunities to develop shared perspectives through learning have also been recognized as critical for collaborative resource management (Schusler, Decker & Pfeffer, 2003; Keen, Brown & Dyball, 2005; Biedenweg & Monroe, in press). This paper investigates

this last factor, the diversity of perspectives towards resources among different user groups. In particular, this study considers how diversity in sources for learning and perspectives about resource health and management responsibilities relate to differing place connections among local residents and tourists, and the possible implications of these differences for CBNRM.

The theoretical framework for this paper, drawing upon the concepts of place connections and CBNRM outlined above, and hypothetical relationships between them, is illustrated in Figure 1. CBNRM can be an important tool in addressing pressing environmental issues (Scott, 1998; Olsson et al., 2004; Berkes et al., 2003). Growing from established relationships between local communities and natural resources, CBNRM depends on peoples' connections to a place and their collective sense of responsibility to care for it. As the community shifts from mainly residents using resources for subsistence, to a combination of residents and tourists using a place for recreation and tourism, people's connections with that place, and their sense of responsibility to care for it, may also change in ways influential for restoration of local management. Drawing from the literature on place attachment and dependence (e.g., Kelly & Hosking, 2008; Stedman, 2006; Kerstetter & Bricker, 2009), place education (e.g., Ardoin, 2006; Kudryastev et al., 2011; Vaske & Kobrin, 2001), and our own field work and experience in this particular site (Vaughan and Vitousek, 2013), we postulated that both place dependence and learning about place would influence residents' and visitors' connections to place. In turn, those place connections have the opportunity to contribute to a sense of responsibility for caretaking of the place, as some studies have suggested that a positive relationship exists between place connections and place-

protective or conservation actions (e.g., Ardoin, 2009; Perkins et al., 1996; Scannell & Gifford, 2010; Vaske & Kobrin, 2001). This sense of responsibility, which may also be affected by individuals' perceptions of resource health (Lukacs & Ardoin, 2012), is an important influence in the extent and form of participation in community based resource management.

<<FIGURE 1 >>

Methods

Study Site

Eena Hā'ena i ka 'ehu kai.
Hā'ena is fearsome in the sea spray.

(This saying, common in *mele* [songs] celebrating Hā'ena,
describes extreme and variable conditions of the area.
Calm summer seas give way to pounding winter surf,
bathing the cliffs in sea spray.)

We conducted this study in the *ahupua'a* of Hā'ena, a rural fishing community on the island of Kaua'i's North Shore. Hā'ena, meaning "the intense breath of the sun," encompasses 1,800 acres including two valleys and dramatic mountains eroded into pinnacles, rising over a large coastal plain and fringing reef (Andrade, 2008). Inhabited by native Hawaiians since before 1000 A.D., Hā'ena has historically been known as a cultural site sacred to *hula* (Hawaiian dance) and for self-sufficient residents who fish and farm taro (Andrade, 2008).[21] The nearest grocery store is a 20-minute drive from Hā'ena, with the nearest shopping center over an hour away. The area is located at the

[21] Taro, called "*kalo*," is a Hawaiian staple crop and is a root vegetable similar to a potato. Taro is grown in dry-land garden beds and irrigated paddies. It is used to make *poi* and figures prominently in Hawaiian creation stories.

end of Kauaʻi's only highway; driving north to "the end of the road" brings one to Hāʻena.

The Hāʻena area and residential community has changed dramatically over the past century. From 1910 – 2010, the population of Hāʻena grew from 67 residents (97% Native Hawaiian) to 431 residents (only 23% Native Hawaiian), more than half of whom have moved to the Hāʻena within the last ten years (Hawaiʻi DLNR, 2001; U.S. Census 2010).

Even after Hawaiian land was privatized in 1850, Hāʻena residents organized a *Hui*, or association, and continued to hold and manage land in common (Andrade, 2008). Non-residents began to buy the land when the *Hui* dissolved in 1960 (Andrade, 2008) and this privatization of land, along with accompanying coastal development of vacation and luxury homes, has led many long-time Hāʻena families to move from the area (Vaughan and Vitousek, 2013). A recent increase of coastal luxury development doubled the number of houses in Hāʻena in the last ten years, adding 166 units, while the number of occupied homes (households) increased by only 50, (43%). More than half of the houses in Hāʻena today are not permanent residences, but luxury vacation rentals owned out of state, many with lot prices upwards of one million dollars.

These changes reflect Hāʻena's increasing popularity as a visitor destination, drawing over 700,000 tourists annually (Juran, 2007), with area beaches hosting nearly 2,000 tourists per day (Juran, 2007; Hāʻena lifeguards, unpublished raw data, 2009; Stepath, 2006). Hāʻena is also frequented by Kauaʻi residents, many of whom continue to fish in Hāʻena, even if their families no longer live there. Hāʻena's reefs provide fish as a source of daily protein for many Hawaiian and other local families, as well as for *lūʻau*

(feasts commemorating events including weddings, birthdays, funerals, and graduations) and other celebrations on Kauaʻi (Vaughan and Vitousek 2013).

In 2006, Hawaiʻi designated Hāʻena as a Community Subsistence Fishery. This designation allows residents to work with the state Division of Aquatic Resources to develop and enforce laws regulating the Hāʻena coastline from the shoreline to one mile out to sea, or the edge of the coral reef, based on traditional management practices *(S.B. 2501, 23rd Leg., Reg. Sess. [HI 2006]).* These regulations affect not only fishing, but all coastal use, including recreational activities such as kite surfing, scuba and kayak tours, and snorkeling, which area fishers believe negatively impact fish populations. In addition, Hāʻena residents are working with the state parks division to increase local involvement in managing a coastal state park, a focal point of tourist activity in Hāʻena.

The survey on which we report in this article is part of a larger study examining community based coastal resource management through a partnership of state agencies and Hāʻena residents. Other aspects of this study focus on past, present, and proposed community management regimes in Hāʻena; incorporating traditional values and practices into law; and assessing collaborative rule-making within government–community resource management partnerships (Vaughan, in prep). We designed the survey to better understand existing coastal use in Hāʻena prior to the implementation of a CBNRM system. This survey's findings related to user demographics, self-reported use patterns, and perceptions of responsibility complement user counts conducted by community groups and other studies to provide baseline data on resource use (Vaughan and Vitousek 2013).

Survey Design

The study's guiding questions included: (1) How do residents and tourists learn about and use the coast of Hā'ena? and (2) How do residents and tourists perceive resource health and caretaking?, and (3) What do they see as their own responsibilities to the place? To address those, we developed survey items related to sources of environmental learning and patterns of resource use among residents and visitors. We also drew from other instruments related to place attachment (Williams & Vaske, 2003; Stedman, 2006) and environmental responsibility (Hungerford & Volk, 1990).

<<TABLE 1>>

We first piloted survey questions with a team of seven colleagues and community members during July 2009. We revised three survey items then re-piloted the revised instrument with fifteen beach-goers, a sample representing a full day sampling every tenth person on one study site beach. Based on pilot results, we clarified wording and reordered items to improve ease of administration. We also used pilot testing to identify surveyor-training needs and refine the introductory statement read aloud to tourists participating in the survey.

The pilot also generated categories for coding multiple open-ended questions such as, "How did you learn about Hā'ena?" in which surveyors solicited free-response answers rather than reading a list of options. We provided surveyors with a list of expected responses, training them to categorize these free-response answers. Throughout the one-year survey period, over 95% of responses fell into the pre-designated categories.

Surveyors recorded other responses verbatim. Three times during the survey, we reviewed all uncategorized, or "other," responses and included new categories for those responses occurring more than five times.[22] When we created new categories, we reviewed all responses previously coded as "other" and re-coded those as appropriate.

Survey Implementation

The survey team, six of whom grew up near Hā'ena, included six university students (five undergraduates and one doctoral-level), and one Hā'ena community member. The team worked with community members to conduct beach-user counts, then selected three survey sites with the highest use on Hā'ena's three-mile coast. We conducted surveys between 7:00 AM and 7:00 PM, seven days per week. We conducted 72% of the surveys during summer (July and August) 2009 and 28% during winter (December 2009 and January 2010), which is characterized by rainy weather and higher surf. [23]

Because of characteristics and constraints of the site, we were not able to use a true random sampling methodology; rather, surveyors systematically approached every third, fifth, or tenth person on the beach, depending on crowd density. We achieved more than a 90% response rate. Surveyors recorded data on individuals who refused to participate, noting observable traits such as sex, a rough estimate of age, and apparent race. We conducted cross-tab analyses to compare characteristics of those refusing to

[22] We originally aimed to complete 250 surveys and chose five responses as our threshold for adding an answer to our code list in order to analyze all answers given by 2% or more of survey respondents.
[23] Cross-tab analysis revealed that findings regarding resident and tourist perspectives were the same in winter and summer, despite different weather and surf conditions as well as differing tourist demographics with more international and East Coast tourists in the winter months versus more domestic and West Coast tourists during the summer.

participate with those of respondents, and found no significant differences in these two populations.

Researchers surveyed 264 beach users, including 77 residents and 187 tourists. We defined "residents" as individuals who reside part-time or full-time on the island of Kauaʻi (not just Hāʻena).[24] As the site description notes, few people live full-time in Hāʻena because of rising property values and the demand for vacation rentals. However, residents from other parts of the 500-square-mile island of Kauaʻi use Hāʻena. Including all Kauaʻi residents in our "resident" count, rather than only those who live in Hāʻena, allowed us to survey individuals who frequently use or have lengthy associations with Hāʻena.

However, we had difficulty finding Kauaʻi residents on the beach to survey. Anecdotal sources such as lifeguards and community monitoring counts estimate that, at any given time, 90% to 95% of the people on the beach at the three study sites were tourists (Hāʻena lifeguards, unpublished data, 2009). To increase the resident sample, we targeted residents (identified by markers such as surfboards, dogs, or vehicle type) even if they did not fall within the systematic-count selection process. We also conducted 20 resident surveys at a Hāʻena community meeting, adapting surveys so that residents could complete them independently. We administered the other 244 surveys, which took approximately 15 minutes to complete, on the beach with surveyors reading the questions aloud and marking responses on the survey sheet. To control for differences in survey population and administration, we conducted all analyses both including and excluding the 20 meeting surveys; the same findings were significant. Because of surveyor error, 15

[24] We conducted 11 surveys with part-time residents. Because of the small group size, we combined part-time resident responses with resident responses for all analyses.

beach respondents were not asked the learning-related questions; therefore the sample size for residents on those items is lower than on others.

We analyzed survey data using SPSS (version 17.0), producing frequency distributions for all data and using crosstabs to compare resident and tourist responses. The significance level for all analyses was set at $p < .05$. Tables display significant findings for each question, with non-significant findings noted below. All findings discussed in the text were significant unless stated otherwise. In the tables, we have noted the instances where the number of responses was too low to meet chi-square requirements.

<<TABLE 2>>

Respondent Demographics

Table 2 displays demographic information for survey respondents (n = 264), including residents (29%) and tourists (71%). We found significant differences in race (Pearson's χ^2=.62.674, p value = .000, df = 7) and occupational status (Pearson's χ^2=.71.284, p value = 001, df = 12) between residents and tourists. Tourists were more likely to be white (82% of tourists versus 54% of residents) and residents to be Hawaiian (26% of residents versus 0% of tourists) or Asian (11% of residents versus 7% of tourists). Regarding occupational status, tourists were more likely to be managers or professionals (68% of tourists versus 28% of residents).

Of the 187 tourist respondents, 52% were from the U.S. West Coast; 62% were on their first or second trip to Kaua'i; and 61% planned to stay on the island for over a week.

Tourists reported visiting Hā‘ena an average of three to four times during their Kaua‘i stay. Of the 77 residents surveyed, 22% lived in Hā‘ena and 43% lived in neighboring *ahupua‘a* within the same district. The Hawaiian community of Anahola, where many of the Hā‘ena families have relocated, was home to 9% of our resident respondents. Residents reported visiting Hā‘ena an average of 158 times per year at a rate of about 13 times per month. Many of the 17 residents of the immediate Hā‘ena area reported visiting the beach daily.

Findings

Question 1: How do residents and tourists use and learn about Hā‘ena?

Activities and Use

We inquired about respondents' activities in Hā‘ena and the importance of Hā‘ena for participating in those activities. Both residents and tourists considered Hā‘ena an important place to pursue favorite activities. Among respondents, 88% of tourists *(n* = 179) and 85% of residents *(n* = 74) ranked Hā‘ena as either "important" or "very important" for engaging in their preferred activities while on the island. This supports the potential for tourists and residents to develop strong place attachments based on the concept of functional place dependence (Moore & Graefe, 1994). However, besides swimming, the popular activities pursued by each group in Hā‘ena differed. Tourists were more likely to snorkel (Pearson's $\chi^2 = 37.21$, p value =.000, df = 1), while residents were more likely to fish and surf (Pearson's $\chi^2 = 84.099$, p value =.000, df=1). The most common activities for residents were swimming (66%), surfing (52%), and fishing

(42%); the most common for tourists were snorkeling (76%), swimming (60%), and hiking (40%). (See Table 3.)

<<TABLE 3>>

Although tourists and residents both frequent Hā‘ena, our findings suggest that they are unlikely to meet and interact on a regular basis because they are largely engaged in different activities. This separation is enhanced by spatial and temporal differences. Research team and community user counts revealed few residents on the beach at peak tourist locations and times (mid-morning and mid-afternoon). Residents tended to frequent less-crowded parts of the coast in the early morning or evening, before and after work. Therefore, although activities in Hā‘ena provide residents and tourists with the opportunity to develop place attachments, differences in activity type, when, and where they take place may mean that tourists and residents develop connections in different ways and to different elements of the place (Stedman, 2003).

Learning about the Place

We asked residents and tourists how they learned—and continue to learn—about Hā‘ena, because researchers have suggested that the process and avenues for learning about a place can be important in forming place attachments and the relationship with stewardship behavior (Kudryavstev et al. 2011; Stedman & Ardoin, in press). We included two items related to learning about Hā‘ena: “How did you first learn about Hā‘ena?” and “What sources of information do you rely on to learn about the place once here?” (See Tables 4 and 5.)

<<TABLE 4>>

<<TABLE 5>>

Both items indicated significant differences in residents' and tourists' learning sources. Residents mainly learned from one another, as well as from first-person experience in Hā‘ena. Residents initially learned about Hā‘ena by growing up there (31%), learning from family (24%), and learning from other locals (14%). (See Table 4.) Once in Hā‘ena, residents still reported learning from experience and from one another. By contrast, 53% of tourists reported using guidebooks to learn about Hā‘ena prior to their visit, and 48% continued using guidebooks once on site. No single other source of initial learning about Hā‘ena (e.g., family, the internet, tour guides, or presentations at visitor accommodations) was used by more than 10% of tourists. Only 5% of tourists indicated learning about the place initially from local residents. Once in Hā‘ena, 29% of tourists consulted locals, 27% relied upon observation, and 48% continued to rely on guidebooks. (See Table 5.)[25]

The difference in learning patterns exacerbates separation between the groups' means of connecting with the place. Fewer than 5% of residents reported reading guidebooks; thus, they had little knowledge of the perspectives or guidance tourists received regarding the place. In addition, since less than one-third of tourists reported inquiring of locals, it appears that tourists rarely learn of local perspectives on Hā‘ena. Interviews and observation conducted along with our survey suggest that many Hā‘ena tourists do not recognize it as having a local community. For example, when asked to

[25] Reliance upon observation to learn about Hā‘ena once there is the only finding reported in the text that was not significantly different between resident and tourist populations, and is therefore not included in Table 5.

describe the Hā‘ena community, one couple who visits annually responded, “The Hā‘ena community? Is there one here? We don’t see a church or a school or store or anything here in Hā‘ena. They’re all down the road in Hanalei. There is a community there for sure, but here, in Hā‘ena? There’s no community here.”

Question 2: How do residents and tourists perceive resource health and caretaking, and what do they see as their own responsibilities to the place?

We are interested in perceptions of responsibility to place as a precursor to environmental behavior and participation in CBNRM. Two factors that may affect development of a sense of responsibility to place are perceptions of resource health in an area and of who is currently caring for it.

Perceptions of Resource Health and Caretaking

Our findings suggest that residents and tourists have different views of resource health and caretaking in Hā‘ena. On average, residents’ perceptions of the health of coastal resources were more negative than tourists’ perceptions, although both groups perceived the resources to be less than perfectly healthy. On a scale of 1 to 5, with 1 being “not at all healthy” and 5 being “very healthy,” residents’ mean rating was 3.49 whereas tourists’ mean rating was 3.96. Crosstab analysis shows this difference to be significant (Pearson’s $\chi^2 = 12.897$, p value =.012, df = 4).

We asked residents and tourists about their perceptions of who takes care of Hā‘ena based on the hypothesis that these perceptions may affect feelings of personal responsibility toward the place. Residents and tourists had significantly different

perceptions of who was taking care of Hā‘ena: 71% of residents *(n* = 72) answered "locals," compared with 25% *(n* =183) of tourists (Pearson's $\chi^2 = 46.931$, p value = .000, df = 1) selecting the same response ("locals"). In contrast, 34% of tourists perceived that the government ("the state") was caring for Hā‘ena, while only 17% of locals (Pearson's $\chi^2 = 7.432$, p value = .006, df = 1) selected this response.

Responsibilities

Studies suggest that residency may be a significant variable in developing place attachments (e.g., Tuan, 1977; Hay, 1998), which may, in turn, affect sense of responsibility and be related to environmental behavior (Lewicka, 2005; Ardoin, 2009). Thus, we postulated that residents might be more likely than tourists to express a sense of responsibility toward Hā‘ena.

<<TABLE 6>>

We asked respondents about their responsibilities to Hā‘ena. Nearly all responses to this item indicated significant differences between the groups. (See Table 6.) In general, tourists felt responsible to clean up after themselves, with the majority answering, "Leave it as you found it" (65% of tourists versus 44% of residents, Pearson's $\chi^2 = 9.794$, p value = .002, df = 1) or "Pick up your own trash" (69% of tourists versus 51% of residents, Pearson's $\chi^2 = 8.1$, p value = .004, df = 1). Although residents described minimizing their own impacts, they also described responsibilities that affect others, such as picking up other people's trash (41% of residents versus 17% of tourists, Pearson's $\chi^2 = 67.131$, p value = .000, df = 1); educating others on the beach (41% of

residents versus .03% of tourists); enforcing informal rules and state laws in Hā‘ena, such as those related to overfishing or not standing on the reef (19% of residents versus .01% of tourists, Pearson's $\chi^2 = 32.429$, p value = .000, df = 1); and keeping others safe (15% of residents versus .01% of tourists, Pearson's $\chi^2 = 24.11$, p value = .000, df = 1).[26]

In sum, residents were more concerned about resource health and more likely to feel responsible for taking care of marine resources. In contrast, tourists perceived caretaking of Hā‘ena to be the government's responsibility. Tourists were more likely to focus on their own behaviors (e.g., picking up one's own trash), while residents were more likely to take actions (e.g., education and enforcement) to influence others' behavior. These findings support those of prior studies (e.g., Morgan, 2009; Lewicka, 2005) suggesting the importance of residence and direct interaction with a resource in developing place connections and a sense of responsibility to the place.

Discussion

Tourists and residents consider Hā‘ena a special place for its beauty, undeveloped wilderness character, and coastal resources (Vaughan in prep). Numerous nonprofits, government agencies, and community groups express interest in local-level collaboration to protect Hā‘ena and its resources (Andrade, 2008). Our survey findings suggest that differences in place connections among user groups, namely residents and tourists, do indeed exist, and here we consider how those differences may affect the restoration of local resource management.

[26] These two responses (enforcing rules and helping to keep others safe) do not meet chi-square requirements for number of cells because of the small number of tourists selecting them.

Activities and Learning: Local-Level Interpretation and Education

In exploring the activities pursued, and the timing of those activities, we found that residents and tourists rarely interact with each other in Hā‘ena: they visit different areas of the coast at different times of day and engage in different activities. Thus, new community proposed regulations affecting recreational activities may differentially impact residents and tourists. Traditional coastal management in Hā‘ena, for example, relied on protecting key spawning and feeding areas for fish (Vaughan and Thompson, in preparation).[27] Draft community rules incorporate traditional principles by closing these areas to fishing and all recreational use. Community members argue that certain fish species only feed in particular places on particular tides, and that snorkeling or surfing may disrupt their feeding patterns. However, closing areas to snorkeling would affect tourists tremendously, as snorkeling is their primary activity in Hā‘ena, whereas fishing or surfing regulations would more heavily impact residents. Local residents may regulate their own use of the resources through normative influences and informal education, yet regulating tourist activities may entail formalized enforcement and educational outreach, requiring enhanced funding and government support.

Regarding education, tourists and residents report different avenues of learning about the place with tourists primarily relying on guidebooks (secondhand, printed information sources) and locals relying on one another (firsthand, personal information sources). Thus, local perceptions about the place tend to be perpetuated internally among local residents. For tourists (who comprise more than 90% of users), guidebooks—and

[27] One elder recalls being taught to walk high up the beach, in the tree line, rather than along the shore, to avoid disrupting fish (Chandler, personal communication, July 2007).

the information or misinformation they contain—are the primary source of education, in effect serving as the "host" in Hā'ena.

The importance of guidebooks has implications for local natural resource management. Because guidebooks are a critical avenue for reaching tourists prior to arrival, they may offer an opportunity for local resource managers to collaborate with authors to shape content, ensuring that it is accurate and aligned with local management principles. Examples of past misinformation published in Kaua'i guidebooks include beaches listed as excellent for year-round swimming and snorkeling which are actually hazardous in winter.

Despite their potential importance, guidebooks have been largely ignored in the CBNRM literature, possibly because CBNRM often takes place in non-tourist destinations or areas such as safari parks where tourism is strictly controlled. This line is becoming blurred as destination and recreation tourism increase the reach of self-guided tourism. Co-authorship, community certifications, and other forms of partnership implying community approval and inclusion of firsthand local knowledge might improve guidebook accuracy and engage community members in knowledge production and dissemination related to their place.

Additionally, the prevalence of guidebooks suggests that more consistent information flow between tourists and residents could benefit both groups. Residents might learn from tourist perceptions of what makes Hā'ena special or from their opinions on the quality of their visit and how it could be improved. Tourists might benefit from a resident-hosted orientation in which residents provide information about cultural practices and significance, the existing community, beach safety, how to protect Hā'ena's

marine and coastal resources, and cultural norms such as the impoliteness of approaching fishermen at their catch.

Resource Health, Caretaking, and Responsibilities: Engaging Residents and Tourists

Residents and tourists also have divergent perceptions regarding the health and caretaking of area resources. Tourists perceive marine resources as healthier than do residents and credit the state of Hawai‘i with caring for the resources. Although tourists feel responsible for leaving the area as they found it, they rarely go beyond self-focused activities. In contrast, residents perceive marine resources as less healthy and more threatened. They feel personally responsible for Hā‘ena and suggest that locals are the caretakers. Many report undertaking place-protective actions and also attempting to influence others' actions.

Differing perceptions of resource health among residents and tourists also have potentially important implications. At high-volume tourist destinations, the level of tourist traffic is sometimes used as a proxy for environmental health, based on the assumption that the resources must be healthy because many people desire to visit them. Yet resource health perceptions are highly subjective and depend on the baseline to which the observer is comparing: a healthier past state of the same area or a more degraded state elsewhere. Local monitoring is important as residents can provide perspective or collect data on resource health over time.

Finally, this study finds that Hā‘ena residents have a stronger sense of responsibility, which may connect with place-protective behaviors, such as cleaning up trash, monitoring resource use infractions, and teaching others about Hā‘ena. An

additional implication for local-level management may be the likelihood of engaging residents in stewardship activities. Residents in our study reported feeling responsible to educate about resources and enforce regulations in Hā‘ena with no formal CBNRM structure in place. Residents might become more involved when rallying around common educational messages and supporting community-developed, agreed-upon regulations. While some residents would be formally employed in local-level management, others might voluntarily participate in its implementation. Moreover, because locals generally rely on other locals for information, training residents to educate others about their area could have widespread effects within the resident population.[28]

However, our findings also suggest ways that effective CBNRM may be difficult in popular tourist destinations as increased tourist traffic can deter residents from frequenting an area. Rising property prices and a high cost of living often associated with increased tourism and development may force out-migration of long-term residents. Our study hints that these socioeconomic dynamics common in tourism-dependent economies may displace the very people most likely to become engaged in active stewardship of natural resources. Examples of avenues for community engagement already implemented or proposed for Hā‘ena include participatory monitoring of resource use and health, engagement in collaborative rule-making processes to create coastal use zones and fishing regulations with state agencies, as well as enhancing enforcement of these rules

[28] An additional survey question not discussed in this article indicates a possible revenue source of CBNRM-related activities in Hā‘ena such as monitoring, interpretation, and education. We asked respondents if they would be willing to pay $5 per person to visit Hā‘ena. Tourists were more willing than residents to pay, but for both groups, willingness to pay increased substantially if the majority of that fee were used to care for the area. These findings are consistent with other willingness-to-pay studies in protected areas, such as Kyle et al. 2003, who found willingness to be based on individuals' relationships with the place as well as intended use of the fees.

through informal education of visitors and other users (Vaughan and Thompson in preparation, Vaughan and Caldwell in preparation).

Limitations

We endeavored to explore the relationships of Hā‘ena’s residents and tourists with the area’s coastal resources. Our findings reflect several limitations: First, like many tourist and visitor studies, we did not conduct a random sample but, rather, worked within the logistical constraints of the site to be as systematic as possible in selecting participants. Second, because of the skewed ratio of tourists to residents—with thousands more tourists than residents visiting the sites—our resident sample was relatively small. Surveying additional residents would allow for more robust comparison between the groups. Third, literature suggests that part-time residents may have different perspectives than full-time residents (Kaltenborn and Williams, 2002; Stedman, 2006), but our small sample size *(n* = 11) did not allow for separate comparison. We recommend more research to explore how part-time residents—a distinct, influential, and growing demographic in many visitor destinations such as Hawai‘i —interact with, perceive, value, and view their responsibilities towards the natural resources of their chosen seasonal residences.

Conclusion

This article expands on literature on place connections and CBRM, drawing in consideration of differences between user groups, specifically visitors and residents. Our findings support past research showing that residents’ place connections differ in quality

and content from those of visitors (e.g., Klanicka et al., 2006; Kaltenborn and Williams, 2002; Stedman, 2006; Scannell and Gifford, 2010). This is particularly true with respect to their sense of responsibility to the place, which is associated with place-protective behaviors and engagement in caretaking of resources at the local level (Lukacs & Ardoin, in review; Wiliams and Vaske, 2003). This work then supports the importance and potential of local-level initiatives that engage residents in resource management and decision making. Our findings also support prior research pointing to avenues other than residency, including participation in recreation (Hwang, Lee, & Chen, 2005; Moore and Scott, 2003) and educational activities (e.g., Vaske and Kobrin, 2001; Kudryastev et al., 2011) through which visitors can develop and strengthen place connections. This study goes further by illuminating ways in which separate avenues of place connection, such as different activities and learning sources, may result in entirely separate visitor and resident experiences and connections, even to the same, small place.

