

FROM PLANNING TO PRACTICE: TOWARD CO-MANAGEMENT OF HAWAI'I CORAL  
REEF FISHERIES

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emergence; transaction costs

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## **Dedication**

I dedicate this dissertation to my family, who has supported me throughout my educational process. To my maternal grandparents, Duane Harvey Loomis and Evelyn Pruden Loomis, whose tireless work ethic, loving kindness, and perseverance to accomplish their goals remain a constant source of inspiration. My grandfather was a lifelong fisherman. He fly fished for trout in streams and rivers in the U.S. and Canada, trolled for king salmon on Lake Ontario, and later, fished for pelagic species in the Gulf Stream waters 65 miles offshore of southeastern North Carolina. During my childhood summers, I would spend a week at a time with him, sleeping on his boat, waking up at 4:00 a.m. to leave Oak Orchard River in search of an early king salmon or rainbow trout bite on the lake. My grandfather had a keen interest in conservation and I know he would have enjoyed learning about my dissertation work. My grandmother came to visit me twice in Hawai‘i. She loved hearing and learning about my research and derived great pleasure in knowing I would one day graduate with a doctoral degree. I only regret that I couldn’t finish sooner so that she could watch me graduate. To my parents, Gerald Joe Ayers and Jane Loomis Ayers, I owe an immeasurable debt of gratitude. They have provided unwavering support for my professional aspirations. My father was a part-time charter fishing captain on Lake Ontario and the Gulf Stream waters off of southeastern North Carolina. My first job was a first mate for him on his boat. The time I spent fishing with him and my grandfather during my formative years provided a basis for understanding what it means to be a fisherman. To this day, conversations with my father about fishing, economics, and policy provide me with invaluable perspective. His keen observations, knowledge, and experience on the water and in business continually challenge and ground my own thoughts and opinions. But I owe the greatest gratitude to my mother, Jane Ayers. Her grace, understanding, kindness, and encouragement have enabled me to follow my dreams. Like my father, conversations with my mother have helped me to put life in perspective when I get too caught up in the minutiae of day to day life. Her understanding and support have also helped me through many difficult times. Together, my parents and grandparents were incredible role models for an inquisitive child. Their love and support continually empowered my personal and professional development.

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## Abstract

Marine ecosystem loss and degradation are a worldwide phenomenon. Ineffective management has allowed land-based pollution, overharvesting, competing uses, and excess coastal development to proliferate in many places. A variety of management innovations have been developed and promoted to improve social and ecological outcomes. Co-management is one promising innovation that entails shared management authority between resource users or communities and a central government. Although co-management has shown great promise in improving natural resources management in many settings, governments and communities often face challenges during shifts from a command and control regulatory approach to a collaborative one. Hawai‘i is one geography where governance transitions to co-management in coral reef fisheries has been limited, despite the presence of highly engaged communities, a legacy of customary marine tenure with a legal pathway that has existed for over 20 years, and significant support from non-governmental organizations (NGOs). This dissertation research traces how fisheries management and marine tenure have changed from Hawaiian Kingdom Era through present day, including how co-management emerged at the community level in Hawai‘i and the barriers faced during planning and implementation. This dissertation research also examines some different ways communities have partnered with the State of Hawai‘i outside of formal co-management relationships, and concludes by critically examining the role of leadership throughout these governance transitions. The results reveal the importance of historical context in shaping institutional design; which events precipitate self-organization and collective action at the community level; how the distributions of costs and benefits at different stages of the policy cycle can affect incentives to engage in co-management; how fragmented authority complicates integrated co-management; and the salience of collective leadership in co-management settings. The findings from this dissertation have implications for fisheries co-management specifically, and more generally, collaborative environmental planning and management in a variety of settings worldwide.

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## List of Acronyms

<b>ACOE</b>	Army Corps of Engineers
<b>CBSFA</b>	Community-Based Subsistence Fishing Area
<b>CWB</b>	Clean Water Branch
<b>CZM</b>	Coastal Zone Management
<b>DAR</b>	Division of Aquatic Resources
<b>DLNR</b>	Department of Land and Natural Resources
<b>DOBOR</b>	Division of Boating and Ocean Recreation
<b>DOFAW</b>	Division of Forestry and Wildlife
<b>DOH</b>	Department of Health
<b>EPA</b>	Environmental Protection Agency
<b>FMA</b>	Fishery Management Area
<b>FRA</b>	Fishery Replenishment Area
<b>MLCD</b>	Marine Life Conservation District
<b>MPA</b>	Marine Protected Area
<b>NARS</b>	Natural Area Reserve System
<b>OCCL</b>	Office of Conservation and Coastal Lands
<b>SAMP</b>	Special Area Management Plan
<b>SMA</b>	Special Management Area
<b>WHRFMA</b>	West Hawai'i Regional Fishery Management Area

## Preface

This dissertation was inspired by both intellectual curiosity and an opportunity to contribute to co-management transitions in Hawai‘i. As a doctoral environmental planning student, I wanted to make a theoretical contribution, but I was also interested in finding a project that could contribute in some way to the people and resources in Hawai‘i.

My personal interest in co-management was inspired by the work of Elinor Ostrom. In 2009, Ostrom was awarded the Nobel Prize in Economic Sciences for her work on common pool resources management. Her research challenged widely held beliefs that common pool resources could only be managed through government coercion or private property rights. Through case studies, she demonstrated that collective action was a viable option in hundreds of global commons and changed the way people thought about commons governance. I first read her work in a course on community-based natural resource management taught by Kem Lowry and Krisna Suryanata in Spring 2010. Suddenly I was excited to read and learn more about common pool resources governance, institutional analysis, and transaction costs. I read much of her writing and that of her colleagues. I eagerly began looking for ways to apply her research to make a scholarly and also, a practical contribution to coral reef fisheries management in Hawai‘i.

Inspired by the community-based management course, I began to learn more about different community planning initiatives underway across the archipelago. I learned about the tremendous customary, indigenous knowledge and practices held within many Hawai‘i communities. It made perfect sense to me that Hawai‘i communities and the state should partner together through co-management to improve coral reef fisheries. After four years of fieldwork and scouring the academic literature for solutions, I have learned that co-management transitions do not come easily, nor do they happen overnight. When I first began this research in 2011, Hā‘ena (Hawai‘i’s only active community-based subsistence fishing area) had already submitted their rules to the Attorney General for review. The rules did not become active until August 2015, over four years later. During that time, I made the transition from a novice *haole* doctoral student to a more enlightened (but still *haole*) doctoral student with a better understanding of Hawaiian history and culture.

Throughout my time in Hawai‘i, I have always struggled with being an outsider. As a *haole* from the mainland (continental) United States, I often question whether I belong in Hawai‘i and if I am the right person to conduct this type of research. However, there have been experiences throughout my dissertation process that have altered my perspective, one being an unforgettable weekend of service on the island of Kaua‘i. In early October 2014, I camped with the Hā‘ena community in a section of the Hā‘ena State Park. There, the local group Hui Maka‘āinana o Makana has been working to restore the *ā‘ina* (land) and *lo‘i kalo* (taro patches) to supply food for local residents. They have a small covered structure where local residents gather together to meet, eat, share cultural practices, and develop restoration plans for the area. While camping that weekend, I washed dishes, and listened intently to learn firsthand what the Hā‘ena effort meant to the local community and other communities across Hawai‘i. I also helped some of Hā‘ena’s ancestral residents prepare public testimony in advance of a big public meeting in Hanalei to discuss their proposed subsistence fishing area. The community members were very passionate, but many were not the type of folks that felt comfortable with standing up and sharing their thoughts in front of the entire community. With enough practice and encouragement from their peers and others involved, folks eventually became comfortable with their messages. When it came time to deliver oral testimony, some entire families stood up at the podium together. Groups of eight or ten grandparents, aunties, uncles, sons, daughters, and grandchildren stood up, in front of the Hanalei Elementary School cafeteria, taking turns sharing their words. A few folks came to tears sharing stories about family members that had passed on and what that area meant to their family. It was truly amazing to see these folks share stories about their deep connections to Hā‘ena with a couple hundred folks they see every day around town, on the beach, and in the grocery store. Delivering that oral testimony in a very public setting was something they were not accustomed to, but it resonated with everyone present, including the government representatives from marine resource management agencies.

After the public meeting, where over 99% of testimony collected was in favor of establishing a community-based subsistence fishing area in Hā‘ena, we retreated back to the campsite to celebrate under the stars at Hā‘ena State Park. There, Hā‘ena residents and others that had worked with the community sang, played guitar and ukulele, ate some delicious food, and commemorated the successful meeting. The *kanikapila* (informal jam sessions) involved folks



from their twenties to others well into their eighties. The celebration stretched late into the night. Later, in the clear, still, muggy night sky on Kaua‘i’s northwest coast, a *po makole* (a night rainbow) appeared, beaming magnificently over the *pali* (cliff). Night rainbows or moonbows are extremely rare. I had never seen or heard of such a thing before this night, and I can honestly say that I have never seen such a beautiful sight as that *po makole*. I believe that the successful public meeting – and that *po makole* we witnessed that night – was a culmination of the work that the Hā‘ena community had put in over the ten years it took to transition Hā‘ena to culturally-based rules and a co-management partnership with the State of Hawai‘i. During that time, many *kūpuna* (elders) that were involved from the beginning of the process had passed away and I would like to think that the *po makole* appeared on that night because Hā‘ena ancestors were pleased with the community’s efforts. There in Hā‘ena with my very small involvement in preparing for that meeting, I finally felt like I belonged. I finally felt like I was able to give something back. With this dissertation, it is my hope that I have contributed in some way to a better understanding and easing of co-management transitions for other communities across *Hawai‘i nei* (beloved Hawai‘i).

## Chapter 1.

### From Planning to Practice: Towards Co-management of Hawai'i Coral Reef Fisheries

#### 1.1 EVOLVING OCEAN GOVERNANCE

For much of human history, the oceans of the world were considered so vast that no level of harvesting could ever exhaust its resources:

For every one admits that a great many persons hunt on the land or fish in a river, the forest is easily exhausted of wild animals and the river of fish, but such a contingency is impossible in the case of the sea (Grotius, 1916).

Centuries of human impacts and collapsed fisheries have shown this to be untrue. Vast anthropogenic impacts on marine ecosystems throughout much of the world has been attributed to overharvesting of marine resources, global markets and trade, development, and climate change (Cinner, McClanahan, et al., 2012; Cinner, Graham, Huchery, & MacNeil, 2013; Halpern et al., 2008; Maire et al., 2016). Self-interested overharvesting or a lack of effective governing institutions in many areas has resulted in what has been called the tragedy of the commons. The tragedy of the commons occurs when people harvest common resources in their own self-interest rather than at levels for the collective good of all, resulting in serial depletion (Gordon, 1954). The solution to the tragedy of the commons was once thought to be limited to just two solutions: government coercion, or enclosure and allocation of property rights (Hardin, 1968). However, Elinor Ostrom and her colleagues showed the multitude of ways resource users could communicate and cooperate to avert the tragedy of the commons through collective action (E. Ostrom, 2005).

Despite the multitude of governance arrangements available, including collective action, ineffective management threatens the ecosystem goods, services, and values that coastal communities rely upon across the world. These goods and services include fisheries resources that feed an estimated one billion people, storm protection functions provided by coastal ecosystems, and socio-cultural services for coastal communities (Barbier et al., 2008). Much of this ineffective management is related to a lack of state-level capacity to manage resources effectively (Pomeroy & Berkes, 1997); regulations that do not adequately consider local context,

historical patterns and norms of use (Cleaver, 2002), a lack of recognition of the capability of resource users or communities to sustainably manage resources on their own (E. Ostrom, 1990), or not devolving property rights to resource users to sufficiently confer stewardship incentives (Grafton, Squires, & Fox, 2000).

## **1.2 TOWARDS CO-MANAGEMENT**

For centuries, indigenous communities across the world employed traditional ecological knowledge to devise place-based sociocultural institutions (sometimes referred to as traditional management, customary management, or customary marine tenure) to manage resources collectively (Berkes, 1999; E. Ostrom, 1990; Zerner, 1994). Traditional knowledge and management has been renewed in many places, particularly across the Pacific (Johannes, 2002). Although traditional knowledge and management are in place in many rural areas around the world, in recent years there has been a movement to integrate traditional knowledge and customary management practices with western-based scientific approaches (Kittinger, Cinner, Aswani, & White, 2015). This integration often occurs through a management partnership between local resource users or communities and the state, termed ‘co-management.’

Co-management and other hybrid governance arrangements have emerged to resolve some of the deficiencies that have manifested in bureaucracy-based governance arrangements (Borrini-Feyerabend, Farvar, Nguinguiri, & Ndangang, 2000; Jentoft, 1989; Pinkerton, 1989). These new collaborative governance arrangements combine aspects of community-based management, such as self-organization and collective action, generally to create a management partnership with the government (Berkes, 2009). Co-management can take many forms and may include market-based approaches, including the sale or lease of harvest rights; co-operative management; access controls; and adaptive management (Basurto et al., 2012; McCay et al., 2014; Olsson, Folke, & Berkes, 2004; Yandle, 2003). Diagnosing exactly how authority is shared within a co-management institutional arrangement can be difficult. A property rights-based approach can be useful because it can articulate and defend which rights are retained or shared in a co-management institutional arrangement (LeCornu et al., in preparation; Schlager & Ostrom, 1992, 1999; Yandle & Imperial, 2009). Co-management may also manifest as a strategy to uphold

traditional forms of community-based management (Vaughan, Thompson, & Ayers, 2016; Vaughan & Caldwell, 2015).

Given its promise, much research has examined transitions to co-management (Cinner, Daw, et al., 2012). The success of these transitions may vary greatly in different settings. Likewise, the existing governance arrangement may vary prior to co-management transitions. Existing arrangements may be situated within a centralized bureaucracy, at the community level via community-based management, in an open-access situation (a lack of management or enforced property rights) or other hybrid approaches. When successful, these transitions have sometimes been characterized as transformations (Westley et al., 2011). Resilience scholars describe this transformability in complex systems as the ability to change states and cast aside the previous system (Folke et al., 2010). These transformations can be categorized by the degree of coordination and the origin of available resources. In other words, whether they are internal or external to the group engaged in the transformation (Berkhout, Smith, & Stirling, 2004). Persistent transformations are described as ‘robust’ (Anderies, Janssen, & Ostrom, 2004). Recent publications have used these concepts to detail governance transformations to co-management in a variety of settings (Armitage, Marschke, & van Tuyen, 2011; Folke, Hahn, Olsson, & Norberg, 2005; Gelcich et al., 2010).

Although co-management is a promising solution to many common pool resource management problems, there are several issues that complicate governance transitions or transformations (Olsson, Folke, & Hughes, 2008). Consensus-building challenges, income inequality, community heterogeneity, and group size may complicate self-organization, consensus-building, or collective action at the community level (Cinner, Sutton, & Bond, 2007). Likewise, governments may not be willing or prepared to cede authority or truly collaborate with communities or resource users (Pinkerton, 1999). Institutional or structural barriers can inhibit co-management, (Levine & Richmond, 2014) as can public planning processes that can be captured by special interests (Turner & Weninger, 2005; Wilson & McCay, 1998). As a result, many governance transitions to co-management have stalled or have taken at least a decade to take hold and build stability and resilience (Gelcich et al., 2010; Gelcich, Edwards-Jones, Kaiser, & Castilla, 2006).

When implemented however, co-management is thought to lead to a variety of social and ecological benefits, including opportunities for knowledge-sharing and learning among diverse groups, improved regulatory compliance, greater community engagement, reduced transaction costs, and improved resource outcomes (Acheson, 2003; Armitage, Berkes, Dale, Kocho-Schellenberg, & Patton, 2011; Armitage et al., 2009; Jentoft, 2005). Despite its promise, co-management, like any governance regime, does not always achieve positive outcomes. Scholars have identified the following less than desirable outcomes: conflict (Castro & Nielsen, 2001); overharvesting by communities responsible for stewardship or agency capture (Singleton, 2000); elite community members capture of resource benefits (MacNeil & Cinner, 2013); asymmetric power relations between communities or resource users and the government (Nadasdy, 2003a); and diverse stakeholder groups that complicate planning processes (Levine & Richmond, 2014). Implementation can be further compounded in developed nations by complex regulatory regimes and overarching legal mandates that can hinder devolution of rights at the local level (Finkbeiner, Ayers, Kittinger, & Crowder, 2015; Kittinger, Ayers, & Prahler, 2012).

The disparate outcomes found across governance transitions in different contexts have led to comparative research into which factors lead to stable, effective co-management regimes (Cinner, McClanahan, et al., 2012a; Gutierrez, Hilborn, & Defeo, 2011; Pomeroy, Katon, & Harkes, 2001). Many social factors have been linked with successful co-management. Among these factors are institutions that address historical and contextual conditions (Cinner, McClanahan, et al., 2012a, p. 5219); self-organization (Basurto et al., 2012; E. Ostrom, 2009); leadership and incentives (Gutierrez et al., 2011; E. Ostrom, 2009; Pomeroy et al., 2001) and governing institutions (E. Ostrom, 1990). Although other social and ecological factors have been shown to have an influence on co-management outcomes, including proximity to markets (Cinner et al., 2013) and dependence on resources (Cinner, McClanahan, et al., 2012; Gutierrez et al., 2011), there is less understanding about the role of history in determining or constraining co-management institutions; how co-management emerges at the community level, including the role of self-organization and leadership; how communities respond to barriers; and governance transitions that occur within a state-nested or polycentric governance system.

The purpose of this dissertation is to investigate and better understand the practical and theoretical issues associated with co-management governance transitions in Hawai‘i. The principal research questions are:

1. How have the rules hierarchy and property rights for small-scale fisheries in Hawai‘i changed over time, and, given the historical change in these institutions, what limitations and opportunities exist for incorporating rights-based approaches in co-management?
2. How does co-management emerge at the community-level in Hawai‘i?
3. What are the barriers to implementation when communities attempt to change institutions from a centralized bureaucracy?
4. What types of co-management partnership opportunities exist for communities outside of the defined co-management pathway?
5. What is the role of leadership in co-management planning and implementation?

### **1.3 METHODOLOGICAL APPROACH**

This dissertation utilizes an in-depth, mixed method case study approach to examine institutional change leading towards co-management governance of coral reef fisheries in the Hawaiian Islands. Mixed method research approaches often combine qualitative and quantitative data to complement, provide additional support for, or triangulate research findings (Tashakkori & Teddlie, 2003). Mixed method research approaches may also collect multiple types of data or combine theoretical frameworks to enhance the understanding of phenomena being investigated (Creswell & Clark, 2007). Embedded case studies entail the creation of sub-units within a case study approach to capture the complexity that exists within a single case or examine sub-cases at a finer detailed scale (Yin, 2009). By employing a mixed method approach that combines multiple theoretical frameworks, including institutional analysis, common pool resources theory, social-ecological systems and resilience frameworks, and planning theory, this research considers the complex interplay that occurs as resource users within multiple communities across Hawai‘i collaborate to change the institutions that govern coral reef fisheries.

### ***1.3.1 Data collection methods***

This research utilizes a mixed method approach, and in some cases different methods were used in different chapters. Table 1.1 describes the different data sources and how they were collected in each chapter.

**Table 1.1.** Dissertation data sources, methods, and data analysis separated by chapter

Chapter	Methods	Data sources	Data analysis
Chapter 2: <i>Who has the right to manage? Distribution of property rights affects equity and power dynamics in co-management</i>	Institutional analysis	Archival data sources	IAD framework to analyze rules hierarchy; Property rights framework to examine which rights components are held or shared.
Chapter 3: <i>Emergence of co-management governance for Hawai'i coral reef fisheries</i>	Mixed methods	Semi-structured interviews; archival data sources, including: public and legislative testimony, government documents and evaluations, community resource plans and rules	Grounded theory approach: Qualitative data analysis; content analysis; legal and policy analysis; content analysis
Chapter 4: <i>Making the Transition to Co-Management Governance Arrangements in Hawai'i: A Framework for Understanding Transaction and Transformation Costs</i>	Mixed methods	Semi-structured interviews; archival data sources, including: government documents and evaluations, community resource plans and rules.	Grounded theory approach: Qualitative data analysis; IAD framework to examine transaction and transformation costs
Chapter 5: <i>Many paths, one destination: developing community guidance in state-centric co-management</i>	Mixed methods	Semi-structured interviews, archival data sources, including: Hawai'i revised statutes, administrative rules, and management plans.	Qualitative data analysis; legal and policy analysis; institutional analysis.
Chapter 6: <i>Reexamining leadership in fisheries co-management</i>	Qualitative approach	Semi-structured interviews	Qualitative data analysis



## 1.4 THEORETICAL BACKGROUND

This dissertation is grounded in theories of common-pool resources, institutional analysis, social-ecological systems, resilience, and sustainability science. Although this integrative, transdisciplinary research draws upon theories from several academic disciplines, institutional analysis and common-pool resource theory are primarily employed to analyze and evaluate the complex interaction of biophysical conditions, community composition, rules, social interactions, and resource outcomes.

### *1.4.1 Common-Pool Resources and Institutional Analysis*

Common-pool resources (CPRs) such as fisheries, forests, and water present a challenge to managers because exclusion is difficult and resource units are rivalrous; each unit harvested is one less left for others in a social-ecological system. In instances without strong government institutions or enforced property rights, CPR systems can be exhausted unless collective choice institutions exclude free riders and regulate extraction through collective action. Institutions can be defined as mutually understood, enforced prescriptions used by humans to determine required, permissible, and prohibited actions at multiple scales and levels of organization and society (North, 1990; E. Ostrom, 2005; V. Ostrom, 1980). Societies across the world depend on institutions governing CPRs such as fisheries, forests, and water for sustenance or survival. Consequently, many scholars have examined how successful CPR regimes self-organized, evolved, and endured over time (E. Ostrom, 1990; Acheson, 1988). Institutional analysis entails the “decomposition of institutional contexts into their component parts as a prelude to understanding how these parts affect each other and how institutions shape outcomes” (McGinnis, 2011, p. 170). Institutional analysis can examine the role that exogenous variables such as rules, biophysical conditions, and community attributes have in affecting actors, decisions, interactions, and outcomes (Imperial & Yandle, 2005). Institutional analysis can also assess the tradeoffs between various institutional arrangements by considering the full range of transaction and transformation costs and evaluating the overall performance of a set of rules or policy (E. Ostrom, Schroeder, & Wynne, 1993). Applying institutional analysis to the study of diverse rule systems, cultures, behaviors, and environmental settings can help explain the pathways, trajectories, and resilience of social-ecological systems. Similarly, institutional

analysis provides a common language and terminology that scholars can employ to facilitate theory building and scientific knowledge (McGinnis & Ostrom, 2014). In this research, institutional analysis can describe and classify hierarchical rules at different levels of choice, property rights, and institutional barriers, as well as community-level variables such as local leadership, that are correlated with self-organization and collective action – community-level precursors to institutional change and co-management transitions in Hawai‘i (Basurto & Ostrom, 2009; E. Ostrom et al., 1993; Polski & Ostrom, 1999).

#### ***1.4.2 Social-ecological systems***

A wider understanding that human agency is a key part of ecosystem trajectories and the application of complexity theory to the study of social and ecological phenomena has motivated scholars to create a revised theoretical view of how humans interact with the environment. The unruly complexity of “wicked” global environmental problems and emerging theoretical research drove many scholars in the field of ecology to discard equilibrium theory and begin viewing ecosystems as complex adaptive systems (Levin, 1998) that are characterized by emergent properties and multiple stable states, some of which may be undesirable (Holling, 1973). Since human society and the environment are exceedingly complicated and intertwined, the term ‘social-ecological systems’ or ‘linked social-ecological systems’ is used to describe the coupling of human-environment relationships (Berkes, Folke, & Colding, 2000). The linked and dependent nature of society and the environment has brought together traditionally disparate academic disciplines to mediate complex, intertwined social-ecological problems such as biodiversity loss, overfishing, and global climate change (Dietz, Ostrom, & Stern, 2003). As complex systems theory became more accepted and embraced across academic disciplines, Elinor Ostrom (2007) developed a social-ecological systems framework that characterized variables commonly associated with self-organization and successful governance regimes along with resource systems, resource units, interactions, and outcomes. This framework has been employed by scholars from diverse disciplines to analyze the complexity implicit to linked social-ecological systems, ease coding of key factors, and facilitate theory development. A revised version of this framework highlighting specific variables related to self-organization and shared authority (E. Ostrom, 2009) was employed in this research proposal. A focus on contextual factors including the political environment as well as factors affecting shared

authority such as self-organization and local leadership instead of design principles alone is necessary to build resilience in social ecological systems (Armitage, 2005).