Community based natural resource management may offer a means of bridging this divide through learning-related avenues such as, for example, resident input into guidebook content or resident-hosted visitor orientations, which may connect user groups. Local-level management initiatives have the potential to leverage residents' sense of responsibility to strengthen visitor connections and engagement. Ultimately, such initiatives may enrich the experiences of all users and enhance both resident and visitor contributions to caring for a place.

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Figure 1. Relationship Between Place Connection, Perceived Responsibility, and Engagement in CBNRM

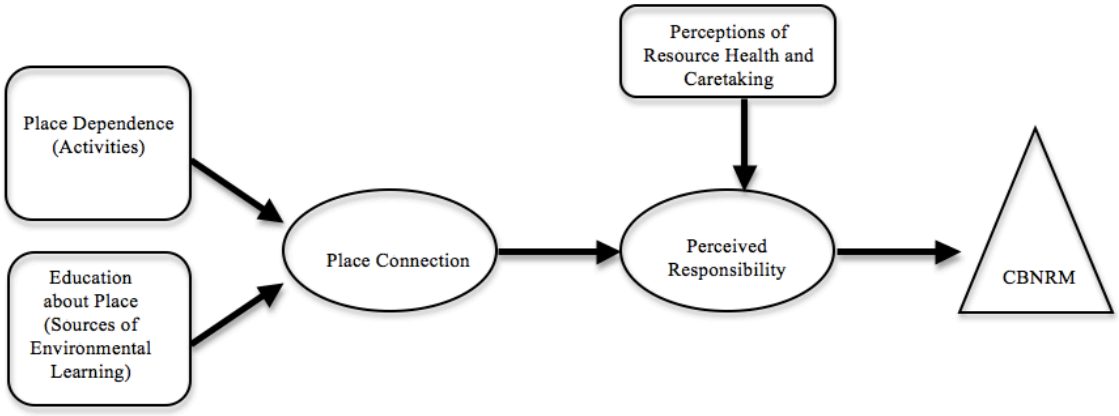

Table 1. Description of Survey Items

Item	Response Type
Residence and number of years in current location	Open-ended, categorical
Activities respondents participate in on the coast of Hā‘ena	Open-ended
Importance of Hā‘ena for being able to participate in these activities*	Likert-type scale indicating level of importance
Frequency of visits to Hā‘ena	Open-ended, categorical
How respondents learned about Hā‘ena initially, and how they learn about it once there	Open-ended
Perceptions of health of marine resources	Likert-type scale
Perceptions of who is caring for Hā‘ena and how well they are doing so	Open-ended, Likert-type scale
Perceptions of their own responsibilities to Hā‘ena while there	Open-ended
Whether they would categorize Hā‘ena as special, and if so why	Closed-ended yes/no response, Open-ended
Demographic information including age, gender, and ethnic/racial background; occupation and occupational status	Open-ended

*Adapted from Williams and Vaske (2003).

Table 2. Respondent Demographics

Variable	Residents' percentage (n = 187)	Tourists' percentage (n = 77)	Total Survey Population (n = 264)
Racial group			
White	54	82	74
Asian	11	7	8
Hawaiian	26	0	8
African American	0	2	1
Hispanic	2	4	6
OPI	0	2	1
Other	3	0	1
Age			
19-34	34	34	34
35-44	30	32	32
45-64	20	27	25
65+	16	7	9
Gender			
Male	58	46	50
Female	42	54	50
Occupational status			
Managers or professionals	28	68	60
Administrative support staff or technicians	11	9	9
Service workers/ sales	13	6	7
Physical laborers	32	1	8
Students	9	5	5
Retirees	4	8	7
Unemployed	2	1	1
Other	2	2	2

Table 3. Activities in Hā‘ena

Activities	Residents' number	Residents' percentage (n = 77)	Tourists' number	Tourists' percentage (n = 187)	Pearson's $\chi^2_{(df = 1)}$	p Value
Snorkeling	28	36	142	76	37.251	0.000
Picnicking	15	20	17	9	5.527	0.019
Camping	10	13	1	1	21.18	0.000
Surfing	40	52	22	12	49.010	0.000
Shelling	22	29	3	2	46.267	0.000
Holoholo (Fishing)	32	42	1	1	84.099	0.000

Note: Differences in the following activities were not significant ($p > .05$): swimming, hiking, sunbathing, sightseeing, scuba diving, kayaking, boating, walking/running on the beach, hanging on the beach, and watching sunset. Kite-boarding and windsurfing had too few responses for statistical comparison.

Table 4. Initial Sources of Learning About Hā‘ena

Source	Residents' number	Residents' percentage (n = 67)	Tourists' number	Tourists' percentage (n = 185)	Pearson's $\chi^2_{(df = 1)}$	p Value
Guidebook	2	3	98	53	51.068	0.000
Grew up Here	21	31	0	0	63.256	0.000
Family	16	24	14	8	12.481	0.000
Locals	8	14	10	5	4.353	0.037
Other	16	24	17	9	9.329	0.002

Note: Differences in the following sources of initial learning were not significant ($p > .05$): brochures, internet, tourism workers, maps, driving to the end of the road, and other tourists.

Table 5. On-site Sources of Learning About Hā‘ena

Source	Residents' number	Residents' percentage (n = 65)	Tourists' number	Tourists' percentage (n = 184)	Pearson's $\chi^2_{(df = 1)}$	p value
Guidebook	3	5	89	48	39.471	0.000
Family/Friends	6	14	4	2	11.287	0.001
Locals	38	59	53	29	18.218	0.000

Note: Differences in the following sources of on-site learning were not significant ($p > .05$): observation, exploring, lifeguards, and signs.

Table 6. Responsibilities to Hā‘ena

Responsibility	Residents' number	Residents' percentage (n = 75)	Tourists' number	Tourists' percentage (n = 186)	Pearson's $\chi^2_{(df=1)}$	p value
Leave it as you found it	33	44	121	65	9.794	.002
Pick up your own trash	38	51	129	69	8.1	.004
Show respect	39	52	34	18	30.166	.000
Pick up others' trash	31	41	32	17	16.994	.000
Educate others	31	41	5	3	67.131	.000
Enforce rules & laws	14	19	1	1	32.429	.000[a]
Help keep others safe	8	15	1	1	24.118	.000[b]
Other	23	31	29	16	7.614	.006

Note: All resident/tourist responses were significantly different except: "Follow rules," "Don't touch or harm marine animals," and "Stay off the coral reef."

[a,b] These responses do not meet chi-square requirements for number of cells because of the small number of tourists selecting this response.

Title:

Mahele: Sustaining Communities Through Small-Scale Inshore Fishery Catch and Sharing Networks

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[29] For this chapter, Mehana Blaich Vaughan completed all the primary data collection and analysis. She also had the primary role in writing.

Running Head:

Mahele: Catch and Sharing Networks

Title

Mahele: Sustaining Communities Through Small-Scale Inshore Fishery Catch and Sharing Networks[30]

Authors

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Abstract

Throughout the Pacific, "subsistence" fishing feeds not only individual fishers and their families, but a much broader network of people through the noncommercial distribution, or sharing, of fish. This study evaluates the present significance of this sharing, through tracking subsistence fish catch and distribution, or *mahele*, in one small Hawai‘i fishery over an eighteen month period. We find that the traditional and customary system of sharing fish, like subsistence activities in other mixed economy settings, provides benefits beyond the provisioning of food. These benefits include perpetuation of traditional and customary skills and practices, social status, social

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networks, reciprocal exchange, and collective insurance. Taken together these benefits enhance the resilience of community level social and ecological systems.

Throughout the Pacific, "subsistence" fishing feeds not only individual fishers and their families, but a much broader network of people through the noncommercial distribution, or sharing, of fish. Subsistence fishing, hunting, and gathering are all forms of self-provisioning or "activities that produce material goods. . . consumed domestically or shared among households, but not sold for cash" (Teitelbaum and Beckley 2006). Sharing of harvests from subsistence fishing is poorly accounted for in academic literature and in marine governance and policy, especially in developed economies. Consequently, little is known about the contemporary extent and significance of subsistence fishing and the noncommercial distribution, or "sharing," of the resulting catch.

Subsistence fishing and sharing in economically developed societies may be important for the health and management of marine resources as well as the health and sustainability of local cultures. In many Pacific island fisheries, even in developed contexts such as Hawai‘i, subsistence catch may be larger than commercial (Friedlander and Parrish 1997). However, most fishing data in Hawai‘i focus on commercial fisheries (Cesar and Van Beukering 2004), even though noncommercial fishing can have significant effects on the ecological health of fisheries (Coleman et al. 2004). Subsistence fishing is also relevant for marine resource decision-making, affecting, for example, the implementation of marine protected areas (Effron et al. 2011, Fox et al. 2012).

Individuals frequently choose to engage in subsistence activities such as fishing, hunting, and gathering, even when these activities are not economically advantageous or

incur economic costs (Brown 1998, Teitelbaum and Beckley 2006). Literature on subsistence and self-provisioning emphasizes the importance of other benefits, sometimes described as lifestyle benefits, beyond the actual food products provided (Teitelbaum and Beckley 2006). These benefits include cultural perpetuation (Panelli and Tipa 2009, Hinrichs 1998), self reliance (Tigges 1998), social status (Bliege-Bird and Smith 2005), social networks (Brown 1998, Severance 2010), and reciprocal exchange (Teitelbaum and Beckley 2006). Many of these community level benefits are inseparable from the act of provisioning itself (Panelli and Tipa 2009, Garibaldi and Turner 2004). These lifestyle benefits can also be described as cultural ecosystem services, or the non-material benefits which human communities derive from ecosystems. They are difficult to measure, and thus to understand; therefore, they often are not taken account in decision-making (Chan et al. 2011).

Studies on the benefits of subsistence hunting and gathering activities generally focus on individuals in mixed economies, where subsistence activities supplement wage labor (Teitelbaum and Beckley 2006). On the other hand, research on the sharing of products from hunting and gathering primarily focuses on geographically and economically isolated indigenous groups for whom these activities are the major means of economic support and obtaining food (Gurven et al. 2004, Smith et al. 2010). Explanations for sharing food within non-market contexts include kin selection (Nolin 2010), reciprocal altruism (Gurven 2006), signaling theory, (Bliege-Bird and Smith 2005), and tolerated scrounging (Gurven 2004), all of which rely upon economic and/or evolutionary explanations in which sharing is viewed as a more effective survival strategy than keeping all the products of one's harvest.

Few studies have applied the broader lens of lifestyle benefits, or cultural ecosystem services, to the sharing of products obtained through subsistence activities such as fishing, to understand non-economic benefits of sharing within a mixed economy setting (Brown 1998). Here we address this gap by investigating the following research questions within the context of a small coastal fishery on the island of Kauaʻi, Hawaiʻi: (1) What is the contemporary extent and significance of subsistence fishing and sharing? (2) How does the traditional and customary practice of sharing fish work in a mixed economy setting? Specifically, where are fish distributed, to whom, and for what purposes? (3) What is the importance of this sharing to both fishers and recipients? We address these questions within the context of Hāʻena, Kauaʻi, because Hāʻena represents a longstanding, culturally important subsistence fishery, and a tractable case in which to explore broadly applicable questions. In addition, the Hāʻena community is engaged in a community based rule-making effort for the inshore fishery (described below), and the results of this study bear on this natural resource planning process.

Study Site

This study was conducted in the *ahupuaʻa* of Hāʻena, a rural community located within the *moku* (district) of Haleleʻa on the island of Kauaʻi's North Shore (Figure 1). *Ahupuaʻa* are traditional land divisions that often stretched from the mountains into the ocean; they were used by Hawaiians to delineate rights to utilize natural resources (McGregor 1996). Natural resource management decisions were made at the *ahupuaʻa* or *moku* (larger district) level, with harvest in each *ahupuaʻa* largely limited to area residents (McGregor 2007, Maly and Maly 2003). Master fishermen within each

ahupua'a were responsible for overseeing collective fishing and distribution of catch, and in some cases for advising local chiefs on management decisions such as when to close a certain species (Jokiel et al. 2011, McGregor 2007). Most fishing knowledge was considered privileged and handed down within families (Jokiel et al. 2011).

<<Fig. 1 near here>>

Prior to Western contact, sharing of fish and other food products between fishers and farmers was critical to community resilience at the *ahupua'a* level (McGregor 2007). Well into historical times, Hā'ena families have sustained themselves from the natural resources of their *ahupua'a*, mainly through taro farming and fishing the area's multiple fringing reefs and two sandy lagoon areas (Andrade 2008). *Kūpuna* (elder) interviews conducted in Hā'ena recall the *mahele*, or distribution of catch to family and neighbors, both after small harvests by an individual fisher, and after collective community fishing events (e.g., "surround" fishing) (Maly and Maly 2003). In surround net fishing, head fishermen would climb certain cliffs to view the school, then signal fishers in a rowboat when and where to lay the net. The entire community would help pull the nets to shore and extricate fish. The head fisherman would then apportion the catch, giving each family their *mahele*, or share (Maly and Maly 2003).

Today Hā'ena is a popular visitor destination with up to 2,000 tourists per day using the coast (Stepath 2006). In the past fifty years, land privatization (Andrade 2008) and extensive coastal development of vacation and luxury homes in Hā'ena has driven escalating property values and declining beach access, leading many long time Hā'ena families to move out of the area. Only half of Hā'ena's 322 homes are occupied (U.S.

Census 2012), with the rest utilized as vacation rentals. Half of the area's 431 residents have moved to the area within the last ten years (U.S. Census 2012).

As in other parts of the Pacific, Hawaiian natural resource management has moved from the local or *ahupua'a* level, to centralized state government managed by the Hawai'i State Department of Land and Natural Resources (DLNR). In keeping with the renaissance of community based management in other parts of the Pacific (Cinner and Aswani 2007, Johannes 2002), and in response to perceived declines in inshore fisheries under state level management, residents of rural Hawai'i communities who depend on local marine resources for sustenance are advocating restoration of community based management in keeping with traditional and customary practices (Poepoe et al. 2006, Higuchi 2008: Friedlander et al. 2013 [this issue]). Initial evidence suggests that in certain cases, including a pioneering community managed inshore fishery at Mo'omomi on Moloka'i, customary management can result in more fish biomass and species richness than government managed marine reserves which prohibit all take of marine species (Friedlander et al. 2003; Friedlander et al. 2013 [this issue]). In response to community pressure, Hawai'i enacted legislation in 1994 allowing DLNR to designate community based subsistence fishing areas (CBSFAs) for "reaffirming and protecting fishing practices customarily and traditionally exercised for purposes of Native Hawaiian subsistence, culture, and religion" (HRS 1994). The legislation defines subsistence as "the customary and traditional native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing" [L1994, c271,&1]. Nineteen Hawai'i communities have taken steps towards becoming CBSFAs (Higuchi 2008), with eight submitting bills for legislative designation (Kittinger et al. 2012). However, only two of

these areas have been permanently designated, and Hā‘ena is the first to submit CBSFA rules (Higuchi 2008). These legislatively mandated rules, created in collaboration with the state's aquatic resource management agency, are based on traditional and customary fishing and coastal management practices specific to Hā‘ena (S.B. 2501, 23rd Leg., Reg. Sess., HI 2006). Hā‘ena's rules and resulting changes in management of the in-shore subsistence fishery are seen as a model for communities across Hawai‘i (Higuchi 2008).

This study focuses on the inshore fishery in Hā‘ena. Hā‘ena's coastal marine resources are relatively healthy (Jokiel and Brown 2000) with biomass at one site among the highest in the state of Hawai‘i (Friedlander 2000). In Hā‘ena, as in many other parts of Hawai‘i (Cesar and Van Beukering 2004), subsistence take from this small coastal fishery is larger than either commercial or recreational harvest. Community studies identified no commercial fishing and a catch per unit effort of only 0.35 kg of fish per hour for the average fisher, although regular fishers from Hā‘ena did substantially better (2.1 kg of fish per hour) (Hā‘ena Catch Per Unit Effort Survey 2011, unpublished data).

Methods

This participatory research began as part of community efforts to conduct baseline studies of Hā‘ena's inshore fishery prior to implementation of new rules for community level management. In community rule making meetings, fishers and community members expressed interest in understanding how fish harvested from the Hā‘ena fishery were utilized, including customary sharing and patterns of spatial distribution. This community generated inquiry began a participatory research process in which a ten person team of both students and Hā‘ena community members worked with fishers to refine research

questions, recruit study participants, pilot and employ quantitative data collection forms, and then conduct analysis and sharing of results. This research team included seven individuals with prior community ties to Hā‘ena, five of whom were descendants of Hā‘ena area fishing families.

Community research assistants helped to increase fisher participation, access to information, and both the quantity and quality of data collected. In Hā‘ena, as in many parts of Hawai‘i, people are reluctant to speak openly about fishing to avoid betraying knowledge of secret fishing spots, appearing boastful, or spoiling one's luck (Maly and Maly 2003, Vaughan and Thompson, in preparation). Community researchers fostered trust in the research team and study goals, making it possible to overcome cultural barriers to participation. These individuals also provided information on community events, along with fishers' fishing patterns, family obligations, and work schedules, helping the research team plan if, when, and how to respectfully approach fishers to collect data. Family members were often present at a catch or its distribution, and helped fishers to fill out data sheets, increasing both the quantity and quality of collected data. In addition, because knowledge of fishing is transmitted within Hawaiian families (Jokiel 2011), conducting interviews with family members present, when possible, was more appropriate and comfortable for all participants, while also contributing to cultural perpetuation. Lastly, working with community research assistants built local capacity to conduct follow-up studies.

During a two month pilot period, the research team observed Hā‘ena fishing activities - assisting with two other area fishing studies including CPUE (catch per unit effort) and a survey of human activities in nearshore waters – while working with five

fishers to develop and pilot data sheets for recording their catch and distribution. These forms were modified five times over the pilot period in response to fishers' suggestions to improve ease of use, relevance of data collected, and protection of sensitive information such as specific harvest locations.

Participant Recruitment

Researchers identified the target population of fifteen regular Hā‘ena area subsistence fishers by combining a list of individuals observed fishing during the pilot period with those consistently named by knowledgeable sources (lifeguards, fishers, coastal residents, community members). At community events, on the beach, and in home visits to each of the fifteen fishers, researchers explained the study, invited participation, and distributed forms. Fishers also helped to distribute forms and recruit other participants. Ten different fishers (67% of the target population) returned forms, two others participated in fishing events reported by other fishers, and one apparently did not fish during the study period, leaving two fishers (13% of the target population) un-represented. All participants had family ties to Hā‘ena, and most shared native Hawaiian ethnicity; fishers ranged in age from nineteen to seventy-seven, were all male, and encompassed variations in Hā‘ena family lineages, *ahupua‘a* of residence, gear types, and regular fishing locations. While other individuals also fish the area, the fisher population surveyed here harvests in Hā‘ena more frequently (an average of twice per month vs. twice per year), and has a higher catch rate than fishers without family ties to Hā‘ena (Hā‘ena CPUE survey 2011, unpublished data).

Quantitative Data Collection

During the data collection period, researchers regularly visited fishers to follow up, often helping to fill in forms based on fishers' recollections. To ensure reliability of catch data and full representation of distribution, researchers collected data from as many fishers as possible in cases where multiple individuals participated in the same fishing event, though catch data were entered only once to preclude double counting. Data were collected for a year and a half, encompassing two summer fishing seasons and one winter season. Fishers logged weather data, fishing start and end time, catch (quantity, length, weight, species name, stomach contents and presence of milt or eggs), along with distribution information including fish recipients' names, relationship to fisher, residence location, and intended use of the fish. This study tracks sharing through "distributions," the number of times fish are caught and transferred from fishers to other individuals, rather than the number or weight of fish transferred. It excludes any further sharing by the first order recipients, those who initially received fish from fishers. We assumed some portion of each catch was consumed within the fisher's immediate households, an assumption that fishers confirmed as generally true.

Qualitative Data Collection

Quantitative data was supplemented by regular informal discussions with fishers and through participant observation of community fishery meetings, fishing activities, pā‘ina or large social gatherings and other events. These interactions informed the final phase of research, shaping questions for twenty semi-structured summary interviews: ten with the participating fishers, and ten with nonparticipating fishers, regular fish

recipients, area elders, and/or expert cooks. One researcher who was already known to interviewees conducted all of the interviews, which averaged an hour and a half. Interview topics included: fishing methods; fish consumption and preparation; how fishers learned and teach; informal rules guiding "responsible" harvest; and descriptions of how, why, and to whom catch is regularly distributed. Each interview was recorded, transcribed, and analyzed using a grounded-theory approach (Glaser and Strauss 1968). Each interview was coded using HYPEResearch qualitative coding software. Broader themes were derived from an initial round of coding (Miles and Huberman 1994), then used to re-code data. Researchers further verified data and engaged community members in participatory analyses by sharing preliminary findings through four community meetings, two focus groups, and multiple informal discussions with fishers and regular fish recipients.

Results

Characterization of Fishing Patterns

This study logged over 50 catch events, totaling 4,231 kg of fish and 200 catch distributions. The most frequently caught species was *Kyphosus spp.* (*nenue* or chub, a complex of species most of which are indistinguishable in the field) while *Selar crumenopthalmus* (*akule* or big eye scad) was most frequently distributed. Though some fishing occurred year round, the summer fishing season of May – September accounted for the majority of catch (65%) and, to an even greater degree, distribution (82%). During summer months, schooling species such as *akule* and *Albula glossondonta* (*ʻōʻio* or small

mouth bonefish) aggregate in nearshore waters – and in the winter, high surf makes access to the ocean difficult and dangerous.

The most commonly used fishing gears reported in this study were cast ("throw") nets and gill ("surround") nets. Throw nets are funnel shaped, opening fifteen to twenty feet in diameter when flung on top of a school feeding on the reef; they can be used by an individual fisher. Surround nets, joining hundreds of feet of straight net lengths, are set using a rowboat to encircle schooling species in sandy bottom lagoon areas. Surround fishing events require a team of individuals, including a kilo (spotter), boat-man, divers maintaining the net under water, and a team to pull the net into shore, then extricate each fish (Maly and Maly 2003). While Hā'ena fishers also use other methods such as Hawaiian sling or hand-held spears, and *pa'ipa'i*, in which groups of fishers drive fish into a set length of net, each of these gears only showed up once in this study.

In this study, throw nets were used year round, and more frequently than surround net (33 times vs. 13 times); surround nets were only used during the summer months. These two gear caught different species, with surround nets used to catch *akule* and occasionally *'ō'io*, while throw nets caught fewer individuals of a wider variety of species including *nenue* and *Acanthurus sandvicensis* (*manini* or convict tang). Though surround nets were used less, this gear resulted in larger catches than throw net (average – 151 vs. 20.4 kgs.) and more distributions per catch (average 8.2 vs. 2.8 distributions). Data collected through semi-structured interviews revealed the importance of throw net for procuring fish year round, even during the high surf season of October – April. In contrast, surround net yielded larger harvests of the prized schooling species during summer.

Characterization of Distribution Patterns

Self-provisioning

Interviewees described Hā‘ena fish as an important food source for fishing families and their *mahele* recipients, whether fresh caught or frozen and stored for later consumption. The family of one fisher described finishing the summer catch of *akule* from its freezer in February. In this case, three surround harvests contributed to six months of protein for one family of four and many of their friends and extended family, representing a potentially substantial savings in grocery bills. Throw net provided more diversity in meals, with fishers typically describing throw netting on the weekend to catch a variety of reef fish for their immediate or extended family's dinner. In every interview, fishers express the importance of being able to feed their families without reliance on grocery stores. Interviewees describe *mahele* as key to surviving major disturbances such as past hurricanes which cut off food supply to the island of Kaua‘i.

Sharing

Consumption at home represented just under 25% of fishing distributions, while sharing represented 75% (63% sharing to other individuals or families, plus 12% shared specifically for *pā‘ina*, large social gatherings commemorating community events such as graduations or funerals) (Figure 2). Interviews reinforced the historical, cultural responsibility of fishers to feed not just their family, but the entire *ahupua‘a* community. Multiple interviewees describe dropping off fish at each house on the way back from a fishing trip, arriving home with just enough fish to feed the family, or even giving it all

away before reaching home. Interviewees also frequently recalled the generosity of head fishers of past generations, for example filling large bamboo baskets with *mahele* for each family after a surround event. *Mahele* in this study ranged in size from 1-220 kg; common means of distribution included gallon size zip-loc bags, five gallon buckets, and 100 to 700 liter coolers.

<< Fig. 2 near here >>

Relationships Between Fishers and Fish Recipients

Fish were shared in roughly equal amounts among fisher's immediate families (24%), extended families (21%), people who helped with harvest (22%), friends or other community members (20%) as well as with *kūpuna* (elders) (11%) (Figure 3). Shares to elders recognized their respected cultural status, ongoing contributions as advisors and teachers, and past contributions of physical labor, in some cases teaching current generations of fishers. Many interviewees expressed the importance of ensuring elders continue to have fish, a taste of their childhood, even after they can no longer procure it for themselves. Interviews describe surround net helpers in this study receiving large *mahele*, (100-200 kgs) that they then shared with many others. Interviews also revealed the concern that fish not be wasted. Fishers distribute fish to families they know will prepare and eat them, avoiding *mahele* to homes likely to receive the same species from multiple people. Less than 1% of fishers' distributions went to coworkers, neighbors, and bystanders on the beach during a harvest (Figure 3).

<< Fig. 3 near here >>

Geographic Distribution

In this study, only 13% of distributions of Hāʻena fish stayed within the *ahupuaʻa*, while 53% stayed within the Haleleʻa *moku* (district) (Figure 4). Nearly half of all distributions were to two *ahupuaʻa*: the neighboring *ahupuaʻa* of Wainiha (25%) and the closest town Kīlauea (25%), which lies just outside of Haleleʻa (Figure 1). Interviewees attribute the high volume of distributions to these two locations to the fact that most fishers with ancestral ties to Hāʻena live in Wainiha and Kīlauea, communities where housing costs are lower than Hāʻena. Some interviewees included Wainiha, which borders on Hāʻena, within Hāʻena's traditional and customary fishing grounds. Fishers and helpers receive over half of the distributions to these areas and within Hāʻena (Table 2). Hāʻena fish were also distributed to areas of Kauaʻi beyond Haleleʻa, with slightly more distributions to Anahola Hawaiian Home Lands and Kapaʻa, areas with higher concentration of families with Hāʻena roots, than to further areas like Līhuʻe and Kekaha (Figure 1, Table 2). While 91% of distributions stayed on Kauaʻi, *mahele* also went to two other Hawaiian islands (Oahu (1.5%) and Hawaiʻi (.5%), and as far as the West Coast of the United States (1%) (Figure 4). Distribution differed by species, with less frequently surrounded species such as *ʻōʻio* shared to more distant parts of Kauaʻi island. Focus group participants also attributed the wide distribution of *ʻōʻio* to the location of families skilled in its preparation who return some of the fish back to fishing families in the form of a local delicacy (fish cake). The main determinants of the geographic distribution of sharing of fish appear to be spatial proximity to Hāʻena and its customary fishing grounds, location of *pāʻina*, fishers' homes, and residences of families with ties to Hāʻena or Hāʻena area fishers.

<< Fig. 4, Table 2 near here >>

Discussion

Traditional and customary practices of subsistence fishing in Hā‘ena continue in contemporary times in spite of historic and economic changes in land tenure and development patterns. Due to these changes, most families with Hā‘ena roots no longer live in their traditional land division (*ahupua‘a*), however, they continue to harvest and to receive fish from Hā‘ena’s inshore fishery through customary sharing networks. Customary sharing of fish, even from a small subsistence fishery, provides multiple linked benefits including perpetuating traditional and customary practices, maintaining socially significant roles for fishers, strengthening social networks of extended family and community ties, distributing natural resource abundance through reciprocal exchange, providing self reliance and collective insurance, and contributing to community resilience.

Cultural Perpetuation - Traditional and Customary Practices

This study illustrates the contemporary significance of place-based cultural practices in sustaining ongoing relationships between Native Hawaiians and particular natural resources or “ *‘āina*” (Kikiloi 2010, Kana‘iaupuni 2006, McGregor 2007, Andrade 2008) as is true for other indigenous groups (Sepez 2008, Panelli and Tipa 2009, Berkes 1999). The cultural significance of traditional and customary subsistence fishing practices (Panelli and Tipa 2009) extends to sharing the products of these harvests (Severance 2010). In interviews fishers describe *mahele* to the *kūpuna* who taught them

to fish, as well as to the broader community, as a way of remembering their teachers and showing respect and gratitude by using skills shared. As one interviewee explained, he never went to school, and he does not speak his Hawaiian language, but he can fish and feed people, and perpetuate those parts of the culture in his life. Through *mahele*, Hā‘ena fishers fulfill a cultural responsibility to feed the entire *ahupua‘a* community within contemporary times, as well as to provide fish for cultural and ceremonial occasions where certain species play an important role (Severance 2010, Sepez 2008).

The cultural importance of species such as *akule* in Hā‘ena is reflected in *mahele* sent to family members living as far away as California. Like salmon in the Pacific Northwest (Garibaldi and Turner 2004), the multiple cultural practices associated with these species - their sharing, preparation, collective harvest, consumption, and associated transmission of knowledge - are as important to cultural perpetuation and identity as the nutritional and economic value of the fish themselves. This study thus supports the concept of *‘āina*, or natural resources, as that which feeds a community, not just physically, but spiritually, culturally, and intellectually as well (Andrade 2008, Vaughan, unpublished data). Provisioning of food is inextricable from other lifestyle benefits accruing from subsistence activities in mixed economies (Garibaldi and Turner 2004, Panelli and Tipa 2009).

Social Status - Roles and Responsibilities

This study supports prior work showing that the motivation to give fish relates to fisher’s role and reputation in their community (Severance 2010). Fishers interviewed in this study expressed pride at being able to give generously and feed their extended

families, fishing helpers, friends, and community members. Many interviewees expressed the belief that "the more you share, the more you catch." Sharing of fish also highlights privileged knowledge of fishing spots passed within families, cultural perpetuation through practice, skill in using certain gear, and fishing "luck" thought to evidence balanced relationships with fish; all attributes which confer respect to individuals and their families. In Hawaiian society, attribution of respect is linked to generosity and fulfillment of collective responsibility (Andrade 2008).

While many studies postulate that subsistence gathering activities are most important for low income families and thus will be less significant in mixed economies where more families are supported by wage labor (Brown et al. 1998), this study suggests the opposite. In indigenous populations integrated within mixed economies, wage labor decreases time for the perpetuation of traditional and customary skills such as fishing, contributing to the specialized nature and value of once common skills. This is especially important for indigenous cultures within mixed economies where many cultural roles, particularly for males, are disrupted or devalued by colonization and economic shifts to menial opportunities for wage labor (Tengan 2008, Kana'iaupuni 2006).

Social Networks - Extended Family and Community

Mahele also serve to strengthen community cohesion, building connections between families and individuals from harvest, to distribution, to collective consumption. Interviews reveal how the largest categories of giving (extended family, friend, and community member) recognize and strengthen existing connections between individuals within the community. For example, one fisherman recounted that he always gives

mahele to the woman who cared for his baby son so he and his wife could work. Though that child is now ten, his father's *mahele* continue to express his gratitude and memory of their families' connection. Sharing networks also often reflect extended family ties between those engaged in subsistence harvest and their recipients (Nolin 2010). In this study, dropping fish at the homes of extended family members strengthens family ties by providing a reason to visit, remember and renew connections. This work supports other studies showing that customary sharing contributes to maintaining strong social networks even within diverse communities. Customary sharing and exchange of fish in the Pacific "often means that fish flows across ethnic and cultural boundaries and brings people of quite different backgrounds together" (Severance 2010). Examples include surround harvests, which commonly engage ten to forty individuals, and *pā'ina* where fish are consumed by hundreds of celebrants; such events regularly bring together large, diverse groups within Kaua'i's Halele'a community. Strong social networks such as those fostered and sustained by the customary harvest and sharing of fish are, in turn, associated with multiple benefits (Putnam 1993) including the potential for collective action to manage natural resources (Janssen & Ostrom 2006, Crona and Bodin 2006). While linkages between community groups and other levels of management such as government seem key to determining management performance (Marin et al. 2012), bonding linkages that strongly connect individuals within a given community can also increase the ability of local fishers to maintain sustainability of their fishery (King 2000).

Reciprocal Exchange – Collective Insurance

Social networks within extended families and community further provide informal economies of exchange and reciprocal sharing that have been documented within both Hawaiian (McGregor and Minerbi 1998) and other indigenous contexts (Panelli and Tipa 2009). Fishers in this study described *mahele* recipients returning a variety of goods from smoked meat, to homemade bread, to Filipino food, to mangoes the week after a surround. *Mahele* facilitates exchange of skills (eg: child care, the ability to make fishing nets, preparation of a culturally important dish) as well as goods. *Mahele* continues the *ahupua'a* function of distributing abundance, both in terms of natural resources and human skills, through informal sharing networks.

These goods and skills that *mahele* recipients share with fishers support past work describing the "obligatory nature" of exchange between Hawaiian families within an *ahupua'a* (McGregor 1996). Recipients of shared products of subsistence harvest have an informal, but nonetheless powerful, obligation to reciprocate (McGregor 1996), creating a non-market exchange system based on generalized reciprocity (Bliege, Bird, and Smith 2005). Unlike barter and trade, or balanced reciprocity, where there is "some expectation of a return gift of some equivalency within a shorter time frame" (Severance 2010), generalized reciprocity is sharing knowing that gifts will be repaid, even if not by recipients themselves, without tracking time or amounts (Bliege, Bird and Smith 2005, Severance 2010). For example, in the recent economic recession fishers regularly took fish to families where one or more parent had recently lost a job or been furloughed. Such sharing extends the benefit of self reliance emphasized in past studies of subsistence harvest (Tietelbaum and Beckley 2009, Hinrichs 1998, Tigges 1998) from the immediate

family to community level. Generalized reciprocity at the societal level acts as a form of collective insurance, helping even those families without individuals who fish to withstand economic disturbances and natural disasters, thus building community resilience.

Community Resilience

Taken together, the benefits described above help to maintain long term relationships between communities and natural resources in the face of pronounced social and economic change. These relationships contribute to ongoing resilience, or "the capacity of a social-ecological system to absorb disturbance and reorganize . . . to still retain . . . the same structure, function and identity" (Walker et al. 2004). Demographic and economic shifts such as rising land taxes and coastal development make it harder for community members to reside in or access the physical *ahupua'a* of Hā'ena, while engagement in wage labor usurps time for traditional and customary practices and with extended family. Customary sharing provides a source of resilience through all these changes. While dispersed, Hā'ena's human community today continues to exist in a "modern day *ahupua'a*," remaining connected through familial and social ties, and through natural resource flows from an area that remains an ongoing source of physical, economic, cultural, and social well being (Andrade 2008). Past studies describe subsistence fishing promoting resilience at the individual family level by providing food security in uncertain economic conditions where wage labor is erratic (Marschke and Berkes 2006). We suggest that the sharing of natural resources from subsistence fishing also promotes resilience, not only for the individual family, but at the extended family

and community level, providing a means of perpetuating vital functions of disrupted social-ecological systems, including access to customary food sources, cultural perpetuation, social roles and responsibility, strong social networks, and collective insurance through reciprocal exchange.

Lifestyle Benefits – Cultural Ecosystem Services

In this study we highlight the importance of non-material benefits people obtain from ecosystems, while adding to knowledge of challenges of measuring these benefits (Chan et al. 2012). First, the benefits of practices such as the customary sharing of fish accrue at the community rather than individual level. Second, these benefits are place specific and difficult to generalize. Third, practices such as *mahele* create multiple overlapping and linked benefits such as cultural perpetuation and social cohesion, for which separation and individual valuation is impossible (Chan et al. 2012). Attempts to quantify the benefits of *mahele* through indices such as harvest rate or quantity, fish distributed, individuals fed, or the economic value of food provided, could capture the benefits of food provisioning services, while missing other categories of value evidenced in this study. Indicators such as relationships built, responsibilities fulfilled, or skills transmitted, though difficult to characterize (much less quantify) represent more meaningful assessments of the benefits of fish sharing and possibly other traditional and customary practices related to subsistence harvest.

Policy Implications

The significance of sharing products of subsistence harvest has several policy implications. First, even small subsistence fisheries may provide substantial benefits to a larger population than fishers themselves. Marine policy implementation efforts may be more successful in areas where subsistence fishing takes place if they account for community sharing networks, and incorporate those networks in their planning through expanded outreach efforts that engage regular fish recipients in decision making processes alongside fishers themselves. Culturally, fishing and sharing fish from a particular place is important. The same species caught in a different location or distributed through different means than these sharing networks would not provide the same benefits. Therefore, where policies close a given fishery, allowances for ongoing, limited subsistence harvest may be more effective than economic compensation or promoting opportunities to harvest the same species in another location.

Second, processes of social change and cultural erosion common to mixed economies may enhance rather than reduce the non-material benefits of customary sharing. For example, when people are engaged in wage labor, sharing may become less important for food security, while its contributions to benefits such as cultural perpetuation and social networks become more valued. Furthermore, cultural ties to particular land and natural resources, along with the benefits they provide, are significant and ongoing, though they may operate in new forms and on more extended geographic scales than in historic times. It is important that policy makers not overlook the ongoing practice and benefits of traditional and customary place-based practices simply because they have adapted to a changed economic and geographic context.

Finally, research to understand subsistence fishing and sharing patterns, along with other resource based traditional and customary practices, requires engaging fisher people and community members. Such research requires respect, flexibility, commitment to protecting sensitive information, and time to build trust and cooperation. Investing time in site specific development of research relationships is necessary to documenting often overlooked benefits of customary practices related to subsistence harvest as these benefits are difficult to generalize or measure in a quantitative way, but are nonetheless important to the life and well being of communities.

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Figure Legends

Figure 1. Kauaʻi Distribution Map.

Map of the island of Kauaʻi showing Hāʻena and other areas receiving fish from Hāʻena. Lines designate historical *ahupuaʻa* boundaries while names indicate towns or smaller settlement areas within particular *ahupuaʻa*. Shading indicates the fraction of fish shared from Hāʻena that went to each area. In addition, small distributions went to the Islands of Oahu and Hawaiʻi, and to California and Oregon. (Created by H. Peter King).

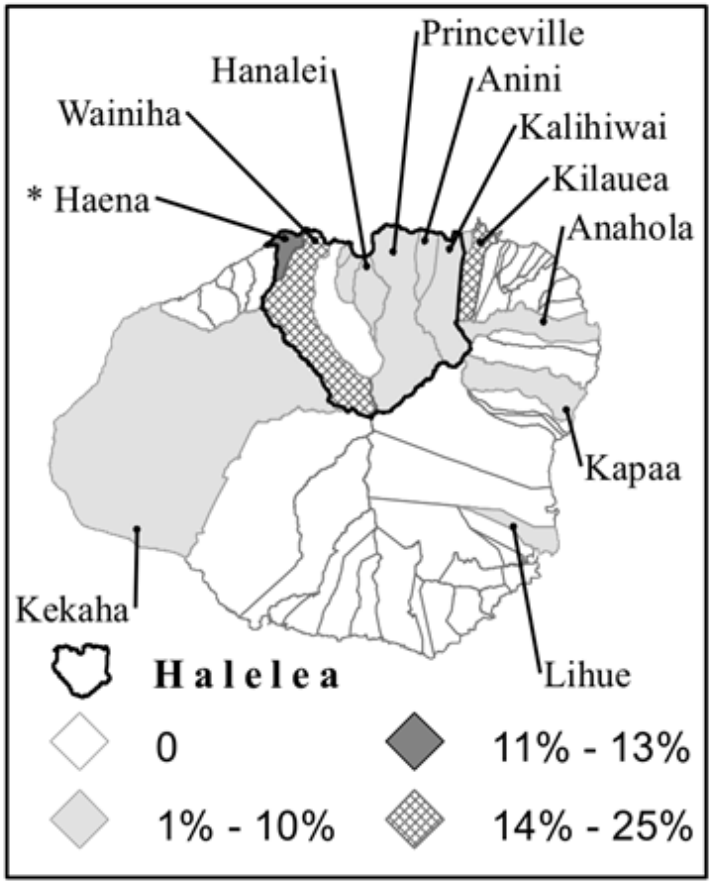


Figure 2: Purpose of Distribution (n=209). 76% of All Catch Was Shared (i.e. *Mahele*).

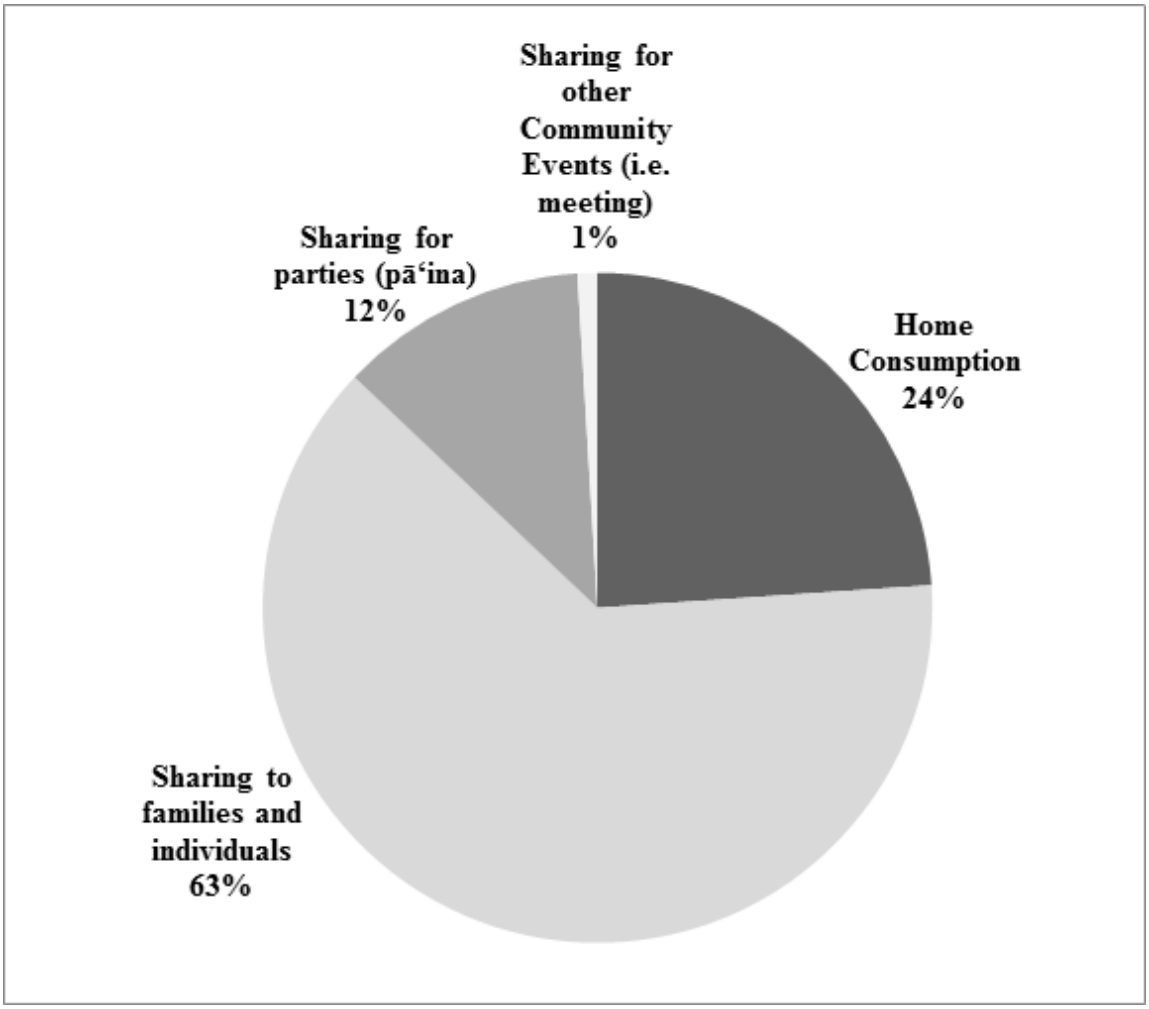


Figure 3: Recipient Relationship to Fisherman (n = 197). Immediate family includes parents, children, and siblings living in the same household. Extended family includes all other family members and relatives. Helpers are individuals who assist with a catch. Elders are individuals given fish exclusively on the basis of their age, who are not members of fishers' extended or immediate family. Bystanders are individuals who happen to be present on the beach during the catch.

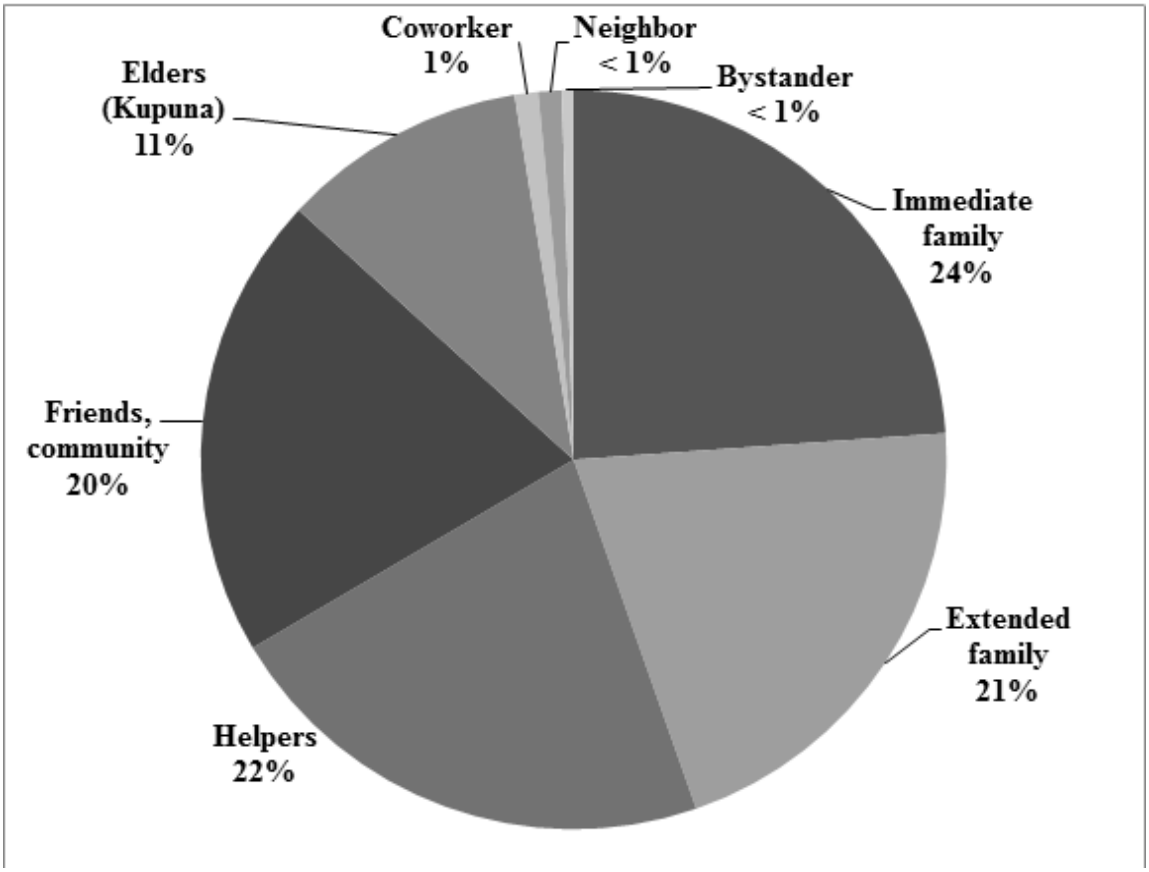


Figure 4: Geographic Distribution of Fish (n=210).

Note: Each category on the chart is mutually exclusive. The distributions for Halele‘a include Halele‘a *ahupua‘a* other than Hā‘ena, while Kaua‘i distributions include all districts other than Halele‘a, and Hawai‘i state distributions include all islands other than Kaua‘i.

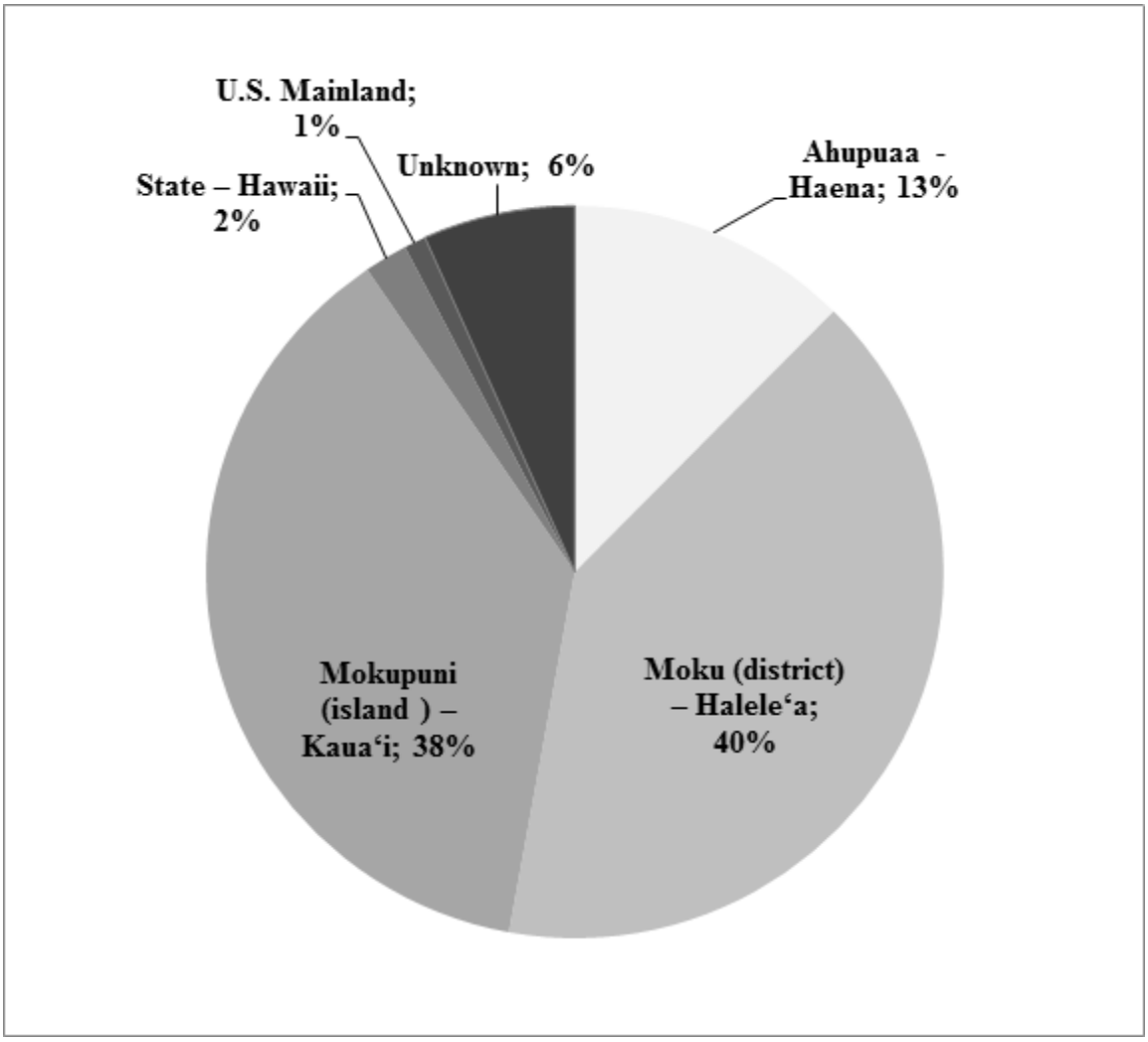


Table 1. (Next Page) Recipients Relationship to Fishers by Geographic Area (n=210).

Categories of relationships between fish recipients and fishers are shown as percentages of the total number of distributions to each area (n=210).

Destination	Number of Distri-butions	Immediate Family (%)	Extended Family (%)	Helpers (%)	Friends, Community (%)	Kūpuna (%)	Other[33] (%)
1. AHUPUA'A:							
Hā'ena	**26**		**19**	**65**	**4**	**4**	**8**
2. Moku (district):	**Halele'a**						
Wainiha	53	38	28	13	19	2	
Hanalei	12				58	33	8
Princeville	2					100	
Anini	6		33		67		
Kalihiwai	12		8	17	58	8	8
District Total:	**111 (53%)**						
3. ISLAND:	**Kaua'i**						
Kīlauea	51	49	10	22	14	6	
Anahola	10		30	20	30	20	
Kapa'a	11	18	9	9	55		9
Līhu'e	5		20		80		
Kekaha	2				50		50
Island Total	**190 (90%)**						
4. STATE:	**Hawai'i**						
O'ahu	3		100				
Hawai'i	1		100				
Non-Kaua'i State Total:	**4 (2%)**						
5. COUNTRY	**U.S.A.**						
California	1		100				
Oregon	1				100		
Non-HI Country Total	**2 (1%)**						
6. Unknown	14 (7%)	20		33	47		

[33] Other = Co-workers, Neighbors, and Bystanders at the Harvest

Title:
Pāwehe ke Kai a‘o Hā‘ena:
Integrating Informal Local Norms of Coastal Management into State Law

Authors:

Mehana Blaich Vaughan
Barton Thompson[34]

Target Journal:

Society and Natural Resources

[34] For this chapter, Mehana Blaich Vaughan completed all the primary data collection and analysis. She also had the primary role in writing.