Although many studies have demonstrated the factors associated with self-organization, such as Ostrom (1990), there is less understanding about the process and key events that preclude self-organization. Understanding of these events can potentially diagnose when conditions may be present for self-organization to occur, a precursor to collective action in many settings. Self-organization and collective action are important because they are antecedents for co-management governance at the community level. The integrative nature of social-ecological systems theory can assist in understanding the connections between natural resources such as fisheries, the communities that depend on them, and the institutions that govern them.

#### ***1.4.3 Resilience and sustainability science.***

Social-ecological systems theory has been embraced by social and natural scientists, often with resilience as a key measure of success. Resilience refers to a system's capacity to: a) endure shocks or disturbances and sustain its structure; b) self-organize; and, c) build capacity to learn and adapt (Berkes, Colding, & Folke, 2003); (Adger, Hughes, Folke, Carpenter, & Rockstrom, 2005). These three measures refer to a system's functional resilience, capacity for self-organization, and adaptive capacity, respectively. Sustainability science investigates the complex interactions between human and natural systems at multiple scales (e.g. local, regional, global), and provides a transdisciplinary, integrative structure to frame problems. Resilience theory has been applied to many academic disciplines, although recent research on coastal hazards (Adger et al., 2005), fisheries co-management policy (Gelcich et al., 2006), and adaptive co-management of social-ecological systems (Olsson, Folke, & Berkes, 2004) are relevant to this dissertation.

Resilient governance systems are characterized by leadership, incentives at higher levels, participation and deliberation, polycentric and multilayered institutions, and just and accountable authorities (Olsson, Folke, & Berkes, 2004); (Lebel et al., 2006). Resilient social-ecological governance increases adaptive capacity to respond to complexity while reducing vulnerability and avoiding phase shifts (Nelson, Adger, & Brown, 2007). For example, a phase shift for a coral reef ecosystem may entail a change from a coral-dominated ecosystem to an undesirable

system state dominated by macro-algae (*corallimorpharia*), soft corals, sponges, or sea urchins (Norström, Nyström, Lokrantz, & Folke, 2009). A phase shift in a social system could signify increased stress, vulnerability, and forced adaptation to changes in the natural environment, e.g. exodus due to sea-level rise, and climate change adaptation in low-lying Pacific Islands (Adger, 2000). In a resilient social-ecological governance system, three evaluative components: livelihoods (e.g. decreased poverty, increased food security), ecological sustainability (e.g. increased biomass, biodiversity, or increases in key species), and planning processes (collaborative activities and social learning) must be assessed (Plummer & Armitage, 2007). Resilient social-ecological governance will depend on institutions to mediate the interplay between planning, management, monitoring, and evaluation of social and ecological systems.

Resilience and complex systems provide much of the theoretical basis for governance transformations and the emergence of co-management in Hawai‘i, as well as the barriers to implementation. Specifically, resilience theory informs the analysis of co-management transitions and transformations by examining the planning processes associated with resilient governance arrangements and analyzing the process of emergence (Geels & Schot, 2007; Plummer & Armitage, 2007). In resilience scholarship, attention is often paid to where system changes originate in addition to the source of the resources used to help initiate the transition. Much resilience scholarship also highlights the importance of leadership in these transformations (Olsson et al., 2006, 2008). Some resilience literature characterizes leadership in terms of institutional entrepreneurs or change agents that lead system transformations (Rosen & Olsson, 2013; Westley et al., 2011; Westley et al., 2013). Resilience and sustainability science provide much of the theoretical framing for the emergence of co-management and the leadership chapters in this dissertation.

#### ***1.4.4 Integrating disparate theoretical approaches***

Although this research combines social science methodologies and theory from diverse fields of study such as common pool resources and institutional analysis, social-ecological systems, and resilience and sustainability science, these fields do not often consider other literatures that may help explain opaque theoretical areas, such as the process of self-organization, or which leadership dimensions are critical for governance transitions. For instance, communicative

action, deliberative democracy, or other dialogue-based planning approaches are not integrated into common-pool resource theory, nor do they consider power relations or the flaws inherent to public planning processes (Forester, 1982; Foucault, 1982; Fung, 2004; Habermas, 1984; Innes & Booher, 1999; Lowry, Adler, & Milner, 1997). The new institutional economics literature recognizes that institutions and incentives affect human behavior but they cannot account for all the ways people benefit from resources (Ribot & Peluso, 2003). Likewise, many studies declare the importance of leadership without carefully considering the context, qualities or dimensions of leadership that are practiced (Evans et al., 2015).

However, integrative theory combining social and ecological approaches has vastly improved. The social-ecological systems (SES) framework considers interactions between governing systems, natural resources, resource units, users, and outcomes (Epstein, Vogt, Mincey, Cox, & Fischer, 2013; E. Ostrom, 2009). Many scholars utilize the SES framework in case study research, which facilitates coding for future meta-analyses that can test, refine, and improve theory. The SES framework contains over 50 variables important for sustainability of social-ecological systems (McGinnis & Ostrom, 2014). These variables are separated into governance systems, resource units, actors, interactions and outcomes occurring within focal action situations, and related ecosystems. Although collecting data on all of these variables in a case study – or any research – would be ideal, it is beyond the scope of this research and most studies. Instead, since this research is focused on co-management governance transitions, data collection is focused on a small set of variables from the actors (A) and governance system (GS) subsets of the SES framework. The actors subset contains variables that are correlated with self-organization: A3: History or past experiences; A4: Location; A5: Leadership or entrepreneurship; A6: Norms (trust-reciprocity)/social capital; and A8: Importance of resource (dependence) (McGinnis & Ostrom, 2014). This research will also collect data on variables related to governance systems (GS), in particular, GS1: Government organizations; GS2: Nongovernment organizations; GS4: Property-Rights Systems; GS5: Operational-choice rules; and GS6: Collective-choice rules. These variables have been refined through hundreds of case studies around the world and are appropriate given the context of this case study.

## 1.5 HAWAIIAN ISLANDS

Many traditional and contemporary Pacific Island societies were and continue to be highly dependent on marine resources, which has led to the development of sophisticated institutions to govern fishing effort (Berkes, 1999). However, centuries of social, political, and environmental change have eroded the resilience of traditional marine tenure systems across the Pacific (Johannes, 1978). Hawai‘i, the most isolated population center in the world, is one of two U.S. states with tropical coral reefs, and is the only one with a unique legacy of marine tenure. Before western contact, as part of a complex sociocultural and religious system, marine resources were managed by *konohiki*, (land administrators appointed by local *ali‘i* or chiefs). *Konohiki* worked to gather input from local fishers and *maka ‘āinana* (land tenants) to develop place-based rules that governed resources sustainably for large populations of Native Hawaiians (Kirch, 2010). Westerners brought religion, disease and population decline, changing economic systems, and trade. Along with this, annexation by the United States, contributed to the loss of traditional land and marine tenure in Hawai‘i (Kirch, 2010). Since then, Hawai‘i’s population and social fabric have changed dramatically, but many of its people continue to fish for sociocultural, economic, and subsistence reasons (Glazier, 2006). Recently compiled datasets indicate that 90% of Hawai‘i’s coral reef fisheries are subsistence-oriented (McCoy, Friedlander, and Kittinger unpublished data) which dampens market effects and commercial incentives to exploit marine resources (Cinner et al., 2013; Maire et al., 2016). Although markets have not exhibited a direct negative effect on coral reef fisheries, overfishing is still occurring across the main Hawaiian Islands (Friedlander, Brown, & Monaco, 2007, Friedlander & DeMartini, 2002), which demonstrates the cumulative impact that non-commercial activities can have on marine ecosystems and the ineffectiveness of centralized management over the past several decades.

A renewal of traditional ecological knowledge and governing institutions has occurred over the past three decades in Hawai‘i (Friedlander et al., 2000); (Poepoe, Bartram, & Friedlander, 2003) and across the globe (Berkes, Colding, & Folke, 2000). This knowledge renewal is in place at Mo‘omomi on the Hawaiian island of Moloka‘i (Poepoe et al., 2003) and is currently underway in several other locations across the Hawaiian islands. Merging traditional or place-based and modern, scientific knowledge systems has improved co-management outcomes in other geographies (Moller, Berkes, Lyver, & Kislalioglu, 2004). Although some Hawai‘i communities

may exercise management authority over their adjacent marine resources in an informal, *de facto* context, as many as two dozen communities are interested in legally sanctioned co-management relationships with the state of Hawai‘i (Higuchi, 2008). While the barriers to integrating traditional knowledge into state law have been examined by other scholars in this geography (Vaughan et al., 2016; Vaughan & Caldwell, 2015), there is less understanding of the role of history as a basis for integration of traditional knowledge into contemporary management systems. These issues will be examined in detail throughout this dissertation, but specifically in chapter 2.

## **1.6 CO-MANAGEMENT IN HAWAI‘I**

A variety of factors have impacted coral reef ecosystems in Hawai‘i such as climate change, development, and introduction of invasive species. Yet centralized management in Hawai‘i has largely been ineffective at managing coral reef fisheries since Hawai‘i became the 50<sup>th</sup> U.S. state in 1959 (Kittinger et al., 2011). Although many factors have impacted coral reef ecosystems, overfishing has seriously impacted coral reef fisheries (Friedlander & DeMartini, 2002b; Friedlander et al., 2007). Coral reef fisheries declines can in part be attributed to a lack of enforcement and an environmental management agency that is chronically underfunded in relation to other U.S. states (Dator, Hamnett, Nordberg, & Pintz, 1999; Jokiel, Rodgers, Walsh, Polhemus, & Wilhelm, 2011).

The ineffectiveness of centralized fisheries management in Hawai‘i, a set of highly engaged communities, and a renewal of traditional management practices have prompted many communities to pursue institutional change towards co-management (Higuchi, 2008). One co-management approach communities have pursued is community-based subsistence fishing areas (CBSFAs). CBSFAs allow communities to work with the State of Hawai‘i Division of Aquatic Resources (DAR) to craft fishing regulations that are based on “the customary and traditional Native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing” (Higuchi, 2008, p. 218). The Hawai‘i State Legislature passed the enabling legislation for CBSFAs in 1994. Although this co-management pathway has been present for over two decades, there have been just two actively co-managed CBSFAs established: a pilot project at Mo‘omomi on the island of Moloka‘i that lasted just two years in the 1990s; and Hā‘ena, Kaua‘i,

where rules were approved in August 2015. These communities' co-management processes will be examined in more detail throughout this dissertation.

Although co-managed areas (CBSFAs) have not been widely implemented across Hawai'i, several other different marine management designations already exist that also allow communities to develop rules and partner with the state in a manner that is similar to co-management. These management designations include, but are not limited to: Fishery Management Areas (FMAs); Marine Life Conservation Districts (MLCDs) – often described as Marine Protected Areas (MPAs); Fishery Replenishment Areas (FRAs); and the Natural Area Reserve System (NARS). These areas are not widely considered to be co-management institutional arrangements, but communities across Hawai'i have partnered with the State of Hawai'i in some different and engaging ways, including developing place-based regulations, monitoring marine resources, conducting outreach and engagement, and reporting rules violations to law enforcement. A set of highly engaged communities, combined with an uneven track record of co-management implementation, make Hawai'i a compelling case study to examine this variation in institutional change.

## **1.7 ORGANIZATION OF THE DISSERTATION**

Each of the chapters includes an introduction that defines the topic, its significance, and supporting literature. A background section typically follows the introduction to provide some historical context. Since the methods vary for each of the five chapters, a separate, detailed methods section accompanies chapters 2-6. Each of these chapters contains a results section provided without interpretation, and a discussion section where the implications of the findings are considered. The discussion section in each chapter identifies practical and theoretical implications related to the findings. Most of the chapters also include a short conclusion in which the broader implications of specific issues related to co-management planning and governance are considered.

Chapter 2 addresses the question: How have the rules hierarchy and property rights for small-scale fisheries in Hawai'i changed over time; and given the historical change in these institutions, what limitations and opportunities exist for incorporating rights-based approaches in



co-management? It uses institutional analysis of archival data sources to document the changes in administrative structure and property rights in coral reef fisheries governance regimes over two centuries of change in the Hawaiian Islands. Three time periods and governance regimes are considered: the Hawaiian Kingdom and marine tenure from 1810-1893; contemporary centralized management in Hawai‘i (under which more than 99% of coastal and marine areas are managed) from 1959 (statehood) to present day; and contemporary co-management in Hawai‘i from 1994 (when the enabling legislation was passed) to 2016. The institutional analysis uncovers a surprising amount of administrative complexity governing small-scale fisheries in Hawai‘i across all three time periods and governance regimes. Property rights were devolved to the local level in the Hawaiian Kingdom, but are only nominally shared contemporarily in co-management through management rights.

Chapter 3 considers the question: How does co-management emerge at the community level in Hawai‘i? It investigates the emergence of co-management in Hawai‘i via an embedded case study approach that highlights examples from three Hawai‘i communities officially designated as co-management areas since 1994: Mo‘omomi, Moloka‘i; Miloli‘i, Hawai‘i; and Hā‘ena, Kaua‘i. This chapter employs a mixed method approach that combines 19 semi-structured key respondent interviews with a policy analysis of the co-management rulemaking process, a content analysis of legislative and public testimony for the three areas, along with evaluation of other archival data sources such as management plans and a government-conducted study of a co-management area. The findings uncover a linked set of drivers and social responses that informed the creation of a planning process model of community-level co-management emergence.

Chapter 4 examines the question: what are the barriers to implementation when communities attempt to transition to co-management from a centralized bureaucracy? This chapter uses a sequential mixed method research approach, initially beginning with 19 semi-structured key respondent interviews that are analyzed using qualitative coding techniques. Next, an institutional analysis of transaction and transformation costs associated with the co-management transition is used to determine which costs occurred at each stage of the policy process, from planning through evaluation. This informed the development of a framework for examining the

transaction and transformation costs associated with co-management governance transitions from planning to policy design, through policy implementation and evaluation. The costs figure identifies which costs may occur at different times, and this study identifies which partners bear which costs at different stages of the policy process.

Chapter 5 considers the question: What types of co-management partnership opportunities exist for communities outside of the defined co-management pathway? This chapter assesses the feasibility of alternative marine management approaches across Hawai'i. A mixed method research approach is used that begins with a legal and institutional analysis on four alternative marine management designations that communities have used in a manner analogous to co-management. Fieldwork was also conducted in six communities state that have partnered with the State of Hawai'i to use four different marine management designations other than community-based subsistence fishing areas (CBSFAs). Semi-structured interviews were conducted with a total 23 individuals from these communities and these data were transcribed, thematically coded, and analyzed. Lastly, an institutional analysis was performed on the rules in place for each of the six management areas along with an assessment using Ostrom's design principles for enduring common pool resource governance regimes. Results revealed that many community members recognize the integrative and linked nature of threats to coral reef social-ecological systems. Analysis of existing marine management statutes and fragmented authorities demonstrates difficulty of pursuing integrative co-management. The findings from the property rights analysis were similar to Chapter 2 in that few property rights components were devolved to communities. Like Chapter 4, the design principles analysis revealed that community-level initiatives to increase local level rights are challenged by outside groups and the government. When this finding is viewed in tandem with Chapter 4, it becomes more clear that transaction costs are one of the biggest barriers to Hawai'i co-management transitions.

Chapter 6 addresses the question: What is the role of leadership in co-management planning and implementation? This chapter employs a qualitative approach to the role of leadership in co-management transitions and institutional change. Semi-structured interviews were conducted with 41 individuals involved with co-management transitions over four years. The interview data is analyzed to determine which leadership dimensions were identified as important leadership

components in co-management transitions. These data were also coded based upon various types of leadership that emerged from the interview responses. Among the leadership dimensions that respondents were asked about, the findings provide strong support for leaders that initiate collective choice processes and moderate support for each of the other dimensions. Coding of responses by leadership types provides strong evidence that a collective leadership approach – one that emphasizes process skills – may be the most effective type of leadership in the context of co-management governance transitions. These findings point to the need to develop collaborative planning skills for co-management transitions such as meeting facilitation, negotiation, and conflict resolution.

Chapter 7 outlines the major findings of this dissertation research and considers how the major findings relate back to existing theories of common pool resources and institutional analysis, social-ecological systems theory, and resilience and sustainability science. This research combines multiple approaches to better characterize governance transitions to co-management, particularly co-management systems that are nested within an existing bureaucracy or a polycentric system of governance. Lastly, this chapter considers the practical implications of the findings for co-management planning and implementation in Hawai‘i and elsewhere.

## **Chapter 2.**

### **Who has the right to manage? Distribution of property rights affects equity and power dynamics in co-management**

This chapter uses institutional analysis to examine changes over time in hierarchical decision making structures and property rights components governing Hawai'i coral reef fisheries. An analysis of diverse historical and archival data uncovered a surprising level of administrative complexity present under historical marine tenure. In contemporary co-management, few rights are devolved to contemporary communities looking to manage subsistence fisheries. The chapter concludes by considering some solutions to address deficiencies in contemporary centralized management and co-management.

#### **2.1 INTRODUCTION**

Marine fisheries provide an estimated 17% of human dietary protein globally but account for as much as 70% in coastal and island areas (FAO, 2015). Despite the importance of marine fisheries for food, protein, and micronutrients, global fisheries catches peaked in the mid-1990s and have been in decline ever since (Pauly & Zeller, 2016). Small-scale fisheries are increasingly recognized for their contribution to global catch and their contribution to livelihoods (Chuenpagdee, 2011; Kurien & Willmann, 2009). Locally sourced seafood is particularly important in Pacific islands, due to its social and cultural importance, and because food systems there are increasingly stressed by changes in land and marine tenure, urbanization, rising food costs, and high import prices (McGregor, Bourke, Manley, Tubuna, & Deo, 2009).

Rights based approaches to management are increasingly sought as a solution in global fisheries management (Costello, Gaines, & Lynham, 2008), and are now being applied to small-scale fisheries. The donor community recently invested up \$65 million to promote and implement rights based approaches across the globe (Rust, 2013). Rights based approaches in small-scale fisheries vary widely in terms of policy instruments and may include catch shares, territorial user rights for fishing (TURFs), individual transferable quotas (ITQs), fisheries concessions, cooperatives, and co-management and may involve limited entry, defined spatial rights, or dedicated resource allocations (LeCornu et al., In preparation). These different rights based

approaches may also be thought of as managed access to a fishery (Foley, 2012). In terms of property rights components, rights based approaches entail placing organizational or distributional rights into the hands of fishers (Yandle & Imperial, 2009).

Among rights based approaches, co-management has gained significant traction worldwide as one of the most promising solutions to resource decline, regulatory compliance, and feasibility (Gutierrez et al., 2011). Co-management encompasses a wide array of approaches, but typically includes shared management authority among user groups or communities and governmental agencies (Berkes, 2010, Sen and Nielsen, 1996). In practice, shared management authority can take many different forms and co-management institutional arrangements may exhibit significant diversity in the distributions of specific property rights among co-managing groups (Yandle, 2008). Property rights components in fisheries may include *access* (the right to enter a resource area), *withdrawal* (the right to harvest resource units), *exclusion* (the right to exclude others from entering a resource area), *management* (the right to make rules regarding access, withdrawal, and exclusion), and *alienation* (the right to sell, lease, or transfer any of the above rights) (Schlager & Ostrom, 1992). Devolution of these various property rights components to the local level may vary geographically based upon a country's legal system. Scholars can assess rights regimes through institutional analysis, which can be used to diagram and assess how institutions at different levels affect individual-level incentives and decision-making, social-ecological systems interactions, program implementation, and outcomes. Institutions are defined as "humanly devised constraints that shape human interaction" (North 1990, 3) and may include formal rules such as laws or rules-in-use that govern a resource area such as a coral reef ecosystem (McGinnis, 2011, p. 175). Rules-in-use may include informal norms or a shared and understood code of conduct among fishermen and fisherwomen that outline where, when, and how to harvest marine resources.

Despite the promise of co-management, there are high transaction costs associated with transitioning from a governance arrangement where government holds most of the property rights in a centralized bureaucracy, to an approach where rights are shared with communities (see Chapter 4). Other issues with the design and implementation of rights based approaches in co-management include a lack of equity in collective choice decision making processes (Yandle,

2003), unequal power relations (Nadasdy, 2003a; Taiepa et al., 1997), a disregard for different worldviews or refusal to accept different data types (Diver, 2012), rent seeking by stakeholders (Imperial & Yandle, 2005), and elite capture of benefits (MacNeil and Cinner, 2013).

As more fisheries systems transition to co-management arrangements, there is a need to assess the key factors that are related to social and ecological success, as well as the key factors associated with deleterious outcomes (Cinner et al., 2012; Ostrom, 2009; Yandle & Imperial, 2009). As diagnostic tools, institutional analysis and a property rights lens can provide a common framework to describe, analyze, and compare fisheries co-management institutions (Imperial and Yandle, 2005, McGinnis, 2011). In addition, a historical examination of changes in property rights over time may be valuable to trace turning points (Baumgartner & Jones, 2009) and trajectories or pathways (Liebowitz & Margolis, 1995). These analyses can facilitate a greater understanding of the constraints and dynamics associated with the design of present and future governance regimes (Howlett & Rayner, 2006).

Here, institutional analysis and a property rights lens are used to analyze Hawai'i's unique history of marine tenure, its transition to centralized management, and its recent experience with co-management. This research is guided by the following two research questions: 1) How have the rules hierarchy and property rights for small-scale fisheries in Hawai'i changed over time; and 2) Given the historical change in these institutions, what limitations and opportunities exist for incorporating rights-based approaches in co-management? This chapter is structured as follows: first, a detailed history of events that shape institutional changes in Hawai'i small-scale fisheries is presented. Next, administrative and property rights differences between two time periods are analyzed: the Hawaiian Kingdom (1810-1893) and under contemporary centralized management (1982-present). Then, co-management in Hawai'i (1994-present) is analyzed. The chapter concludes with the implications of the findings for the design of rights based governance arrangements in Hawai'i and elsewhere.

This research uses a case study approach from the Hawaiian Islands, which offer a unique case to examine how changes in property rights over time continue to affect policy design and rights based approaches in small-scale fisheries. Hawai'i has a history of marine tenure that was eroded

over two centuries as a result of western brought disease, religion, trade, changing economies, and annexation by the U.S. (Kirch, 2010). Today, Hawai‘i is subject to a set of overlapping state and federal regulations that protect public access rights and a regulatory structure that ensures rules apply equally to all citizens. Although Hawai‘i is now a multicultural society, fishing and gathering remain vital social and cultural activities that provide food for many people across the state. Recent scholarship found that 90% of coastal fisheries across the main Hawaiian Islands are subsistence-oriented (McCoy, Friedlander, and Kittinger, unpublished data), which limits the effect of market integration and proximity as drivers of depletion in many global fisheries (Cinner et al., 2013, Maire et al., 2016). Despite the seemingly low impact of commercially-oriented fishing activities in Hawai‘i, overfishing has seriously impacted coral reef fisheries (Friedlander, Brown, & Monaco, 2007, Friedlander & DeMartini, 2002), highlighting the impact of recreational, customary or traditional fishing practices, and more efficient fishing technologies. A lack of clearly defined rights and a less than robust monitoring and enforcement regime have resulted in de facto open access property rights arrangement for most Hawai‘i coral reef fisheries (Finkbeiner et al., 2015). In response to ineffective centralized management, declining coastal resources and increasing conflict, Hawai‘i created a legal pathway for co-management in 1994 (Ayers and Kittinger, 2014, Matsuoka, 1994). Through this pathway, communities can partner with the State of Hawai‘i to create place-based rules for “subsistence” purposes, defined as “the customary and traditional Native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing” (Higuchi, 2008) to manage small-scale coral reef fisheries. Despite this institutional pathway created for co-management, implementation has consisted of one pilot project at Mo‘omomi and Kawa‘aloha Bays on Moloka‘i in the mid-1990s and one permanent co-management area at Hā‘ena, Kaua‘i. The Hā‘ena co-management area on Kaua‘i only recently became active after nearly ten years of planning in late 2015 (Vaughan & Caldwell, 2015). Although rules for the Hā‘ena, Kaua‘i co-managed area were based on customary norms and practices, they still allow anyone to enter and fish the area (Vaughan et al., 2016).