Pāwehe ke Kai A‘o Hā‘ena

(Intricately Patterned is the Sea of Hā‘ena):

Creating State Rules Based on Customary Norms of Coastal Management

ABSTRACT:

This is a case study of collaborative creation of formal state management rules based on informal customary norms, or rules of behavior for interacting with resources. We explore one rural Hawai‘i fishing community’s five year effort to create state rules based on customary norms guiding fishing and coastal use. What is needed to integrate customary norms into state rules? What key factors and constraints influence this integration? What relevant lessons emerge for other efforts to base contemporary management on customary systems? We draw three main conclusions. First, implementing some norms of customary management requires fundamental changes in state-level resource institutions: specifically increased integration among agencies, increased diversity in the types of data informing decision making, and increased flexibility to adapt rules. Second, communities can sometimes overcome constraints in state-level institutions by identifying substitutes for community norms that are impossible to implement directly. Third, because many community norms play a major social role, their implementation requires supplementing formal regulation with educational and social programs outside the rule-making process. Based on these outcomes, we offer suggestions for other efforts to base contemporary management on customary norms.

"You don't go hunt everywhere for fish,
you meet them when they come home for lunch"
(Hā'ena fisherman).

"*No kapulu,"* meaning don't leave the place a mess
(Hā'ena elder).

"When we go *holoholo* (fishing) everything has to be nice
and the niceness comes from the home.
You cannot have arguments that day or the night before,
everything has to be good in the home"
(Hā'ena fisherman).

"People used to be scared to *kolohe* (be rascally towards or disturb) the fish"
(Hā'ena elder).

"It's not how it was 200 years ago, it's not how it was 100 years ago, but we're going to figure out how to operate within this system to make sure that our culture survives. We can still eat from the land and the ocean and *mālama 'āina* (care for natural resources) so that we are healthy. And that is the embodiment of the community's voice attempting to be resilient in the face of change."
(Hā'ena community member)

"I find a lot of courage in Hā'ena for being willing to be the pioneers down this path, see what happens in taking their traditional values and applying them in a Western system. But anytime people take that kind of risk, they might not like the outcome"
(Rule-making process facilitator).

"What we need to do is figure out how to use the tools that we see as constraining us. How do we learn to use those tools to our own advantage?"
(Hā'ena community member).

"I'm really proud of the rules that we submitted in our draft proposal.
I think they do a good job of maintaining the foundation of the culturally based rules,
putting it in a way that makes sense for people who are not from here
or do not necessarily share that same world view"
(Hā'ena community member).

INTRODUCTION

Can contemporary State management rules integrate customary norms?[35] Norms are "customary rules of behavior that coordinate our interactions with others" (Duraluf and Blume 1999). These norms, or informal customary rules, regulate interactions among people as well as between people and their environment. Under certain conditions, local resource management systems based on customary norms can result in sustainable natural resource management, providing an alternative to either solely government or private systems (Berkes 2000, Ostrom 1990). Research on nearshore fisheries, in particular, suggests benefits of basing contemporary management on customary systems (Johannes 2002, Cinner and Aswani 2007). Customary management systems consist of "local practices designed to regulate the use, access, and transfer of resources…which have been crafted through generations of human interaction with the environment" (Cinner and Aswani 2007, p. 202). These benefits include incorporation of "best practices," adapted to effectively conserve specific resources for communities who rely upon them (Berkes and Folke 1998) and increased legitimacy of regulations leading to enhanced compliance (McClanahan et al. 2006). Research on the integration of contemporary and customary management systems often focuses on specific practices, without considering underlying norms, the rules that actually promote or prohibit specific practices (Jones 2011). Yet norms express values and fundamental cultural

[35] Throughout this paper, I use the term, "customary norms," to refer to informal rules guiding interactions with resources at the local level. I choose customary rather than "community norms" to highlight that these norms have developed over long periods of interaction with a specific place. I chose customary rather than "traditional," or "indigenous," (an ethnic descriptor of the native or "first people" of a place) because, though the customary norms in this case are Native Hawaiian, the findings and analysis in this study, apply in other cases where user communities are not indigenous (i.e., Acheson 2004). It is also important to note that other research has showed that local ecological knowledge, and strongly held norms of resource use, can develop over time periods as short as ten years, as with immigrant groups harvesting non-timber forest products in the Pacific Northwest (Ballard and Huntsinger 2006).

understandings of relationships between people and natural resources. Policies based on particular norms may result in redistribution of power or resources (Jones 2011).

Co-management partnerships, involving shared management authority and responsibility between governmental agencies and community groups often assume incorporation of indigenous knowledge and practices into unchanged state management regimes without examining conflicts in underlying norms and values (Jones 2011, Nadasdy 2003). Meaningful integration of customary norms into western management is difficult even in cases involving indigenous groups with sovereign powers such as New Zealand Maori and First Nations groups in Canada who negotiate with government bodies on terms of nation-to-nation status guaranteed by treaty rights (Nadasdy 2003, Tipa and Welch 2006). However, legislative mandates to base management on customary norms may help to increase their integration within state rules by decreasing power inequities (Pinkerton 2003).

We examine creation of rules based on customary norms regulating coastal use within one rural, Hawai‘i fishing community. Here, legislation mandates state resource management agencies to partner with area residents to create and enforce rules based on traditional and customary management practices for the area. We investigate the following three research questions: 1) What is needed to integrate customary norms into state rules? 2) What key factors and constraints influence this integration? 3) What relevant lessons emerge for other efforts to base contemporary management on customary systems? In this research, the customary norms are indigenous, in this case Native Hawaiian, and the government agencies are state level. However, findings of this study may also apply in other cases where longstanding, informal community norms are

integrated into formal government policy.

BACKGROUND:

We focus this study on the *ahupua‘a* of Hā‘ena, a rural community located within the *moku* (district) of Halele‘a on the island of Kaua‘i’s North Shore (Figure 1). *Ahupua‘a* are traditional land divisions, typically stretching from the mountains into the ocean, used by Native Hawaiians to delineate rights to utilize natural resources (McGregor 1996, Beamer 2012). These exclusive gathering rights provided both responsibility and incentive for residents of a given *ahupua‘a* to sustainably manage the resources they and their *‘ohana* (families) depended upon for survival (Andrade 2008; Kelly 1982; McGregor 1996). As in other parts of the Pacific, management of nearshore coastal fisheries in Hawai‘i and other parts of the Pacific has shifted from the local or *ahupua‘a* level to centralized government management.

Figure 1: Location of the *Ahupua'a* of Hā'ena in the District of Halele'a, on the Island of Kaua'i, Hawai'i.

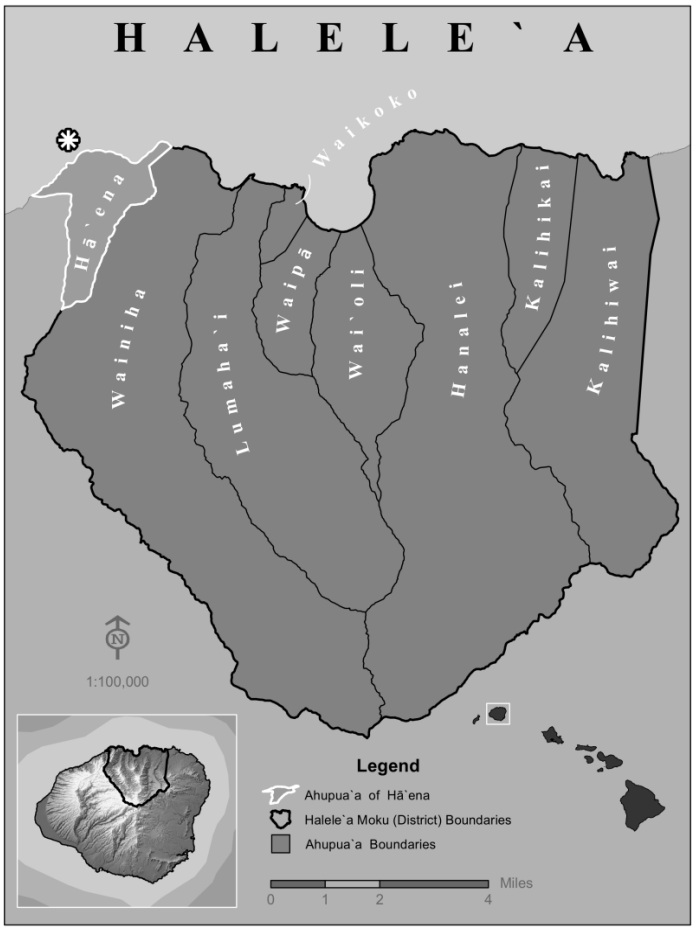
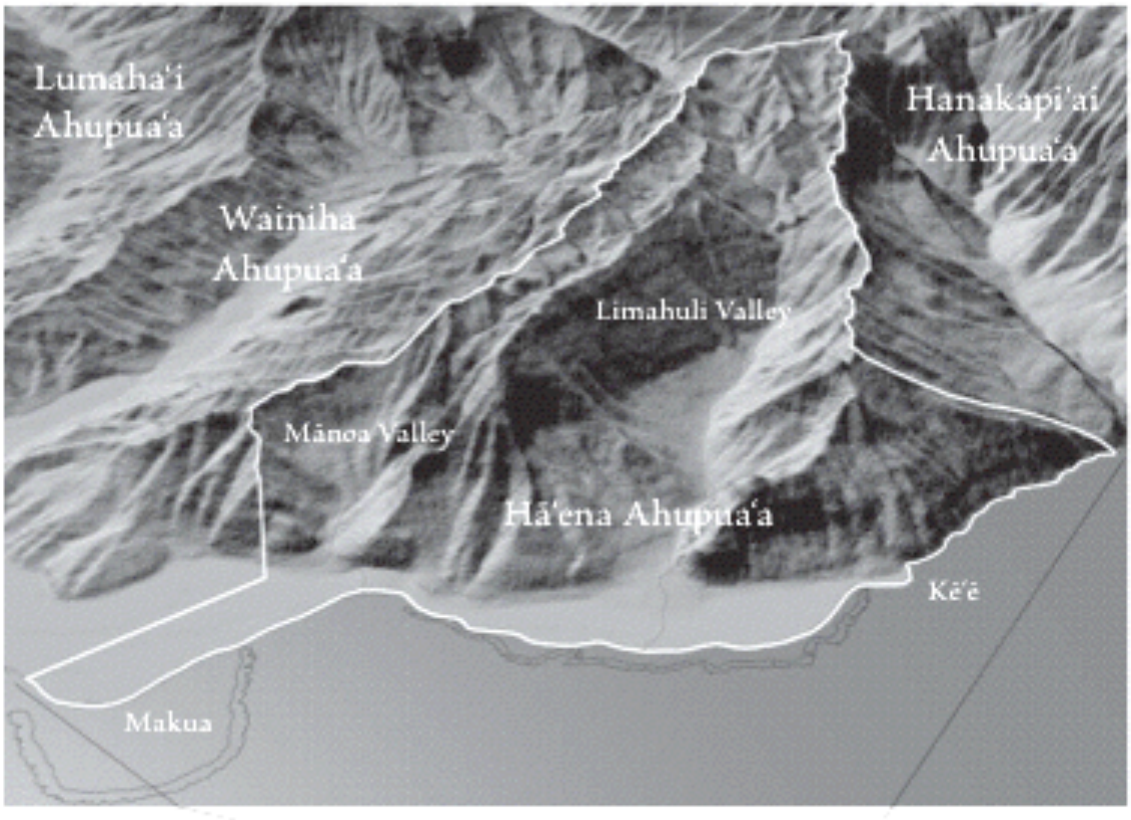


Figure 2: Aerial View of the *Ahupua'a* of Hā'ena and its Nearshore Fishery.



Ahupua'a fisheries extended from shore to the edge of the fringing coral reef. Areas seaward of this boundary were ruled centrally by the *ali'i* (royalty of the Hawaiian Kingdom) with rights to manage and use areas nearshore of the boundary reserved for *ahupua'a* residents and the *konohiki*, often a local overseer representing the ruling *ali'i* (Higuchi 2008).[36] These property rights were formally recognized and incorporated into Hawai'i's first constitution in 1848 (Kosaki 1954, Higuchi 2008).

Master fishermen within each *ahupua'a* were responsible for overseeing collective fishing and distribution of catch, and in some cases for advising *konohiki* on management decisions such as when to close a certain species (McGregor 2007, Jokiel et

[36] *Konohiki* is often translated as headman or woman. However, its literal meaning, "*kono*," to invite or welcome, and "*hiki*," ability or willingness, literally means one who makes things possible, mobilizing community ability. Hā'ena is known for both female *konohiki*, and for many of these *konohiki* ruling independent of central *ali'i* or chiefly authority (Wichman 1998).

al. 2011). Fishing knowledge was privileged and handed down within families (Jokiel et al. 2011). Fishing followed moon and spawning cycles, and seasonal patterns in weather and surf. Common customary local level management tools include rotating area and seasonal closures, restricting harvest to area residents, and reserving particular species for certain individuals (Higuchi 2008). Local level management sustained healthy in shore fisheries that were the primary source of protein for a population, at least on the outer islands (excluding O‘ahu), greater than that of Hawai‘i today (Jokiel et al. 2011). However, *ahupua‘a* based management and fisheries rights were formally terminated when the United States incorporated Hawai‘i as a territory in 1900, shifting to centralized fisheries management under the territorial and later state government.

Today fisheries management in Hawai‘i falls to the State Department of Land and Natural Resources (DLNR), a large Honolulu-based agency. DLNR consists of eleven divisions, each responsible for managing different resources (e.g., fresh water, forests). The Division of Aquatic Resources (DAR) regulates fishing. DAR’s regulatory approach is based upon four main tools: restricted use areas, gear restrictions, species-specific catch limits and minimum sizes; and closed seasons for select species (Higuchi 2008). Catch, size, and season restrictions apply statewide though research shows certain species spawn at different times across Hawai‘i (Poepoe et al. 2006). Penalties for rule infractions include fines and confiscation of gear, however DOCARE (Division of Conservation and Enforcement), DLNR’s enforcement division, is understaffed due to budget constraints. For example, six officers patrol the 562 square miles Hawaiian island of Kaua‘i (USGS 2012), from mountain forest to three miles out to sea, including approximately 115 miles of coast.

In response to perceived declines in nearshore fisheries under state level management, and in keeping with the renaissance of customary management in other parts of the Pacific (Cinner and Aswani 2007), residents of rural Hawai‘i communities who depend on local marine resources for subsistence advocate for restoration of customary local management. In Hawai‘i, evidence suggests that customary management can result in more fish biomass and species richness than government prohibitions on all take of marine species (Friedlander et al. 2003; Friedlander et al. 2013). In response to community pressure (Vaughan and Vitousek 2013, Higuchi 2008), Hawai‘i enacted legislation in 1994 (Act 271) allowing DLNR to designate community based subsistence fishery areas (CBSFAs) for "reaffirming and protecting fishing practices customarily and traditionally exercised for purposes of Native Hawaiian subsistence, culture, and religion" (Hawai‘i Revised Statutes, Chapter 188, Section 22.6). Achieving designation as a CBSFA "allows community members to assist DLNR to create management strategies based on native Hawaiian values" (Higuchi 2008, p. 2). Nineteen Hawai‘i communities have taken steps towards becoming CBSFAs (Higuchi 2008), with eight, including three entire islands, submitting bills for legislative designation (Kittinger et al. 2012). However, only two CBSFAs in Hawai‘i have been permanently designated. Hā‘ena is the first to submit CBSFA rules (Higuchi 2008).

Many elements facilitating customary management remain strong in Hā‘ena, including ongoing traditions of subsistence fishing (Vaughan and Vitousek 2013) , healthy marine resources including some of the highest biomass of fish in the state of Hawai‘i (Jokiel and Brown 2000), and community experience in advocating for local level resource management (Andrade 2008). The community and its marine resources

have also undergone substantial changes within a short time. In fifty years, the population of users has grown from a small community of Hawaiian families, fishing and shelling, to 2000 people per day, mainly tourists, using the coast for recreational activities (e.g., snorkeling, swimming, kite boarding) (Stepath 2006). During the same time period, extensive coastal development of luxury estates in Hā‘ena (Higuchi 2008) has driven up property values and reduced beach access (Andrade 2008). Many long time Hā‘ena families have moved out of the area although they still return to fish (Vaughan and Vitousek 2013). Today only half of Hā‘ena’s 322 homes are occupied by residents (U.S. Census 2010). The rest are vacation rentals. Hā‘ena’s CBSFA legislation is part of broader community efforts to restore customary management within this changed landscape of coastal use.

Hā‘ena’s CBSFA legislation mandated DLNR to work with Hā‘ena’s small population of around 430 residents, including nearly 100 Native Hawaiians, to create and enforce proposed rules based upon traditional management practices specific to the area (S.B. 2501, 23rd Leg., Reg. Sess. (2006). DLNR required proposed rules to meet the following parameters:

- Fall under the jurisdiction of the Division of Aquatic Resources
- Be able to pass the DLNR rule-making process as mandated by state of Hawai‘i administrative procedural law (including public hearing, and review by the small business association, governor and attorney general) (Kittinger et al. 2012)
- Adhere to U.S. and State constitutional law
- Strengthen, but not weaken, current State regulations
- Be simple to obey and enforceable.

These legal parameters present rigid constraints on potential outcomes. For five years a Hā‘ena “fisheries committee,” composed of representatives of families with ancestral

ties to Hā‘ena and other community members, worked with DAR and a nonprofit conservation group to draft proposed rules:

- One year for planning efforts to identify traditional practices, species of concern and key threats;
- Two years to integrate feedback from representatives of Hā‘ena area user groups and DLNR agencies and to agree on the basic content of the rules;
- Two more years to translate this content into legal language.

After over five years, forty-five meetings, and twelve rules drafts, Hā‘ena submitted proposed rules for DLNR approval on June 2, 2011. As of the writing of this paper, whether these rules pass DLNR and enter the formal review process to become law remains to be seen. This study focuses on the substantive results of this rule-making effort, considering integration of customary norms within the final proposed rules package, and how these rules changed over the five year process leading up to submission.

METHODS:

We identified customary norms and practices of coastal management in the *ahupua‘a* of Hā‘ena through document analysis supplemented by interviews, surveys, and a focus group. First we analyzed primary source documents spanning 1840-2010. A search of myths and legends and nineteenth century Hawaiian language newspapers offered only three specific references to coastal fisheries in Hā‘ena. Hawai‘i’s earliest written constitutions and records of case law regarding in shore fisheries illuminated customary property rights and the transition from *ahupua‘a* to state management. Fourteen oral histories of area elders provided place-specific information on coastal use between 1920 and 1970. From these primary source documents, we compiled a draft list

of customary norms for review by a focus group of knowledgeable Hā‘ena community members who deemed it a historically accurate representation.

To gather contemporary understandings of customary norms and practices, we analyzed minutes of ten community rulemaking meetings; conducted ten interviews with fishermen and other long time Hā‘ena community members; and administered open ended surveys to twenty community members of various ages and demographic backgrounds, asking them to list “traditional rules” related to fishing in Hā‘ena. All of the customary norms in our list derived from historic sources were reflected in contemporary understandings, though they were described in less detail and certain norms were emphasized more than others.

We used HyperResearch analytical software to review and code the oral histories, interview transcripts, and meeting minutes for specific examples and documentation of each norm. This data was used to organize the list of customary norms to seven, and to refine their descriptions (see Table 1). We then traced these seven norms through twelve iterations of community rules proposals emerging from the five-year rule making process to assess how norms were integrated into state rules.

RESULTS

Seven customary norms guiding coastal resource management in Hā‘ena emerge from this research (See Table 1). Through analysis of how each norm was integrated into the proposed rules package intended to become law, we find three distinct outcomes. First, implementing some norms of customary management requires fundamental changes in state-level resource institutions: increased integration among agencies,

increased diversity in the types of data informing decision making, and increased flexibility to adapt rules. Second, communities can sometimes overcome constraints in state-level institutions by identifying substitutes for community norms that cannot be implemented directly. Third, because many community norms play a major social role, their implementation requires supplementing formal regulation with educational and social programs outside the rule-making process.

Table 1: Customary Norms Identified In this Research with Key Findings.

SEVEN NORMS OF CUSTOMARY MANAGEMENT IN HĀ‘ENA	THREE OUTCOMES OF INTEGRATION WITHIN STATE RULES
1) *Ahupua‘a* (Integrated management at the watershed level) 2) *Ho‘omalu* (Minimize disturbance) 3) *Ho‘omaha* (Rest areas and rotate harvest)	1) Cannot be integrated into rules without changes in state resource management institutions.
4) *Kuleana* (Exclusive rights based on responsibilities) 5) *Lawa Pono* (Take only what you need)	2) Indirectly integrated into rules but customary norms may be unrecognizable in their new form.
6) *Hō‘ihi* (Maintain respectful relationships with resources) 7) *Mahele* (Share catch)	3) Cannot be integrated within state sanctioned rules, must be pursued through education and other social efforts.

A. Need for Institutional Changes in Government Resource Management Agencies

The following section illustrates institutional barriers to articulation of customary norms in state rules. We focus on three norms from the Hā‘ena process: *ahupua‘a*, integrated watershed based management; *ho‘omalu*, minimizing disturbance to key habitat; and *ho‘omaha* (rest), or rotating harvest areas.

Ahupua'a (Integrated management at watershed level):

> "When we go up to the mountain, we must respect, don't *kapulu* (dirty) the place. . . . not to *kapulu* the *kahawai* (river) and the *kai* (ocean)."

In some cases, customary norms may not match the scale and structure of governmental regulations. For example, the customary norm of *ahupua'a*, or integrated watershed management, recognizes the interconnectedness of resources from mountains to sea. From this perspective, the health of in-shore fisheries begins on land, depending upon the flow and cleanliness of fresh water streaming to the ocean. Hā'ena community members' goals for rules include addressing declining fresh water quality and quantity, as well as increased land-based pollution and sedimentation from coastal development (Hā'ena Submitted Rules, June 1, 2011). However, these impacts are regulated by three separate divisions of DLNR (Forestry and Wildlife, Office of Conservation and Coastal Lands, and the Commission on Water Resource Management). Hā'ena's proposed rules were required to fall exclusively within the jurisdiction of the Division of Aquatic Resources which strictly deals with fisheries and fishing impacts. Though customary *ahupua'a* based norms extended from mountain peaks to deep ocean, the proposed rules govern only a narrow band of shoreline, from the high water mark to the edge of the reef. The customary norm of *ahupua'a* management is incompatible with the fragmented organizational structure of Hawai'i's state resource management agency.

Ho'omalu (Minimize disturbance of key habitat areas):

> "If you're a farmer then you want your cows and pigs to be comfortable and happy, not scared. It's the same with fish. If you're always driving over with the boat, they're going to be scared" (Hā'ena community member).

Another problem that can arise in efforts to integrate customary norms is differences between the types of knowledge that are accepted by the community versus the government. Customary management in Hā‘ena emphasized *ho‘omalu*, or protection, minimizing disturbance to key areas of the coast where fish were known to feed and seek shelter. Only a generation ago in Hā‘ena the coast was viewed as a place to obtain food, not as a place for recreation, and adults recall coming to the beach as children only to help their families fish, pick *limu* (seaweed), or collect shells to be strung into *lei*. In particular, places of feeding, resting, and spawning were disrupted as little as possible so that fish would continue to frequent these areas. One 80 year old recalled her father instructing her not to walk along the shoreline of a crucial nursery lagoon. Instead, they walked a hundred yards up the beach in the trees, lest their shadows or footsteps scare the *pua (*baby fish) from the shallows where they were safe from predation.

Today, this same lagoon is the center of tourist recreational activity in Hā‘ena, with up to 300 people at a time snorkeling, scuba diving, and swimming, and an average of 20 people at a time walking the shoreline, on a typical summer day (Hā‘ena Community Coastal Use Study, Unpublished Data, 2009). Proposed rules would close all access, including fishing, to roughly a fourth of the inner lagoon, addressing widespread community concern that high volume recreation use within this hatchery area is linked to declining populations of juvenile fish. DAR officials expressed multiple concerns regarding this closure, including a lack of scientific studies linking changes in fish behavior and abundance to recreational use.[37] The proposed closure area was decreased

[37] Other objections are 1) lack of jurisdiction over boating and recreational issues which is regulated by the DLNR Division of Boating and Recreation (DOBOR), 2) anticipated vehement public opposition, 3) insufficient size to produce ecological benefits, and 4) enforcement challenges of closing access completely.

in size after negotiations with multiple user groups (i.e. surfers, kite surfers), and approved by DOBOR, the division of DLNR that regulates boating and recreational use. However, the acting DAR who held the authority to approve the rules at the time they were submitted was reluctant to regulate activities other than fishing on the basis of community knowledge,

> "When you're proposing to exclude all kinds of activities, not necessarily fishing activities, for the benefit of the resource, there has to be some supporting evidence. (At) a public meeting . . . people will say, 'Where's your proof? How can you propose to take away surfing because you think that it's going to affect the fish. . .?' Maybe the residents of Hā'ena (are) very good fishermen who understand that there's a connection. But I can't find something in the literature, some study that would support that." (DAR administrator).

Data derived from scientific studies is valued for decision-making within DAR over local ecological knowledge based on observational data. Integrating *ho'omalu,* minimizing disturbance of key habitat areas based on a holistic view of impacts that affect the fishery, requires expanding the types of data deemed valid for decision-making, or willingness to treat new rules such as this closure as an experiment.

Ho'omaha **(Rest)** Rest areas and rotate harvest:
Flexibility for Responsive Resource Management

> That is how the old folks did it. Grandpa did not fish certain places and he told all the uncles, 'Don't go fish over here for certain months out of the year.' And sure enough, they don't fish, and when they go back, AH! The *i'a* (fish) stay home again." (Hā'ena fisherman).

A final institutional challenge can be the procedural obstacles to modifying state rules. In customary management throughout the Pacific, spatial closures, restricting fishing in certain areas, are almost always temporary, usually for short periods of several weeks to twelve months. Often, these closures occur as part of a larger system of

"fallow" rotation. Elders interviewed in Hā'ena describe following a similar, informal, self-enforced system of rotating harvest, letting a given fishing spot rest after harvesting there to allow fish stocks recover. When asked how to restore the fishery, elders also referred to seasonal rotations, "Make sure they *kapu* (rest or close), a certain season. Give the fish a chance to come back again."

Temporary closures were difficult to implement because DAR staff offered only two means of repealing species closures once established. Proposed rules could automatically expire after a certain number of years or when populations reach established thresholds of abundance. Based on the difficulty of getting rules implemented, the fisheries committee opted against automatic expiration dates. DAR staff also asserted that scientific data was insufficient to justify thresholds for all but one species, *opihi*, a culturally significant limpet. As a result, the final rules package proposes a rest only on *opihi*, leaving out four other previously identified species of concern community members had proposed to temporarily give up harvesting.[38] The proposed rules automatically revoke the *opihi* ban (reverting to the State's existing limit of 20 individuals) if the species recovers after three years. For review and modification of all other proposed rules, DLNR must hold a public hearing in Hā'ena once every five years, solicit input and then suggest rules changes. Any changes would require the same extensive approvals the proposed rules package must undergo in order to become law (Kittinger et al. 2012). [39]

[38] These species may still be protected through other provisions of the rules package such as gear restrictions or catch limits.

[39] The review process to become law includes DLNR, BLNR, Attorney General, Small Business Review Board, and Governor's review along with a public hearing (Haw. Rev. Stat. § 91-6. Haw. Admin. Rules § 13-1-26.) Note: This process for rulemaking by administrative agencies is laid out in The Hawai'i Administrative Procedure Act, codified as Chapter 91 of the Hawai'i Revised Statutes (Kittinger et al. 2012).

Customary management in Hā‘ena was flexible, with rotating harvests and seasonal closures informally followed by the small group of fishers. Flexibility is a key element of customary systems (Cinner and Aswani 2007). Local level decision-making allowed customary rules to change easily, with *kapu* (closures) instituted on a temporary basis or in response to observed changes in the resource. Western regulatory structures, in contrast, emphasize due process, and a series of checks and balances, with potentially significant time lags between observed environmental changes and new management measures.

In summary, certain norms of customary management require fundamental changes in the institutions of state government in order to be embedded into state rules. Holistic management, encompassing entire watersheds and diverse impacts on marine resources, cannot be incorporated without integration between resource management agencies and respect for the validity of traditional knowledge. Responsive resource management, in which use rotates or adapts to change in a resource, cannot be incorporated without ability to easily modify rules.

B. Communities are Finding Ways to Indirectly Integrate Customary Norms Even Without Changes in Institutions:

Communities can sometimes overcome constraints in state-level institutions by identifying substitutes for community norms that are impossible to implement directly. Hā‘ena’s rules committee crafted multiple substitute rules to indirectly limit access without recognition of collective property rights, and to translate norms of a small homogenous group into concrete, enforceable regulations for the general public. Two norms of customary management, *kuleana* or “exclusive rights based on responsibility,”

and *lawa pono*, or "taking only what you need," illustrate how communities can indirectly achieve underlying norms of customary management within state rules.

***Kuleana* –** Exclusive rights based on responsibilities:
Creative Substitutes for Collective Property Rights

Customary marine management is embedded in local level common property systems that limit harvest to small groups of local users (Cinner and Aswani 2007, Johannes 2002). In Hā'ena customary norms assigned *kuleana*, exclusive rights of fishing, to certain groups on the basis of responsibility. Examples include limiting harvest to members of the family responsible for taking care of an area, reserving one species for the *konohiki* responsible for regulating a fishery, and limiting harvest of seaweed on shallow, easily accessible reefs to elders. As in other parts of Hawai'i, familial gathering areas in Hā'ena were smaller than the boundaries of the *ahupua'a* (Beamer 2010, Jokiel 2011). Small stretches of reef, generally fronting certain families' homes, were informally reserved for those families, and other Hā'ena residents refrained from harvesting in these areas.

Familial harvesting areas, still frequently referred to in contemporary times as a family's "icebox," fostered in-depth knowledge of specific resources accessed regularly, while encouraging restraint in harvest to ensure food for the future. Many Hā'ena fishermen continue to respect these informal property rights today, through asking the most elder family member before fishing in their customary area. Elders laugh that if they went to fish outside of Hā'ena, people would tease that they must have failed to care for their home area and depleted its fish. Today, people come to harvest in Hā'ena, known for its healthy reef and plentiful fish populations, from across the island of Kaua'i

and even other parts of the State (Hā‘ena Community Fishing Study, unpublished data 2009).

After Hawai‘i became a territory in 1899, the Organic Act of 1900 opened nearshore fisheries to all the public, and *maka‘āinana* (tenants) exclusive rights to harvest in their own *ahupua‘a* were effectively extinguished. However, the proposed Hā‘ena rules limit access without violating the State's constitutional mandate to "protect the public's use and enjoyment of the reefs," (Haw. Const. art. XI, § 6). Gear limits, a common state fisheries management tool, limit access to users of century old Hā‘ena methods. One rule requires harvesting squid by hand or stick (practices used mainly by area elders) instead of a spear. Another rule bans spear guns (automated and released by a trigger) and SCUBA tanks. Instead, proposed rules permit free diving using a hand-held three-prong spear (released using a rubber band). Permitted gears are more difficult to use, requiring more skill and knowledge of particular areas to catch fish, thus indirectly privileging regular Hā‘ena area uses. Another rule requires boats fishing in Hā‘ena to launch at a single place within the *ahupua‘a*. Currently boats can launch from other places on Kaua‘i or even other islands and harvest without ever coming to shore. This proposed rule allows community members or state enforcement officers to intercept fishers, educate them about area fishing norms, and monitor their catch. These examples illustrate substitute rules that perpetuate customary norms restricting harvest rights within the constraints of constitutionally protected public access.

Lawa Pono (Enough) - Take only what you need:
Enforceability Increases Complexity

> "It's about taking what you need, never pillaging the spot, because once you take a resource and it's gone, it's gone forever" (Young Hā'ena Fisherman).

While customary norms apply to small groups connected by culture, family ties and dependence on the same natural resources, state rules have to be enforceable for the general public. State rules then require a much higher standard of proof than community recognition. Identifying enforceable substitutes and translating them into legal language, allowed for inclusion of some customary norms within state rules, at the cost of increasing complexity.

Lawa pono, the norm of "take only what you need" is the most commonly expressed value guiding harvest in interviews with both elders and younger generations of Hā'ena fishermen and women. When asked in a meeting to write down traditional rules of fishing, fourteen out of sixteen Hā'ena area community members wrote "take only what you need, " articulating a cultural expectation to cultivate restraint in harvest. As one elder explains, "Only enough to eat, that's how they used to fish before. Not you go for the kill no, in my life we never did that. We were always cautious . . . you leave some back. . . . so you always get." Practices for limiting harvest included "catch and release," with part of the school freed after communal surround (gill) net harvests, along with harvesting just enough for a family meal. As one elder explains, "Maybe you (are) only going (to) use five, six, the rest. . . what do you do?. . . . Let them go." Customary management in Hā'ena did not define specific catch limits, relying instead on broad norms such as "don't waste," or "take only what you can use," which depended, for

example on family size.[40]

Translating these broad norms of customary management into substitutes that were clear and enforceable to the public, state conservation officers, and courts made proposed rules increasingly complex as illustrated in Table 2. The community initially proposed banning all commercial harvest in Hā‘ena. State enforcement personnel, along with DAR staff, argued that enforcing a commercial ban would require officers to observe a violator both harvesting and selling the same fish. In response, Hā‘ena’s rules committee attempted to enhance the ban’s enforceability. by adding restrictions to target gears used by commercial vs. subsistence fishermen, limiting boat size to preclude commercial vessels, and setting catch limits too small to be commercially viable (Table 2, Part 1).

[40] The legislation establishing community based subsistence fishing areas in Hawai‘i defines subsistence as “the customary and traditional native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing” [L1994, c271,&1].

Table 2: Translating Broad Customary Values into Enforceable Legal Language

Customary Norm	**1) Three Types of Proposed Rules Encompass this Norm**	**2) Example of One Rule (Type 1a –) Drafted with DAR's Rulewriter**	**3) Actual Legal Language** (specific definition of just **one** term within rule 2)
Take only what you need.	a. Limits on exploitative gear. (e.g. ban spear guns while allowing three prong spears, allow harvest of seaweed only by hand) b. Catch limits for a few species (e.g. 2 lobster, 5 urchins, 2 squid) c. Ban on commercial harvest (Hā'ena community rules proposal draft, April 2010)	It is prohibited to use a lay net, except that lay nets may be used where at least two people are in the ocean and touching the net or are within five feet of the net as in the fishing practices commonly referred to as bang-bang or *pa'ipa'i*, or surround or *ho'opuni*. Practices that use lay nets which do not require at least two people immersed in the ocean and touching the net or within five feet of the net at all times, such as in the practices known as lay/set/soak or *moemoe* are not allowed. [41] a. All vessels used in surround net fishing must be 14 feet or smaller and launched from the beach in the Hā'ena CBSFA. b. It is unlawful for any person using a lay net to leave a lay net unattended at any time" (Hā'ena CBSFA submitted rules draft, 5/14/2011).	"Lay net" means a panel or panels of net mesh that is suspended vertically in the water with the aid of a float line that supports the top edge of the net upwards towards the water surface and opposite to a lead line that keeps the bottom edge of the net downward towards the ocean floor.
→ → INCREASING COMPLEXITY → →			

Developing rules to preclude commercial and exploitative techniques, that use the same gear as subsistence harvests was especially challenging. For example, one rule aimed to prevent commercial surround net operations, where fish are often kept in the net

[41] Multiple fishing methods using the same gear, a lay net, include bang-bang or *pa'ipa'i* (set in shallow water with fish scared into it by multiple people splashing water), *ho'opuni* (multiple lengths set around a school of fish with a rowboat, then pulled to shore), or lay/set/soak or *moemoe* (set and left attended).

for days, and lay net, where unattended nets harvest indiscriminately. While allowing use of the same size and style of nets to surround fish, the proposed rule, created over six hours of debate in three separate meetings, requires people to actively attend to their nets and release fish after a few hours. (Table 2, Part 2). Translating proposed rules into legal language and format, with separate sections for definitions, permitted and prohibited activities, created yet another layer of technical complexity as illustrated by the sample definition of just one fishing technique in Table 2, Part 3.

While the value of taking what you need endures in the rule package, this example also illustrates how a relatively simple principle, common in customary fisheries management in Hawai‘i and throughout the Pacific (Cinner and Aswani 2007), becomes increasingly complex when incorporated into state law. The level of specificity required for a law to be enforceable (i.e. measures of boat length or net depth) may detract from the ability to transmit its underlying purpose, conservation, remembering tomorrow when harvesting today, so that a food source and way of life can endure for future generations. Further, the final proposed rules, in their technicality and legal specificity, may not be recognizable to community members as embodying customary cultural norms such as take only what you need. In order for rules to be enforceable by the state, they may need to be translated into language that undermines community enforcement, requiring more enforcement by the state.

C. Social and Educational Purposes of Customary Norms Pursued Outside State Rules:

Customary norms historically provide educational and social functions, teaching people how to interact with natural resources and with each other. These functions are

not fulfilled by state regulations that often focus on negative restraints rather than on imparting positive standards. Educational and social purposes of customary norms like *hōʻihi* (respect) for resources, and *mahele* (generous distribution of catch) must be pursued through avenues other than rules, such as community education programs.

***Hōʻihi* (Respect)** Maintain respectful relationships with resources:
Importance of Education

The customary norm of *hōʻihi* (respect) teaches the importance of maintaining balanced, reciprocal relationships between humans and natural resources. In Hāʻena, an important part of fishing and gathering is respect for the resources themselves. Numerous customary fishing practices impart understanding of fish as conscious beings that choose whether to be caught. First, people refrain from talking about "fishing" or naming specific targeted species, using the euphemism "*holoholo*," (cruising around). They avoid conversations with fishers on their way to harvest. Two elders recall asking their grandfather's reaction when asked what he was doing or where he was going, while preparing to fish,

"CC: He throw that net down and walk away, *pau* (finished), he not going fishing.
"TH: Because it's bad luck?
"CC: Yes. When you talk the fish can hear and they disappear"

Another practice of respectful fishing is to give thanks for one's catch by throwing back the first fish. One elder remembers her father always whispering to one fish before setting it free. The next time he went to harvest, he would call that fish by name to bring the school to him. Other elders recall watching schools lined up outside

the bay waiting to swim to this same fisherman's nets. Here fishing skill is neither solely physical nor intellectual, but based upon a mutually respectful relationship with fish.

In Hā'ena traditions, fish are not only selective, animate beings, but sometimes actual family members. Certain large sharks were considered *'aumākua,* or ancestors returned in animal form to watch over their descendants. Both historical and contemporary accounts describe families feeding, nursing, riding, and naming shark *'aumākua* which in turn protect fishers in the ocean, and guide schools of fish to their nets (Ho'oulumahiehie 2007). While families with shark '*aumākua* believed certain individual sharks, and not all sharks were the embodiment of family members, this belief reinforced respect for marine resources.

Mahele **(**Generous distribution of catch, sharing):
Importance of Community Building

In addition to teaching respect for natural resources, customary norms strengthen social ties and build community as in the expectation of generous *mahele*, the distribution and sharing of catch. This practice built community by connecting people to one another through collective use and sharing of marine resources. Expert fishermen and women in Hā'ena are expected to *mahele*, or distribute their catch to other Hā'ena community members. As one elder explains, "My dad always said to share because when you share, you get more luck. . . . And until today, when we catch fish, we always share." Elders remember past generations of head fishermen in Hā'ena and surrounding areas for their generosity in feeding the community. "There was no limit to the *mahele*, his idea was to share his fish with everybody." In contemporary times, sharing of fish through *mahele* continues to supply food for extended family networks, community members in need, as

well as cultural and ceremonial occasions (such as *lū'au* commemorating funerals, graduations etc.) where certain species play an important role. *Mahele* also help to maintain strong social networks from collective harvests to consumption at community gatherings (Vaughan and Vitousek 2013).

Early community brainstorms required anyone fishing in Hā'ena to *mahele* some catch within the area, particularly to elders. However, fishery committee members were discouraged by DLNR from mandating sharing by drafting these ideas into proposed rules. Instead, a proposed rule prohibits commercial sale of fish, indirectly encouraging sharing. In this example, state rules are premised on prohibiting unwanted behaviors, while customary norms promote desirable behaviors and values. Informal opportunities for youth and elders to fish together, visit neighbors' homes afterwards to share fish, and tell stories of generous fishermen and women, are means of directly encouraging community building norms such as sharing that cannot be perpetuated within state rules.

The educational and social functions of customary norms related to maintaining respectful relationships among people and resources are not fulfilled within proposed state rules. At the same time, stresses on customary management systems operating within a State context make these functions more crucial. For instance, the belief that fish will stop coming to a greedy fisherman provides a self-enforcing restriction on over harvest. When a fishery is opened to wider public access, few fishers share this belief. Teaching respectful connections between people and natural resources becomes even more important.

Concerned that younger generations are not learning customary norms once handed down within families, Hā'ena community members have developed two different

education programs. The first is a *lawai'a* (fishing) immersion program where thirty community members camp together twice a year for five days on the coast of Hā'ena. Participants - of all ages - fish, gather seaweed, learn to sew nets, prepare food harvested from the ocean, and eat together while playing music and sharing stories. Another program targets Hā'ena's school age children on vacation times, engaging them in fishing and other cultural activities while also teaching contemporary management skills, like GIS mapping and resource monitoring. Both programs promote education and community building, major social functions historically played by customary norms, through means other than formal regulation.

DISCUSSION

Table 3: Selected Quotes Illustrative of Findings:
"You have to get it passed, implement it and let (Hā'ena) go downstream in five years and see where they are at when they want to amend it. That will be quite telling. If they come back saying, we need to change everything, then you know. On the other hand, if they are pretty happy, then we got it right the first time" (DLNR administrator). "I said, you can set up a set of sustainable practices that apply to you and everybody else, but you don't get special treatment. . . . So they went back and retooled their bill. This left them in a more interesting spot because now whatever they set up for everybody else is also what they have to live with" (DLNR administrator). "*Ahupua'a* management is decentralized management, rules that make sense for us. And when we took those rules to the people in centralized management, to different offices in DLNR, especially the enforcement officers, they said, Hey, this isn't realistic. We can't be expected to enforce something that is just so place-based that nobody else from the outside is going to get it'" (Hā'ena community member). "Have we come so far away from the traditional that it no longer looks at all the way people want it to look, therefore they're not going to support it?" (Rule-making process facilitator). "Users of the area are going to grumble. And it's going to be a lot of education on our part to get people to understand. Because ultimately it's community based not lookouts on the beach with a ticket. It's going to be getting community support that is going to make this successful" (Hā'ena community member).

Three distinct outcomes emerge from this case study of efforts to integrate customary management, and its underlying norms, into state rules. Institutional changes in the organization, decision-making processes, and rule change procedures of state government are required to integrate some norms. Other norms are integrated through great ingenuity on the community's part, showing up through complex substitutes within state rules, yet accomplishing some original purposes of customary management. Finally, state rules cannot achieve major social purposes of customary norms. It is therefore important to maintain time outside of the formal rule-making process for

activities such as education programs to perpetuate these norms. Based on these three categories of findings from the Hā‘ena process, what suggestions emerge for other efforts to base contemporary management on customary systems?

Suggestions for Needed Institutional Changes:

In Hā‘ena, as in other parts of Hawai‘i and the Pacific (Cinner and Aswani 2007) customary fisheries management was integrated at the watershed level, recognizing terrestrial effects on marine systems. Perpetuation of customary norms like *ahupua‘a*, along with contemporary ecosystem-based management approaches (Layzer 2011), requires increased collaboration and integration among government resource management agencies. These agencies are organized to focus on specific resources (e.g., forests, fresh water, or fisheries), and often operate in isolation (Holmes 2010). Changes such as integrated resource management planning (Layzer 2011), cross agency review boards , regular meeting times, shared office space and grants for cooperative efforts could decrease formal and informal barriers to inter-agency collaboration without wholesale reorganization of state resource management.

Holistic norms of customary management such as *ho‘omalu*, or minimizing disturbance of key habitat areas, could be integrated by reexamining government norms regarding the types of data considered valid for decision-making. Customary management systems consider a wide range of impacts on natural resources such as fisheries (e.g. fresh water, pollution, recreation, as well as fishing), while Western management agencies tend to focus on fewer impacts (in this case, just fishing) and measuring these quantitatively. Legislative mandates are insufficient to ensure

meaningful integration of indigenous knowledge into decision-making without mutual trust, respect and clear protections for intellectual property rights and use of indigenous knowledge (Berkes 2012, Nadasdy 2003).

Without increased flexibility to change rules, social and ecological benefits sought from integrating customary and state systems may not be realized for two reasons. First, one key advantage of customary systems, adaptive management, relies upon flexibility to adjust rules locally in response to observed changes in a resource. Second, inability to relax state rules with minimal administrative process if fish populations replenish, may lessen community members' willingness to ban or restrict harvest of culturally significant species. Agencies should devolve authority to review and modify rules to the local level, mimicking tight feedback loops of customary monitoring (through observation and use), and decision-making. Other suggestions include hypothesis testing and experimentation with management techniques, engaging natural scientists in collaborative monitoring alongside community members, and funding community participation in regular monitoring.

Because customary norms unarticulated in rules, such as retaining flexibility for adaptive management, are crucial in cases where customary management systems have achieved sustainable use of natural resources over time, expected ecological benefits of co-management are unlikely to be realized without institutional changes. Further, thorough examination of the norms underpinning state government structure, alongside the sort of analysis of community values undertaken in this article, would reveal further institutional obstacles to effective management. Changes in operational level rules (regulating how people interact with specific resources), such as gear types, are

insufficient to achieve meaningful integration of customary norms within co-management. Meaningful integration also requires changes in collective choice and constitutional level rules (determining how rules are made and changed, and who participates), such as the ability of state government agencies to recognize common property arrangements

Suggestions for Achieving Customary Purposes within State Parameters:

Communities can sometimes overcome constraints in state-level institutions by identifying substitute means to achieve underlying purposes of customary norms that are impossible to implement directly. However, indirect routes also increase rule complexity. The need for creative substitute means of integrating customary norms arises from two challenges: failure of government to recognize customary common property rights, and translation of proposed rules into enforceable legal language.

The first challenge is the failure of state government to recognize customary common property rights which limit harvest rights to a small group of users (Cinner and Aswani 2007). Within customary management systems in Hawai‘i, and other parts of the world, rights are predicated on responsible harvest and caretaking. Willingness by state agencies to adopt rules allocating preferential access contingent upon responsibilities could yield middle-ground solutions that limit access within the parameters of state law. One example is issuing fishing permits to individuals who take a class on respectful conservation practices for the *ahupua‘a* and agree to register fishing trips, record catch and conduct simple resource monitoring activities. Everyone has an equal opportunity to take part, but must invest time in service to the resource in order to be included. Here,

the community of users could still be limited to a small and identified group, however group membership would be determined not by familial ties or residence, but by voluntary actions and commitment to place. Another example could be total allowable catch quotas including allocations for subsistence harvest awarded to fishers who follow cultural norms such as cultivating restraint or sharing their catch.

Second, western standards of legal review, which have been shown to undermine customary management in other cases (Tipa and Welch 2006), make translating broad customary norms into state rules arduous and complicated. In Hā‘ena, proposed rules required to supplement rather than replace existing state rules, protect public access, and meet state standards of enforceability, emerged as complex, disjointed prohibitions. This complexity may hamper community enforcement, key to increasing ownership of and compliance with rules. Rules created by community members based on customary practice cannot be effective if enforcement is limited to external government enforcement agencies. Therefore, institutions of collaborative enforcement, employing community members or training and deputizing them as volunteers, need to be negotiated within the rule-making process.

Rule-making based on customary management systems requires both thorough understanding of legal parameters at the outset, and collective ingenuity, in which a group of dedicated community members and state employees can think of ways to overcome obstacles together. In planning for rule-making efforts in consultation with indigenous communities, as in the example of California's North Coast MLPA (Marine Life Protection Act) process, state agencies need to provide for facilitation that respects and understands both the state and customary community context, and fosters creative,

collaborative thinking. Because state natural resource management agencies lack expertise in collaborative partnerships and community relations, third party facilitation will often be necessary. Even with outside facilitation, agencies should recognize that rule-making and other co-management processes require substantial staff time, the value of which can be maximized if each process is also seen as a learning and capacity building opportunity to improve staff capabilities for future processes.

Suggestions for Facilitating Educational and Social Purposes:

State management rules cannot fulfill the same educational and social functions historically provided by customary norms. Customary management in Hā‘ena did not just lay out rules; it built common social understandings of a community that included both people and their environment. As in other indigenous contexts, customary fishing norms in Hā‘ena emphasize the importance of maintaining respectful, balanced relationships with fish and all elements of the natural world, considered not just animate beings but family (Tipa et al. 2007, Berkes 2012, Jones 2011). Other norms promote balanced relationships, not just with the resource, but with other people in the community, teaching, for example, the expectation of fair and generous distribution, or *mahele*, of catch for daily meals as well as cultural and ceremonial occasions (Aswani and Cinner 2005, Vaughan and Vitousek 2013). Customary norms served to transmit these spiritual and social aspects of relationships with natural resources. Rather than building positive standards to guide interdependent relationships, state regulations focus mainly on restricting undesirable behaviors.

Fundamental purposes of customary management and its underlying norms cannot be accomplished through rules of the kind that can be affirmed by the state, though these purposes continue to be important to indigenous communities in contemporary times. As a result, indigenous communities are actively working on multiple fronts to perpetuate and restore educational and community building aspects of customary management through other avenues such as educational programs, community festivals, collective fishing, and informal sharing and barter systems. Constraints on integrating customary and contemporary management should be assessed and explained clearly at the beginning of any co-management process such as rule-making so that communicates can decide how to allocate their time, ensuring adequate human resources for other efforts. At the beginning of any endeavor to create state rules based on customary management, it is important to recognize that formal regulation is not the end goal, but one tool of many for achieving broader purposes.

CONCLUSION

Basing state management on customary systems of natural resource management is challenging. However, despite obstacles, communities can integrate some important customary norms into state rules. Analysis of this case yields lessons to facilitate more productive future efforts. Suggestions include openness to institutional changes in place of a narrow focus on operational level rules; recognition of collective common property rights; facilitation to increase creative thinking among collaborators; and transparency at the beginning of a rule-making process about constraints on the process in order to leave time for other efforts such as community enforcement and education programs.

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APPENDIX 1:

Changing Rights to Natural Resources Under Different Management Systems

Governing System	Access	Harvest	Manage	Exclude	Alienate
Customary tenants & Konohiki		• Subject to responsibility			Tenants remained even when transferred betw. Ali'i
Government	Resident rights same as public	Govt can limit			
Co-Management		can be limited			
Suggested Collaborative Management					no one can alienate

Legend:

Green is community

Red is government (the public)

Yellow is Private Land Owners

Title:

Hana Pa'a: Challenges and Lessons for Early Phases of Co-management

Authors:

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Target Journal:

Marine Policy

[42] For this chapter, Mehana Blaich Vaughan completed all the primary data collection and analysis. She also had the primary role in writing.

Hana Pa‘a: (To Make Fast)

Challenges and Lessons for Early Phases of Co-Management

ABSTRACT:

In this case study, we provide in depth analysis of an early phase of natural resources co-management. Co-management, involving shared management responsibility between resource users or community groups and governmental agencies is recommended as a key tool in sustainable nearshore marine resource management. We explore collaborative rule making based on traditional management practices for a small, rural nearshore Hawaiian fishery important for local subsistence. In this case, legislation mandates the state of Hawai‘i’s natural resource management agency work with community residents to co-create and enforce rules for the fishery. We elucidate new challenges to early phases of co-management, including uncertainty regarding substantive and procedural statutory mandates, reliance on a bridging organization, cross-generational leadership development, and separation of the co-management rule-making process from the target geography and natural resources themselves. Together, these findings question the assumption that early stage collaborations necessarily build capacity for future co-management endeavors. We highlight ways in which early phase process and structural choices can decrease collaborative capacity of both government and community participants. We also offer recommendations to improve other fledging co-management efforts.

INTRODUCTION:

In this research, we consider an early phase of co-management of natural resources, collaborative creation of rules to govern a nearshore fishery. Co-management partnerships, involving shared management authority and responsibility between resource users or community groups and governmental agencies (Berkes 2009) are a recommended means of engaging local community groups and government agencies to manage nearshore marine resources (Aswani et al. 2012, Ostrom 2007, Armitage, Berkes 2009). Though understudied, initial stages of co-management are important because they can foreshadow long-term outcomes, such as ecological health and enhanced management capacity (Wamukota et al. 2012, Olsen 2004). In addition, co-management partnerships often fail to engage local resource users meaningfully or effectively at early enough phases of decision-making (Pinkerton 2003). For example, community members might be asked to provide input on or help to implement already developed management plans (Tipa and Welch 2006), instead of actively participating in management plan creation.

Rule making is an especially important early phase of co-management because rules dictate how resource management decisions will be made (Ostrom 2010, Brennan and Buchanan 1986), as well as how partners interact with one another and with the natural resources they seek to manage (Ostrom 2010). Rules thus determine the process by which a co-management partnership proceeds, and shape its potential outcomes. While the finalized rules themselves are clearly important, our focus here is how rule making takes place within a co-management partnership. Early collaborations which achieve specific goals, such as drafting a rules package, are thought to lead to enhanced

capacity for future co-management endeavors when certain "success factors" (e.g., enabling legislation mandating collaboration, strong local-level relationships with marine resources, experienced and skilled leaders, dedicated outside funding, facilitation by a third party bridging organization) are in place (Olsson et al. 2004, Folke et al. 2005). This study focuses on a case in which many of these "success factors" were in place, but difficulties nevertheless arose early in the process.