## 2.2 METHODS

This research employs a comparative case study approach to examine changes in property rights and administrative decision making over three different time periods and governance regimes in Hawai‘i coral reef fisheries. The three time periods and governance regimes being compared include: 1) historical marine tenure during the period of Hawaiian self-governance (1810-1893); 2) contemporary centralized or bureaucracy-based management (from 1982-present); and, 3) co-management governance (from 1994-present). A comparative case study approach was chosen for this study because: 1) the analysis was conducted retroactively; 2) the efficacy of the governance regimes are difficult to definitively disentangle from other confounding causal mechanisms; 3) multiple data sources and accounts were examined and combined; and 4) the purpose was to examine, build, and refine theoretical constructs and not to generalize to populations or make predictions (Agranoff & Radin, 1991). Multiple data sources and analytical tools were used to examine changes in property rights and administrative decision making (see Table 2.1).



**Table 2.1.** Data types, sources, citations, examples, and analytical tools used to examine changes in property rights and administrative decision making over three time periods and governance regimes in Hawai‘i coral reef fisheries.

Data type	Data source	Citation	Data analysis
Archival or Historical	Indigenous Hawaiian Mo‘olelo (stories or histories)	Malo (1951);	Institutional analysis
	Oral history	Maly & Maly (2003); Titcomb (1972);	
	Archaeological and historical anthropological studies	Kirch (2010); Kirch (2007); Kirch & Sahlins (1994);	
	Marine historical ecology	Kittinger et al., (2011)	
	Hawaiian historical research	Beamer (2014); Gonschor & Beamer (2014)	
Published literature	Published manuscript	Friedlander et al., (2013); Kittinger et al 2011;	Legal analysis
Technical report	Policy briefing Legislative report	Kittinger et al (2012) Kosaki (1954);	Policy analysis Institutional analysis
Legal analysis or reference	Legal handbook	Forman & Serrano (2012); Mackenzie (1991); Van Dyke (2008)	Legal analysis; Institutional analysis;

Data sources gathered and analyzed for this research included archival and historical accounts of historical marine tenure regimes collected by indigenous Hawaiian scholars (Malo, 1951); oral histories collected from knowledgeable *kūpuna* (elders) (Maly & Maly, 2003; Titcomb, 1972); archaeological and historical anthropological studies (Kirch, 2010); marine historical ecological analysis (Kittinger et al., 2011); and Hawaiian historical research (Beamer, 2014; Gonschor & Beamer, 2014). To examine what is possible under the United States and Hawaiian laws, this research drew upon a legal analysis of native Hawaiian resource rights (Forman and Serrano, 2012, MacKenzie, 1991, Van Dyke, 2008); a policy analysis of contemporary fisheries policy instruments in Hawai‘i (Kittinger et al., 2012); and rules and management plans for the only two co-management areas that have been actively managed over the past 20 years in Hawai‘i (Hui Makainana o Makana, 2011; Hui Malama O Moomomi, 1995). To increase the accuracy of research findings, published historical accounts of tenure and property rights arrangements were

crosschecked against each other. The findings were further shared with noted scholars in this area for expert review in order to increase their robustness.

These data sources were analyzed using the Institutional Analysis and Design (IAD) Framework (McGinnis, 2011) and a property rights framework (Schlager & Ostrom, 1992). The IAD Framework is an analytical tool that can be used to examine how institutions (rules) and other variables influence decision making at multiple levels. This research uses the IAD Framework primarily to examine the decision making authority present at different multiple levels: meta-constitutional level, constitutional level, collective choice level, and at the operational level. The IAD framework can be useful to examine fisheries governance arrangements and other commons situations due to emphasis on contextual factors, interactions that occur at different levels, and evaluative criteria (Imperial & Yandle, 2005). This research also utilizes a property rights framework developed by Schlager & Ostrom (1992) to examine which entity shares or retains five property rights components, including access, withdrawal, exclusion, management, and alienation. This property rights framework has been used in other fisheries settings to uncover and compare governance arrangement (LeCornu et al., In preparation, Schlager and Ostrom, 1999, Yandle and Imperial, 2009). Although the IAD Framework and a property rights lens may not be useful in examining all resource interactions – such as how users may benefit from resources (Ribot & Peluso, 2003) or when resource users exhibit a high discount rate (Bromley, 1991) – they can be used to diagram, analyze, and elucidate the diversity of institutional arrangements present in the context of marine tenure and governance regimes.

## **2.3 BACKGROUND**

### ***2.3.1 Marine tenure in pre-contact Hawai'i***

Hawai'i is one of the last places on earth to be colonized by humans, as part of the expansion of eastern Polynesia around AD 1100-1250 (Wilmshurst, Hunt, Lipo, & Anderson, 2011). Although historical ecological evidence points to exploitation of coral reef resources after first contact, coral reef resources exhibited recovery after AD 1400, likely due to stewardship and intensification of land-based food production (Kittinger et al., 2011). Resource recovery coincided with substantial increases in island populations. This period is associated with the rise

of a complex hierarchical system of land and marine tenure known colloquially as the *ahupua‘a* system (Beamer, 2014, p. 34). Ahupua‘a can be defined as a “culturally appropriate, ecologically aligned, and place specific unit with access to diverse resources” (Gonschor & Beamer, 2014, p. 7171). The ahupua‘a system separated islands into *moku* (districts), which were further divided into ahupua‘a. This hierarchical land division was devised by *ali‘i* (chiefs) on multiple islands around AD 1400 to manage irrigation, agriculture, and augment resource production (Beamer, 2014; Kirch, 2010). *Ho‘okupu* or tribute from *hoa‘āina* (ahupua‘a tenants) sustained the *aha ali‘i* (council of chiefs or central government) (Beamer, 2014; Gonschor & Beamer, 2014). *Konohiki* (land agents or resource managers) were chosen by *ali‘i ‘ai ahupua‘a* (an ahupua‘a level chief) to administer and distribute key fisheries and water resources within an ahupua‘a for the *hoa‘āina* (ahupua‘a residents) (Kirch, 1990; McGregor, 1996). *Ahupua‘a fisheries* were “certain areas of the sea, from the reefs and, where there happen to be no reefs, from the distance of one geographic mile seaward to the beach at low watermark...” (Kosaki, 1954, p. 3). The *konohiki* and the *hoa‘āina* maintained exclusive rights to ahupua‘a fisheries (local level small-scale fisheries) (Ibid).

Increased social stratification also arose around AD 1400 that separated social classes via the *kapu* (forbidden or taboo) system (see Table 2.2). The *kapu* system included structured social and religious rituals that organized ancient Hawai‘i, dictated gender relations, governed resource extraction at the species level, prescribed food consumption and cooking practices; and defined social interactions between societal classes (Friedlander, Shackeroff, & Kittinger, 2013; Kirch, 2010). Sanctions for being caught breaking *kapu* were severe and often deadly. Although there is no way to know for certain the impact of the *kapu* system, resources in the Hawaiian Islands were self-sustaining despite pre-contact population levels estimated to be at least 200,000-400,000 native Hawaiians and perhaps as high as 1,000,000<sup>1</sup> (Kirch, 2007).

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<sup>1</sup> Archaeological evidence indicate a pre-contact population of 200-400,000 but oral accounts suggest a much higher population approaching one million (Stannard, 1989). The unresolved

**Table 2.2** Timeline of major historical events that influenced property rights in Hawai‘i

<b>Date</b>	<b>Event</b>
1450-1500	Hierarchical sociopolitical and ecologically-based land divisions emerged in response to population growth, often attributed to the chief Mā‘ilikūkahi on the island of O‘ahu, with similar hierarchical divisions noted on the island of Maui under Kaka‘alaneo. Agricultural and industrial innovation is also noted under Manokalanipō on Kaua‘i.
1650	<i>Kapu</i> (forbidden or restricted) system emerged to protect <i>mana</i> (spiritual power or authority), manage resources; regulate food consumption and cooking; and delineate gender and social classes in Hawai‘i within the <i>maka‘āinana</i> (commoners) and the <i>ali‘i</i> (chiefly) class. <i>Maka‘āinana</i> were expected to provide regular <i>ho‘okupu</i> (tribute) via fish and agricultural products in exchange for working and living on the land. Rules violations were often punishable by death.
1778	First western (European) contact made by Captain James Cook in Waimea Kaua‘i, bringing disease, western technology (including armaments), and opening the Hawaiian islands to Pacific colonial economies.
1810	The Kingdom of Hawai‘i is established when Kamehameha I unifies the Hawaiian Kingdom for the first time, becoming the first <i>mō‘ī</i> (supreme ruler) for all of Hawai‘i.
1819	Calvinist Missionaries arrive. Kamehameha I dies; his son Liholiho (Kamehameha II) shares the throne with Kamehameha I’s favorite wife Ka‘aumanu; the <i>kapu</i> system is abolished.
1823	Literacy spreads rapidly across Hawai‘i
1839	Kamehameha III ushered in Hawai‘i’s first written laws to regulate taxation; codify property rights of the different social classes by organizing ancient relationships between <i>maka‘āinana</i> , <i>konohiki</i> (resource administrators or land agents), and <i>ali‘i</i> classes. Laws decreed that the land and fisheries were jointly owned by three classes: the <i>mō‘ī</i> , <i>ali‘i</i> , and <i>maka‘āinana</i> . These laws created a new system of government by melding European notions of property with ancient Hawaiian relationships with land. Hawai‘i is severely affected by depopulation from western-brought disease.
1840	Hawai‘i’s first constitution is written, codifying and refining traditional rights. The constitution affirmed vested land and marine tenure in the Hawaiian Kingdom.
1848	The Great Māhele divided all lands in the Hawaiian Kingdom, which separated land and divided fee simple titles to land among the <i>ali‘i</i> and <i>konohiki</i> , the government, and the <i>mō‘ī</i> (the crown lands). Foreigners could purchase government lands, ushering in a new era of private property, foreign land ownership, development, and a market-based economy. Land titles were still subject to the rights of <i>maka‘āinana</i> . Claims were required to secure ancestral lands, however many <i>‘ōiwi</i> (native Hawaiians) did not participate in the registration process and their fishing rights were dispossessed.
1850	The Kuleana Act allowed <i>maka‘āinana</i> to purchase fee simple title to land, further formalized ancient resource rights, relationships between <i>‘ōiwi</i> and the <i>‘āina</i> (land) and access to the benefits of resources. The act also allowed for a large government by developing new revenue streams through taxation and protected national interests. The Kuleana Act effectively institutionalized ahupua‘a-level resource rights into law.
1887	Under threat of force, King David Kalākaua signed the Bayonet constitution, making voting rights contingent on property ownership.
1893	The Hawaiian Kingdom is overthrown by a group of American businessmen with the

- backing of the U.S. military.
- 1900 The Organic Act terminates ‘konohiki fisheries’ unless they were registered within two years; 300-400 konohiki fisheries are registered across the Hawaiian Islands; 248 were not registered, and the government condemned 37 others. Subsequently, a series of U.S. court cases uphold the concept of ‘vested’ fisheries rights, subject to evolving *hoa ‘āina* (ahupua‘a tenant) rights.
- 1927 The Division of Fish and Game is established for the Hawai‘i Territory, ushering in the beginnings of centralized or bureaucracy-based management
- 1940s-1950s Documentation of landowners still excluding outsiders from their ahupua‘a fisheries on O‘ahu and Kaua‘i
- 1959 Hawai‘i become the 50<sup>th</sup> U.S. state, seemingly severing locally held fishery rights.
- 1976 Hawaiian cultural renaissance; punctuated by the first Hokulea voyage: a celestially navigated traditional Polynesian voyaging canoe successfully sails to Tahiti and back; renewed interest in Hawaiian language, culture, music, and *mo‘olelo* (stories and oral traditions). The Protect Kaho‘olawe ‘Ohana files suit against the U.S. Navy to prevent bombing on the Island of Kaho‘olawe.
- 1978 Hawai‘i’s first constitutional convention reaffirms some Native Hawaiian rights
- 1982 The Division of Fish and Game is reorganized, The Division of Aquatic Resources becomes the state agency charged with managing fisheries.
- 1994 Enabling legislation for co-management (Community-based Subsistence Fishing Areas, CBSFAs) is passed by the Hawai‘i state legislature; Native Hawaiian community efforts were instrumental.
- 1995-1999 Pilot CBSFA (co-management) project occurs at Mo‘omomi on the island of Moloka‘i; the co-managed area is allowed to sunset without renewal
- 2005 Miloli‘i on Hawai‘i Island becomes the first permanent, legislatively-designated CBSFA in Hawai‘i
- 2006 Hā‘ena on Kaua‘i becomes the second permanent, legislatively-designated CBSFA in Hawai‘i
- 2015 Hā‘ena rules based upon traditional practices are approved; becomes the first active co-managed area since Mo‘omomi in 1994.
- 

### ***2.3.2 Marine tenure in the Hawaiian Kingdom***

King Kamehameha I united the Hawaiian Islands under one ruler for the first time in AD 1810 and established the Hawaiian Kingdom. Shortly after his death in AD 1819, the kapu system was abolished, and in 1820, arriving protestant missionaries set up schools which rapidly increased literacy but significantly altered the social fabric of Hawai‘i. Along with his advisors, Kamehameha III penned Hawai‘i’s first written laws in 1839, which codified ancient relationships with the *‘āina* (land and sea). The laws delineated property rights of the different social classes by organizing ancient relationships between *maka‘āinana*, *konohiki* (local-level resource appropriators), and *ali‘i* classes. These laws proclaimed that three classes jointly owned the land and fisheries: the *mō‘ī*, *ali‘i*, and *maka‘āinana*. The 1839 laws and Hawai‘i’s first

constitution in 1840 created a new system of government by combining European notions of property with ancient Hawaiian relationships with the land and sea.

Under the 1839 laws, the 1840 constitution, and other subsequent revisions, some fish were reserved specifically for the ali'i class. These fish were designated as *kapu* (restricted) by the ali'i 'ai appointed konohiki. Konohiki at the ahupua'a level were selected for their exceptional resource knowledge and were entrusted with resource management decisions at the local level. In exchange for their important caretaking, konohiki were given either one third of the local fishery catch or exclusive harvest rights for one fish species (Beamer, 2014; Higuchi, 2008). As political appointees, konohiki were expected to ensure resource productivity and could be removed if poor management decisions led to famine or decreased harvests. Konohiki could also be affected by political changes such as the death or removal of a higher-level ali'i. Further highlighting administrative complexity, other historical accounts reference coordination across multiple ahupua'a within the same moku (Kirch & Sahlins, 1994).

The 1848 Great Māhele divided all lands in the Hawaiian Kingdom, which separated land and divided fee simple land titles among the ali'i and konohiki, the government, and the mō'ī, whose lands are often described as the crown lands (Van Dyke, 2008). Foreigners could purchase government lands, ushering in a new era of private property, plantations, and development, and the introduction of a market-based economy. However, titles were still subject to maka'āinana rights, and claims were required to secure ancestral lands, but many 'ōiwi or *kanaka maoli* (native Hawaiians) did not participate in the registration process, and thus their fishing rights were dispossessed. The 1850 Kuleana Act allowed maka'āinana to purchase fee simple title to land, further classified ancient resource rights, such as relationships between 'ōiwi and the 'āina, and access to the benefits of resources. The Kuleana Act further institutionalized ahupua'a-level resource rights into law.

### ***2.3.3 Overthrow of the Hawaiian Kingdom and annexation***

Under threat of violence, a group of advisors and cabinet members forced King David Kalākaua to sign the Bayonet constitution in 1887, which stripped the monarch of many of his powers, and also made voting rights contingent on property ownership. Following Kalākaua's death in 1891, Kalākaua's sister Queen Lydia Liliuokalani attempted to restore power to the monarchy. In response, a small group of influential foreigners and American plantation owners illegally overthrew the Hawaiian Kingdom. The overthrow was backed by the U.S. military (Chock, 1995). Following the overthrow, the Organic Act (1900) declared Hawai'i to be a U.S. territory and as a consequence, condemned "private" or community level rights to nearshore fisheries unless they were vested and registered (Kosaki 1954). The vesting process allowed landowners at the ahupua'a level to register their fisheries to retain their fishery rights. Although past evidence suggested 101 out of 400 of these ahupua'a fisheries were registered by 35 different owners (Higuchi, 2008), recent scholarship suggests 300-400 konohiki fisheries were registered across the archipelago (Akutagawa, In preparation).

### ***2.3.4 Hawaiian Territory and statehood***

Local level property rights were also weakened during territorial governance (Kosaki, 1954) until they were seemingly nullified in 1959 during Statehood (Friedlander et al, 2013). Still, local level fishing rights persisted in some areas into the 1940s and 1950s (Cramer, 2010), and perhaps even until 1970 in some areas. Although most "konohiki fisheries" were condemned and purchased by the Hawaiian Territorial government, new details are emerging that the actual number of konohiki fisheries is much higher than previously reported by Kosaki (1954) (Akutagawa, n.d.; Murakami & Tanaka, 2015). In some areas, such as the North Shore of Kaua'i, respected *de facto* local-level rights were maintained for several decades after Statehood condemned them (Vaughan & Ayers, 2016).

### ***2.3.5 The Hawaiian renaissance and the emergence of co-management governance***

Several landmark historical events occurred in Hawai'i in the 1970s that were embedded within a larger renaissance of native Hawaiian language, culture, dance, and traditional voyaging and navigation (Lewis, 1987). A constitutional convention in 1978 established the Hawaiian

language as an additional official language for Hawai‘i for the first time since the Hawaiian Kingdom. The convention also recognized that the State of Hawai‘i must:

...protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the rights of the State to regulate such rights (Hawai‘i Constitution Article XII § 7, 1978).

The 1978 constitutional convention was the basis for enabling legislation that authorized co-management nearly 20 years later. Declining marine resources and conflict in the early 1990s precipitated community-level efforts to return to place-based, native Hawaiian resource practices that were once effective in Hawai‘i (Poepoe et al., 2003). Community efforts to renew Hawaiian resource management practices and local-level property rights led to passage of enabling legislation for co-management in 1994 (Ayers & Kittinger, 2014). This legislation allows communities across the Hawai‘i to partner with the state to create rules for their adjacent marine areas based upon the 1978 Constitution. Although the Hawai‘i co-management pathway has existed since 1994, there is just one active co-management area in the state due to a variety of institutional constraints that complicate implementation (Ayers et al., In review; Vaughan & Caldwell, 2015).

## **2.4 RESULTS**

Below, the findings of an institutional analysis of two time periods and three governance regimes are presented: historical marine tenure present during the Hawaiian Kingdom (described below as historical marine tenure), with contemporary centralized or bureaucracy-based management, and contemporary co-management in Hawai‘i. First, the hierarchy of decision making (Table 2.3) is compared, followed by an analysis of the property rights components under the two governance arrangements (Table 2.4).



### ***2.4.1 Hierarchy and authority for rules***

Hierarchical administrative decision making in the Institutional Analysis and Design Framework is divided into four levels: meta constitutional, constitutional, collective choice, and operational. Meta constitutional represents the highest level of institutions that guide and constrain how decisions are made at the constitutional level. The constitutional level prescribes how decisions may be made at the collective choice level. Collective choice is most often thought of as collective decision making to decide upon operational level rules such as fishing regulations. Most research describes collective choice occurring within community-based management at the local level. Conversely, this research reveals that collective choice decision making over operational rules, particularly in co-management, may not occur at the local level.

Although it may appear that the historical marine tenure system, contemporary centralized management, and co-management are arranged in a classic bureaucracy, the historical marine tenure system exhibits polycentric institutional structure characterized by multiple overlapping centers of authority. Historical accounts suggest that decision-making was sometimes coordinated at the regional (moku) level, while other times it was devolved to the local level (ahupua‘a-level). Although administrative decisions were sometimes coordinated at higher political levels, operational decisions were made locally without direct supervision. Local level autonomy was made effective by the wealth of local-level resource knowledge. Master fishers worked with enabled local managers (konohiki) to create adaptive rules that maximized resource productivity. Depending on the scope of rules (for both centralized management and co-management under contemporary governance arrangements), they must still be approved at multiple levels of state government, and thus both governance arrangements are embedded within a classic bureaucratic administrative structure.

#### *A. Meta Constitutional*

The meta constitutional level holds the authority to develop constitutional level rules or the highest level rules that structure rules interactions at all lower levels. The highest level of authority was found to be present in the historical marine tenure system, contemporary centralized management, and the current co-management system. Under historical marine tenure, the Mō‘ī (absolute monarch) presided over the meta constitutional level (Beamer, 2014). Today

however, the U.S. government and the U.S. Constitution represents the umbrella framework and institutional structure under which all other levels of government operate in contemporary centralized management and co-management. The fourteenth amendment of the U.S. constitution, the equal protection clause, guarantees that U.S. laws apply equally to everyone. This can be problematic for the design of rights based management and operational level rules that seek to privilege local users or exclude outside groups. Rulemaking at lower levels must take this into account when attempting to limit access.

### *B. Constitutional*

The *ali'i nui* (island high chief) held the authority to preside over the constitutional level for the Hawaiian Kingdom. In their role as high chief, the *ali'i nui* attended political and administrative meetings with the *aha ali'i* (council of chiefs) and took directives from the Mō'ī. Today, the executive branch of the Hawai'i state government, headed by a democratically elected governor, represents the constitutional level for contemporary centralized management and co-management. The Hawai'i state constitution authorizes the executive branch of the state government to manage resources as well as protect and regulate traditional practices and resources importance for native Hawaiian subsistence, culture or religion.

### *C. Collective Choice*

In the historical system, the *ali'i 'ai moku* (district level chief) retained authority over the collective choice in the historical marine tenure system, sometimes coordinating lower ahupua'a-level decision-making. In the current co-management system, the governor-appointed, seven member Board of Land and Natural Resources (BLNR) represents the collective choice level in contemporary centralized management and co-management. The BLNR must approve any changes in operational level rules, subject to final approval by the governor.

### *D. Operational*

The *ali'i 'ai ahupua'a* appointed local-level konokihi (resource appropriators) that worked together with master fishers and residents living in the area to devise operational level rules. In contemporary centralized management, rulemaking authority is ceded to the Division of Aquatic Resources (DAR), with final approval by the appointed Board of Land and Natural Resources

and the Hawai'i State Governor. Under co-management, formal operational level rulemaking authority is shared between community members and the Division of Aquatic Resources, and is enforced by the Division of Conservation and Resource Enforcement (state level marine resource management and enforcement agencies).

**Table 2.3.** Nested rules hierarchy and authority for small-scale fisheries in the Hawaiian Kingdom (1810-1892), Contemporary Centralized Management (1982-present), and Contemporary Co-management (1994-present)

	Level of Analysis/Arena of Choice	Governance Arrangement		
		Historical Marine Tenure	Centralized Management	Co-management
Decision making authority within each Arena of Choice	<b>Meta-Constitutional</b> <i>individual actions that directly affect rules that affect Constitutional situations</i>	<i>Mō‘i</i> Ruling Monarch (Absolute Monarchy (1810-1840; Constitutional Monarchy 1840-1892)†	Federal Government/U.S. Constitution/Federal Statutes	
	<b>Constitutional</b> <i>individual actions that directly affect rules that affect Collective-choice situations</i>	<i>Ali‘i</i> (Ruling Chief on each island) <i>Aha ali‘i</i> (council of chiefs)	State of Hawai‘i/Hawai‘i State Constitution	
	<b>Collective Choice</b> actions that affect rules that affect Operational Situations	<i>Ali‘i ‘ai moku</i> (Ruling Chiefs in each district), made decisions in consultation with the <i>Ali‘i ‘ai ahupua‘a</i> (Ruling chief of lesser rank at the ahupua‘a level) and the <i>Konohiki</i> (agent or land manager)	Board of Land & Natural Resources; State of Hawai‘i Resource Management Agency (DLNR)	
	<b>Operational</b> rules-in-use that affect everyday user decisions	<i>Ali‘i ‘ai ahupua‘a</i> appointed a <i>Konohiki</i> the authority to appropriate resources and devise rules in concert with expert fishers and <i>hoa ‘āina</i> (ahupua‘a tenants)	DAR/DOCARE	Rulemaking authority shared between users and resource management agencies (DAR/DOCARE)

†This period followed a period of initial settlement, the ‘Ohana network, which exhibited little social stratification and then the territorial hierarchy, in which greater social stratification was evidenced by the presence of an ali‘i class, the ahupua‘a system and the appointment of konohiki (Beamer, 2014).

#### **2.4.2 Property Rights Components**

Schlager and Ostrom (1992) define five property rights components that are integral to the analysis of natural resource governance arrangements: access, withdrawal, exclusion, management, and alienation. Possession of these rights under historical marine tenure, contemporary centralized management and co-management is presented in Table 2.4. A description of each of the rights in each governance arrangement is provided below.

##### *A. Access and Withdrawal*

Under historical marine tenure, both ahupua‘a tenants and local resource managers held the right to enter resource areas and harvest resource units. Under centralized management, the Public Trust Doctrine and the Hawai‘i state constitution ensures that coastal and marine access may not be restricted, subject to certain rules and regulations. In most areas, anyone may enter coastal and marine areas and fish, except for areas where fishing activity is prohibited by all users. Likewise, in contemporary co-management, rights to exclude are not currently recognized, so there is no *de jure* managed access to resources. As a result, anyone may enter a resource area and harvest resource units subject to existing resource rules and regulations. Access and withdrawal rights are subject to operational level rules under both governance arrangements in both time periods.

##### *B. Exclusion*

Under historical marine tenure, local resource managers enforced *palena* (boundaries) at the ahupua‘a level; ahupua‘a tenants from other ahupua‘a required permission from the konohiki to enter and harvest. Hoa‘āina retained rights within *ili* (sub-areas of an ahupua‘a). In both contemporary centralized management and co-management, no one can be legally excluded from resource areas except under state coercion.

### *C. Management*

Management rights entails the rights and responsibilities associated with making decisions regarding access, withdrawal, exclusion, and alienation. Konohiki retained management rights in historical marine tenure, but their rulemaking rights required consultation with master fishers and ahupua‘a tenants. Moreover, their management rights were subject to changes in the Hawaiian Kingdom political landscape and political change at higher levels of authority. The Division of Aquatic Resources holds management rights in contemporary centralized management, subject to approval by the Board of Land and Natural Resources. Community members share some management rights to co-develop operational level rules (fishing regulations) with the Division of Aquatic Resources in contemporary co-management.

### *D. Alienation*

Some alienation occurred under historical marine tenure during the mid-late 1800s as the Hawaiian Kingdom transitioned to a market economy. For example, some konohiki leased or sold their rights to certain species to commercial fisheries for economic gain while still practicing subsistence fishing (Kirch, 2010; Kittinger, 2010a). Today, the State of Hawai‘i may sell or lease any of the property rights components subject to the State and Federal constitutions. However, ceded lands, sometimes referred to as the ‘crown lands’ may limit the state’s alienation rights. Ceded lands were the lands once owned by the Hawaiian Mō‘ī that today are treated as a collective property right shared by all Native Hawaiians (Van Dyke, 2008). Currently, the sale, transfer or lease of the crown lands is subject to a two-thirds vote by both the State of Hawai‘i House of Representatives and the Senate (Van Dyke, 2010).

**Table 2.4.** A comparison of Historical Customary Marine Tenure and Co-management Institutional Arrangements in Hawai‘i [property rights] adapted from Schlager & Ostrom (1992)

Property right component	Historical Marine Tenure	Centralized management	Co-management
<b>Access</b> (right to enter a resource area)	Hoa‘āina and konohiki only	Anyone, subject to regulations that apply equally	
<b>Withdrawal</b> (right to withdraw or harvest resource units)	Hoa‘āina subject to konohiki rules and ho‘okupu provided to ali‘a ai ahupua‘a	Anyone – subject to resource rules and regulations	Anyone – subject to rules based upon customary practices
<b>Exclusion</b> (right to exclude others from entering a resource area or harvesting resource units)	Konohiki enforced <i>palena</i> (boundaries) at the ahupua‘a level; hoa‘āina from other ahupua‘a needed permission to enter and harvest.	No one can be excluded unless rules specify that everyone is excluded.	
<b>Management</b> (right to make operational rules and enforce sanctions)	Konohiki, in consultation with <i>kilo i‘a</i> (master fishermen or fish spotters) and hoa‘āina, subject to appointment by ali‘i ‘ai ahupua‘a (ahupua‘a level chief)	The DAR develops rules, subject to attorney general approval, public input, majority approval by the BLNR, and approval by the Governor of Hawai‘i.	Rules devised at the community level in consultation with the DAR, subject to approval by the attorney general, public input, majority approval by the Board of Land and Natural Resources (BLNR), and the Governor.
<b>Alienation</b> (right to sell or lease any of the above rights)	Some alienation occurred in the late 1800s during the transition to a market economy as some konohikis leased or sold their rights to certain species to commercial fisheries for economic gain while still practicing subsistence fishing.	Only the State of Hawai‘i can sell or lease any of the above rights, except ceded lands, which are subject to collective rights of Native Hawaiians. Their sale or lease requires approval by both houses of the Hawai‘i state legislature.	

## 2.5 DISCUSSION

Hierarchical decision making, fisheries property rights, and the design of institutional arrangements for resource management have changed substantially over the last 200 years in Hawai‘i. If broken, many rules once punishable by death now merely levy a small fine if the accuser is caught, brought to court, and proven guilty. Resources have declined substantially from historical levels in Hawai‘i, particularly in contemporary times, leading to the emergence of a new governance arrangement – co-management – that includes some aspects of local-level management once present under the historical marine tenure system. However, analysis of hierarchical authority and property rights components under historical marine tenure in Hawaiian Kingdom, contemporary centralized management, and co-management raise several issues relevant to the general design of rights based management regimes. These issues include: the devolution of property rights at the local level; matching administrative and social-ecological complexity; the importance of historical context and narratives in shaping solutions; and the legitimacy of governance arrangements. These issues are considered for the remainder of this section.

### *2.5.1 Devolution of property rights at the local level*

Studies of fisheries management failures across the globe found that many management problems can be successfully remedied through devolution of rights to users that confer stewardship incentives (Costello et al., 2008). However, there can be unintended consequences associated with rights based approaches, including elite capture of benefits (Cinner, McClanahan, et al., 2012b) and consolidation of rights causing loss of employment and a way of life for fishers and associated industries (Rust, 2013). Thus, regulators must pay careful attention during the institutional design process of rights based management to account for these and other unfortunate consequences. If not, institutions and incentives may be misaligned. Yet in co-management, too often rights are not devolved to communities or user groups (Pinkerton, 1999; Pomeroy et al., 2001). Further, the fisheries described in this chapter are primarily subsistence-based and not commercial. Nevertheless, data on contemporary co-management presented in this case confirms that rights have not been devolved to local resource users. Under contemporary co-management in Hawai‘i, communities supposedly sharing management authority are allowed



to create rules for their area, but other rights such as access and withdrawal, exclusion, and alienation are not conferred to the local level – which may fail to adequately confer stewardship incentives to communities and may hinder the success of the rights based approach (Grafton et al., 2006). Communities therefore only can exert rights to manage, primarily through the process of advancing site-based rules for adoption by the state, which is subject to a labyrinthine approval process involving multiple bureaucratic approvals and public hearings (Ayers and Kittinger 2014). This process can take multiple years to complete (Vaughan & Caldwell, 2015).

Viewed holistically, co-management in Hawai‘i has thus far been implemented on a piecemeal basis, and despite the presence of enabling legislation, co-management represents just one rarely used option in a diverse portfolio of management strategies. Outside of Hawai‘i, other countries have ushered in large-scale change swiftly and definitively. Marine management in Chile was changed almost overnight via the Chilean Fishing and Aquaculture Law, which mandated co-management in 1991. There, the 1991 law ushered in statewide change in property rights by devolving exclusive benthic harvesting rights to local fishers. The near collapse of a Chilean Abalone (*Concholepas concholepas*) (*loco*) and the success of a small experiment to devolve exclusive harvest rights to local users drove passage of the law. Although some difficulties were associated with the abrupt transition from the traditional management system (Gelcich et al., 2006), there is evidence of positive social and ecological outcomes as a result of co-management governance in Chile and the law is generally considered a success (Gelcich et al., 2010; Gelcich, Kaiser, Castilla, & Edwards-Jones, 2008). If co-management in Hawai‘i is ever going to be implemented on a scale beyond a few small and isolated areas or demonstration projects, more rights must be devolved to communities. To devolve more rights, perhaps a different set of constitutional rules akin to Chile’s 1991 law may be necessary to facilitate wider implementation. New constitutional rules could mandate co-management in specific cases, further codify and recognize rights to Native Hawaiians, or cede governmental authority back to the Hawaiian people.

### ***2.5.2 Matching administrative and social-ecological complexity***

Rights-based approaches to management may take many forms and it would be foolish to limit the diversity of policy instruments available to resource appropriators. However, rights-based approaches – including co-management – may not be successful without an administrative structure that is commensurate with the complexity of the social-ecological system it governs (E. Ostrom, 1998). State-level spending on natural resources in Hawai‘i is among the lowest in the nation, averaging 1-4% of overall state budgets from 1997-2013 (Teneva, Unpublished data). A consequence of this lack of natural resource spending is a lack of institutionalized enforcement and a de facto open access property rights arrangement for most small-scale fisheries in Hawai‘i (Finkbeiner et al., 2015). Declines in biomass and apex predators across the main Hawaiian Islands have been observed in open access areas (Friedlander & DeMartini, 2002a). One explanation for low spending and a lack of enforcement is that there is no license program for non-commercial fishing activity. A fishing license program typically raises revenue for enforcement, education, and collects valuable data for management. Conflict is another consequence of low spending on natural resources and enforcement. Up to 90% of coral reef fish caught in Hawai‘i are consumed or shared by fishers (Kittinger & Friedlander, unpublished dataset) – which demonstrates a dependence on the ocean for sustenance. A 1994 study used to justify co-management found that nearly two-thirds of residents of Moloka‘i island regularly fished, and more than one third engaged in ocean gathering activities gathering *limu* (seaweed) and *opihī*, an intertidal limpet – both culturally important local foods; and fishing and hunting activities provided over one-third of food for island residents (Matsuoka et al., 1994). Given the dependence on resources on Moloka‘i and their corresponding decline, it is not surprising that conflict and even violence has erupted between Moloka‘i residents and visiting fishermen from neighboring islands over increasingly scarce resources (Guth, 1999). Likewise, it is not surprising that Moloka‘i residents would seek to strengthen local property rights to avert the tragedy of the commons.

In order to manage these conflicts, a robust administrative structure, including a community presence, should match the complexity of the social-ecological system. This could entail sharing authority with communities and/or increasing management funding to augment planning staff, data collection, monitoring, and enforcement efforts, which are vital governance components.

However, community-level enforcement remains a challenge, as efforts to deputize community members have met administrative and legal resistance. Legally, community members are not allowed to enforce resource rules, which is considered a key element of community-based governance (E. Ostrom, 1990). At this time, community members must report incidents to the state-level Division of Conservation and Resource Enforcement (DOCARE), the enforcement arm of the Department of Land & Natural Resources. As a Division, DOCARE is woefully understaffed. For example, on the island of Kaua‘i, there are just nine DOCARE officers to patrol from *mauka* to *makai* (from the mountains out to three miles in the ocean). A greater commitment to compliance and enforcement must be a part of any administrative changes in Hawai‘i.

### ***2.5.3 The importance of historical context in shaping current solutions***

Although this research presents historical marine tenure in the context of a different time period in Hawaiian history, Hawai‘i’s legacy of marine tenure still lives in Hawai‘i through mo‘olelo, historical accounts, and native Hawaiian resource management practices (Maly & Maly, 2003). Memories of the recent past have not been lost and many traditions continue to live on in some areas of Hawai‘i (McGregor, 2007). Management failures and declining resources are often attributed to the arrival of western conceptions of management (bureaucratic administration and centralization) and a departure from native Hawaiian practices, values, and ways of knowing (Ayers & Kittinger, 2014). Thus, when solutions are considered for problems facing contemporary resource systems in Hawai‘i, many of these historical narratives or ‘artifacts’ resurface (V. Ostrom, 1980).

Although institutional analysis of historical marine tenure, contemporary centralized management, and co-management reveal some similarities in terms of administrative complexity, there are vast differences in terms of efficiency, accountability, and resource outcomes. Some Hawai‘i communities frame the emergence of co-management as a small component within a larger political movement toward restoring native Hawaiian sovereignty or a renewal of Native Hawaiian values and relationships with the natural world (Vaughan et al., 2016, Vaughan and Caldwell, 2015). Twenty or more communities are currently in various stages of co-management planning across Hawai‘i (Higuchi, 2008, Levine and Richmond, 2014), which indicates some

dissatisfaction with the current management regime, the larger political system, and a desire to reintegrate aspects of historical marine tenure into contemporary management.

Part of the dissatisfaction with the contemporary centralized management may be a product of not paying adequate attention to historical and cultural context in designing the fisheries management regime. Development scholars have widely documented institutional failures in a multitude of global cases that stem from solutions imposed by external forces that do not adequately consider local knowledge, customs, and context (Boettke et al 2008, Scott, 1999). Although evidence reveals declines in resource productivity from ancient Hawai‘i to present day (Kittinger et al., 2011), there is a prevailing notion among many Hawaiian communities that aspects of marine tenure can be still be effective. For example, place-based rules based upon customary practices and values. Also, there are no laws that prohibit local monitoring and educational programs (Vaughan et al., 2016). However, attempts to initiate institutional change in Hawai‘i have largely been stymied by significant transaction and transformation costs (Ayers et al., In review). Co-management transitions have taken significant time and resources – ten years or longer – in other areas of the world (Gelcich et al., 2010; Yandle, 2003), which may also indicate the difficulty of changing behavioral patterns, the ‘stickiness’ of institutions, or the reluctance of governments to cede authority.

Critical institutionalist scholars have characterized the messy process of institutional change as ‘institutional bricolage’ whereby “people...assemble or reshape institutional arrangements, drawing on whatever materials and resources are available...Institutional components from different origins are continuously reused, reworked, or refashioned to perform new functions” (Cleaver & De Koning, 2015, p. 5). Institutional bricolage is a dynamic, negotiated process shaped by social relations, power, agency, and structural constraints (Cleaver, 2002; Hall, Cleaver, Franks, & Maganga, 2014). The messy, nonlinear, political process of institutional bricolage may be a better frame through which to understand some of the contextual factors that as of yet, have slowed institutional change in Hawai‘i coral reef fisheries. As a concept, institutional bricolage can help illustrate the importance of historical context and narratives surrounding institutional analysis and design of policy solutions. It is too soon to tell if the twenty or more communities across Hawai‘i interested in renewing aspects of marine tenure will

be able to overcome sticky institutions or path dependency (*sensu* Baumgartner & Jones, 2009) currently holding much of the authority and rights to resources in Hawai‘i.

#### ***2.5.4 Legitimacy of governance arrangements***

Jentoft (2000a, p. 145) explained the positive relationship between legitimacy and authority: “Autonomy (or the lack of such) is an essence of power as such it needs legitimation. The lesser the autonomy, the greater the legitimation problem.” Although the historical marine tenure system may have been implemented under a constitutional monarchy, in many ways it may be viewed as more legitimate than contemporary co-management in fisheries since more management authority was devolved to lower levels where local expertise could be integrated into management. In the Hawaiian Kingdom, chiefs and resource managers were not selected for leadership positions through a democratic voting process, yet the success and tenure of ali‘i and konohiki depended on their ability to manage resources effectively and distribute harvests equitably and fairly throughout an ahupua‘a. To ensure accountability, the Hawaiian Kingdom decentralized decision-making to local resource managers that consulted with and placed great value on information gathered from expert fishermen (Vaughan & Ayers, 2016). Even though ali‘i and konohiki held a great amount of authority, their position of power was tenuous; they could be removed – or even killed – if their decisions were deemed unfair or led to resource decline (Beamer, 2014; Kirch, 2007; Van Dyke, 2008).

In contrast, as the institutional analysis showed, very little management authority is devolved to communities in Hawai‘i co-management. Communities rely upon highly protected government civil servants that can only be fired for cause, and on resource regulations that are largely unenforced due to low agency budgets. Further, the administrative rulemaking process in Hawai‘i ensures four or five opportunities for public input (Kittinger et al., 2012), but in many ways reinforces or amplifies existing power relations. For instance, public meetings are almost always held at agency offices located in the urban core of Honolulu. Due to the high cost of living in Hawai‘i, many community members advocating for co-management often work several jobs to make ends meet or may be retired and living on fixed incomes. These factors make travel and time off to attend meetings and provide in-person testimony prohibitively expensive and difficult. Conversely, entrenched commercial or other organized interests opposed to co-

management may employ trained communications staff and legal counsel to lead strategy, threaten litigation, or contest community claims. This has been found true in other public fisheries arenas, where more nuanced rhetoric and argumentation in public processes was found to be effective at influencing the policy sphere (Wilson & McCay, 1998).

If management is not considered legitimate by fishers, they may find ways to break the rules or seek ways to speak out and try to change them (Jentoft, 2000a). The test of legitimacy is whether participants support the process or merely the outcome. In other words, if participants feel that their voices are heard then they can live with an unfavorable outcome (Jentoft, 2000a). There is much evidence that existing participatory and decision making structures are ineffective in Hawai‘i. Recent research in this system has found that the participatory rulemaking process is one of the biggest barriers to co-management in Hawai‘i (Ayers et al., In review, Levine and Richmond, 2014, Vaughan and Caldwell, 2015). The legitimacy challenge facing the state of Hawai‘i is to develop participatory spaces where constructive deliberation is not dominated by power relations, particularly since Hawai‘i has a multicultural population, a diversity of cultures and worldviews that can complicate agreements and policymaking (Foucault, 1982, Fung and Wright, 2003, Umemoto, 2001).

Although it is no easy task, deliberative democracy approaches offer a suite of participatory design alternatives that may increase legitimacy, equity, and even enhance outcomes. No two public policies, management regimes, or social-ecological systems are equal, so why employ a one-size fits all participatory strategy? Varying participant involvement, the type of input and decision making allowed, and the extent of their influence on the outcome may help ensure the most fair and efficient outcome can occur (Fung, 2006). For example, if a rural community is pursuing a co-management area, a tourism or commercial fishing business situated on another island may not be considered to be a stakeholder and thus could be prohibited from participating in the public input process. Prohibiting non-local input would likely require constitutional changes. However promising, deliberative democracy is not a silver bullet. Decision making regarding who is allowed to participate, provide input, and influence outcomes may be biased, leading to some of the same legitimacy problems that plague other participatory processes

(Parkinson, 2003). Deliberative democracy, like democracy, is messy. Yet it may offer some effective strategies that can be tailored to enhance specific co-management planning situations.

## **2.6 CONCLUSION**

Rights-based approaches to small-scale fisheries management such as co-management are increasingly gaining traction around the world. This research has demonstrated that administrative complexity has remained largely constant over time in Hawai‘i, but property rights have changed dramatically in Hawai‘i coral reef fisheries. Rights once devolved to local resource managers are currently held by the central government of the State of Hawai‘i, which devolves relatively little management authority to local communities. History and path dependency may currently hold a firm grip on fisheries management institutions in Hawai‘i, particularly constraining possibilities for rights based approaches to co-management. However, this research presented some ideas that can be applied both locally in Hawai‘i and globally that are facing similar rights based implementation challenges. This analysis has also shown how the Institutional Analysis and Design framework can pinpoint where alternative pathways may be available through changes at specific decision making arenas; that administrative complexity may be necessary to address social-ecological complexity; the role that history and context play an important role in effective institutional design; and how innovative participatory strategies adopted from municipal governance can lead to increasingly legitimate, effective participation in co-management planning. Deliberative democracy approaches hold much promise for the practitioners, planners, and communities embedded in seemingly thorny, complex path dependent situations, or nascent co-management planning endeavors. More participatory research utilizing deliberative democracy strategies may be the key to shortening the incubation time for rights based approaches and co-management, which often takes a decade or longer to mature (Gelcich et al., 2010). Regardless of whether participatory and decision making strategies outlined by deliberative democracy scholarship are formalized, targeted stakeholder engagement and negotiation may reduce disputes and conflict that can occur later on in co-management processes. If the current trend of rights based approaches in small-scale fisheries continues, these strategies may offer a path forward towards more effective and legitimate governance transitions.

### **Chapter 3.**

#### **Emergence of Co-management Governance for Hawai'i Coral Reefs**

Chapter 2 traced how hierarchical decision-making structures and property rights from Hawaiian Kingdom times through to present day have affected Hawai'i coral reef social-ecological systems. Co-management, via community-based subsistence fishing areas, was one of the governance regimes analyzed. Chapter 2 showed that the rights devolved to communities in co-management were limited to some management authority to develop operational rules for marine areas adjacent to communities. Analyzing property rights components and administrative structure may explain some of the current limitations inherent to Hawai'i co-management. However, chapter 2 did not examine the creation story behind community-based subsistence fishing areas. This chapter will focus on that process, employing a grounded theory approach to develop a simple typology of drivers and the social responses that enabled co-management to emerge from the community level in Hawai'i. Later on, the chapter pivots to some of the theoretical issues related to emergence theory and community-level co-management planning processes. The chapter concludes by considering key issues related to co-management planning and implementation.

#### **3.1 INTRODUCTION**

Failures in natural resource management that take top-down, centralized governance approaches have inspired considerable research on ways to involve communities and resource users in co-management. Co-management can take many forms, but generally involves shared management authority and responsibility between resource users or community groups at the local level and governmental agencies (Berkes 2010). Co-management can be conceptualized as a spectrum of institutional arrangements and bundling of property rights in which management responsibilities are shared between local-level resource user communities and state-level institutions (Yandle 2008). Some investigators have characterized co-management as an adaptive, iterative learning process where all involved parties share costs and benefits, rather than a strategy or management tool (Pomeroy & Rivera-Guieb 2006).



Recent scholarship on co-management has focused on small-scale fisheries, which have become increasingly recognized as globally significant in food security, livelihoods, and fisheries landings (Berkes et al. 2001, Chuenpagdee et al. 2006, Costello et al. 2012). Early research on co-management of small-scale fisheries focused primarily on descriptive assessments of these approaches (e.g., McGoodwin 1980, Jentoft 1989, Pinkerton 1989), while more recently, researchers have turned their attention to identifying the factors associated with different social and ecological outcomes, primarily through comparative approaches (e.g., Gutiérrez et al. 2011, Cinner et al. 2012). This growing literature associates co-management with several advantages, including increased collaboration and learning among partners, higher compliance with regulations, community empowerment, and increased stakeholder buy-in and stewardship (Acheson 2003, Jentoft et al. 1998, Jentoft 2005, Gelcich et al. 2010). But co-management can also lead to undesirable outcomes such as increased social conflict, elite capture of benefits, and perverse incentives for resource overexploitation (Castro and Nielsen 2001, Gelcich et al. 2006, Macneil and Cinner 2013; Pomeroy et al. 2007, Singleton 2000).