We focus this study on Hā'ena, a rural subsistence fishing community on the North West shore of the island of Kaua'i, Hawai'i. Hā'ena is one of only two Hawai'i communities legislatively mandated to collaborate with State resource management agencies to co-create and enforce traditionally based rules governing coastal use. The Hā'ena process is a model for nineteen other Hawai'i fishing communities interested in co-managing coastal resources based on traditional and customary practices (Higuchi 2008, Kittinger et al. 2012). However, challenges have delayed collaborative rule making in Hā'ena four years longer than predicted, the scope of rules has progressively narrowed so that the local community is unlikely to achieve initial process goals, and, as of the writing of this article, the fate of the proposed rules package remains uncertain. Through in-depth community level analysis of collaborative rule making, this research highlights critical challenges in the early phases of co-management, while also recommending solutions to assist other fledgling co-management partnerships. We ask:

1. What challenges emerge in collaborative rule making for co-management of coastal resources?
2. How do these challenges both reinforce and question previously identified principles for co-management?
3. What solutions does this case suggest for addressing these challenges in early phases of other co-management partnerships?

BACKGROUND:

As in other parts of the Pacific (Johannes 2002), management of nearshore coastal fisheries in Hawai‘i has shifted from the local level (Jokiel et al. 2011, McGregor 2007) to centralized government management (Cinner and Aswani 2007). Historically, traditional local level resource management sustained healthy nearshore fisheries which were the primary source of protein for a population greater than that of Hawai‘i today, at least on every island but O‘ahu (Jokiel et al. 2011). However, local level management rights were extinguished when Hawai‘i was annexed by the United States in 1900. Nearshore fisheries management shifted to centralized control now under the Hawai‘i State Department of Land and Natural Resources (DLNR) (Higuchi 2008).[43] In keeping with the renaissance of community based management in other parts of the Pacific (Cinner and Aswani 2007), and in response to perceived declines in nearshore fisheries under state level management, residents of rural Hawai‘i communities who depend on local marine resources for subsistence, are advocating restoration of local management based on traditional and customary practices (Poepoe et al. 2006, Higuchi 2008). Recognizing the effectiveness of traditional and customary Hawaiian management, and the ongoing importance of subsistence fishing in Hawai‘i (Vaughan and Vitousek 2013, McGregor 2007, Higuchi 2008), Hawai‘i enacted legislation in 1994 (Act 271) allowing DLNR to designate community based subsistence fisheries (CBSFAs) for “**reaffirming and protecting fishing practices customarily and traditionally exercised for purposes of Native Hawaiian subsistence, culture, and religion**” (Hawai‘i Revised

[43] DLNR’s Division of Aquatic Resources (DAR) manages Hawai‘i fisheries using standard Western management tools: size, catch, and gear limits and seasonal fishing closures(Haw. Rev. Stat. § 187A-2 (5, 8) (2005), Haw. Code. R. §§ 13-49 to -52 (2008), available at http://hawaii.gov/dlnr/dar/admin_rules.html). These rules apply uniformly across the state though research shows that individual species reproduce at different times throughout the archipelago (Poepoe et al. 2006, Higuchi 2008).

Statutes, Chapter 188, Section 22.6). Achieving designation as a CBSFA "allows community members to assist DLNR in creating management strategies based on native Hawaiian values, . . . engaging communities in direct management of resources they depend on for survival" (Higuchi 2008, p. 2).

Pursuing departmental designation through DLNR is an intensive process requiring communities to provide a list of community members and an organizational charter, delineate fishery boundaries, and develop a management plan (Higuchi 2008, Kittinger et al. 2011). As of this writing, twelve years after Act 271 became law, DLNR has not designated a single CBSFA. In response, communities have pursued CBSFA status through an alternate avenue, direct legislative designation to obtain CBSFA status and authorize specific, stand-alone shared management agreements between DLNR and an individual community (Kittinger et al. 2012). Hā'ena became only the second Hawai'i community to obtain legislative designation in 2006, an achievement attributed to the political opportunity created by the retirement of a long time senior Kaua'i legislator (Higuchi 2008). In subsequent sessions, the legislature rejected ten other communities, including three entire islands (Kittinger et al. 2012, Higuchi 2008). Of the two designated CBSFA's in Hawai'i, only Hā'ena has succeeded in working with DLNR to submit a draft rules package for approval (Higuchi 2008), making it a precedent-setting case for at least nineteen other Hawai'i communities seeking to pursue CBSFA designation and other avenues for co-management of local fisheries (Higuchi 2008).

SITE DESCRIPTION:

> "Hā'ena is important because they are going to set the precedent for how (co-management of inshore fisheries) might happen in the future (in Hawai'i). If it's a complete mess, (DLNR) is (not) going to go down this route again anytime soon. But if it works out, then you might actually see this trend towards gradual re-empowerment of communities" (DAR administrator).

The community of Hā'ena has long been exemplary in its efforts to collaborate with state government to locally manage a broad range of natural resources, including fisheries. Many factors contributed to Hā'ena's singular ability to achieve CBSFA designation and submit a rules package. These include ongoing and documented traditional subsistence fishing practices (Vaughan and Vitousek 2013), thriving marine resources (Jokiel and Brown 2000), an existing community nonprofit representing native Hawaiian families with long time genealogical ties to the area, skilled community leaders, and external funding from government agencies and nonprofit groups.

While many elements facilitating local management remain strong in Hā'ena, the community and its marine resources have also faced substantial changes and stresses within a short time. Community interviewees recalling Hā'ena as recently as thirty years ago, describe plentiful fish, open space along the coast, with only a few small homes and unfenced yards, and less than ten Hawaiian families using the coast mainly for fishing and shelling. Today Hā'ena is a popular visitor destination hosting more than 750,000 tourists per year with up to 2,000 per day using the coast for recreational pursuits including snorkeling, swimming, and scuba diving (Stepath 2006, Vaughan and Ardoin in review). The area is also a popular site for Kaua'i residents to surf, windsurf, kite board etc. In the past fifty years, land privatization (Andrade 2008) and extensive coastal development of vacation and luxury homes in Hā'ena (Higuchi 2008) has driven

escalating property values and declining beach access, leading many long time Hā‘ena families to move out of the area.[44] Only half of Hā‘ena's 322 homes are occupied as primary residences (U.S. Census 2010), with the rest utilized as vacation rentals.

There is widespread community concern that increased recreational use (with impacts of sunscreen, direct damage to corals, and disturbance of marine species) and development of luxury vacation homes (affecting fresh water flows, sedimentation, and pollution from septic tanks) are impacting the health of Hā‘ena's marine resources (Higuchi 2008). Community goals for the CBSFA process reflect these concerns:

1) Increase resource health by addressing multiple ecosystem based threats including high volume recreational use and coastal development;
2) Reduce user conflicts and impacts to subsistence fishermen from tourism and recreational activities; and
3) Perpetuate Hawaiian cultural resource management practices (Hā‘ena Community Management Plan Draft, June 1, 2011).

Co-creating CBSFA rules based on customary norms for Hā‘ena's fishery has taken six and a half years (see Timeline, Figure 3). The "Hā‘ena fisheries committee," a group of twelve Hā‘ena community members, most of whom represent families with ancestral ties to Hā‘ena,[45] has worked with a nonprofit conservation group, the Hawai‘i Community Stewardship Network (HCSN) to create the rules.[46] The Hawai‘i Community Stewardship Network's mission is to "empower communities to improve

[44] From 2000-2010 the resident population of Hā‘ena increased from 300 to 431 individuals, over half of whom have moved to Hā'ena in the past decade, while the Native Hawaiian population declined from 36 to 23% (U.S. Census 2010, Stokes, K. Kauaian institute personal correspondence). Over the same period, the number of housing units doubled, while the number of units used as primary residences increased by only 43%

[45] The Hā‘ena fishery committee included Native Hawaiian board members of Hui Maka‘āinana o Makana (the community nonprofit representing descendants of families living in Hā‘ena prior to 1850), Hā‘ena residents, fishermen and longtime community advocates who reside outside Hā‘ena. The committee was roughly 40% female, and 60% male, 80% Native Hawaiian, and 60% fishermen.

[46] A formal rules package is only one vehicle by which the Hā‘ena community is pursuing restoration of local management and improved health of natural resources including their fishery. The community recognizes that the rules cannot meet all local management goals. Other efforts include education and enforcement activities associated with the rules (Vaughan and Thompson in prep).

their quality of life through caring for their environmental heritage."[47] HCSN works with a statewide network of twenty-five Hawai'i communities who request their assistance to improve community capacity to plan, implement, fund, evaluate, and adapt resource management practices. HCSN is a small organization staffed by an executive director, administrative assistant, and University of Hawai'i student interns. HCSN is funded by grants from private foundations, state, and federal resource management agencies including NOAA (National Ocean and Atmospheric Association, and State of Hawai'i Division of Aquatic Resources (DAR). In addition to individualized community efforts, HCSN seeks to connect partner communities though an email list serve and two annual in-person gatherings. These gatherings include youth representatives from each community, focus on informal sharing of experiences, hands on restoration work, and training in identified common need areas (e.g., legislative advocacy, ecological monitoring, and video documentation of elders). Prior to the rule making process, HCSN staff worked with the Hā'ena community to establish a summer program aimed at transmitting traditional fishing practices from elders to youth.

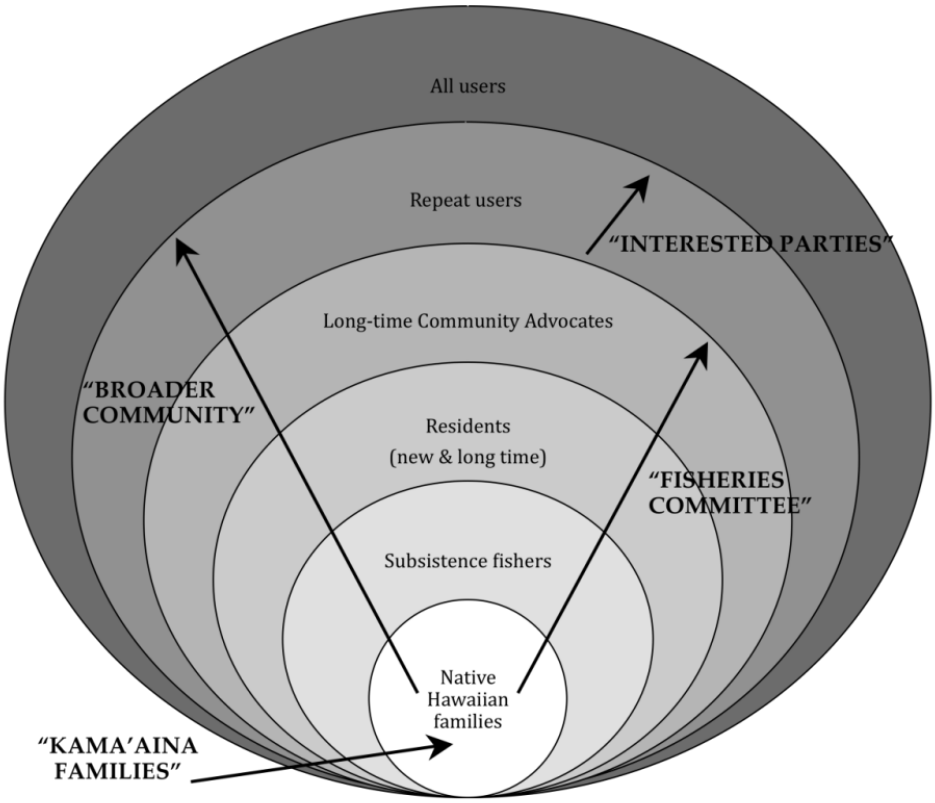
To facilitate rule making after passage of Hā'ena's CBSFA legislation, HCSN first worked for a year and a half with members of the Hā'ena community to compile data on traditional management practices, conduct baseline marine health assessments, set objectives for the rules package, survey community members on trends in resource health, perceived threats, and solutions, then integrate all of this information into a draft rules package. Feedback on these draft rules was solicited through another two years of community gatherings for "*kama'āina* families" (those with Hawaiian ancestral ties to Hā'ena), consultations with representatives of other "interested parties," including

[47] HCSN is now called KUA (Kua'āina Ulu 'Auamo).

commercial groups operating in the Hā‘ena area, public meetings to engage the “broader community” of area residents and regular users (Figure 1), and multiple rounds of review by DAR staff and representatives of other DLNR divisions (Figure 2). After reaching agreement on the basic content of the rules, it took two more years to translate this content into legal language in collaboration with DAR staff and legal experts (see Timeline Figure 3).

After six and a half years and twelve different rules drafts, the draft rules proposal was submitted to DLNR for final approval on June 2, 2011. At the time of this writing, it is still uncertain whether DLNR will approve the submitted rules and enter the protracted formal administrative review process to convert them into law. Analysis of the lengthy process of state and community negotiation to arrive at the proposed rules package now awaiting state approval nonetheless offers important lessons for other communities interested in engaging in collaborative rule making.

Figure 1: Multiple Levels of Hā‘ena Community Participating in Rule Making



The fisheries committee was composed of representatives of the inner four rings, including long time community advocates residing outside the Hā‘ena area. The "broader community" engaged through public meetings roughly included all circles but the widest. Meetings with "interested parties" focused on individuals in the regular user (labeled here repeat user) circle, both commercial and recreational users. Finally, public hearings mandated in the approval process will afford input from any individual, including those not in the diagram who have never been to Hā‘ena.

METHODS:

This research used three methods: (1) interviews, (2) document analysis, and (3) observations of rule making meetings. Researchers attended 20 meetings, recording both verbatim minutes and notes on proceedings. We also analyzed minutes of 20 meetings held before the research process began. We analyzed community strategic planning notes

and twelve iterations of rules drafts. Prior work with Hā‘ena community members by the lead author, who grew up twenty minutes away, facilitated this in depth community level analysis of the rule making process.

The lead author conducted fifteen in-depth, semi-structured interviews from June 2009 – September of 2011 with community members (9), as well as nonprofit and government agency staff (6) involved in the rule making process. Government interviews, mainly conducted after rules were submitted in the summer of 2011, represent all participating agencies and multiple levels of decision-making authority. We sought to interview governmental participants and community members who had evidenced varying degrees of support for the rules process, including two community members who were not process participants but who would be affected by the rules. Interviewees ranged in age from 20 – 76, with experience in past co-management efforts varying from 30 years to none.

The lead author conducted all interviews, which averaged an hour and half. These were recorded and transcribed. Interviewees were asked to reflect on the rules co-creation process – initial goals, successes and challenges encountered, best and worst meetings attended, how rules changed throughout, lessons learned for future processes and other communities, along with describing their own individual roles, expectations and learning. Additional questions focused on topics identified in prior studies as "success factors" for co-management: adaptation and evaluation of rules, relationships between participants, distribution of rights and responsibilities, power sharing, definitions of community, capacity building needs and learning (See Appendix 1 for actual interview questions.)

We analyzed interviews using a grounded theory approach. Themes emerging from the research were used to systematically analyze data, allowing development of theory grounded in empirical data and observations (Kittinger et al. 2011, Glaser and Strauss 1967). We used research reflections and an initial set of interviews and meeting notes to derive initial themes (Lofland et al. 2006, Miles and Huberman 1994) and developed a code list. We then used HyperResearch analysis software to code all interview transcripts, meeting notes, and policy documents. Three separate individuals coded all data, compared results, and adapted the code list until coding was consistent. By analyzing data, including interview quotes, related to each theme, we were able to group themes into larger categories of findings presented below in results.

THEORY:

Collaborative partnerships, or co-management agreements, in which management authority and responsibility are shared between resource users or community groups and governmental agencies (Berkes 2009) are a recommended tool for sustainable management of nearshore marine resources (Aswani et al. 20102, Ostrom 2007, Armitage, Berkes 2009). Suggested advantages of shared authority include: learning and creative solutions generated by diverse partners (Berkes 2010); integration of local knowledge (Cinner and Aswani 2007); decreased conflict and mistrust among stakeholders (Berkes 2010); and increased community buy-in and stewardship leading to enhanced compliance (McClanahan et al. 2006, Drew 2004). Partnerships with government agencies can also strengthen local level systems eroded by external stressors, (e.g. economic shifts) (Ostrom et al. 2002, Ostrom 2010) and internal pressures (e.g.

changing community demographics and weakened communal norms of harvest) (Berkes and Folke 2005, Tipa and Welch 2006).

Early stages of co-management are crucial to building processes for adaptive learning, in which partners modify management strategies, policies, and even decision-making rules (Folke et al. 2009). These modifications respond to external ecosystem feedbacks as well as collaborative learning processes within the partnership (Olsson et al. 2010, Folke et al. 2009). Through adaptive learning, early phases of collaboration to achieve specific goals are expected to increase capacity for future success on broader endeavors (Olsson et al. 2010, Folke et al. 2009).

While there will never be a one-size-fits-all solution (Ostrom 2007, Fox et al. 2012), research identifies multiple "success factors" likely to foster effective, adaptive co-management (Armitage et al. 2007, Berkes 2009), particularly of nearshore marine resources (Wamukota et al. 2011, Cinner and Aswani 2007). These success factors include: strong enabling legislation (Olsson et al. 2004, Kirlin et al. in revision) mandating early collaboration between government and community groups (Pinkerton 2003); facilitation by a bridging organization (Berkes 2009); conflict resolution mechanisms (Ostrom 1990); leadership capacity (Pinkerton 1998, Folke et al. 2003); prior relationships and trust between individual members of the partnership (Olsson et al. 2004); and design of co-management to reflect customary systems (Aswani et. al. 2012).

RESULTS:

In this study we explore a case in which all of the above success factors were already in place, but difficulties nevertheless arose early in the process. Our results highlight four previously unidentified key challenges in the early phases of co-management. For each previously unidentified challenge, we offer suggestions in the discussion section intended for other fledgling co-management partnerships. Table 1 displays the number of interviewees who mentioned related themes within each of these key overarching challenges: 1) legal uncertainty regarding substantive and procedural statutory mandates, 2) over reliance on bridging organizations, 3) cross-generational leadership development, and 4) separation from the target geography.[48]

[48] Within these themes some were emphasized more by community members (capacity building, leadership, and youth), with others stressed more frequently by policy makers (legal translation), however, all were mentioned in interviews with both groups (See Appendix 2 for the top themes, identified by frequency of mentions in interviews, for community members and policy makers independently).

Table 1: Key Findings by Related Themes Emerging from Participant Interviews
Note: This table lists the number of interview participants, including both community and government interviewees, who discussed each theme. Each theme listed here was discussed in at least one third of interviews (n=15)

Theme	**# Interviews**
1) Substantive and Procedural Legal Uncertainty	
Uncertain, Bureaucratic Process	7
Role of Public vs. Community	7
Unresolved Legal Questions	6
Jurisdiction	5
2) Over Reliance on Bridging Organization Reducing Capacity Building	
Bridging Organization / Facilitation	8
Capacity Building Needs / Learning	8
Capacity Building Needs of Community	8
Capacity Building Needs of Government	5
3) Cross-Generational Leadership Development	
Youth	9
Need for Leadership	7
Trust and Respect, Relationships	8
4) Separation from Target Geography	
Connection / Responsibility to Place	8
Monitoring	8
Enforcement	8
Meeting Location	5

1) Legal Uncertainty Regarding Statutory Mandate:

"Constitutionally, the department is the steward of the resource. And devolving that to any degree then gets into interesting places that people do not know how to go" (DAR administrator).

"I cannot think of any point in this process where DLNR has said 'No forget it you cannot.' What they say is 'We are constrained by the constitution, we are constrained by the system,' but they have always worked with us through the process" (Hā'ena community member).

> "There needs to be some degree of the community of various levels behind it. You'll never get 100% but you need to feel folks are legitimately speaking for a critical mass" (DAR administrator).
>
> "My take on the community is really more the lineal families and long term residents of Hā'ena *ahupua'a*. For me there's a tiered level of stakeholders but technically if you're with the state, everybody's equal right?" (DAR staffer).
>
> "When I put out a public meeting notice, it is for the public in general. I am not overly concerned with who and what is community. I am just concerned that the announcement reaches the county, people are affected and that they will show up and give us their opinions" (DAR administrator).

In the Hā'ena CBSFA rule making process, uncertainty about legal interpretations created delays, and allowed differing expectations to remain unresolved. Legal uncertainties centered on two areas: 1) substantive concerns regarding agency jurisdiction and 2) procedural uncertainties regarding a) criteria for rules review, b) the required degree of public input, and c) how "community" would be defined. In response to these legal uncertainties, DAR adopted progressively narrowing interpretations of its legal authority. These progressively narrower interpretations were more difficult to challenge because they emerged relatively late in the process.

The first substantive legal uncertainty was whether formal rules were limited to regulating activities directly under DAR jurisdiction (e.g., catch limits, and gear restrictions on fishing) or could extend to issues and uses regulated under other divisions within the broader authority of DLNR (e.g., fresh water, land based pollution, boating or recreational impacts). CBSFA legislation names DLNR as the responsible governing agency. However, DLNR delegated CBSFA rule making to DAR, narrowing the interpretation of DLNR statutory authority for implementing CBSFA to the specific jurisdiction of DAR.

Another example of the government's narrow interpretation lengthening the process and limiting the application of traditional management was the community's proposed kapu zone (closed area). This zone precluded recreational and fishing activities within a key hatchery area (Vaughan and Thompson, in prep). Unresolved uncertainty on whether CBSFA rules could regulate recreational uses (a primary community goal of CBSFA designation), which fall under the jurisdiction of the Division of Boating and Recreation (DOBOR), led community participants to believe that such regulation was a viable option. On the advice of DAR staff, the fisheries committee invested 18 months obtaining input from DOBOR and recreational user groups through six separate meetings. In response, they reduced the size of the area closed to recreational use, excluding channels surfers and kite surfers use to launch. They also added exceptions for safe passage of boats in emergency situations. In recognition of these changes, DOBOR submitted a letter of support to DAR with Hā'ena's rules package. DAR staff also provided five rounds of feedback to translate the *kapu* zone proposal into legally enforceable language.

However, a year after the rules were submitted, DAR staff alerted HCSN that unofficial Attorney General review indicated that the rules must fall exclusively under DAR's specific jurisdiction. The rules are less likely to obtain approval to become law if the *kapu* zone remains part of the package. If the community and DLNR had received an official Attorney General (AG) review indicating rules must fall exclusively under DAR's limited jurisdiction earlier in the process, participants might have sought legal assistance to potentially challenge this narrow interpretation and produce a more flexible legal frame for the rulemaking package.

There was also significant legal uncertainty regarding procedural mandates of the CBSFA statute. These open questions centered on decision rules used in the approval process including: a) review criteria at multiple stages of approval: b) the required degree of public support, and c) a clear definition of who is included in "community." CBSFA legislation sets out multiple levels of review that Hā'ena's rules must undergo to become law (Kittinger et al. 2012). [49] However, there is no explanation of criteria for review at each stage. It is also uncertain whether changes recommended at any step of this approval process require community agreement before proceeding to the next level. The approval process also requires consideration of public input at multiple stages including a public hearing (Kittinger et al. 2012, Higuchi 2008). However, the required level of public support remains undefined.

Most challenging of all, the CBSFA statute fails to define "community" (Higuchi 2008), leaving DAR in control of the term's meaning for the purposes of implementing the law. The significance of the term "community" becomes particularly salient in the face of DAR staff's repeated warnings that community support for rules would be crucial to securing their approval.[50] In the case of the only other Hawai'i community designated a CBSFA, opposition to proposed rules at a public hearing - by area residents, fishermen, and outside commercial interests - permanently tabled rule making (Higuchi 2008). However, DAR has provided no explicit guidance regarding whom to include in

[49] DLNR, BLNR, Attorney General, Small Business Review Board, and Governor's review along with a public hearing (Haw. Rev. Stat. § 91-6. Haw. Admin. Rules § 13-1-26.) Note: This process for rulemaking by administrative agencies is laid out in The Hawai'i Administrative Procedure Act, codified as Chapter 91 of the Hawaii Revised Statutes (See Kittinger et al. 2012).

[50] The dual requirements that DLNR consult with as broad a group as possible of *ahupua'a* inhabitants (ACT 241), and that " all interested persons" be afforded the opportunity to comment (Chapter 91), "risks contradicting the CBSFA statutes' requirements and intent" to protect customary practices (Higuchi 2008). This problem is exacerbated by uncertainty about where to hold the required public hearing, whether in neighboring Hanalei town, or in Honolulu, which would make it difficult for Hā'ena residents to attend and provide input due to the prohibitive costs of airfare.

"community" (e.g., qualifying criteria such as residency or proof of regular use) or what percentage of those qualifying individuals need to agree (e.g., consensus or a simple majority). Hā'ena's rules were developed through an intensive, inclusive community input process. The fisheries committee negotiated agreement on rules with diverse user groups, including permitted commercial operators, or "interested parties," over two years. They held eleven different meetings averaging thirty-six attendees, six with Hawaiian descendants of the area, or "*kama'āina* families," and five with the broader community (see Table 2). The committee used various means to advertise these meetings, two attended by sixty plus participants, including phone trees, email list serves, door to door flyers, public radio spots, and coordination with standing meetings of the area community association. Opinion polling at these meetings reflected over 90% agreement with the content of the rules. Yet the threat remains that DAR will decide the process produced insufficient levels of "community" support.

Table 2: Number of Meetings Held Between Different Parties During Hā'ena's Rulemaking

Year	**Fisheries Committee**	**Kama'āina Families**	**Interested groups**	**Greater community**	**DAR**	**DOCARE or DOBOR**	**DLNR Chair**
2006	1						
2007	6	4					
2008	5		1		1	1	1
2009	4	1	2	4			
2010	2				1	2	
2011	5	1		1			1
2012	1						
Total Meetings	**24**	**6**	**3**	**5**	***2***	***3***	**2**
Attendance	(4-12) Ave. = 8	(19-60) Ave. = 40	Ave. = 5	(18-65) Ave. = 32	(2-12) Ave. = 7	(1-3) Ave. =2	(1-6) Ave. = 4

Note: These are meetings with community members present. HCSN had multiple other meetings with DAR staff other DLNR divisions and the DLNR chair.

Clarifying interpretations of the legal mandate up-front helps to adjust participants' perceptions of possible outcomes in a co-management process. The cloud of legal uncertainty regarding jurisdiction, review criteria, public support, and the definition of community fostered disparate expectations between individual community members and agency personnel. Initial Hā'ena community goals for the CBSFA aimed to address multiple ecosystem-based threats to resource health. These threats include land based impacts, high volume recreational overuse, and pollution from boats. DAR's narrow interpretation of the scope of its statutory authority would preclude rules addressing all threats but impacts from fishing.

Uncertain and conflicting interpretations that could have been resolved at the outset of the process led to lengthy delays and unfulfilled community expectations. These delays and seemingly endless new procedural obstacles may have contributed to a handful of community members, mainly youth participants, dropping out of the process. Reflecting on community members' experience of these delays, the process facilitator said, "It takes some very special people to have the patience. It is so methodical just to trudge along and keep at it. . . . I do not know if there is a way to compare it to cultivation or to farming, or the patience it takes to fish, to help (community members) translate this process to their world." DAR's forecast that its rule making process would take 12-18 months (Higuchi 2008) proved a significant underestimate. Indeed, the process remains unresolved after six and a half years. This case suggests that uncertainty regarding statutory mandates can weaken rather than gradually build capacity for future collaborative resource management efforts.

2) Over Reliance on Bridging Organization:

> "In my opinion it is difficult for the community to organize the community" (DAR administrator).
>
> "The capacity that it takes to run a meeting, to gain consensus, to work with people is so needed and so rare and so different than the skill sets people have if they are (trained as fisheries) biologists. . . . How do you get those skills to your staff?" (DAR staffer).
>
> "My advice to other communities? Find a (names process facilitator)" (Hā'ena community member).
>
> "Let's say it was an NGO that I did not think was going to run a good process. Do you think I would be pushing it as hard?" (DAR administrator).
>
> "When we started the process I think we were all a little naive about what the results were going to be, how it was going to empower the community . . . . I guess when I go to the next community I will bring a more realistic view of what to expect. When I came to Hā'ena, I always said, it is not sovereignty, but I really realize the depths to which that is true now" (Process facilitator).

Rule making in Hā'ena was coordinated by a third-party nonprofit conservation organization, Hawai'i Community Stewardship Network. HCSN's involvement and facilitation expertise was pivotal to completing the rules package despite key areas in which both government and community members lacked capacity. However, this case also illustrates ways in which Hā'ena and the DLNR may have over relied on HCSN. This dependence decreased interactions and capacity building of both parties and may have prevented them from questioning narrow legal interpretations described in the last section.

While the Hā'ena CBSFA legislation provided a clear mandate for collaborative rule making it provided no personnel, funding, or process to develop rules. Neither government agency staff nor community members had the resources, time or facilitation skills required to plan and coordinate collaborative rule making. This crucial

coordinating role fell to HCSN. The nonprofit executive director obtained and administered grants for base line monitoring, led strategic planning, and facilitated every fisheries committee and broader Hā‘ena community meeting. The Hā‘ena fisheries committee met without her only twice in the entire rulemaking process, planning their meetings around her availability to fly to Kaua‘i from Honolulu. She set deadlines for community deliverables (e.g., consultation with an area elder regarding a particular fishing practice, distributing paper rules drafts to those without email, or drafting legal language to define a particular gear type along with a Hā‘ena resident lawyer), and followed up to see tasks were completed. Fisheries committee members helped to publicize, secure venues, and provide food for broader community meetings. However, they mainly relied upon the facilitator to describe the rule making process and proposed rules and to facilitate verbal feedback from attendees.

The facilitator also submitted the final Hā‘ena rules proposal to DAR on behalf of the community and wrote the accompanying management plan based on strategic planning conducted early in the process. Both government and community participants expressed respect for this facilitator's integrity and abilities. Nearly every interviewee suggested that submission of draft rules would not have been achieved without the facilitator. Many cited her leadership as one of the most effective aspects of the process.

She also served as liaison between Hā‘ena, DLNR, and DAR staff. This role was especially critical because HCSN is located on O‘ahu where the facilitator could interact more easily with state level DLNR and DAR staff than Hā‘ena community members located on Kaua‘i. However, relying on HCSN allowed for progressively less direct interaction between government staff and Hā‘ena community members. Both

parties met in person three-four times per year in early years of the process, but only met once in the two years before proposed rules were submitted. During this time, the fisheries committee had to revise the twelve draft rules reflecting community consensus, and translate them into legal language based on feedback from DAR, DLNR, and third party experts (i.e., marine ecologists). In this process, the facilitator articulated and interpreted each group's input and responses back and forth between all parties. The only time community members heard or questioned DAR's reactions to proposed rules directly was one visit by DAR's rule maker to a Hā'ena fisheries committee meeting. The acting head of DAR for these crucial years of the process, who possessed the authority to review and approve the submitted rules package, never met face to face with community members. The facilitator was not a legal or rule making expert and largely deferred to DAR's instructions and statutory interpretations regarding CBSFA implementation. Hearing these instructions indirectly through her, rather than from DLNR administrators, may have dissipated community member frustration with the agency's progressively narrowing interpretations and prevented direct confrontation with DLNR.

In this case, a small bridging organization, HCSN, was critical to achieving the short-term goal of a rules package. However, relying so heavily on this organization to facilitate the entire rule making process, may have overtaxed HCSN's capacity. HCSN is the only organization exclusively dedicated to increasing community capacity for local level coastal resource management in the State of Hawai'i. The facilitator's extensive work on this process reduced to the time she could devote to other Hā'ena efforts, such as the educational programs she had helped to found, as well as the twenty-four other

communities supported by HCSN. At the same time, by delegating their responsibility for rule development within the local community to HCSN, DAR and DLNR were able to avoid formally dedicating staff time to the CBSFA rule making process, which was never incorporated into any staff job descriptions or formal responsibilities. Further, reliance on HCSN also had the unintended consequences of decreasing face-to-face interaction between government and community members and reducing long term capacity building.

3) Durable Cross-Generational Leadership Development:

> "If you really care about something then you have to make sure it can be sustained when you are not there" (Hā'ena community leader).
>
> "In twenty years (my agency) could be a different landscape. What we need is more students going and learning, then coming in with new ideas and passion and a different perspective" (DAR staffer).
>
> "That's been kind of a reoccurring theme for us, the inability to take the human resources we have in our community and . . . get them into a stronger leadership role" (Hā'ena community leader).
>
> "We have to be patient, because they are the *kūpuna* (elders) now, and it is their time. Our time will come but right now our job is to back them up. That doesn't mean I cannot disagree or say so, but I need to show respect" (Hā'ena youth).
>
> "Who from the younger generations in Hā'ena can we build up and empower and educate so that they can take over my job?" (Hā'ena community leader).

In this case the Hā'ena community possessed substantial capacity for co-management, including interpersonal relationships with individuals in state government built through past CBRM efforts (Andrade 2008). However, even such experience, with the relationships and capacity it builds, can be insufficient in complex situations like rule

making under CBSFA, unless it is transmitted to new leaders and across generations. This study reveals not only community capacity and leadership development needs, but also those of government. In this case agency staff lacked capacity in many of the same areas as did community members.

The small group of Hā‘ena community leaders who drafted and secured passage of the CBSFA legislation had already worked together for twenty years engaging with the state on natural resource management issues, including planning for increased community management of the local state park. This group of leaders includes directors of community non-profits and representatives on multiple statewide boards and task forces related to natural resource issues. Together they hold extensive experience in policy processes, community organizing, meeting facilitation, grant writing, county and state environmental laws and Hawaiian resource management.

Relationships between these community leaders and key individuals in DLNR helped facilitate the CBSFA rule making process early on. However, as the community's contacts within DLNR left state employment and Hā‘ena leaders grew busier with their own professional responsibilities, the benefits of these relationships to the rule making process decreased. In interviews, more experienced community members expressed frustration with their inability to translate their leadership skills, relationships and experience to developing other local community leaders, including Hā‘ena youth. Other members of the fishing committee contributed extensive knowledge of community dynamics and fishing practices. However, they were less comfortable in leadership roles including organizing meetings and serving as spokespeople.

Similar leadership capacity gaps on the government side also presented challenges. DAR staff lacked key skills for engaging effectively with communities including organization and facilitation of meetings. In addition, lack of communication, consensus and spokespeople within the agency made it difficult for DAR to develop or convey official agency positions. Government also faced high turnover of key personnel. In the six and one-half year duration of this process, three different individuals directed DLNR, and four different individuals presided over DAR, two of whom were only "acting." Positions remained unfilled for long periods of time due to budget cuts. Additional delays of up to six months resulted when new individuals finally filled these positions and started over in building trust and familiarity with the process (See Appendix 3).

The Hā'ena experience points to the need for capacity building within both communities participating in co-management agreements and their counterparts within government. Capacity building should be focused on the same key skills (e.g., organization, facilitation, and communication) necessary to build agreement within either a government agency or a community, as well as between the two. Within communities, it is important to transmit knowledge, not only of fishing and cultural practices, but of legal and policy processes, to younger generations. Both government agencies and community groups struggled with lack of proactive transition planning for new leadership.

4) Separation from Target Geography and Resources

> "They're doing the studies in the office" (Hā'ena fisherman).
>
> "If you're going to do this stuff you better actually go up and engage with community. . . . You better not just sit in an office and assume that it will work. This is the problem of trying to interface local communities with centralized government that sits on a whole different island!" (DAR administrator).
>
> "If we stop fishing, we will not know how the resources are doing" (Hā'ena fisherman).
>
> "Every time I go out there, I learn something new" (Hā'ena community member describing participating in coastal monitoring).

A final key challenge was separation of the rule making process from the target geography - the local people and resources - that the rules are intended to manage. The lengthy rule making process required substantial commitments of community member time, including reviewing rules drafts by e-mail and attending meetings. The average time commitment for twelve Hā'ena fisheries committee members was twelve hours per month, with up to twenty-five hours per month per person in intensive periods. Many attended forty meetings over six and a half years, some held for up to eight hours on Saturdays. Weekends, when less people work, are the main time for both Hā'ena community members and outsiders to camp and fish in Hā'ena. Community rule making meetings thus reduced both community fishing and ability to monitor the coast at exactly the times when Hā'ena's resources are most threatened.

However, monitoring efforts piloted in parallel with the rule making process had the opposite effect of increasing community presence on the coast. To facilitate future assessment of the impacts of CBSFA rules, seven Hā'ena community members were employed as surveyors to conduct baseline studies of human use. For these studies,

surveyors walked the coast in three hour blocks, counting and recording all human activities, focusing especially on documenting fishermen, their gear and catch. Surveyors expressed their enjoyment of working outdoors on the coast, getting to know and help take care of places their ancestors had lived and fished. One woman in her early fifties said that, though she lives not five minutes up the road, she hadn't walked the coast of Hā'ena in years. She enjoyed talking with people she encountered to raise awareness of community efforts to care for the fishery.

Surveyors were less positive about the formal data collection aspects of the job, particularly the repetitive observation forms and protocols that revealed what participants felt were familiar and obvious patterns of coastal use. However, these observations did help to identify previously undocumented user groups including immigrants and illegal fishers harvesting late at night. Community members also expressed frustration at not being able to start enforcing proposed rules they were developing through the CBSFA process. They wanted not just to record, but to halt, observed behaviors they believed were harmful, such as overharvesting, harassing turtles, interfering with fishermen, and walking on the reef. Community surveyors always brought along volunteer helpers ─ friends, children, cousins and siblings ─ further extending community connections to the coast.

During the rule making process, the most well attended meetings, and those cited as most effective by participants (see Table 3), took place in closest proximity to Hā'ena, which is located at the end of an eight mile stretch of winding two-lane highway. One highlight was a site visit and tour by all DLNR division heads to Hā'ena in the first year of the rule making process. The agency heads were impressed with community

members' knowledge of and dedication to caring for the area. Community members appreciated government staffs' commitment in traveling so far, and expressed pleasant surprise at how comfortable they felt interacting with them on the community's "turf." The most well-attended community meeting, attracting 60 community members, was convened in the backyard of one of Hā'ena's longtime families, just across the street from the coast. Hā'ena community members attended meetings with three island based DLNR staff in the county capital. However, all but three meetings with DLNR personnel at higher State levels of decision-making authority took place in DLNR's Honolulu offices, nine hours roundtrip by car and airplane (a $220 fare), from Hā'ena, (see Table 2)[51], making it harder for community members to attend.

Table 3: Meeting Attendance by Location.

Note that these data exclude fisheries committee meetings, all held in Hā'ena.

Meeting Location	**Round-trip Distance from Hā'ena**	**Round-Trip Time**	**Average Community Attendance**
Hā'ena	<1 mile	< 10 minutes	60
Hanalei (nearest town)	16 miles	40 minutes	32
Līhu'e (county capital)	62 miles	3 hours	2
Honolulu	244 miles	9 hours (and $220 airline ticket)	0-1?

This research highlights challenges of building community ownership and engagement in natural resource management when critical decisions are made far from

[51] HCSN's facilitator was located on O'ahu, making it possible for her to interact in person with DLNR state-level staff and administrators more easily. While section two of this paper describes drawbacks to relying on her to conduct meetings with DLNR, the cost and distance made it difficult to avoid.

the resources themselves. In this case, a formal co-management process (rule making) risked monopolizing community member time in ways that detracted from interaction with resources. However, place and field-based initiatives, including site visits and monitoring efforts, increased community members' sense of ownership and connection to coastal resources and their desire to be involved in enforcing regulations to protect them.

DISCUSSION

Although the process of CBSFA rule making in Hā'ena exhibits many "success factors" considered critical for co-management, both community member and government participants encountered the following key challenges: legal uncertainty regarding substantive and procedural statutory mandates; overreliance on bridging organizations; cross-generational leadership development; and separation from the target geography. Here we consider how each of these four obstacles supports or challenges existing literature, while offering solutions to overcome these barriers in other early phase co-management efforts (See Table 4).

Resolve Legal Uncertainties and Provide Transparency in Decision-Making:

Uncertainty about, and failure to expeditiously resolve, competing legal interpretations of statutory mandates can hinder early phases of co-management. In the Hā'ena case legal uncertainties centered on three key issues: the extent of a particular government agency's authority for co-management, decision rules at multiple stages of approval including review criteria and the required degree of public support, and how to define community. Failure to resolve legal questions in a timely manner unnecessarily

lengthened the rule development process and led to proposed rules based on legal interpretations that ultimately were rejected by the State. Community members often have broader expectations of a process than government agency personnel (Pinkerton 2003), who tend to define process outcomes much more narrowly (Tipa and Welch 2006).

Previous cases involving indigenous communities support the importance of clearly delineating the relevant community who should have input in decision-making (Tipa and Welch 2006, Gray 1989). In Aotearoa, researchers argue for narrowing the definition of community. "With a collaborative approach, the final agreement defining the common good is not the proclamation of the ruling elite or the result of political logrolling and majority rule, but rather a consensus agreement among those chiefly involved (Gray, 1989, p. 118). Some Maori scholars propose collaborative management as a distribution of power among those whose interests are "most keen" (Tipa and Welch 2006). In the case of CBSFA rule development for Hā'ena, community could be defined more narrowly than the general public or all stakeholders based on the original purpose of the enabling statute, reaffirming and protecting subsistence fishing. To inform the designation of "community," empirical research can characterize particular user communities and their interactions with specific resources (Vaughan and Vitousek 2013).

Much literature on co-management assumes that setting limited goals in early phases leads to enhanced capacity for future collaborative efforts (Olsson et al. 2004, Plummer and Armitage 2007, Berkes 2010, Folke et al. 2005). This research highlights an important distinction between agreed upon limited goals articulated at the start of a process and restricted potential outcomes based on progressively narrowing legal

interpretation. Allowing process outcomes to be determined by the latter approach can produce differing expectations, disillusionment, and attrition of participants. While monopolizing limited community time for other local level efforts (Vaughan and Thompson in preparation), such processes potentially decrease collaborative management capacity within a partnership. Therefore, it is important to achieve clarity on the legal parameters of any co-management process and its potential outcomes at the beginning, while also ensuring legal capacity to inform and question legal interpretations and expand process goals.

Suggestions:

1) Maximize Decision Making Transparency: Transparent decision making rules allow participants to set realistic expectations. We suggest articulating every step in a rule making process at the outset. These include stages of the approval process, criteria for output review, set opportunities for public comment and input, standards for evaluating this input, delegation of responsibilities including who has authority in case of a key decision-maker's absence, as well as a clear timeline for each step and the overall process.

2) Rapidly Resolve Legal Uncertainties: Availability of third-party legal experts can help inform and resolve uncertainties regarding interpretation of the statutory mandate and process requirements. Legal experts can help challenge unnecessarily narrow interpretations of statutory authority, afford constant clarity on legal constraints, and opportunities, and facilitate forward progress on broader community goals. For example, in California's state-wide effort to situate marine protected areas, differing expectations, rooted in conflicting legal interpretations, were resolved expeditiously.

Outside legal consultants provided timely legal input and guidance (Fox et al. c 2012). Staff turned to legal experts for opinions on whether policy issues raised by stakeholders fell within the California Marine Life Protection Act's (MLPA) statutory authority. Committees were convened to separately address issues outside the scope of the process without derailing MLPA goals and timeline (Fox et al. c 2012).

3) Provide Pre-Approved Rules Templates: One tool being developed by DAR staffers to help other Hawai'i communities interested in becoming CBSFAs, is an agency pre-approved rules menu of customarily-based rules templates. To minimize time spent in co-development of rules, community groups could simply select the rule options they want, knowing that they those options are presumptively, legal, enforceable, and translated into legal language. Seeing the range of plausible outcomes at the start of the process could further help to prevent false expectations and community burnout. Community members and representative groups would be able to decide how many people hours to invest at the outset of rulemaking.

Reduce Reliance on Bridging Organizations:

This research reinforces the importance of bridging organizations in co-management (Berkes 2009, Sudtongkong and Webb 2010, Aswani et al. 2012), while challenging the assumption that their involvement automatically leads to capacity building. In this study, reliance on a bridging organization to facilitate co-development of rules may have hindered development of local and state capacity for co-management by reducing interaction between government and community groups. Face to face interaction (Jentoft 2007), and communication

(Plummer and Armitage 2006, Fox et al. b 2012), particularly in small groups (Fox et al. b 2012) foster learning, trust and respect, each key to co-management (Pomeroy 2004, Layzer 2011, Pinkerton 2003).

Overreliance on bridging organizations can also delay a process when these groups, often nonprofits, face funding challenges or leadership transitions (Olsson and Folke 2001, Pomeroy 2004). In addition, early stages of co-management, and the durability of emerging rules, may be compromised by political perceptions of the bridging organization or gaps in the capacity of a single facilitator. If bridging organizations help partners accomplish specific tasks such as rule making, without addressing underlying conflicts, power inequities, or capacity gaps, they may ultimately compromise the long-term durability of a collaborative resource management partnership.

Suggestions:

Invest in Facilitation for Capacity Building: We suggest investing in facilitation explicitly designed to build capacity by fostering learning and trust. Facilitated formative evaluation of co-management processes should assess capacity building alongside progress towards more immediate outcomes such as rules. Facilitation should cultivate understanding of legal and policy processes, as well as agency and community culture. They should mentor community and government representatives in both conflict resolution and consensus building skills. Three separate facilitators, with diverse skill sets, could focus on building community agreement, organizing agency staff, and working on collaborative

efforts with both groups. Key decision-making meetings should include representatives of all parties.

Plan For Durable Cross-Generational Capacity Building:

This study supports past research emphasizing the need for capacity building, not only for community participants in co-management, but also for government agencies and personnel (Tipa and Welch 2006). Past studies differentiate community and government capacity needs (Pomeroy 2004). However, community and government capacity needs can intersect. Overlapping needs include conflict resolution (Berkes 2009, Pomeroy et al. 2004), Aswani et al. 2012, Wamukota et al. 2011), communication (Pomeroy et al. 2004), and facilitation (Berkes 2010) as well as legal (Cinner and Aswani 2007, Fox et al. c 2012) and scientific expertise (Sayce et al. in revision).

Capacity building may be insufficient, however, if it is restricted to a small group of individuals. Long time leaders in the Hā‘ena community possessed many capacities required for co-management, yet faced substantial challenges in transferring their skills to others in Hā‘ena, particularly youth (Vaughan in prep). The need to build leadership (Pinkerton 1998, Folke et al. 2003, Leach and Pulley 2001) with legitimacy in the eyes of the whole community (Menzies 2007) is well established. However, little work on co-management emphasizes the importance of building cross-generational leadership capacity. Community youth, who have the ability to undermine a process if they are not mentored, should be engaged and mentored, along with younger government agency staff.

Failure to transmit traditional ecological knowledge (TEK) across generations is

one of the primary challenges to the continued resilience of community level resource management (Ostrom 2005). This study extends the need for knowledge transmission to include, not just TEK, but knowledge of legal and policy processes. This research further underscores the need to build local leadership for community level administrative structures and natural resource management institutions (Aswani et al. 2012, Taiepa et al. 1997).

Suggestions:

Mentor New Leadership: We suggest mentoring and "apprenticing" new leaders in all aspects of co-management processes. Young people with leadership potential could shadow community leaders and agency staff and work alongside facilitation, legal, and scientific advisors. It is important to provide diverse community engagement opportunities, in combination with mentoring. Some examples include leadership of place-based children's education programs, roles in resource monitoring, hosting visiting groups from other communities, board positions in community nonprofits, and opportunities to speak on community efforts with practice and communications training beforehand. Seeking opportunities to create jobs and internships that employ community members, particularly youth, in support of process goals is critical.

Strengthen Connections Between People and Natural Resources:

Co-management processes such as rule making can separate participants from the very resources they are seeking to manage by concentrating decision making far from target resources, and monopolizing limited community member time in non-resource based activities (e.g., meetings, lobbying, grant writing). Because customary

management constantly evolves through observation and harvest of resource (Berkes and Folke 2005), co-management processes may inadvertently contribute to stagnation of the very customary management they are designed to protect. Lengthy processes may decrease both government and community participants' time for monitoring and using marine resources, and distance decision making from actual changing conditions of resource health and patterns of use.

Suggestions:

1) Site visits and meetings held in close proximity to resources are two ways of decreasing this separation (Pomeroy et.al. 2004, Wollenberg et al. 2007, Fox et al. in press b). In California's north coast MLPA for example, numerous meetings were held locally (including within local and tribal community centers), and in the off season to not reduce conflicts with fishing activities. Where meetings cannot be held within the community, providing transportation costs for community members to attend could facilitate local participation.

2) Co-design Monitoring and Enforcement: Co-designing participatory monitoring and enforcement efforts from the outset of rule making processes could promote decision making based on best information, and increase local enforcement and monitoring capacity, while strengthening connections between people and natural resources. In particular, participatory monitoring (engaging community members in working together to monitor resource health and use) (Sudtongkong and Webb 2010) can strengthen community engagement in management (Kofinas 2002, Mutimukuru et al. 2006, Sudtongkong and Webb 2010, Aswani et al. 2012). A scientific advisory team could help develop monitoring protocols, evaluate the ecological benefits of particular

rules to aid in decision-making, and help both government and community groups access the latest science and apply it along with traditional knowledge to contemporary conditions and threats. Piloting education and community outreach efforts to enforce unofficial rules, rather than waiting until they become law, potentially increases community ownership of rules, and thus their effectiveness.

3) Place More Agency Staff in the Field: Increasing the number of resource management agency staff in the field would increase interactions with community members and with resources, potentially building relationships, trust, and knowledge of on the ground conditions.

4) Initiate Restoration Efforts: We also recommend initiating restoration efforts alongside rule making. Efforts such as weeding invasive seaweed or out-planting native coastal species could sustain engagement by helping community members to see tangible improvements in resource health. Hands on work together also could help build agency staff and community member relationships while maintaining connections to the resources being managed.

CONCLUSION:

Neither government agencies nor community groups can effectively manage coastal resources alone. Early stages of collaboration, such as rule making, set the foundation for successful co-management. Long-term capacity building of all participants is therefore as important an outcome of early partnering efforts as specific outputs such as rules. Whatever the fate of these specific outputs, enhanced capacity of government and community to collaborate creates transferable benefits. In this case

study, we show that the presence of established success factors, without careful attention to how they are implemented within early phases of a partnership, is insufficient. In certain cases, both enabling legislation (failing to establish clear legal authority or a transparent decision making process), and facilitation by a bridging organization (without addressing gaps in the skills of both community and government partners), may reduce long term capacity to co-manage in certain cases. Starting out with a long-term view to future leadership, while reinforcing relationships between people and natural resources, may increase the odds that early phases of co-management will lead to collaborative success.

Table 4: Selected Suggestions Emerging From Hāʻena CBSFA Rule Making

SELECTED SUGGESTIONS For Addressing Challenges	**Unresolved Legal Interpretations**	**Overreliance on Bridging Organization**	**Cross Generational Leadership Development**	**Separation of Process from Natural Resources**
Make Decision Making Process Transparent	X	X		V
Rapidly Resolve Legal Uncertainties	X	X	V	
Invest in Facilitation for Capacity Building		X	X	
Mentor New Leadership		X	X	
Co-design Monitoring and Enforcement			X	X
Place More Agency Staff in Field		X	V	X

NOTE: We selected these suggestions because each addresses more than one challenge. Xs indicate challenges directly addressed by each solution. Vs indicate those the solution may address indirectly if designed according to criteria described in the text. For example, field based agency staff and legal advisors engaged to resolve legal uncertainties could both mentor new government and community leaders.

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APPENDIX 1:

Policy Interview Questions

1) Tell me more about your job, your role, and responsibilities?

2) Can you tell me about your past experiences with CBNRM of aquatic resources in Hawai‘i?

3) Can you tell me about the process of rule making in Hā‘ena?
How did the opportunity arise? What is your role in the process?

3.5) Who do you think of when you hear the words Hā‘ena community? How would you characterize community goals and perspectives in this process?

4) What did you expect from the process at the start? What were its goals and purpose and yours in getting involved?

5) What are the most promising aspects of the process? Its biggest challenges?
(What about the process is working? What isn't?)

6) Could you please describe the best meeting you've attended? The worst?

7) Who are some of the different interest groups and stakeholders involved in this process and how would you characterize their perspective and interests?

8) How would you assess the balance of what different stakeholders are gaining vs. giving up?

9) How have the rules changed over the course of the process and why?

10) How will we know if these new rules are working?

11) What capacity building needs do you see from participating in this process?

12) What have you learned from your participation in this process?

13) What do you see as key lessons for other places and communities?

14) What are your suggestions for such a process to work more effectively in the future?

15) What do you see as the role of CBRM in marine resource management in the future (in Hawai‘i)?

16) What are your hopes for Hā‘ena and other communities in the future?