While considerable and justifiable attention has been paid to these outcomes, there is an increased need to understand how co-management arrangements emerge and persist in the face of socioeconomic and environmental change. Emergence theory describes many related concepts and draws on a diversity of disciplinary fields (de Haan 2006). Accordingly, the concept of emergence has a diverse set of meanings, theories, and frameworks. In its simplest terms, emergence describes a process by which much system complexity may result from a small set of enabling conditions and constraints or rules (Holland 1999). The most fundamental attribute of which are the observation of some non-linear system behavior, usually described as a function of complexity, evolution, and interaction of several factors (Rotmans et al. 2001, de Haan 2006). Scholars have employed several analytical approaches to better understand and map the emergence process, including theoretical and conceptual models (Margoluis & Salafsky 1998; Salafsky et al 2002), agent-based computational modeling (Holland 1999, Epstein 1999), the emergence and diffusion of new ideas (Rogers 2003), the policy process (Sabatier 1999), and institutional analysis at different levels (McGinnis 2011).

In environmental governance literature, emergence has been used to describe the development of new institutional arrangements (e.g., Basurto et al 2012), and the ability of such arrangements to persist is referred to as ‘robustness’ (Anderies et al. 2003; 2004). This literature also characterizes the transitions between governance regimes in terms of transformations, with emerging empirical evidence on the factors key to these transformations (Olsson et al. 2006, Gelcich et al. 2010, Westley et al. 2011,). In resilience scholarship, transformability is used to describe the capacity of a complex system (e.g. social, economic or ecological) to transform into a new system, leaving the old system behind (Folke et al 2010). Emergent transformation is conceived as a bottom-up transition pathway characterized by less coordinated, externally driven regime change (Berkhout, Smith, Stirling 2004; Westley et al 2011). Emergent transformations can be operationalized in terms of actors, interactions, and events (Geels & Schot 2007).

In relation to governance systems, recent research on co-management has focused on emergence of new governance arrangements and the key factors associated with these transformations (Gelcich et al 2010, Basurto et al 2012, Cudney-Bueno & Basurto 2009). These examples from recent literature demonstrate the growing interest in this field, particularly as this scholarship relates to policy development and conservation actions on the ground. With a few exceptions (e.g., the Maine Lobster fishery in the US – Acheson 1988; Acheson 2003; fishery management in New Zealand – Yandle 2003; Yandle 2008; McGinnis 2012; the Pacific Northwest fisheries – Singleton, 2000), most of this literature derives from research in the developing world. As such, less is known about emergence of co-management in developed world contexts. Further, little attention has been given to the important processes of integrating community-based and state-level planning into robust co-management governance.

Here, the emergence of co-management for natural resource governance is examined, using a case study approach from coral reef fisheries in the Hawaiian Islands. As a case study, Hawai‘i possesses some unique characteristics that provide opportunities for novel insights. Hawai‘i straddles the developed-developing dichotomy in terms of its ethnic and cultural diversity, the intersection between western-based and legally recognized traditional management institutions, and economic development that varies from high density urban to isolated, rural agrarian areas. In Hawai‘i, fishing and gathering remain a central aspect of communities due to their

sociocultural significance and for food security, yet centralized approaches to managing fisheries resources and habitats have proven largely unsuccessful, prompting calls for increased engagement of local fishers and communities in management. Although Hawai‘i has been part of the United States since 1959, the islands have a legacy of traditional management based on its Polynesian cultural heritage. Marine resources were historically governed through a sophisticated watershed-based tenure system (the *ahupua‘a* system) (Kaneshiro et al. 2005; Kittinger et al 2011). The past success of this system and the failures of bureaucracy-based management since statehood are often used as justification for a return to traditional management in areas across the state. In response to calls for more local autonomy in management of coral reefs, one alternative that has gained traction in Hawai‘i is community-based subsistence fishing areas (CBSFAs) (Levine & Richmond, 2014). CBSFAs are spatial management measures that allow communities to propose rules to manage nearshore areas for “subsistence” purposes, defined as “the customary and traditional Native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing” (Higuchi 2008; Richmond 2013). CBSFAs allow for the development of co-management partnerships between state resource management agencies and community groups. Below, the ‘creation story’ behind this co-management arrangement is documented and the emergence process of this co-management governance system is evaluated, drawing on a robust policy analysis, archival data sources, and a set of key respondent interviews. The findings are related to broader theories on emergence of governance arrangements for social-ecological systems and conclude by describing ways that the findings can directly inform policy and planning in practice.

### **3.2 METHODS**

This research employed a mixed method approach. I conducted a series of in-depth interviews and an analysis of archival documents, plans and legislative testimony. Archival data sources included legislation, testimony, management plans, government evaluations, publications and reports. Testimony submitted for the enabling legislation and the three successfully legislated CBSFAs (in the communities of Mo‘omomi, Miloli‘i, and Hā‘ena) were also gathered from the Hawai‘i State Archives. A content analysis noting patterns or themes was performed on 44 pieces of submitted testimony heard during Senate or House committee hearings for bills that

eventually became one of the State's three legislated co-management areas. In some cases, citizens or stakeholder groups submitted testimony multiple times, but their testimony was only counted once in the analysis since most, if not all of the testimony submitted multiple times went unchanged. These data were used to supplement and confirm data gathered from key respondent interviews. I also draw on a rigorous legal and institutional analysis of the State of Hawai'i administrative rulemaking process previously conducted (Kittinger et al 2012).

### ***3.2.1 Sampling approach***

Individuals selected for in-depth, semi-structured interviews were identified based upon a series of informal conversations occurring between May 2010 and March, 2012. A purposive sampling approach was employed among identified individuals to preferentially interview respondents who were highly knowledgeable about fisheries co-management in Hawai'i. Purposive sampling is a type of sampling in which "particular settings, persons, or events are deliberately selected for the important information they can provide that cannot be gotten as well from other choices" (Maxwell 1997, 235). This sampling typology is commonly employed in studies seeking to characterize specific dimensions of a set of issues, and is a valid method for achieving representativeness or comparability among a broad set of cases or topics (Patton 2002; Teddlie & Yu 2007).

In total, 19 interviews were conducted with individuals from government, non-governmental organizations (NGOs), communities, and academic institutions between March and December 2012. Table 3.1 displays a count of interviewees by sector. Although interview respondents are identified by the sector in which they work, due to the embedded nature of planning practice the lines are often blurred between academics, NGO employees and community members in this resource system (small-scale, coral reef fisheries). Interviewees included planners, administrators, managers, tenured faculty, community members, and private consultants with significant experience working on co-management in Hawai'i. "Snowball," or chain referral sampling (Creswell 2007) was employed to ensure that 19 semi-structured interviews resulted in sufficient theoretical saturation (Bernard 2012). Although care was taken to ensure that multiple perspectives were gathered in this process, no additional interviews were scheduled or conducted once new data gathered from individuals e.g. themes, theories, proposed causal mechanisms,

began to mirror data already gathered. The decision to limit interviews ( $N=19$ ) was based on a self-assessment of data saturation, i.e. I began collecting similar responses from respondents. Based on other similar research, this self-assessment was deemed sufficient to explain the complexity of co-management emergence in this system and is consistent with qualitative and mixed method research designs (Patton 2002; Curry et al 2009; Gruby & Basurto 2013).

**Table 3.1.** Total number of interviewees by sector.

<b>Interviewee Sector (count)</b>
State Government (6)
NGO/Foundation (5)
Community (3)
Federal Government (2)
Academia (2)
Consulting (1)

### **3.2.2 Data analysis**

Interviews typically lasted around one hour and respondents were ensured that all data would be reported anonymously or in the aggregate. A total of 18 out of 19 interviews were audio recorded and transcribed. Post transcription data analysis followed a grounded theory approach to uncover co-management emergence (Miles & Huberman 1994; Bernard & Ryan 2009). A deductive, iterative process of open or axial coding was used to identify patterns, themes and subthemes in the interview data. This data analysis was facilitated with NVivo 9 Qualitative Data Analysis Software. Nascent themes describing co-management emergence were grouped into topical areas, then later into major categories. Although counts of key respondents identifying major categories are presented to give a general idea of convergence within key interview respondents, they do not represent archetypal results of a quantitative survey approach nor are they generalizable in any way. Interview findings were combined with data gathered from the policy and institutional analysis and a content analysis of legislative testimony to inform the development of a temporal or causal chain of drivers and responses for co-management emergence. The drivers and responses were evaluated within the context of a planning framework at the community level. The proposed causal chain was then shared back with interview respondents for additional comment and review.

### **3.3 RESULTS**

#### ***3.3.1 Key factors in emergence***

I identified five major themes related to the process of emergence: resource depletion, conflict, self-organization, consensus-building, and collective action. These themes were based upon data from interview results, legislative testimony, a careful retracing of historical events, and a review of secondary data sources and archival documents. The five themes were separated into two categories in an attempt to disentangle the emergence process: drivers for emergence of co-management governance and the social responses from various stakeholder groups in Hawai‘i seeking to organize and implement co-management. A descriptive narrative of the enabling conditions and policy environment, enabling legislation, and pilot project that allowed the co-management governance system to arise is also presented. A timeline of key events was also created from the analysis of interviews, legislative testimony, and archival data. The timeline (Table 3.2) presents key events that occurred in Hawai‘i over the past 20 years that impacted the trajectory and emergence of co-management governance.

#### ***3.3.2 Drivers for emergence***

Drivers for emergence were identified through iterative, deductive coding process of qualitative interview data and archival sources such as legislative testimony, drawing on established definitions in the literature to differentiate these concepts (Table 3.4). I consider these drivers and their sub-components below, supplemented with examples and additional coding data presented in Table 3.4. Exemplar quotes from key respondents describing each of the drivers of emergence are presented in Table 3A1.

#### ***3.3.3 Resource depletion***

The enabling legislation and co-management framework for Hawai‘i coral reefs emerged following an extended period of resource depletion. Over half of all interview respondents mentioned resource depletion as a key driver affecting the emergence of co-management. Within the broad category of resource depletion, interviewees specifically cited overharvesting of marine resources, development or tourism impacts, and ineffective management practices (See Table 3.4, Table 3A1). Resource depletion was also independently mentioned in 43% of all

legislative testimony as justification for a governance shift to co-management. These observations by key respondents are corroborated by research in these fishery systems, which have documented long-term declines in key resources and reef health over the past century (Friedlander et al. 2008; Kittinger et al. 2011).

### ***3.3.4 Conflict***

Conflict was described by 5 out of 18 respondents as a key driver that led to the enabling conditions for emergence of co-management. Within the larger category of conflict, respondents described increased competition over resources as causing disputes or conflict, outsiders entering areas previously accessed only by nearby communities, and communities taking site-based actions to prevent poaching. According to these respondents, conflict followed a period of resource decline and increased competition over scarcer resources. Although just 5/18 respondents described conflict as a key driver, conflict was also independently mentioned in 25% of all legislative testimony (11 out of a total of 44 independent sources submitted for three different co-management areas: Mo‘omomi, Miloli‘i, and Hā‘ena) submitted by community members, stakeholder groups, or government as justification for a governance transformation from bureaucracy-based management to co-management.

Narratives derived from testimony, interviews, and other archival sources often detailed how conflict over resources in Hawai‘i occurred when technological advances (e.g., newer more efficient gears, GPS, the use of refrigeration) and population growth led to an influx of new fishers entering previously inaccessible or remote fishing areas (Guth, 1999). These new fishers began competing with existing fishing communities over increasingly scarce marine resources. Since monitoring and enforcement at the state level was minimal or non-existent, there was no threat of sanctions for those breaking resource rules. Resource depletion escalated some disputes into protracted conflict over rights to marine resources. In some cases communities took enforcement into their own hands or sought other means to change and improve the regulatory regime. Community-level enforcement actions described by interview respondents included unlawful access controls, which included varying levels of intimidation, and some illicit actions to protect their marine resources (See Table 3.4, Table 3A1).

### ***3.3.5 Enabling conditions and policy environment***

Resource depletion and conflict created the enabling conditions for the emergence of a new governance system. These drivers played out on the rural island of Moloka‘i, just 51.49 km from the urbanized island of O‘ahu. In 1990, U.S. Census Bureau reported that just 7,333 residents were living on the small island of Moloka‘i (comprising just 68,000 hectares). Many Moloka‘i residents, particularly Native Hawaiians residing in the Ho‘olehua Hawaiian Homestead community fronting Mo‘omomi Bay on the island’s northwest coastline, had grown frustrated by outsiders traveling from other islands such as O‘ahu harvesting resources on which they depended on for food and sustenance. The community of Mo‘omomi fishers formed a *hui* or group (Hui Mālama o Mo‘omomi) and began lobbying state government for greater protection and management autonomy over the marine resources they depended on.

Interview data and policy analysis revealed that the efforts of local community members from the rural Mo‘omomi community on the island of Moloka‘i were key to the emergence of co-management in Hawai‘i. For several years, Moloka‘i community members raised public awareness about their dependence on fishing for subsistence and their successes employing traditional management methods (Friedlander et al 2002; Poepoe et al 2003). In 1993, as a result of these efforts, Governor John Waihe‘e commissioned a Task Force to examine the extent to which subsistence activities contribute to food security on Moloka‘i, the barriers making subsistence activities more difficult, and “to recommend policies or programs to improve the situation” (Matsuoka et al 1994; Matusoka et al 1998). With state data reporting an unemployment rate of 20% – nearly three times the unemployment rate reported on the other Hawaiian islands (Hawai‘i DBEDT, 1987) – the subsistence study confirmed that Moloka‘i households were indeed heavily dependent on land and ocean resources. Subsistence activities such as hunting, fishing and gathering accounted for 28% of food for the average Moloka‘i resident, with a quarter of all those sampled reporting that over 50% of their food was derived from subsistence (Matusoka et al 1998).

As a result of these findings, the Governor’s Subsistence Task Force recommended that community-based management be implemented in areas such as Mo‘omomi Bay along the island’s Northwest coast. Hui Mālama o Mo‘omomi advocated the importance of subsistence



and changing fishing regulations to protect marine resources. Over several years, the 43 members of Hui Mālama o Mo‘omomi lobbied the state for an increased community role in management, arguing that a community educational program, a fusion of customary practices and contemporary management would be efficient, cost-effective, and offer an improvement over current management (Hui Mālama o Mo‘omomi, 1995).

### ***3.3.6 Enabling legislation***

In response to the recommendation made by the Governor’s Subsistence Task Force and sustained lobbying efforts made by the Hui Mālama o Mo‘omomi community organization, the Office of Hawaiian Affairs, and The Department of Hawaiian Homelands, Act 271 was passed by the Hawai‘i Legislature late in the 1994 legislative session. The legislation gave the State of Hawai‘i’s Department of Land and Natural Resources (DLNR) the power to: (1) designate CBSFAs and carry out fishery management strategies for other areas across Hawai‘i via the Hawai‘i’s administrative rule-making process (see Kittinger et al. 2012 for a detailed legal analysis); and, (2) establish a two-year *pilot project* for Mo‘omomi and Kawa‘aloa Bays on the island of Moloka‘i. Passing the legislation enabled communities across Hawai‘i to apply to become community-based subsistence areas, paving the way for future co-management efforts. Act 271 required communities pursuing a CBSFA designation to: include the name of the organization or group applying, including their charter, a list of the group’s members, a description of the proposed location and boundaries, why the designation is needed and how it may impact current public uses, a management plan including rules for the area, monitoring and evaluation processes, and funding and enforcement mechanisms. Proposals submitted by communities “shall meet community based subsistence needs and judicious fishery conservation and management practices” (Session Laws of Hawai‘i Act 271, 1994).

### ***3.3.7 Pilot project***

In response to the legislation, Hui Mālama o Mo‘omomi worked with the Division of Aquatic Resources (DAR) to follow the newly developed guidelines for a two-year pilot project, drawing on traditional ecological knowledge and practices (Friedlander et al. 2002, Poepoe et al. 2003). Although the Hui Mālama o Mo‘omomi originally intended for the project to include a much larger swath of coast and extend 3704 m seaward from the coastline, the pilot project

encompassed just two neighboring bays, Kawa‘aloa and Mo‘omomi, totaling approximately 36.4 hectares of ocean area. Community-developed rules for the project utilized spatial measures which defined permitted and prohibited fishing activities in seaward and shoreward zones, gear restrictions, and a permitting system to govern fishing effort. Access was managed by the DAR, which issued free permits requiring monthly catch reports. In addition, the community sought to train community volunteers to monitor fishing and gathering activities and educate novice fishers.

As part of the pilot project, DAR biologists were tasked with assessing the impact of the community-devised rules and were required to submit a status report to the legislature 18 months into the project. During those 18 months, DAR biologists performed three surveys of fishery and benthic resources along Kawa‘aloa and Mo‘omomi Bays. In their status report to the legislature, the DAR determined that additional time and surveys were needed to assess the impacts of the Pilot Project but recommended that the project be continued due to community interest (Hawai‘i DLNR, 1996). Despite significant community interest, the project was allowed to sunset at the end of the two-year term without conveying a permanent co-management designation by the DLNR. The DLNR were uncomfortable with new, expanded boundaries proposed by the Mo‘omomi community, who were in turn were frustrated with the state’s lack of cooperation and inaction. At that time, both parties agreed to step away from the partnership for the time being. In 2016, Mo‘omomi revived its co-management proposal. Its draft rules and management plan are currently under review with the DLNR.

**Table 3.2.** Timeline of key events in the emergence of co-management for fisheries in the Hawaiian Islands.

Date	Event
Early 1990s	Resource depletion, increasing disputes and conflict over resources across the state, particularly (Moloka‘i, East Maui)
1994	Enabling legislation passed; Community efforts were instrumental
1995-1997	Co-management pilot project at Mo‘omomi & Kawa‘aloha Bays on Moloka‘i
	Lost Fish Coalition lobbies for stronger regulations on West Hawai‘i aquarium fishing industry
1997-	Pilot project not renewed; Mo‘omomi develops a <i>Traditional Resource Management Moon Calendar</i> based on customary practices
1998	Act 306 Establishing West Hawai‘i Regional Fishery Management Area
2001	Research paper authored on community-based management in Hawai‘i: <i>People and the Sea: A review of expert opinion of what it will take to enhance the conservation of marine resources in the main Hawaiian Islands.</i> The report was funded by the Hawai‘i Community Foundation and was influential in driving donor-based support for co-management planning in Hawai‘i.
2001	The Nature Conservancy (TNC) establishes a Hawai‘i Marine Program
2002-2003	Castle Foundation funds first community-based capacity-building efforts in Hawai‘i
2004	Community Conservation Network (CCN) begins its Hawai‘i program
	E Alu Pū (Managing Better Together) begins under TNC and is subsequently moved to CCN (and later to the Hawai‘i Community Stewardship Network, now Kua‘āina Ulu ‘Auamo [KUA])
2005	Miloli‘i CBSFA established by Hawai‘i Legislature
2006	Hā‘ena CBSFA established by Hawai‘i Legislature
2008	Bills advanced by Ho‘okena, Honaunau; Entire Island of Moloka‘i; Ni‘ihau; East Maui; None were passed into law
2009	Lāna‘i community-based management legislation proposed; does not pass
2010	Conservation International begins their Hawai‘i Fish Trust program
2012-2013	Castle Foundation Funds Co-Management (CBSFA) Planner Position, funds co-management workshop in Honolulu

### 3.4 SOCIAL RESPONSES FOR CO-MANAGEMENT PLANNING

In response to perceived resource decline and or conflict, communities across Hawai‘i began to self-organize, forming community organizations to educate their communities, monitor their resources, and organize to build consensus around potential solutions. For example, the Kaua‘i community of Hā‘ena formed the Hui Maka‘āinānā o Makana in 1998 in response to increased

tourism and recreational impacts at Hā‘ena State Park. Hui Maka‘āinānā o Makana worked with the State Park managers and other entities to increase local involvement in Hā‘ena coastal area management. Part of the Hui’s *ahupua‘a* (mountain-to-sea) focus included the management of nearshore fisheries and coral reefs. The results of the Hui’s mobilizing within their community ultimately resulted in one of only two permanently designated CBSFAs (co-management areas) in the state. The state-sanctioned CBSFA designation was a result of years of community-led beach surveys to estimate catch per unit effort and document existing social and ecological baselines (Vaughan 2012). In addition to documenting resource baselines, community members also submitted testimony and lobbied state lawmakers. Community-level lobbying efforts originating in Hā‘ena, Kaua‘i were instrumental in establishing the Hā‘ena co-management area.

Analysis of archival data sources and 19 semi-structured interviews uncovered three general social responses important for co-management planning that followed the emergence drivers. The social responses were identified using the same iterative, deductive coding process of qualitative interview data and archival sources used to pinpoint the emergence drivers (see Table 3.3). These social responses include self-organization, consensus-building and collective action, which are presented in Table 3.3, together with examples and additional coding data. Exemplar quotes for each of the social responses are presented in Table 3A1.

**Table 3.3.** Definitions of key terms in the co-management causal chain analysis. Definitions are derived from the academic literature (see supporting citations), with adaptation for the Hawai‘i case study.

		<b>Definition</b>	<b>Supporting Citations</b>
<b>Drivers</b>	<b>Resource Depletion</b>	Decreased ecosystem health and reduced catch, often from anthropogenic drivers such as increased fishing effort, pollution, introduction of invasive species, and other threats	Friedlander et al 2008; Kittinger et al 2012
	<b>Conflict</b>	Protracted disputes among fishers; sometimes between ethnic communities or recent immigrants; often resulted in vandalism or violence	Bennett et al 2001; Pomeroy et al 2007
<b>Social Responses</b>	<b>Enabling Conditions</b>	Conditions allowing communities and states to successfully implement and complete a planning process or plan	Fox et al 2013
	<b>Self-Organization</b>	Community members or user groups form a community organization and develop collective choice arrangements for decision making	Ostrom 2000; Schlager 2004
	<b>Consensus-building</b>	Activities undertaken by a self-organized community to build support and achieve some level of consensus toward actionable objectives	Innes & Booher 1999;
	<b>Collective Action</b>	Collectively agreed upon interventions and cooperative behavior undertaken by a self-organized community to address fisheries depletion and ecosystem degradation	Olson 1965, Ostrom 1990;

### ***3.4.1 Self-organization***

Community self-organization was listed by 11 of 18 interviewees as a key social response related to the emergence of co-management. Self-organization was divided into several sub-themes or underlying factors described by respondents as contributing to community-level self-organization. Specifically, respondents described the importance of leadership at the community level, a community’s dependence on resources, community members that possess a diverse

combination of skill sets, extraordinary community effort and commitment, and NGO involvement as critical factors relating to organizational development (See Table 3.3, Table 3A1).

### ***3.4.2 Consensus-building***

Consensus-building activities were identified by 8 of 18 respondents as a necessary condition for the emergence of co-management. Although less than half of the respondents explicitly mentioned consensus-building as necessary, other scholars in this system (e.g. Vaughan & Caldwell, unpublished data) described its critical importance in developing community-based institutions. Interview respondents often cited Miloli‘i as an example of a community that has yet to achieve consensus towards collective action. The Miloli‘i community had already self-organized by forming Pa‘a Pono Miloli‘i in 1980 to improve the quality of life of area residents. Many years later, several Miloli‘i residents and Pa‘a Pono Miloli‘i members responded to increased fishing pressure from outsiders by lobbying and testifying in support of a bill to permanently designate their adjacent marine areas as a CBSFA. In 2005, six years after the Mo‘omomi/Kawa‘aloa co-management area was allowed to sunset, Act 232 designated Miloli‘i as the first permanent CBSFA in Hawai‘i. However, during a public scoping meeting to discuss a draft rules package after designation it became apparent that consensus had not yet been reached over rules for the area. Community support was divided over a proposal that would ban commercial fishing in Miloli‘i’s adjacent marine waters. At the end of the meeting, the Miloli‘i community decided not to support the rules package. Since the contentious public meeting Miloli‘i retains its CBSFA designation but has yet to submit another rules package to the state.

Within the larger consensus-building category, respondents described the following aspects to be critical: building a strong community organization, overreliance on one person/leader can be detrimental to building consensus, and building consensus is easier in smaller, more homogenous communities (See Table 3.3, Table 3A1). In the case of Miloli‘i, respondents reported that overreliance on one community member was detrimental to community consensus-building.

### ***3.4.3 Collective action***

Collective action for co-management planning involves collectively agreed upon interventions and cooperative behavior undertaken by a self-organized community to address fisheries depletion and ecosystem degradation (Olson 1965; Ostrom 1990). In Hā'ena, self-organization and consensus-building activities such as community meetings resulted in fruitful collective action: Hā'ena submitted the first management plan by a Hawai'i community for a CBSFA (co-management area) in nearly fifteen years. The draft rules include gear restrictions that are grounded in traditional practices specific to Hā'ena while not excluding any outsiders from fishing the area. CBSFA rulemaking is particularly challenging since Hawai'i State law mandates that resource rules must apply equally to all users, limiting place-based rulemaking authority (Ostrom 1990). However, the Hā'ena community was able to work within this legal constraint and devise draft rules that intend to restore traditional and customary practices specific to that area.

In interviews, collective action was the most frequently cited social response (15/18) leading to the emergence of co-management in Hawai'i. Under the larger umbrella of collective action, respondents described communities seeking specific resource management solutions such as access controls, in addition to governance reform (See Table 3.3, Table 3A1). An example of successful collective action included lobbying activities undertaken by community organizations like Hā'ena's Hui Maka'āinana o Makana at the state legislature leading to the passage of a permanent co-management area, along with agreeing upon and submitting a rules package to the DLNR governing agency.

**Table 3.4.** Drivers affecting the emergence of co-management in Hawai‘i coral reefs, identified among key respondent interview (*N*=18).

Driver - subcategories	Total and percentage of respondents referencing theme
Resource Depletion	
- Overharvesting resources	
- Development/tourism impacts	10/18
- Current management ineffective	
Conflict	
- Communities using violence to prevent poaching	
- Increased competition for resources caused disputes or conflict	5/18
- Roving bandits	
Self-Organization	
- Leadership	
- Community dependence on resources	
- Diverse combination of skills in the community	11/18
- Extraordinary community effort and commitment	
- NGO involvement	
Consensus-building	
- Building a community organization is key	
- Leadership not a necessary condition; overreliance on one person can be detrimental	8/18
- Small, homogenous communities easier	
Collective Action	
- Communities seeking resource management solutions	15/18
- Access controls	
- For governance reform	

### 3.5 DISCUSSION

Co-management has increasingly become a focus in scholarship on natural resource management, with the first scholarship on fisheries dating back more than 25 years (McGoodwin 1980, Jentoft 1989, Pinkerton 1989). Its success and potential have been widely touted as a solution to fishery management problems across the world (Gutierrez et al 2011; Cinner et al. 2012). However, little is known about how co-management governance emerges and transitions in developed nations that have a long history of centralized, top-down management. Decades of centralized fisheries management and a recent revival of traditional practices make Hawai‘i an intriguing geography to examine the trajectory of co-management emergence in a developed



world context. Further, the intersection of customary practices and top-down conventional management make this case study an interesting proving ground for how co-management governance may arise and perform. Below, the findings are discussed in the context of theory on institutional emergence and collaborative planning. Then attention is turned towards how this theory can help inform the practice of co-management planning and management.

### ***3.5.1 Emergence theory and collaborative planning processes***

In this case study, results of interviews and analysis of archival data suggest that the drivers for the emergence of co-management may occur in a temporal sequence or causal chain of events that together influence collaborative planning processes. Figure 3.1 describes this process model, comprising a linked set of drivers and social responses, which together describe a theory of emergence in a collaborative planning framework. The planning process model (Figure 3.1) describes a simple relationship between drivers and the attendant social responses in this resource system. The model does not accommodate the full complexity of the emergence process, but is sufficient in describing the general planning process leading to the emergence of a new governance system (co-management in Hawai‘i). This model currently fits all three community-based co-management areas in Hawai‘i: Mo‘omomi, Miloli‘i, and Hā‘ena. However, as many as 50 distinct communities across Hawai‘i have worked to increase local involvement in marine resource management, and many of them have pursued legislation (Figure 3.3) to codify co-management areas with varying levels of completion and success. At this point it is unclear exactly why varying levels of success in establishing co-management areas have been observed across Hawai‘i. This is a subject of ongoing research by scholars in this system. A comprehensive examination of the drivers, social responses, and barriers communities faced along the way would strengthen confidence of the planning process model in this system and its potential application to other geographies.

#### ***A. Co-management and emergence***

Although the drivers may be somewhat specific to this resource system, the social responses have attributes that are consistent with existing literature on the social processes that mediate transition pathways and ‘emergent transformation’ (Berkhout, Smith, Stirling 2004; Geels and Schot 2007). In this system, co-management resulted from social responses that were initiated by

actors in the resource system and arose as new discourses largely external to the dominant, top-down governance system. Local actors created space for co-management as an innovative alternative to the existing governance discourse, but were met with several challenges. Identifying the specific challenges faced by communities in Hawai‘i can be found in Chapter 4. However, it is worth noting that co-management was emerging more broadly in the Pacific region in the early 1990s, and these geopolitical processes may have aided this solution in gaining traction in this case system (Baland & Platteau 1996; Johannes 2002). These results indicate that local actors played a key role in diffusing co-management as a viable alternative and innovative approach; however, it remains difficult to disentangle the extent to which this transformation pathway was mediated via local actors versus discourses and initiatives operating at the regional scale.

### *B. Drivers and enabling conditions*

The role of resource depletion and conflict in driving institutional change towards co-management and away from ineffective centralized management have been well-documented by scholars in many resource systems and geographies across the globe (Castro & Nielsen, 2001; Pomeroy et al 2007; Berkes 2009). These findings are consistent with these previous studies, where marine resource decline was a major driver, increasing the prevalence of disputes over resources and rights to fish certain areas. These disputes escalated into conflict, particularly in areas where residents were highly dependent on marine resources for subsistence. Conflict can also arise – as it did in this system – from increased fishery mobility, as fishers seeking marine resources outside their own areas or home islands may increase competition for resources (sometimes referred to as ‘roving bandits,’ *sensu* Berkes 2006). The linked processes of depletion and conflict were the primary drivers that helped create the enabling conditions and window of opportunity (e.g. Kingdon 1995; Olsson et al 2006) for a new co-management governance system.

Co-management was engaged as a viable, alternative pathway over increased state enforcement or other strategies because of a variety of reasons, including pervasive budget cuts due to stagnant Hawai‘i economy, a renewal of traditional and customary stewardship practices across Hawai‘i and the perception by some that these customary forms of government were more

effective than existing top-down management (Friedlander et al 2000; Poepoe et al 2003), resource dependence in many rural areas, and a government open to testing out a new management arrangement. These issues elevated the narrative about co-management to a higher political level, which in turn resulted in a specific fact-finding assessment (Governor-commissioned Task Force, Table 3.2). In response, communities affected by these drivers self-organized to build consensus and advocate for a change in management systems. In this case study, community members helped generate political will, which aided the enabling legislation to pass, thus creating a pathway to co-management. Legislation was passed based on recommendations from the fact-finding assessment and a pilot project was developed and implemented (Table 3.2). These enabling conditions set the stage for the emergence of the co-management governance system.

### *C. Self-organization*

Theory on institutions for common-pool resources (CPRs) often uses the term self-organization interchangeably with self-governance (McGinnis 2011). However, distinctions are often made between: 1) resource attributes conducive to cooperation and self-organization, e.g. feasible improvement, indicators, predictability and spatial extent (Ostrom 2000); 2) the characteristics of the resource appropriators associated with emergent cooperative behavior, e.g. salience, common understanding, low discount rate, trust and reciprocity, autonomy, and prior organizational experience and local leadership (Schlager 2004; Ostrom 2005; Basurto 2013) – which may or may not be community-based in a co-management governance arrangement (Yandle 2003; Imperial & Yandle 2005); and, 3) the presence and performance of key ‘design principles’ which are believed to influence whether a given common-pool resource institutional arrangement will endure over time (e.g. Ostrom 1990; Cox 2010). In analyzing the emergent planning process for co-management, this research was primarily concerned with the characteristics of the appropriators (see Table 3.3 for definitions and references). In this planning framework, community-level self-organization was considered to have occurred when community members or user groups form a community organization and developed collective choice arrangements affecting the governance of their adjacent marine areas through this organization (e.g., by meeting and developing strategies). These two actions set the stage for actors to engage in consensus-building and collective action (i.e., implement strategies in a target geography). This

proposed sequence of actions is consistent with human behavioral models described by other scholars (e.g. Ostrom 1990; North 1990; Table 3.3). It is important to note here that self-organization does not necessarily imply stability, in fact self-organization may be an iterative process and many factors can affect the durability of self-organized systems. For instance, internal or outside forces may break down a seemingly cohesive community, forcing them to reboot internal planning processes.

#### *D. Consensus building*

Consensus-building activities are undertaken by a self-organized community to build support and achieve some level of consensus toward actionable objectives (Table 3.3). Building consensus towards a collective course of action and co-management can be a challenge for community-based initiatives. In this system, the consensus-building process may take many years or even decades (Vaughan & Caldwell, unpublished data). For example, following the passage of the Hā‘ena CBSFA legislation (Session Laws of Hawai‘i: Act 241, 2006), the Hui Maka‘āinānā o Makana community organization spearheaded nearly a decade’s worth of public meetings in their area to develop and revise palatable rules to govern five miles of coastline fronting Kaua‘i’s North Shore. Yet years of community meetings to collectively develop a rules package were necessary to ensure that alternatives were considered and different perspectives were integrated (Vaughan 2012). Without sufficient consensus-building, community support for collective solutions may be fractious, and may jeopardize the future planning stages if all stakeholders are not engaged early in the process.

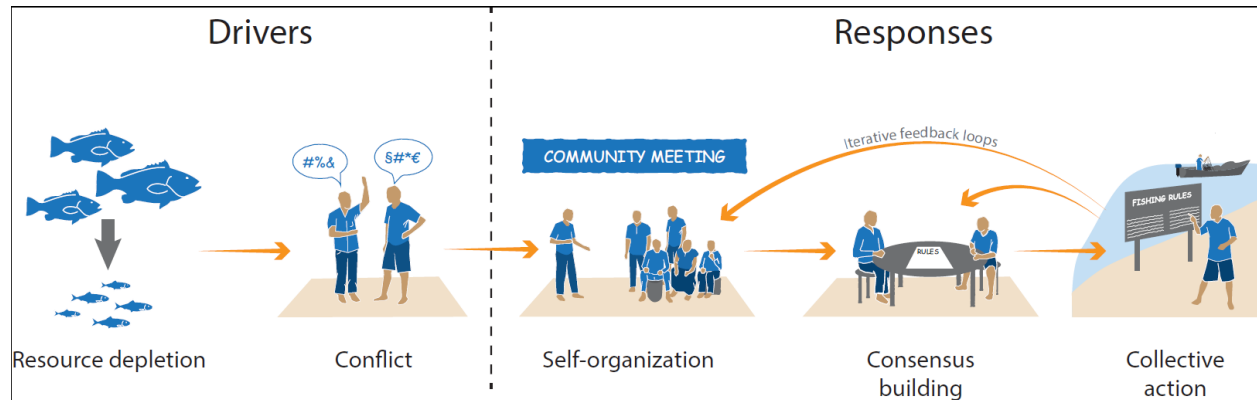
A lack of widespread success in consensus-building may in part be explained by the ethnic and cultural diversity in this system and the multitude of stakeholder and interest groups present with conflicting value systems. Interview respondents described how public meetings discussing marine resource rules are often dominated by interest groups because of awareness that government support for community initiatives “wilts” under the smallest of opposition. Engaging multicultural stakeholders and building consensus can be particularly challenging, perhaps necessitating creative engagement and guided, deliberative strategies to ensure meaningful participation and input (Lowry et al 1997). In addition, western planning processes are not often designed to integrate indigenous and multicultural input and may privilege certain worldviews

and ways of knowing over others (Sandercock 2004; Porter 2006). Without careful attention to participatory, epistemological, and power issues, western-based planning processes in postcolonial, multicultural geographies such as Hawai‘i may reinforce existing power relations and stifle consensus-building initiatives (Umemoto 2001).

#### *E. Collective action*

Collective action towards any objective is challenging, since it involves cooperative behavior and agreeing on a common goal, and because free-riding behavior often occurs (Olsen 1965). Community-level collective action in co-management planning can be stymied by a variety of factors. Since co-management implies sharing some level of management authority between resource users and the state, collective action at the community level without full governmental recognition and cooperation may not result in institutional change (Cudney-Bueno and Basurto 2009). In Hawai‘i, there are two instances – Mo‘omomi and Hā‘ena – where communities self-organized, built consensus around a management plan and collectively acted to achieve a modicum of decision-making over resource rules in their area. Despite the presence of enabling legislation and in some cases extraordinary community effort and collective action, co-management in Hawai‘i has been hindered by a lack of capacity in communities and at the state management agency, institutional culture and rigidity at the partner resource management agency, and an ambiguous, complicated administrative rulemaking process (Ayers in prep; Vaughan 2012; Kittinger et al 2012; Finkbeiner et al in prep). Another issue that may affect collective action is dependency on marine resources. Although fishing and gathering remains a central aspect of Native Hawaiian culture, most livelihoods in Hawai‘i are not dependent on marine resources for survival, since multiple substitutes exist for food and employment. Substitutability and the lack of direct dependency for livelihood support may dilute the incentives for collective action at the community level in some areas, presenting challenges for co-management.

**Figure 3.1.** A planning process model of the drivers and responses associated with emergence of co-management governance. Drivers include resource depletion, which causes increased conflict among resource user communities. Responses comprise a set of social actions undertaken in planning processes at the community level, to engage in co-management, including initial self-organization, consensus building and finally implementation of collective action. These steps can also include iterative feedback loops to cope with socioeconomic and environmental change.

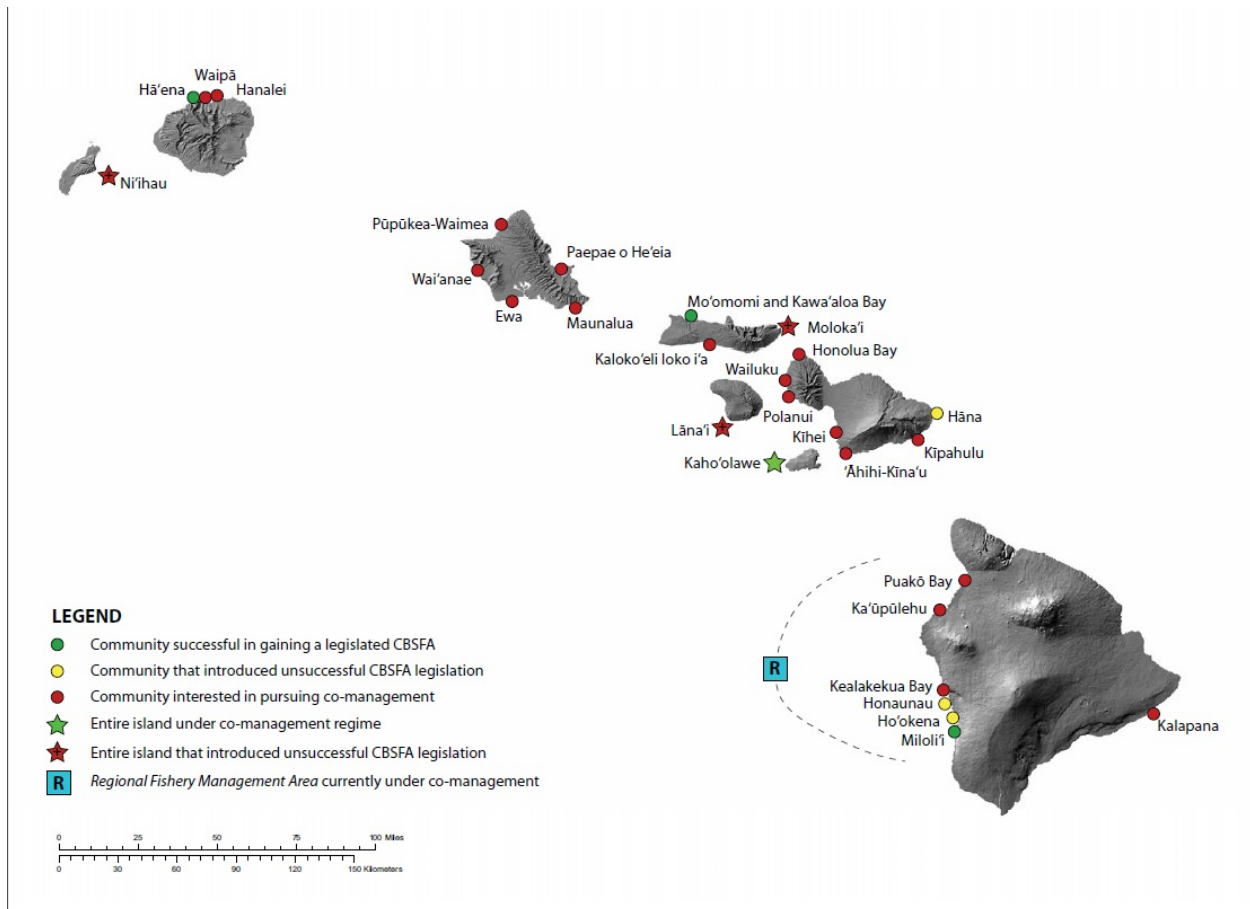


### ***3.5.2 From theory to action: what matters for co-management emergence and implementation?***

Understanding the causal linkages between driving factors, attendant social responses, and planning processes can help inform future co-management planning efforts. Although the enabling legislation was passed nearly two decades ago, Hawai‘i is still early in its transition to co-management. Documenting the sequence of events in co-management emergence can enable learning across case studies and the development of a coherent theory of governance transformations, emergence processes, and collaborative planning. The sequence of these drivers and how they affect collaborative planning can determine the level of success in collaborative management, as communities and states consider governance transitions towards co-management. Understanding these processes is important because collaborative planning is often a conflict-filled endeavor and particularly so for co-management planning which usually involves competing values, discourses, and perceptions of legitimacy for rights to common-pool resources. Building conflict management and dispute resolution strategies into complex co-management planning processes, e.g. establishing trust across organizations, developing a shared definition of the problem, defining mutual interests, establishing a balance of power, and increasing policy instrument diversity (e.g. Kauneckis & Imperial 2007) could help ensure that state-community cooperation is fruitful and increase the potential for successful co-management

emergence. Documenting the initial drivers of co-management in other geographies and testing the effectiveness of good planning practices in ongoing governance transitions could help resolve how emergence theory applies more broadly to the evolution of governance in social-ecological systems. The discussion concludes by highlighting some key findings from co-management emergence in Hawai‘i that should have bearing on implementation and planning apply in other geographies.

**Figure 3.2.** Overview of the policy processes and steps for establishing community-based subsistence fisheries areas in Hawai‘i. The process is governed by several existing rules and regulations, including the State of Hawai‘i’s Chapter 91 administrative rulemaking process (HRS 091), including the Small Business Regulatory Flexibility Act (HRS 201M) and Administrative Directive 09-01. DLNR=State of Hawaii Department of Land and Natural Resources. Modified from Kittinger et al. (2012).



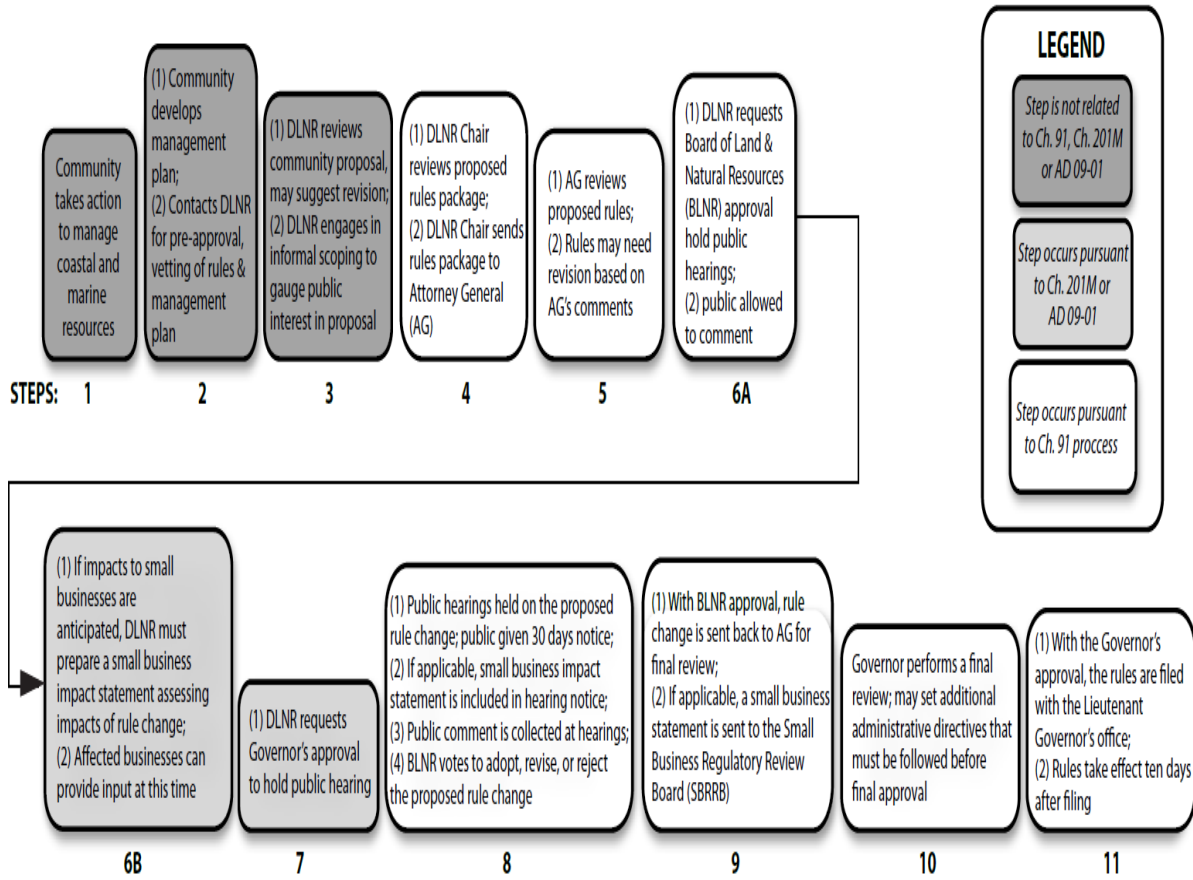
*A. Ensure enabling conditions are present*

Since this legislation passed, interest in co-management governance among communities throughout the state of Hawai‘i has increased (Figure 3.3). Even with the enabling legislation, however, there is not an actively co-managed CBSFA in Hawai‘i, suggesting there are still significant barriers to successful implementation (Kittinger et al. 2012). While this area is the focus of current research (Ayers, in prep), several factors may serve to explain this implementation gap, including the absence of additional enabling conditions identified as important in the collaborative planning process for the California Marine Life Protection Act



(Fox et al 2013). These include: 1) lack of consistent political support and leadership, 2) adequate funding for administrative support, and 3) a vague and difficult co-management process. Efforts are currently underway in Hawai‘i to increase funding for administrative support and to streamline the planning and administrative rulemaking process.

**Figure 3.3.** The co-management seascape in the Hawaiian Islands, showing diversity in existing mechanisms for collaborative management, as well as interest among communities in co-management.