APPENDIX 2: Most Common Interview Themes
(Listed by frequency of mentions in interviews)

COMMUNITY	**GOVERNMENT**
THEME	THEME
1. Leadership	1. Process Bureaucracy
2. Trust and Respect	2. Precedent setting for other communities
3. Learning – Capacity Building to Employ Community Members	3. Enforcement by DOCARE
4. Process Bureaucracy	4. Legal translation challenges
5. Youth	5. Political Compromise
6. Learning from participation in rule making by Community Members	6. Enforcement through monitoring
7. Generational Differences	7. Economics
8. Enforcement by community	8. Division of Aquatic Resources
9. Learning – Capacity Building for leadership	9. Fragmented nature of DLNR's organizational structure
10. Precedent setting for other communities	10. Rules approval process

APPENDIX 3: Hā‘ena CBSFA Rule Making Timeline

YEAR	Events Related to CBSFA Process*
1994	Legislation passes (Act 271 or HRS 188 22.6) allowing DAR to create CBSFAs.
2006 June 26	CBSFA legislation passes on May 2, 2006 and is signed into law by the governor on June 26, 2006 (Act 241).
2007 = Collecting data to inform management plan, and ng strategic planning to develop vision, goals, key s of concern, threats, and approaches.	ot enforcement (Ma Kai watch) and monitoring (human use counts) Summer Program unity members conduct studies regarding perceptions of resource health in Hā‘ena, conducting interviews with Community Members (15), and Marine Scientists (2), and a summary of past ecological monitoring (final report in December)
2008 January 17 April 15 July 6 **FOCUS =** Fisheries Committee Drafts Initial Rules September	MEETINGS: Kaua‘i Head of DOBOR (Division of Boating and Recreation) DAR Administrator in Hā‘ena DLNR Hā‘ena SITE VISIT: Chair and Administrators of each division visit Hā‘ena, chosen as one of 4 communities in DLNR pilot of increased integration across divisions. **5 Fisheries Committee** Ave. Time = 3 hrs., Ave. Attendance = 6 people 1 Other Interested Parties = Commercial Kayak Operators Ongoing pilot enforcement and monitoring (human use counts)* Summer Program* Baseline Ecological Monitoring*
2009 January 30 April Summer October 28	**11 MEETINGS** (Hawaiian families *lū‘au*, Attendees = 60, 5.5 hrs.) (2 other interested parties, surfers and kayak companies) (3 broader community, Ave. Time = 4 hrs., Ave. Attendance = 27 people) Fishing studies 3 Monitoring Trainings* (1 broader community (20 attendees), 2 fishery committee (5 attendees) (1 Fisheries Committee , Time = 3 hrs., Attendance = 7)

= Rules are adapted according to DAR feedback and translation into legal language.	HCSN meets with DAR for feedback on rules **(No Hāʻena community members present)** HCSN changes name, reorganizes. Umbrella nonprofit folds and takes HCSN's monitoring grants which take six months to be recovered
2010 April 22 July 31 **FOCUS =** Rules are adapted according to DAR feedback and translation into legal language. November / December	 Fisheries Committee Meeting Time = 3 hrs. , Attendance =11 DAR Administrator is removed (March) Fisheries Committee Meeting with DAR staff present. Time = 6 hrs. , Attendance = 5 HCSN and DAR staff, particularly rules writer meet multiple times regarding rules translation. **(No Hāʻena community members present)** New Governor is elected, New DLNR Chair appointed
2011 January 26 March 6 April 12 April 29 May 17 **June 2** **Focus =** Final Edits to Rules. Presentation to Broader Community and Kamaʻāina Families. Submitting Rules to DAR August October December	MEETINGS DOCARE DOBOR Fisheries Committee Hawaiian Families Meeting Present final rules Broader Hāʻena Community Meeting (community association) Present final rules Attendance = 65, Time = 2 hrs. Hāʻena CBSFA Final Rules Draft is submitted for DAR review by HCSN (Draft to fisheries committee by email on 5/25 for comments, petition of support etc) Hāʻena human use monitoring reports and fishing studies are completed by HCSN (May) and Stanford researchers (August) Community Fishing Camp * Hāʻena Community hosts HCSN gathering of 25 communities New HCSN executive director introduced to community by outgoing executive director (referred to in article as "facilitator")

2012	
May	New HCSN executive director meets with community
August	Two Hā‘ena members travel to HCSN policy and advocacy training workshop
September 21	DLNR chair to visit Hā‘ena and meet with community

Note: Fishery committee members generally attended all community meetings (including those with the *‘ohana* council, other interested parties, and the greater community).

*All of these other activities related to CBSFA also engaged HCSN and Hā‘ena community members, including members of the fishing committee.

CONCLUSION

*I Mea Aha La? (*And So What?)

I investigated the following research questions through four separate articles: (1) How do multiple diverse user communities relate to the same place? (2) What is the contemporary significance of customary sharing from subsistence harvest of natural resources? (3) How are informal community norms integrated into formal management rules intended to become law? (4) What lessons does this case offer for early phases of other co-management efforts? This section describes key themes emerging from my dissertation, as well as directions for future research related to each theme.

Kaiaulu (Community): The Flourishing Sea

It is challenging to define "community" in community based resource management (Agrawal 2003, Berkes 2009). I use a place based approach to define community as encompassing particular natural resources and the people connected to, and by, their relationships with those resources, or "communities of use." My findings supports previous research showing that different activities create different communities of use, as do distinct avenues for learning about a place, (i.e. fishing with one's family, surfing with friends, or reading a guidebook) (Moore and Scott 2003). Communities of use can thus be quite separate, even if interacting within one small area. Controlling the means through which people learn about a place can be a powerful tool in managing their interactions with resources (i.e. guidebooks, signs, outreach on the island's visitor channel, airline in-flight videos, etc).

In planning for collaborative management, it is difficult to identify, much less engage or facilitate agreement between all user communities. Further, decision-making processes can overlook key user groups. Underrepresented communities of use in this case include part-time residents, immigrant fishermen, regular fish recipients, people who grew up in the area but no longer live there, and youth. In the future, I will draw on data not utilized in this dissertation for another paper on defining and engaging diverse communities of users over a multi-year collaborative management process.

In this study, I found that natural resources themselves are, for many participants, an important part of the community. Co-management processes can recognize this perspective by increasing physical proximity of decision making to resources, strengthening relationships between people and resources through ongoing use and education, and developing rigorous assessments of whether management efforts actually improve resource health. Monitoring of both resource use and health may be the most important factor in determining the success of community based natural resource management, (Ostrom 2005). In this study, pilot monitoring efforts were both empowering and frustrating for community members. This experience suggests some specific design criteria for participatory monitoring which I would like to investigate in future collaborative research. These criteria include: empowering monitors to develop and adapt monitoring protocol, developing broad observational skills instead of focusing exclusively on one species or transect line while maintaining scientific rigor, devising scientifically validated inexpensive and accessible sampling techniques, minimizing overly burdensome requirements of entering, storing and analyzing data, and engaging monitors in analysis and sharing of data, not just data collection. I am also interested in

monitoring techniques that occur alongside or through harvest activities; under customary systems such as in Hā‘ena, resource harvest was the principle form of management. Long term, I would like to investigate how engagement in participatory monitoring affects community ownership of rules and informs changes in management, including community harvesting practices and norms.

‘Āina (Resource): That Which Nourishes

Place-based cultural practices, such as harvest of natural resources for subsistence purposes, continue to be important in contemporary times. While investigating subsistence fishing and sharing, I found that the significance of such practices is much greater than the specific products they provide. These practices may take on new forms as they adjust to changing circumstances. However, they continue to nourish people's connections to particular places and to one another in multiple meaningful ways – defining personal identity, providing family security in uncertain times, maintaining strong social networks, allowing for distribution and exchange of abundance, and enhancing community resilience.

Because these benefits are overlapping, place specific, and accrue at the community level rather than at the individual level, they are difficult to measure, and need to be studied in specific contexts with community collaborators. Researchers and fishermen in other Hawai‘i fishing communities have expressed interest in using the participatory fish tracking methods developed in Hā‘ena, to study subsistence fishing and sharing in other parts of the state. Future Hā‘ena research could also incorporate data we collected on a

third fishing season and tracking subsequent levels of giving from fish recipients to others, rather than including only gifts emanating from fishers themselves.

I would also like to extend this research to collaborations with other interested groups of cultural practitioners. One example is harvest of native forest plants for *hula* (Hawaiian dance), *la'au lapa'au* (medicine,) and *lei* (adornments fashioned of greenery and flowers). Do the same categories of benefits I found for fish apply to cultural resources not used for food? I would like to bring cultural practitioners and natural scientists together to investigate how norms of cultural harvest relate to regeneration processes for specific species, and engage users in discussion of sustainable harvest in light of heightened threats to resource health.

Pono (Balance): Power Sharing

In this case study of collaborative rule making, this early phase of co-management required more than a legislative mandate, protection of specific cultural practices within law, or narrow accomodations within formal rules. Co-management is premised upon equitable power sharing, yet usually occurs in the face of substantial power differentials between the state and community groups (Nasdasdy 2003). I suggest transparency at the outset of any co-management process regarding its legal mandate, and range of possible outcomes. Access to legal expertise and representation may also allow community groups to challenge narrow legal interpretations of government agencies. In addition, all partners in co-management must retain authority - not just to create, but also to review and modify rules regularly. Because community members participate at higher personal cost, volunteering where state and non-profit staff are paid, it is important to level the

playing field of engagement. Suggestions include providing for travel costs, holding meetings as close to communities as possible, and seeking ways to create community employment in support of the co-management process.

Negotiating clear allocation of power to enforce rules is also important. I tangentially address enforcement within this dissertation because Hā‘ena’s main focus over the last six years has been drafting rules. However, enforcement emerged as one of the top themes in both interviews and rule-making meetings. Community members talked about enforcement by community members. Agency staff talked about enforcement by DOCARE (Division of Conservations and Resource Enforcement), DLNR’s enforcement arm. I would like to study “Makai Watch,” the collaborative enforcement effort, now 10 years old, between ten other Hawai‘i fishing communities and DOCARE. This program aims to enhance monitoring of resource use and reduce infractions by training community volunteers. These volunteers patrol the coast, record data on human use and report infractions to DOCARE officers. Officers are expected to be more responsive to participating communities because they have established connections with “deputized” volunteers. There has been no study of this program and its effects on enforcement capability, resource health or participant capacity for management. I would investigate this program alongside other enforcement efforts not endorsed by the state, in which community members regulate fishers through direct confrontation and confiscation of gear.

Kuleana[52] **(Rights and Responsibilities):**

Past research identifies the importance of common property arrangements that differentiate collective rights of specific communities from the general public (Cinner and Aswani 2007, Tipa and Welch 2006). Under co-management, communities lose their customary rights to exclude other users.[53] This difference emerges as a critical challenge in this study. This research contributes new understanding of how rights under customary management depend upon responsibilities. In Hā‘ena, people who took on customary management responsibilities had increased rights to harvest and increased authority in decision-making. It was challenging to formally recognize this critical balance of collective rights tied to responsibilities in state-sanctioned rules. Instead, both the community and DAR invested substantial time and human resources in crafting indirect mechanisms to privilege harvest by certain user groups. Further, individuals who have never set foot in Hā‘ena could still mount vehement public opposition and sink the entire rules package. In future research, I would like to compare common property arrangements that differentiate specific user communities from the general public by allocating rights (of both use and decision-making) based on responsibility. Some examples:

[52] Sections of *‘āina* cared for by a particular *‘ohana* within an *ahupua‘a* were known as *kuleana*. *Anakala* Eddie Ka‘anānā, a beloved *kūpuna* of *Miloli‘i* fishing village on the island of Hawai‘i, explained the meaning of "*kuleana*" this way (Personal communication April 2003). He described the land under one's stewardship and care as the primary meaning of *kuleana* and the root of all other responsibilities and accomplishments in one's life. The level or responsibility and respect afforded to a family by the community as well as a family's ability to care for their children depended on their collective ability to *mālama* that primary *kuleana*, caring for that piece of land and making it productive. In this description, all rights and responsibilities, are inextricably rooted in the land itself and in how well we care for it.

[53] Another key difference is that under customary management, no one had rights to alienate (sell or transfer) the resources, but under the co-management regime with State involvement, private property owners can sell natural resources.

- Reserving limited catch allocations for subsistence harvest provided fishers share their catch.
- Closing public access to a state park one day a week, limiting entry to community members helping with restoration projects.
- Competitive allocation of commercial permits for public beaches based on proposed stewardship efforts such as hauling out trash, or engaging tour groups in invasive species removal.
- Weighting public response to a development proposal or management plan based on criteria such as the number of meetings a respondent has attended, how regularly they use the affected area, and the degree to which their use provides community vs. individual benefits.

I see tiered stakeholder rights, allocated based on responsibilities, as an exciting and minimally explored area of natural resource management research. I think these collective, balanced, differentiated rights may nurture community investment, or "sense of ownership," pivotal to both collaborative and community based natural resource management.

ʻAʻo Aku, Aʻo Mai (Teach and Learn): Building Durable Cross Generational Capacity for Co-Management

Basing contemporary management on customary systems requires creativity and ongoing learning, particularly due to multiple obstacles and challenges suggested in this research. At the same time, co-management partnerships can be conducive to collaborative thinking, integration of different perspectives and potential to generate new solutions. Co-management processes take a long time, and it is important to plan for leadership development, through transfer of knowledge and relationships to avoid reinventing the foundation upon which collaboration is built. In Hāʻena, the ability of experienced leaders to develop leadership skills in younger community members was a

key challenge. Transition planning within government agencies with frequent turnover was also an obstacle. Cross-generational transmission of traditional knowledge is crucial to the longevity of community based resource management systems (Ostrom 2005). However, this research suggests that transmission of knowledge to younger generations of leaders concerning the legal and political system within which collaboration takes place (i.e. history of past policy processes, knowledge of multiple levels of environmental law, understanding the EIS process and how to comment) is equally essential.

I look forward to further exploring youth experience and learning within co-management partnerships. With the help of two undergraduate research assistants, I conducted ten youth interviews and three youth focus groups in Hā‘ena, which are not included in this dissertation. Youth interviewees spoke little about the formal rule-making process, but had a lot to say about the importance of practicing and perpetuating their culture through hands on work, feeding their families from natural resources and finding ways to live and work in Hā‘ena again. I also want to pursue my interest in "elder" interviews, extending it to an emerging generation of knowledgeable elders. These are community leaders and policy makers in Hawai‘i who have been engaged in collaborative natural resource management efforts at the local level for decades, and whose stories of past agreements, past land uses, and past planning efforts are invaluable and need to be documented now.

Future research could also focus on broader themes of learning through collaboration. I am interested in model cases where effective facilitation builds learning, capacity, and durable collaboration for natural resource management with previously adversarial parties. I am also interested in assessing learning by participants in co-management over

longer periods of time. How will Hā‘ena community members and DAR adapt rules in the future based on ecological and social outcomes?

Ka Hopena: Conclusion

Throughout this research I found that terms such as “community”, “resources,” “management,” and “co-management,” inadequately capture the full meaning of the ideas they are intended to convey. In reflecting with interviewees and collaborators, I often found these terms limiting instead of clarifying. For example, some interviewees found it difficult to answer questions that included the word “management,” as they did not feel humans could ever presume to “manage” an ecosystem. However, I struggled to find substitute terminology for use in this research. In the future I hope to collaborate with other scholars to generate terms that are more illustrative of relationships between humans and natural resources, particularly within indigenous contexts.

I also intend to apply the findings, methods and conceptual framework of this dissertation to the nineteen other fishing communities in Hawai‘i engaged in collaborative efforts to manage inshore fisheries. Nearly all of these communities are participants in the Hawai‘i Community Stewardship Network (HCSN) whose role is discussed extensively in this thesis.[54] These communities and their fisheries are extremely diverse in marine resource health, degree of urbanization, population demographics, leadership capacity, degree of fishing pressure, and strength of customary practice. They also are making different choices regarding their level of engagement

[54] HCSN is now called KUA (Kua‘āina Ulu 'Auamo).

with the state and avenues for pursuing community level management.[55] The state level resource management agencies and personnel are the same across the state, including Hā‘ena, making these cases especially interesting for comparison.

I conducted one initial focus group with representatives of seven different communities in October of 2011. That group suggested the broader importance of some of the themes emerging from this research including interpersonal relationships with DAR staff and challenges of turnover, legal uncertainties, dilemmas of balancing customary rights and public access, leadership development and difficulties in engaging youth, desire for community engagement in the all important area of enforcement, frustration with working across DLNR's many divisions to care for resources in an integrated way, risks of community burn out, and the crucial role of HCSN. Through research engaging more communities within and beyond the HCSN network, I will be able to explore these themes further. However, I would also like to work with other scholars, including economists and natural scientists, to explore longer-term questions related to the "success" of co-management. Together, we would investigate community and government capacity, adaptation, and impacts on marine resource health in these different communities over time.

[55] Examples of these different choices include: whether or not to pursue formal CBSFA designation; emphasis on rule-making versus other activities such as enforcement through Ma Kai Watch; and developing Native Hawaiian "Ahupua‘a Councils" of cultural practitioners envisioned as local level governing bodies for all natural resource issues through another legislatively mandated process within DLNR.

EPILOGUE:

ʻ*Āina* (Land, That which Feeds)
Researching Community Based Natural Resource Management at Home

Hāʻena, site of this research, is fifteen minutes drive from the town where I live and grew up in the Haleleʻa district of the north shore of the island of Kauaʻi. This section offers some closing reflections on working in my home community, and particularly on trying to conduct research that "gives back" to the places and people I study. Giving back is a daily dilemma because I reside and raise my family among those I research, not just for a field season, but for life. We bump into each other in the grocery store, attend funerals for one another's family members, drop and pick up our children from the same schools. I regularly interview people who knew me as a child, or whom I taught as children in my prior career running outdoor education programs at local schools. In fact, concern for the lack of post-high school opportunities for my students triggered my decision to go back to school and pursue a doctorate in environmental studies. I aspire to put my education to work creating college level field based programs which build the capacity of community members to care for and govern the unique natural resources of our area at the local level.

Huli nā lima i lalo, ʻ*ai ka waha.*
"When the hands are turned down, the mouth eats."

Though my education and research are aimed at giving back to my community, I often worry day to day that I am taking more than I can give. I crave immediate and tangible means of reciprocation: turning my hands down in the muck to plant alongside interviewees in their restoration projects; having ready-to-go robust findings easily

packaged into effective testimony for an upcoming contentious land-use hearing; taking bread hot from my oven or vegetables from my garden when I head out to spend the day recording in someone's garage while they feed me stories and seasoned raw fish; returning video and a transcript the week after an interview for their grandchildren to one day find and treasure.

I find though, that as a young mother, working to finish a dissertation at an institution 2,500 miles away, trying to keep up with reviewer and committee feedback, I often fall short of concrete, quick, or complete reciprocation towards those amongst whom I live and conduct research. I make it to the community meetings I need to observe, but not the hands-on work days; spend hours alone at my computer sorting data into slowly emerging and not at all clear cut - much less clearly useful - findings; grab mangoes from the local fruit stand on the way to the interview with no time to garden or cook; and take a year to return the compact disc recording with thank you note sans transcript. Guilt that I am not giving back enough has led me to turn my cart down a different aisle after spotting a research subject at the only local supermarket. Yet, as one of the fishermen I interviewed once told me, "Don't worry, you are not going anywhere, we know where you live." I have come to realize that the three main ways that I give back to the community I research, my home community, are intangible and long term: researching meaningful community questions; sharing research results; and teaching.

***Kōkua Aku Kōkua Mai* (Help and be Helped)**
Researching Meaningful Community Questions:

My dissertation research questions are all relevant and meaningful to the communities I work with because they have the potential to inform and improve ongoing

community based resource management efforts. I explore challenges of basing contemporary state management of fisheries on customary local level rules, seek to understand how different users interact with and learn about the same coastal area, and assess challenges facing collaborative management efforts between communities and government. Within these broader questions with relevance for community efforts, I have chosen specific areas of focus in collaboration with community members.

One of my research questions emerged directly from working with fishermen involved in community planning efforts for the local fishery I study. They were curious about where fish from their area go, to whom and for what purpose. Together, we designed a participatory section of my dissertation research around tracking subsistence catch from the area, and how it is distributed. I worked with a group of seven fishermen and other community members to delineate the study's purpose and research questions, develop and pilot catch logging forms, recruit participants, collect data by going to fishermens' homes, and conduct analysis of initial results. Their enthusiastic voluntary participation in all aspects of the research grew from genuine interest in its results. I know that the findings are important to the community because people ask me to share the research in both community gatherings and meetings with representatives of state resource management agencies. In this instance, my initial intent was to give back by focusing on a community generated question. However, I found that this participatory approach was the most rewarding part of my dissertation, and also immeasurably improved the research. In a community where people are raised not to ask or talk about fishing, saying they are going "*holoholo*," (cruising around), lest they appear boastful or alert the fish, our study obtained an 87% participation rate. My own sense of data

reliability as a non-fisher was questionable. However, our research team sitting together looking over log sheets had a keen sense of how well our catch rates and patterns reflected reality, quickly identifying fishing events we'd missed or mis-recorded. When relationships between fishers and fish recipients, which we had not been recording, turned out to be important, this team could go back through a year of data and fill in community relationships they knew by heart. Through this research, I found that giving back is not a one directional reversal in the usual flow of research benefits, but continual back and forth, benefitting both the researcher and researched in often unexpected ways.

Hānai aku Hānai mai, (Feed and be Fed): Sharing Research Results

The second way I strive to give back is by sharing research results in multiple ways. When we completed data collection for the fishing study, I delivered binders with draft fish distribution maps to the homes of each of the fishermen who had logged their catches during the year and a half study. These visits often spawned conversations which yielded a whole new layer of information, eliciting participant explanations of the patterns shown by the research, and new kernels of knowledge upon which these explanations were based. However, I was uncomfortable with asking more time for these visits from busy individuals, almost an additional round of interviews. As a result, I often failed to prepare for this new and time-consuming level of analytical sharing. I found myself caught in kitchens, while wives and other family members grew interested and started to add their interpretations and fishing knowledge, wishing I had brought my tape recorder or a note pad, yet reluctant to use either when the study was supposed to be finished.

Group presentations and discussions were more efficient than these individual home visits. They allowed me to show results to many people at once, and to gauge from the collective discussion whether particular explanations of distribution patterns were widely agreed upon. For these presentations, I attended existing meetings of involved community groups to present and answer questions as part of their regular agenda. I also organized two community research sharing meetings, each attended by around 30 people including study participants, supportive family and friends, members of the public and our area state legislator. These sessions, publicized through fliers and community radio spots, offered food, community building time for introductions and informal interaction, a power point presentation on the research, time for question and answers, and multiple opportunities for written and oral evaluation and feedback. Evaluations were all overwhelmingly positive, with people leaving excited about the research and its connections to other community efforts. However, I sometimes left these gatherings worried that I had taken on more responsibility to serve as a community spokesperson and to carry on the research than I could fulfill.

As I turned from collecting data to writing, while still living at home in the community, I simply had less time to interact with other community members about the research. Towards the end of my writing, with deadlines looming, I began to receive invitations to attend meetings with government officials to present the research. While I did so on a few occasions, I started instead to email resources I thought might be useful such as a new policy review of laws enabling community based fisheries management in Hawai‘i. It turned out that my research offered the only documentation of nearly six years of community meetings to create proposed rules for local coastal management, so I

provided a table of meeting dates, locations, and attendance. Through these efforts I discovered the value of giving back by compiling and sharing the best data I could, then letting others decide its usefulness, and interpret its meaning.

Aʻo aku aʻo mai (Teach and Learn)
Teaching Community Research Assistants

Finally, I strive to teach "community research assistants" of two types: individuals from the geographic area where I conduct research, and community minded student researchers who come from and will go on to work in other places. We know from other research that both groups are important because too frequently studies proceed with no awareness of the communities in which they take place. At the same time, too few communities have local capacity to design and conduct their own research. For three consecutive summer fishing and fieldwork seasons, I have built a diverse research team composed of undergraduates from Stanford, the University of Hawaiʻi, and local community members. The team included undergraduates who grew up within my research area (often the first in their families to attend college) and are home for the summer, as well students from Hawaiʻi attending Stanford. These local students helped forge connections between their fellow college students from other parts of the country and the community.

I am deliberate in teaching my student research assistants to respectfully and effectively engage with communities. I provide an orientation to offer explicit suggestions for community interaction such as "work with your hands, close your mouth, observe with your eyes, and listen, then listen some more," or "do not go everywhere in a big group." I teach an ʻoli (chant) composed for the group and other culturally

appropriate ways to enter our community. I also require students to do monthly community volunteer work outside of their research. These projects, many involving hands on work with natural resources, have included trail restoration, community gardening, native planting, litter clean ups, marching in a parade, and assisting with the final party for a local summer camp. Student research, if not related to my dissertation, is conducted in collaboration with non-profit community groups encouraged to suggest projects the group wants to accomplish but cannot do on their own. Research projects have included water quality testing; monitoring spread of invasive seaweeds; Google mapping Hawaiian cultural sites and place names; and one master's thesis analyzing public support and land preservation options for an undeveloped stretch of coast.

Through these approaches, student research assistants have helped to forward my dissertation work while simultaneously providing assistance to understaffed and underfunded community conservation efforts. Community groups have expressed appreciation by organizing field trips for their interns to experience the island, contributing small monetary donations towards students' expenses in the upcoming school year, planning community gatherings where students present results of their projects, and holding going away parties for their interns. In turn, student evaluations of their summer experiences unanimously express appreciation for having truly gotten to know the community of Kaua‘i, a popular tourist destination that most people who visit learn very little about. They describe their community work as the key to their learning.

I also try to build community research capacity and contribute to community based economic development by writing grants to employ research assistants from the north shore of Kaua‘i. Our island is a tourism based economy where most residents are

working two to three menial jobs such as cleaning vacation rentals or maintaining golf courses in order to afford high priced groceries and rising property taxes. I feel it is necessary to pay people who assist with my research on a sustained and regular basis. This means of giving back also provides multiple unexpected community benefits. For instance, employing community research assistants in the fishing study may have helped to increase inter-generational transmission of cultural knowledge by ensuring that information on fishing traditionally shared only within families was collected by family members, and that interviews took place with family members present. Community researchers enjoyed conducting beach surveys of coastal users that engaged them in learning about and helping to take care of their home area. One woman in her early fifties said that though she lives only ten minutes away, this study was the first time she had returned to the coastline where she grew up in over a decade. Community research assistants also always brought others along with them to collect data, whether friends, family, children or siblings.

One of the most challenging, and rewarding parts of engaging community member researchers was encouraging their participation in presenting and sharing the research. Though they were initially nervous and reluctant, five different community members have participated in presenting our research at state and national conferences. Along with building skill and confidence in public speaking, these presentations seemed highly beneficial for the positive feedback and interest they received from diverse audiences, and the opportunity to learn from others engaged in similar work. Through teaching, and learning from a team of both student and community member research assistants, I have glimpsed potential long-term benefits of giving back. I hope that my

efforts might help to build ability of future scholars to give back to the communities in which they conduct research, while also building the ability of the community I work in, to both research and represent itself.

Ka Hopena: Final Thoughts

In our fishing study, fishermen who shared fish from a harvest with their neighbors, extended family members, and friends, often returned home to find their door-step laden with fresh fruit, vegetables, smoked pig meat, or home made bread. Some fish recipients reciprocated over longer periods of time, with skills and not goods, setting up tents for a fishing family's baby party, mending torn nets, sending high school age children to baby-sit. At the core, my home community is one where people believe in giving back. However, the exact means and timing vary. Selection of research questions, sharing results, and teaching are each long-term pursuits, which do little to relieve my day-to-day unease that the vocation of research, takes more than it gives. Though these avenues of giving back are less tangible and immediate than those described at the opening of this article (and best used in combination with concrete everyday reciprocal actions such as taking food to meetings, taking time in each interaction, and listening sincerely), these approaches are nonetheless important. They have potential to do far more than fulfill a responsibility to give back. They may build a given community's potential to care for '*āina*, the natural resources which feed it, physically, intellectually, and spiritually. They may also build broader capacity for scholars to conduct research that contributes to the communities in which it takes place. These avenues simultaneously contributes both to the researcher and the researched, also reveal that

giving back never occurs in one way, but continuously flows in all directions, whether we spend a lifetime, or a short time in the communities we research.

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