### *B. The complexity of 'community'*

It is also important to note that a 'community' can be defined in many ways. Communities can be spatial, occupational, interest-based, cultural, or ethnic, comprising a small spatial unit, a social structure, or shared norms (Agrawal & Gibson 1999; Pollnac et al. 2006). In this case system, self-organized 'communities' generally include groups of fishers, community leaders, and aspirant resource appropriators which access and harvest in a common geographic area. However, the definition of community can be a difficult issue in co-management both from the perspective of local resource users (who to involve/include) and the state (who to recognize and collaborate with at the local level). In this case study system, intergenerational families may have moved out of the immediate vicinity of the resource system, but may still access marine and other resources as part of their customary and familial practice. Additionally, community is included in the enabling legislation but is not defined, which can lead to divergent views on how this critical issue is viewed among stakeholders. Not incorporating all interests in the planning process resulted in failure of a burgeoning co-management planning process in Miloli'i, and as a result the state suspended efforts to implement a CBSFA plan in that area.

### *C. Adopting realistic timelines for co-management transitions*

Planning processes that yield high quality agreements can increase the likelihood of rule compliance and successful co-management governance, but there is little scholarship in the academic literature on how practitioners can develop and implement these processes for marine resources. However, creating high quality agreements may initially entail higher transaction and transformation costs (Ostrom et al 1993), which can cause undue strain on community users and leaders. Transaction and transformation costs associated with governance transitions to co-management are additional formative criteria not often employed that could be examined by future research. It is these costs and the long timelines for building critical capacity in both state and community-level institutions that are the focus for much attention among practitioner communities, and often go underappreciated by scholars working on co-management systems. Further, it illustrates the importance of long-term commitments, both for grantmaking organizations and practitioner communities seeking to create lasting change. One illustrative example of this is Chile, whose transition to co-management took a decade or longer, while

exhibiting periods of instability, even weakening traditional institutions at the community level and reducing adaptive capacity before eventually building resilience (Gelcich et al 2006; Gelcich et al 2010). Extending realistic timeframes to account for co-management transition and maturation is critical considering that many large grantmaking foundations are increasingly focusing on small-scale fisheries.

#### *D. Process legitimacy and outcomes*

Further, the focus of most co-management research is summative (outcome-based), examining the impacts of institutional change on social and environmental indicators. While this is important, there is much to be learned from formative analysis and evaluation of co-management planning processes, including intangible but critical factors that affect process, the stages of planning processes, stakeholder engagement mechanisms (i.e., when to engage, whom, and how), and more (Gruber 1994; Innes & Booher 1999). In other words, although the outcomes of co-management may be contingent on a combination of factors, the quality of the underlying planning process is a critical determinant for whether a governance shift emerges and is sustained over time. Understanding critical elements in the early phases of co-management development, such as defining the community, implementing an effective stakeholder engagement strategy, compiling stakeholder views, values, and ideas into a cohesive strategy, and more all affect social and environmental outcomes. For instance, if one set of users reaches agreement on a specific co-management rule governing the take of marine species, but they do not gather input from other user groups or work to generate sufficient support for it (e.g. Miloli'i), stakeholders may become disenfranchised and choose not to engage further with the planning process, or to break the rules once they are implemented. Consequently, processes affect outcomes.

In conclusion, these findings reveal the importance co-management planning processes and understanding the 'creation story' of governance arrangements, which influence their application in specific policy contexts, and by extension, the outcomes of such arrangements. Taking the long view of how these governance arrangements are initially conceptualized and then developed and implemented can help scholars evaluate the important planning processes that affect success.

More importantly, such information can aid practitioners seeking to optimize planning processes and affect positive social and environmental outcomes.

## APPENDIX 3A

**Table 3A1.** Factors associated with emergence of co-management in Hawai‘i coral reefs (*N*=18)

Factor	Exemplar quotes
Collective Action (15)	<p>“As with many of the community-based initiatives, the community developed their own set of proposals and then brought them to the division of Aquatic Resources and if I understand it correctly, initially the Division of Aquatic Resources wasn’t even interested, didn’t know how to deal with it, didn’t know to touch it, had never really been engaged in a community-based management effort, so it really took a concerted effort by the community and a number of other stakeholders to get the legislation introduced for the division to try to start to pay attention to the whole process.”</p>
	<p>“...but I really think in Mo‘omomi it was more about let us do what we know is best to do in our place. And trying to find a way to do it legally instead of just doing it, you know, their way.”</p>
	<p>“Really it was the NGOs, The Lost Fish Coalition; it was you know, these community groups who were... Tina Owens that were throwing their arms up and grabbing at press, making the press come down and look at...and it’s still happening. Maui is now a battleground. It was partly the mortality but really it was these community groups stepping forward and actively pursuing exposure of the unsustainability of the (aquarium fishing) trade and bringing the media. And the media kind of forced the issue. That’s when the legislators got on board. Once the media was there and they saw the newspaper articles and the TV ads, the television programs, the legislature said hey, you know, this’ll get me votes, let’s get in on this. So the Lost Fish Coalition was a really important role in pushing the whole thing forward. And I think that speaks to the power of collaborative management in the sense that it’s not just about government.”</p>
	<p>“They police themselves and outsiders. If somebody comes in...I mean you know, it’s one thing for Makai Watch, which in a lot of communities is a bunch of, you know, umm, you know, I don’t know, people that may not even been born or grown up here; a lot of people not from Hawai‘i yelling at the local fishermen. That’s a lot different than a local fisherman from this place telling you: hey brah, cannot do that here. Maybe they’ll have words but guarantee that that guy is going to pay attention.”</p>
	<p>“Well a lot of them are motivated by maybe trying to go back to more of a traditional ahupua‘a type of approach where the resources are for them and not for outsiders. And what really bugs them is when people from outside their area come to their area to fish. And a lot of them at least initially want is exclusive use.”</p>

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<p>Self-organization (11)</p>	<p>“But you need leaders and even though they’re not elected officials really, even though they don’t have any official title, they are still, at some level in that community, recognized leaders. They need to exist and to make this work as the resource agency, you need to figure out who they are, go talk to them, and come to some sort of working relationship with them.”</p>
	<p>“They’ve realized that they want to take responsibility for their area. And it doesn’t have to be specific to marine resource management, we want to take care of our area. Could be mauka, could be makai, could be any of that, but they’ve formed a community group that then becomes the entity with which we work.”</p>
	<p>“Because all those things require effort. People can get all up in arms, yeah, yeah, let’s do this, let’s do this. But month after month after month after year, it takes extraordinary commitment and you need to have something that keeps it all together and keeps it working.”</p>
	<p>“Well it takes a combination of skills. You have to have the people who are the traditional fishermen that have the traditional, indigenous knowledge but they’re not always the persons who then can then put together the grants to have the support to sustain a process like this, or to get the proposals written. That’s another skill set that you need to have. People who are willing to be involved at that level to contribute. So it just takes a combination of skillsets, you know, kind of a partnership to develop it and then it’s always good to have the support of the landowners so you can have managed access at least for the land side of it.”</p>
<p>Resource depletion (10)</p>	<hr/> <p>“The Nā Pali it just overwhelmed resources at the end of the road at Hā‘ena State Park and the impacts on the offshore resources, etc, etc. In Hāna – which was a newer community in the larger scheme of things – it was opihi.”</p>
	<p>“I think it’s definitely a recognition, an awareness, or a fear that resources are declining. I mean, in Hā‘ena specifically, they were looking at, you know, comparing today to the 1960s and seeing what they considered a drastic decline in some species. Not necessarily across the board but some key species for them as community food fishes. That’s true in Ho‘okena as well.”</p>
	<p>“The basic premise that the residents felt concerned you know, over there fishing areas, their fishing grounds, they didn’t like outsiders coming in, fishing, maybe overfishing, to the point where the resource gets depleted and they don’t have anything for themselves.”</p> <hr/>

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“I think the last thing is you can’t rely on just one or two individuals. You absolutely have to make sure that whatever you’re devising as your set of management strategies and regulations – if you really want to go all the way to regulations – are well-vetted within the community. That’s what happened in Miloli‘i. They relied too much on one or two individuals. They hadn’t vetted it in the community.”

Building  
community  
consensus (8)

“When the folks who would otherwise be ignored are able to raise an idea or are heard – I mean not listened to, but heard –those smallest voices resonate in a management decision making framework. Any voice. Whether it be a youth, a young fisherman, a woman, where those voices are often marginalized and disenfranchised from decision making, even traditionally are heard...by relying too much on our kupuna or our community leaders we actually hold back what I believe – in my limited life experience – is one of the most potent aspects of co-management.”

“It’s one leader? That won’t work here. That’s a big problem here in fact. And that’s a big...it’s been a big limiting factor, a big cause of a lot of problems. Like for example, you have [names local fisher] He’s a great leader and a great practitioner. But he doesn’t try to be the end-all, be-all in that community. He doesn’t try. Maybe in the beginning when he was getting everybody going, but he’s got a lot of people that have come on board with him. Maybe people won’t enjoy the same status as he does, maybe they won’t go around the state talking to communities like he does, but there’s a co-management among community members. A co-leadership among community members.”

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“..it was definitely things were almost getting dangerous in some of the communities where there were reports of people pulling guns on aquarium fishing boats. It’s hard to tell whether those were blown out of proportion stories or were accurate.”

Conflict (5)

“I never got in this business to be focusing on conflict but I’m telling you, that’s going to drive everything.”

“Nobody can do it all. Community can’t...literally as clichéd as it sounds, it takes a village right? It’s a rare thing that the community can do it all by themselves. And even then they’ll be constrained by the legal issues you know? Theoretically they could just shut everybody out. Miloli‘i did that for a little while you know. If somebody tried to fish there, they’d lock the gate at the top of the hill and you could not get out basically. That was their form of regulating. Same thing in East Maui. There was a time when they took matters into their own hands and they were smashing windows, slashing tires or fishermen that weren’t from there, or even tourists.”

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**Table 3A2.** Categories and results from deductive, iterative coding facilitated by NVIVO 9 Qualitative Data Analysis Software. For each code, numbers represent the number of individuals that referenced this specific coding category; numbers in parentheses represent the total number of references for this coding category.

Emergence factors identified by respondents ( $N=18$ )

- Collective Action 15(37)
  - Increased community interest in resource management 13(25)
    - Finding legislative solutions 5(6)
    - Preserving traditional and cultural practices 4(6)
    - Community wants to take responsibility for their area 4(4)
    - Advocacy by community groups 2(2)
    - Strong sense of place 1(2)
    - Pilot project 1(1)
    - Retiring legislators 1(1)
  - Access Controls 4(5)
  - Governance reform 2(3)
  - Primarily Native Hawaiian communities 2(2)
  - Simple narrow goals and early successes 2(2)
- Self-organization 11(35)
  - Leadership 9(16)
    - Leaders that build coalitions of support
  - Community dependence on resources 4(6)
  - Diverse combination of skills within community 4(5)
    - Intergenerational learning 1(1)
  - Extraordinary community effort and commitment 4(5)
    - Assurance that effort will lead to positive outcomes 1(1)
  - Federal support 1(1)
    - Federally initiated then community-driven 1(1)
  - Must be community-driven 1(1)
  - NGO involvement 4(5)
    - Growth of marine conservation industry in the NGO sector 2(4)
    - Investment by the donor community 2(2)
- Building community consensus 8(10)
  - Community organization more important than a strong leader 2(3)
  - Leadership not a necessary condition for co-management; overreliance on once person can be detrimental to the effort 1(2)
  - Small homogenous communities easier 1(1)
- Conflict 5(9)
  - Communities using violence to prevent poaching 3(4)
  - Increased competition caused conflict 1(1)
  - Roving bandits 1(1)
- Resource depletion 10(19)
  - Current Management ineffective 3(4)
  - Development, tourism impacts 3(4)
    - Tourism impacts 1(2)

- Excess commercial development around Kailua-Kona 1(1)
  - Many believed land-based pollution was the culprit, not fishing effort 1(1)
- Overharvesting resources 3(5)
  - Aquarium reef fish collection 2(2)
  - Depletion or overharvesting of Opihi 1(2)
  - Overfishing 1(1)
- Science and education 2(2)
  - Protect resources, educate the next generation 1(1)
  - Science demonstrating depleted fisheries 1(1)

**Table 3A3.** Legislative testimony submitted for Hawai‘i’s three co-management areas (N=44)

<b>CBSFA</b>	<b>Name</b>	<b>Stakeholder Group</b>	<b>Justification</b>	<b>Mentioned Resource depletion?</b>	<b>Mentioned conflict?</b>
Mo‘omomi	Citizen 1	Citizen	Would lose freedom to dive, fish, surf, snorkel; called it race-based management.	N	N
Mo‘omomi	Citizen 2	Citizen	Thought that the proposal should not extend out two miles; should include baseline and ongoing scientific monitoring; the proposed subsistence area should include all people & not just Native Hawaiians; Enforcement should be carried out by DLNR and not a private organization.	N	N
Mo‘omomi	DLNR Chair	Politically Appointed Administrator	Supported with a few changes: namely to allow DLNR to enforce rules; acknowledged the importance of protecting subsistence fishing areas for rural, Native Hawaiian communities; suggested inclusion of existing uses and fishing into the bill.	N	N
Mo‘omomi	Ka Lāhui Hawai‘i Political Action Committee	PAC	Subsistence fishing is important for cultural purposes and also for food.	Y	N
Mo‘omomi	Citizen 3	Citizen	Resource depletion; conflict; emphasized the need for peer enforcement and education.	Y	Y
Mo‘omomi	Citizen 4	Citizen	Resource depletion; poor management; keep food on table; increase understanding of Native	Y	N

			Hawaiian practices through communication and education.		
Mo‘omomi	OHA (twice)	Government	Drastic reduction or total depletion of marine resources; Will help locate fishery resources; identify competitive forces affecting those resources (read, conflict); mitigating competitive forces; assess management strategies, enforce rules & regulations, funding requirements; expand Hawaiian fishing rights; Resource depletion; deepwater fishing practices, environmental impacts and international fishing covenants have negatively impacted traditional fishing practices.	Y	Y
Mo‘omomi	Ali‘i Holo Kai	Stakeholder group	Questioned the need to extend the boundaries to two miles offshore;	N	N
Mo‘omomi	Citizen 5	Citizen	Questioned the need for the project; also questioned the availability of state funds to accomplish goals of the area, e.g. enforcement.	N	N
Mo‘omomi	Citizens 6-57	Citizens	No reasoning given	N	N
Mo‘omomi	Citizens 58-60	Citizens	Data from Subsistence Task Force Report, e.g. reliance on local resources for subsistence; resource depletion, conflict; mismanagement; pollution, poor land-use practices;	Y	Y
Mo‘omomi	Citizen 61	Citizen	Amendment to establish Hāna, Maui as a Subsistence Fishing area.	Y	Y
Mo‘omomi	Hui Mālama O Hāna	Community Group	Charter to establish Hui Mālama O Hāna as a Community Organization	Y	Y

Mo‘omomi	Hawai‘i Fisher men’s Founda tion	Stakeholder group	Purpose and scope of the bill are not clearly defined; would create special and restricted use; lack of scientific input; discrimination/violates civil rights; restricts interstate trade; irreparable damage to charter, commercial, recreation, scenic, educational and scientific uses; undefined goals and objectives; doesn’t meet criteria for federal funding;	N	N
Mo‘omomi	Hawaii an Homes Commi ssion (four times)	Government Agency	Resource depletion; homestead community members rely on these resources for subsistence; bill provide a mechanism for the designation and management of Native Hawaiian fishing areas and ensure subsistence fishing continues and areas are available for use by NHs.	Y	N
Mo‘omomi	Hui Mālam a O Mo‘om omi	Community Group	Resource Depletion; conflict	Y	Y
Mo‘omomi	Citizen 62	Citizen	Interstate commerce; privileging one group (NHs) over others; mainly legal and constitutional questions; violates civil rights; other factors can account for resource depletion; regulations will be impossible to enforce	N	N
Mo‘omomi	Citizen	Citizen	Livelihoods are dependent on fishing, this bill would jeopardize that; sets precedence for other free enterprise limitations; would grant one group (NHs) exclusive rights;	N	N

			should instead enforce existing laws; if enacted the bill should be amended to grandfather in existing fishers that have fished in that area and include compensation for lost income.		
Miloli‘i	Citizen 1	Citizen	Prevent further resource depletion & conflict; learning experience; fisher input into rulemaking process; no additional allocation of taxpayer \$\$\$	Y	Y
Miloli‘i	DLNR Chair (twice)	Government	Existing regulations are already supported by the community; No proof that, if enacted, this bill will meet subsistence needs	N	N
Miloli‘i	OHA	Government	Superior local knowledge, education, and enforcement can be integrated into regulations and management; community empowerment;	N	N
Miloli‘i	Pa‘a Pono Miloli‘i (twice)	Community group	To prevent resource depletion seen on other islands; Education – Miloli‘i can become a model for other areas in Hawai‘i	Y	N
Miloli‘i	TNC (twice)	NGO	Declining resources; Include local knowledge and monitoring, involve community in the management process; documenting and sharing kupuna knowledge and fishing traditions	Y	N
Hā‘ena	Aqua Lung	Business Owner	Prevents commercial vessels not engaged in fishing from entering state waters adjacent to the Hā‘ena ahupua‘a.	N	N
Hā‘ena	Charter Captain	Business Owner	Resource decline; but bill is ill-defined and privileges	Y	N

			one group (Native Hawaiians) over all others.		
Hā'ena	Community Conservation Network	NGO	Decline in resources; Important for subsistence purposes; eliminate bad fishing practices and resource decline from an influx of new visitors/inhabitants (conflict); Native Hawaiians possess an intimate knowledge of the sea; local community members devised the bill; will demonstrate the legislature's understanding of the critical role communities play in maintaining/restoring Hawai'i's nearshore resources.	Y	Y
Hā'ena	Citizen 1	Citizen	Consultation with culturally sensitive, Native Hawaiians that possess a deep knowledge of the area will improve outcomes and ensure community support.	N	N
Hā'ena	Citizen 2	Citizen	Needed to do resource decline; supported by the community, local fishers and honors their role in regulation/rulemaking, establishes a small test area to learn from; doesn't restrict all forms of fishing.	Y	N
Hā'ena	Citizen 3	Citizen	Resource decline from an influx of fishers from other areas & unsustainable fishing practices; Hā'ena waters are vital to people that live there; restores traditional management practices; tremendous education potential	Y	Y
Hā'ena	Citizen 4	Citizen	Senior fishers represent an unbroken chain of	N	N

			subsistence fishing knowledge and practice and should be involved in the development & enforcement of fishing regulations; legislation would create an inclusive rulemaking process		
Hā'ena	Citizen 5	Citizen	Provides the community a say in decision making processes, fishery regulations, and activities affecting the fishery.	N	N
Hā'ena	DLNR Chair (twice)	Government (politically-appointed)	Provide community input and protect resources of value.	N	N
Hā'ena	Hanalei Watershed Hui (twice)	Community group	Pressures and stresses on the resources and people of Hā'ena; the people and place are a correct place for a CBSFA model; boundaries are well-defined; creates an inclusive process; great opportunity to combine traditional and western-based science into management.	Y	Y
Hā'ena	Hawai'i Nearshore Fishermen	Stakeholder organization	Concerned with privileging one group, i.e. private rule over public access; worried about definition of resident/community;	N	N
Hā'ena	Holo Holo Charterers	Business owner	Privileges one group over the public (special interest group), unfairly allows residents to regulate non-fishing activities including access to Na Pali Coast	N	N
Hā'ena	Kaua'i Sea Tours General Manager	Business Owner	Threatens rights of other user groups; concerned about its precedence and impacts on other recreational and commercial users across the state.	N	N
Hā'ena	Lahaina Divers	Business Owner	The bill is problematic for recreational boaters not	N	N



			fishing.		
Hā'ena	Maui Dive Shop	Business Owner	The bill is problematic for recreational boaters not fishing.	N	N
Hā'ena	Maui Frogman	Business Owner	The bill is problematic for recreational boaters not fishing.	N	N
Hā'ena	Maui Moloka'i Sea Cruises	Business Owner	Would eliminate the handful of permitted vessels currently operating through Hā'ena unrelated to fish take.	N	N
Hā'ena	Ocean Tourism Coalition (twice)	Stakeholder Group	Would eliminate the handful of permitted vessels currently operating through Hā'ena unrelated to fish take; would support CBSFAs as long as they recognize existing DLNR permitted marine activities.	N	N
Hā'ena	OHA	Government Agency	Superior local knowledge, education, and enforcement can be integrated into regulations and management; community empowerment;	N	N
Hā'ena	TNC	NGO	Resource decline; action needs to be taken; Hā'ena can be a model for local subsistence fishing and management	Y	N
Hā'ena	Senator Hemmings	Elected Representative at Committee Hearing	Resolve spatial conflicts, include traditional knowledge into regulation.	Y	Y

## **Chapter 4.**

### **Making the Transition to Co-management Governance Arrangements in Hawai‘i: A Framework for Understanding Transaction and Transformation Costs**

Chapter 3 explored the creation story behind community-based subsistence fishing areas and co-management in Hawai‘i. The chapter concluded by considering some of the practical issues related to planning and implementation of co-management, including setting realistic timelines for co-management transitions. This chapter focuses primarily on the institutional aspects associated with governance transitions from centralized management to co-management. Multiple methods are used to investigate the governance transition, including semi-structured interviews, policy analysis, and institutional analysis to identify the barriers to co-management transitions in Hawai‘i. A transaction and transformation cost framework is also used to analyze the costs associated with governance transitions in Hawai‘i. The combination of these analyses yields some estimates of the tremendous costs being absorbed by communities and their NGO partners. The chapter concludes by offering some viable solutions that can balance the costs of co-management transitions, mobilize support for governance transitions, and manage conflict between parties involved in public processes.

#### **4.1 INTRODUCTION**

Globally, fisheries provide a significant supply of food to almost one-third of the world’s population and marine fisheries employ over 260 million people (Teh et al. 2014). Despite their importance, many fisheries are ineffectively managed. For example, the FAO estimated that in 2011, 61.3% of major marine fish stocks were fully fished and an estimated 28.8% were overfished at a biologically unsustainable level (FAO, 2015, p. 7). Other estimates found that 7-13% of all stocks are collapsed and 15% are overexploited (Branch et al. 2011), which leaves little room for increases in catch despite a growing world population.

A variety of management approaches govern these fisheries including centralized or bureaucracy-based management, privatization or devolution of property rights, market-based management, community-based management, co-management, and other hybrid approaches (Yandle & Dewees, 2008; Yandle & Imperial, 2009). Of particular interest in this study are the

collaborative governance strategies referred to as co-management (Armitage et al. 2009). Co-management involves sharing management authority between the government and communities or user groups (Berkes, 2010). It also involves an iterative learning process with shared costs and benefits within the governance system (Pomeroy & Rivera-Guieb, 2006). Co-management also offers the potential to tailor rules to local conditions, increase regulatory compliance, improve collaboration, and lead to greater stakeholder engagement and empowerment (Acheson 2003; Jentoft et al. 1998).

However, the design and implementation of effective co-management systems involves some significant institutional barriers, particularly when it involves making a transition from a system where regulatory control is centralized in a traditional bureaucracy. The literature identifies a range of barriers including: community-level resource overexploitation, agency capture by communities, or co-option of local autonomy (Singleton, 2000); community failure (McCay & Jentoft, 1998); community or user group size (Cinner et al., 2007); social conflict (Castro & Nielsen, 2001); the equity of collective choice processes (Yandle, 2003); unequal distribution of benefits (Cinner, McClanahan, et al., 2012a); government desire to control data, privatization policies or regulatory capture (Pinkerton 1999); uneven power relations (Nadasdy, 2003b; Taiepa et al., 1997); marginalization of different worldviews (Diver, 2012); cultural and ethnic diversity of stakeholders (Levine & Richmond, 2014); or when rights are not devolved to users (Wade, 1994). Building co-management regimes in the developed world can be particularly challenging, due to: conflicting legal mandates and overlapping regulatory structures (Crowder et al., 2006); legal systems that stymie devolution of rights or local autonomy (Finkbeiner et al., 2015); rent-seeking behavior (Imperial & Yandle, 2005); and lengthy public planning processes (Vaughan & Caldwell, 2015). Many of these barriers are further compounded when stakeholders have multiple opportunities to influence policymaking.

Institutional analysis is a useful tool to examine how institutions at multiple levels affect social-ecological interactions and program implementation. Institutions are defined as “humanly devised constraints that shape human interaction” (North, 1990, p. 1) and include both *dejure* rules (rules of law) and *defacto* rules (shared norms or rules in use). In institutional analysis, many implementation barriers are the product of the configuration of transaction and

transformation costs and how they are distributed within the governance system. Transaction costs include the expenses associated with gathering information, holding meetings, and processes related to negotiation, deliberation, and decision-making. Transaction costs are sometimes separated conceptually between planning (*ex ante* costs) and governance activities (*ex post* costs). *Ex ante* transaction costs associated with planning for natural resource co-management often include information gathering about key social-ecological, governance system, and stakeholder attributes (E. Ostrom, 2009). However, transaction costs may also include protecting, monitoring, and enforcing agreements (North, 1990). Redistributing property rights components, operationalizing negotiated agreements, and implementing new regimes are sometimes referred to as *ex post* transaction costs. These *ex post* transaction costs may also be thought of as transformation costs. Transformation costs are often synonymous with production costs (the costs of turning inputs into outputs) but also implementation costs associated with changing citizen preferences, developing new revenue streams, performance monitoring, regulating patterns of use, enforcing compliance with revenue streams, and procuring inputs (Ostrom et al. 1993).

Several scholars have used a case study approach to identify barriers to fisheries co-management (Levine & Richmond, 2014; Pinkerton, 1999; Pomeroy et al., 2001; Prystupa, 1998) and a transaction costs approach has been employed to empirically examine the frictions of participatory and collaborative governance arrangements in fisheries (Kuperan, Abdullah, Pomeroy, Genio, & Salamanca, 2008; Turner & Weninger, 2005). This research differs from other case studies in that it examines the key social and organizational barriers that occur during governance transformations. One objective of this study is to use a case study analysis to identify and categorize the institutional barriers encountered in making the transformation to co-management governance systems. Identifying these transaction and transformation costs will help community leaders, government officials, and resource managers to change the configuration of these costs and benefits to better facilitate the transition to co-management systems.

The study focuses on the attempt to transition to co-management governance systems in three fishing communities across the Hawaiian archipelago: Hā'ena on the island of Kaua'i,

Mo‘omomi on the island of Moloka‘i, and Miloli‘i on Hawai‘i Island. The case analysis was guided by three research questions: 1) What are the barriers to the transition to a co-management governance system in Hawai‘i? 2) What are the transaction and transformation costs associated with the transition to co-management systems; and how are these costs distributed within the system? 3) What are the implications for planning and management?

## 4.2 BACKGROUND

Hawai‘i, though part of the United States, maintains a unique legacy of customary management. Prior to western contact, resource management decisions were made at the local level by knowledgeable *konohiki* (land agents) of the local *ali‘i* (chief) in consultation with expert fishers and *maka‘ainana* (land tenants). Sophisticated tenure arrangements managed resources for a highly populated and politically complex society in pre-contact times (Kirch, 2010). Although marine resources are depleted well below historical levels (Kittinger et al., 2011), fishing and gathering remain socially and culturally significant, while providing an important component of food security for many Hawai‘i residents (Kittinger, Teneva, et al., 2015; Vaughan & Vitousek, 2013). Since centralized management approaches have proven ineffective at preventing resource depletion and decreasing conflict, there is increasing support in many communities to return to culturally based regulations and local-level management (Ayers & Kittinger, 2014). Community-based subsistence fishing areas (CBSFAs) are one state-level management designation that has gained traction within Native Hawaiian fishing communities. CBSFAs allow communities to partner with the Hawai‘i Division of Aquatic Resources (DAR), within the Department of Land and Natural Resources (DLNR), to devise rules based upon “the customary and traditional Native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing” (Higuchi, 2008, p. 218). The legal pathway to create CBSFAs was created in 1994. While two dozen Hawai‘i communities have expressed interest over the past 20 years in crafting CBSFAs, only a single two-year pilot project at Mo‘omomi in Moloka‘i was actively involved in co-management until August 2015, when rules took effect for a CBSFA in Hā‘ena, Kaua‘i.

### 4.3 METHODS

The institutional complexity, ethnic diversity, and legacy of customary management make Hawai‘i an ideal locale to examine barriers to co-management implementation. This study employed a mixed method research design (Tashakkori & Teddlie, 2003) that relies primarily on the qualitative analysis of data from key respondent interviews ( $N=19$  and archival data sources to identify institutional barriers associated with the transition to co-management systems. These qualitative data were then used to analyze the transaction and transformation costs associated with this transition. This approach to the analysis of transaction costs and transformation costs builds upon the IAD Framework developed by Elinor Ostrom (2005) and her colleagues (Ostrom et al. 1993; Imperial 1999; Imperial and Yandle 2005).

Nearly two years of informal meetings with participants involved in the planning and implementation of co-management between March 2010 and May 2012 informed the purposive sampling of initial interview respondents (Maxwell, 1998). After several interviews were completed, snowball or chain referral sampling (Noy, 2008) was then used to identify additional key respondents knowledgeable about efforts to develop and implement CBSFAs until data saturation was reached (Bernard, 2013). Interviews were semi-structured; respondents answered the same questions but the interviewer remained open to new conversation threads (Patton, 2002). Interview questions are provided in Appendix A. A breakdown of the interviewees and their sectors is provided in Table 4.1. Eighteen interviews were recorded, transcribed, and iteratively coded using NVivo 9 QDA software. One interview was not recorded due to a difficult research setting and was not analyzed. Coding followed a deductive, iterative process whereby interview transcriptions were analyzed and strings of text were selected and organized by themes when patterns emerged from the data (Bernard & Ryan, 2009; Miles & Huberman, 1994). This dissertation also draw upon years of ongoing ethnographic data collected during the planning for the only actively co-managed area in Hawai‘i (Vaughan & Caldwell, 2015). Archival data sources included management plans and meeting minutes for proposed co-management areas, community guidebooks, stock assessments, and legislative testimony. A policy analysis of the State of Hawai‘i administrative rulemaking process is also referenced (Kittinger et al., 2012).

**Table 4.1.** Total number of completed interviews by sector ( $N=19$ )

Interviewee sector	Total
State government	6
NGO/Foundation	5
Community	3
Federal Government	2
Academia	2
Consulting	1

**Table 4.2.** Definitions of key terms and supporting citations

Term	Definition	Supporting Citations
<b>Institution</b>	humanly devised constraints that shape human interaction	(North, 1990, p. 1)
<b>Institutional analysis</b>	a tool to examine how institutions at multiple levels affect social-ecological interactions and program implementation	Ostrom 2005
<b>Conservation or Policy stalemate</b>	when heightened public participation allows stakeholders multiple opportunities to influence and polarize environmental policymaking, rendering government decision makers unable to implement effective policy or programs that can satisfy competing interests	Amy 1983
<b>Transaction costs</b>	information gathering about key social-ecological, governance system, and stakeholder attributes	Ostrom 2009
<b>Coordination costs</b>	all costs associated with planning and implementing a co-management regime, including time, capital and personnel costs	
<b>Information costs</b>	the costs of gathering and organizing temporal and place-specific information and scientific data (social and biophysical)	Ostrom, Schroeder, and Wynne 1993
<b>Strategic costs</b>	increased implementation costs as a result of individuals or entities that exploit information asymmetries, power relations, political influence, or financial advantages in order to tip resource benefits in their favor	
<b>Free Riding</b>	when exclusion is difficult, individuals are incentivized to consume more than their share or their contribution can encompass a wide variety of behaviors, but generally occurs when individuals influence policies or programs that will disproportionately benefit them at the expense of others	(E. Ostrom, 1990)
<b>Rent seeking</b>	the use of government resources to benefit private entities, including nepotism, favors, extortion, or persuading public officials pass policies that subsidize	(E. Ostrom et al., 1993)
<b>Corruption</b>		

	public goods, particularly when demand is high	
<b>Consensus building</b>	Activities undertaken by a self-organized community to build support and achieve consensus toward actionable objectives	Innes and Booher 1999; Ayers and Kittinger 2014
<b>Transformation costs</b>	the costs of changing citizen preferences about co-management, which occurs at the planning stage (consensus building); arranging for funding during the policy design; and monitoring performance, regulating patterns of use, and enforcing regulations, all of which occur during policy implementation	Ostrom et al. 1993, 120

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## 4.4 RESULTS

### 4.4.1 *Barriers to co-management in Hawai'i*

The first stage of the qualitative analysis focused on identifying the barriers associated with making the transition from the current governance arrangement for state fisheries management to the formal adoption and implementation of CBSFAs. The analysis further grouped these into four general institutional barriers to co-management implementation in Hawai'i: governmental structure and operations; planning and decision making processes; organized opposition from special interest groups; and consensus building processes. The four primary barriers and sub-themes identified by key respondent interviews are presented in Table 4.3. Examples of quotes that provide additional support for the identification of these institutional barriers are provided in Table 4.



**Table 4.3.** Barriers to fisheries co-management implementation in Hawai‘i coral reef fisheries, identified through iterative coding using NVIVO qualitative data analysis software (N=18)

<b>Barrier</b>	<b>Total respondents mentioning theme</b>
<b>Governmental structure and operations</b>	17/18
<ul style="list-style-type: none"> <li>- Organizational culture resistant to change</li> <li>- Lack of enforcement and management capacity</li> <li>- Institutional design flaws</li> <li>- Lack of trust in government</li> </ul>	
<b>Planning and decision-making process</b>	13/18
<ul style="list-style-type: none"> <li>- Administrative rulemaking process too long and onerous</li> <li>- Requirements for site assessment, administrative process, plan development difficult to meet</li> <li>- Ambiguous enabling legislation</li> </ul>	
<b>Organized opposition from special interest groups</b>	10/18
<ul style="list-style-type: none"> <li>- Organized interests oppose any fisheries regulation</li> <li>- State government support dwindles under any opposition</li> <li>- Communities disenfranchised by organized lobbying efforts</li> </ul>	
<b>Consensus building</b>	10/18
<ul style="list-style-type: none"> <li>- Stakeholder factions and diversity complicate consensus-building</li> <li>- Insufficient outreach and resources to build consensus</li> <li>- Difficult to continually engage community members</li> </ul>	

*A. Governmental structure and operations*

Nearly every interview respondent (17/18, 94%) identified *governmental structure and operations* as a barrier to co-management implementation in Hawai‘i. Governmental structure and operations was divided into four subthemes: organizational culture; enforcement and management capacity; institutional design flaws; and lack of trust. Interviewees reported that the state resource management agency tasked with managing coral reef fisheries, DAR, possesses an organizational culture that promotes resource extraction despite observed fisheries declines and is resistant to change. DAR’s culture appears to be the product of its historical legacy from when it was originally founded as the Division of Fish and Game. Respondents also cited a lack of regulatory enforcement and management capacity leading to a *de facto* unregulated, open access property arrangement for most areas (see Table 4.3 and Table 4.4). Overall, management capacity at the DLNR is limited by low funding levels and a lack of expertise. Interview respondents explained that many DLNR positions go unfilled when employees retire and most DAR employees do not have the training or the skillset to work effectively with communities.

### *B. Planning and decision-making process*

A majority of interview respondents (13/18, 72%) also identified the *planning and decision making process* as an important barrier preventing co-management implementation. In particular, respondents referenced four sets of problems associated with planning and decision making: an administrative rulemaking process that is long and onerous; requirements for site assessment and administrative processes that are difficult to navigate, and requirements for plan development that are difficult to meet; and ambiguity in the enabling legislation (See Ayers & Kittinger (2014) for additional discussion of this process). One example of legislative ambiguity is that “community” is undefined in the enabling legislation. Leaving community undefined consistently opens processes to contestation. Communities must engage with a broader community when planning for co-management, but to what extent and what area is also unclear. In terms of outputs, the legislation authorizing the State of Hawai‘i’s co-management process requires community organizations to develop a comprehensive management plan. The management plan must provide an overview of funding and enforcement methods, evaluation and monitoring processes, and it must assess how rules for the area may interfere with boating, navigation, and public recreation (Hawai‘i State Legislature, 1994, sec. 1).

Accordingly, these plans have the potential to affect a wide range of economic interests. Respondents frequently cited the burden of these activities as a major barrier for communities. For example, communities do not often possess the expertise necessary to frame and conduct scientifically rigorous baseline data collection and monitoring activities. The state of Hawai‘i also privileges data gathered via western scientific methods over customary monitoring activities, which further challenges Hawai‘i communities. Respondents also described barriers associated with the co-management legislation, which is ambiguous in key areas relevant to the establishment of co-management. For example, the legislation does not define community, which places the burden on a community to define their claims to an area. This ambiguity also makes it difficult to know whether the stakeholders engaged in the planning process are sufficient. Much of this process-related ambiguity was resolved in late 2014 when the DLNR approved a clear, step-by-step procedural guide for CBSFAs (Zanre, 2014). This CBSFA process manual reduced legislative ambiguity by clearly delegating state and community responsibilities for data collection from pre-proposal through rulemaking.

### *C. Organized opposition from special interest groups*

Organized opposition from special interest groups was listed by 10 of 18 interviewees (56%) as a major barrier to co-management in Hawai‘i. My analysis identified several subthemes, including: organized interests that oppose any fisheries regulation; state government support dwindles under any opposition; and community disenfranchisement from organized lobbying efforts (see Table 4.4). These interview data are further supported by legislative testimony submitted in opposition to proposed co-management areas in Hā‘ena, Kaua‘i and Miloli‘i on Hawai‘i Island. In the case of Hā‘ena, several commercial tour operators from the island of Maui submitted testimony against the proposed co-management area due to the precedence it may set later on for their respective island businesses. Representatives from a well-organized commercial fishing lobby also testified against Hā‘ena at public hearings. Respondents also explained how state government support for co-management dwindles under any opposition, particularly if the opposition is vocal and consistent. Still, the Hā‘ena co-management area passed because public support was overwhelmingly positive – over 99% of written and oral testimony collected during public meetings and hearings supported the area (Vaughan & Caldwell, 2015).

### *D. Consensus building*

Consensus building was identified by 10 of 18 respondents (56%) as a key challenge to co-management in Hawai‘i. Under the broader category of consensus building, respondents cited: stakeholder factions and diversity within communities complicate consensus building; a lack of community outreach about rules proposals; and, difficulties encountered when continually engaging community members. Several interview respondents referenced Miloli‘i as an example of incomplete consensus around a rules package. In the case of Miloli‘i, one segment of the Miloli‘i community worked closely with a local legislator to establish a permanent CBSFA designation for their area. However, once their proposed rules were available for public comment it became evident that there was not adequate consensus within the community around several of the rules (see Table 4.4).

**Table 4.4.** Selected quotes from interview respondents separated by barriers to co-management of coral reef fisheries in Hawai‘i and coded by subthemes (N=18)

Barrier	Exemplar quotes
Governmental structure and operations (17)	<p>“We’ve done too many unfunded mandates. The Legislature has not come to the table... Where is the will? There’s a lot of lip service... Look at our budget – one-half of one percent of the state’s budget.” (<i>Lack of enforcement and management capacity</i>)</p>
	<p>“Yes it is. Just an aside on this, in some respects Hawai‘i is very much behind a lot of areas in the Pacific just in terms of having really effective nearshore fisheries management. We’re almost like the fourth world here, not even the third world. If you look at what we consider third world countries and you look at their marine resource stuff, and you’re like whoa, they’re doing that? And they don’t allow that?” (<i>Institutional design flaws</i>)</p>
	<p>“I think we could do more with what we have, but it takes leadership [within the agency]. And that’s the key. Right now there’s none so people are off doing their own little thing. There’s no concerted effort to focus on various things. If we had an administrator that said ‘Hey, Hā‘ena is moving a long ways, they’ve got to get this going, you and you and you need to go over there and work with the community, and help come up with some drafts and let’s move forward with creating those rules, then it would get done right?’ But nobody is doing that right now and as far as I can tell, there’s no light at the end of tunnel, not in the near term anyway.” (<i>Organizational culture resistant to change</i>)</p>
	<p>“Unfortunately right now it’s a lack of institutionalized enforcement, it’s just a free for all.” <i>Lack of enforcement and management capacity</i>)</p>
	<p>“And in the other side, there hasn’t been a willingness for anyone in DAR to participate – no one in DAR wants to participate. There’s that whole dynamic. I don’t know how you crack that nut.” (<i>Lack of trust in government</i>)</p> <p>“It’s a long process. It’s two or three years just to go through the process. I’ve been explained the process. I’d like to have it figured out...At some point I’ll figure out institutionally, you know, it has to go the attorney general, then it waits six months...” (<i>Administrative rulemaking process too long and onerous</i>)</p>
Planning and decision-making process (13)	<p>“I think the original legislation I take issue with because I think there’s lack of clarity, a lack of definitions in what they’re requiring, what they’re asking. It just says to work with the department... There’s such a range, well I’m working with you by providing you with this management plan or am I working with you by inviting you to every single community meeting? There’s no layout...” (<i>Ambiguous enabling legislation</i>)</p>

“As far the other communities that could go through the Land Board and not actually have to have their own statute, because that is an option, I think that goes back to a lack of a clear process. There might be communities that are interested but it’s a difficult process to navigate because it hasn’t even been set officially by DLNR, and also it says you have to have a management plan. They are probably going to need support to do these things. And so on that end, there needs capacity and on the state end it’s been five years budget cuts and staffing cuts, so it’s very difficult...” (*Administrative rulemaking process too long and onerous*)

“And one of the things unfortunately about government at least on the state level is it’s almost axiomatic if somebody almost in the singular is strongly enough opposed to something, government wilts. And certainly if you get an organized group of people, even though you maybe have lots of people in favor of it that are not in somebody’s face and maybe it’s obvious that it’s the right thing to do, it doesn’t take much to make government back off.” (*State government support dwindles under any opposition*)

Organized  
opposition  
from special  
interest groups  
(10)

“Well, I mean, just the Hā‘ena rules in particular, when they were going through the legislature, we had a bunch of commercial/recreational operators, boating recreational operators from Maui show up and testify against the Hā‘ena bill you know, because they were afraid of the precedent it was setting to give community members a say in regulating commercial activities.” (*Organized interests oppose any fisheries regulation*)

“I think some of these rights to fish groups are very... against community-based fisheries.” (*Organized interests oppose any fisheries regulation*)

“You’ve got a real strong advantage in that most fishermen in Hawai‘i, most people that have any traditional roots will not try to tell another community what to do, what not to do. That’s your place, you do what you want to do. But there is a commercial fishing lobby in Honolulu that will show up to any hearing at any site and argue against it just on the basis of the constitutional right to fish and that is usually a problem although I think that can be overcome.” (*Organized interests oppose any fisheries regulation*)

Consensus-  
building (10)

“I think you know, Miloli‘i is a good example of where there was not a community that was on the same page, even though they had the legislation... I think to think that you’ll have a community that is 100% on the same page is foolish, it will not happen. But I think you can hope for a large percentage of buy-in and a good process and you’ve vetted it.” (*Stakeholder factions and diversity complicate consensus building*)

“The community members often don’t get consensus.” (*Insufficient outreach and resources to build consensus*)

#### ***4.4.2 Transaction costs***

Next the analysis focuses on the transaction costs associated with co-management arrangements in Hawai‘i by drawing upon data from key respondent interviews, previous research in Hā‘ena, Kaua‘i (the only active co-management area in Hawai‘i), and public testimony. The institutional analysis and design (IAD) framework identifies three primary categories of transaction costs: information costs; coordination costs; and strategic costs (Ostrom et al. 1993; Imperial 1999). The results of my analysis of the transaction and transformation costs of co-management and centralized management are summarized in Table 4.5.

##### *A. Information costs*

Information costs include the costs of gathering and organizing place-based information and social and biophysical scientific data. In Hā‘ena, information costs included developing baseline data through resource monitoring activities and community interviews, including a catch per unit effort (CPEU) survey, and an analysis of human uses and spatial conflicts. The Hā‘ena community also engaged stakeholders in informal meetings and performed public education and outreach via the Makai Watch program (a community-state collaboration whereby community members educate the public on marine fisheries and document rule noncompliance). Hā‘ena community members often provided food for informal meetings, publicized upcoming public hearings, drafted testimony for supporters, and conducted petition drives to collect support. The Hui Maka‘ainana o Makana, a Hā‘ena community organization, performed or organized all of these activities with assistance from a local nonprofit organization, Kua‘āina Ulu ‘Auamo (KUA). The government did not gather any temporal or place-specific information. Therefore, the costs of these activities were borne entirely by the community. The Hā‘ena co-management area rules included a small no-take area sheltered by the fringing coral reef to protect a juvenile spawning habitat. At first, the DLNR did not accept community claims about the nursery, despite generations of observational data and customary knowledge gathered by local fishers and community members. The community was required to commission a scientific study by coral reef ecologists that confirmed community claims before the DLNR allowed the area to remain a part of the rules package. Thus, the burden was on the community to gather scientific information about their area.

### *B. Coordination costs*

Coordination costs refer to all costs associated with planning and implementing a co-management regime, including time, capital and personnel costs. In Hawai‘i, costs were expended to plan, negotiate agreements, monitor compliance, and enforce regulations. Due to low funding and administrative capacity at the state level, communities were forced to absorb many of the coordination costs for co-management in Hawai‘i. Fortunately, the non-profit sector including non-governmental organizations (NGOs) and a local foundation helped communities absorb these costs by providing human and financial capital investments in community coordination processes. Respondents from multiple sectors cited a lack of capacity at the state level as a major barrier. Until 2012, when the locally based Harold K.L. Castle Foundation funded a co-management planner position, there were no employees at the state level responsible for working with communities to support the development of co-management governance arrangements. This position, along with support from several local NGOs, including KUA, The Nature Conservancy, and Conservation International Hawai‘i, provided community assistance for planning, community organizing, developing rulemaking proposals, engaging with government officials and other planning activities. These bridging and brokering roles represent a significant portion of the coordination costs for transitioning to a co-management system in Hawai‘i.

### *C. Strategic costs*

Strategic costs are incurred when individuals or organizations exploit information asymmetries, power relations, political influence, or financial advantages to tip resource benefits in their favor. Strategic costs include free riding, rent seeking, shirking, social loafing, and corruption. My analysis reveals several examples of strategic costs associated with making the transition to co-management governance systems. A lack of institutionalized enforcement means that many fishing areas across Hawai‘i have become de facto open-access (an absence of defined property rights), which encourages free riding behavior. A 2012 creel survey in a West Maui herbivore no-take area found that nearly 20% of reported catch included restricted herbivore reef fish (Friedlander, Koike, Kekoa, & Sparks, 2012). In terms of rent-seeking behavior, respondents described how organized fishing interests actively work against co-management planning efforts by lobbying politicians, co-opting public meetings, and using their process-related knowledge to

subvert community-led initiatives. For example, organized fishing interests heckled crowds and decision makers at public meetings, filed petitions to delay an administrative decision, and lobbied new legislators in an attempt to block approval of rules. Respondents frequently reported that organized interests opposed any rules changes despite documented resource depletion across the Hawaiian archipelago (Friedlander & DeMartini, 2002b; Kittinger et al., 2011). There is no data to indicate that corrupt activities affected co-management or centralized fisheries management in Hawai‘i.

**Table 4.5.** Comparative Performance of Institutional Arrangements Related to Coral Reef Fisheries Management Costs (Transformation and Transaction costs) in Hawai‘i, (adapted from Ostrom, Schroeder & Wynne (1993))

<i>Intermediate performance criteria/provision costs</i>	Co-management	Centralized management
Transaction costs		
Coordination costs	High	Low
Information costs		
Time and place	High	High
Scientific	High	High
Strategic costs		
Free riding	Med	High
Rent seeking	High	High
Corruption	N.A.	N.A.
Transformation costs	High	High

\*The ordinal scale of ‘Low’, ‘Med’ for Medium, and ‘High’ for Co-management and Centralized Management in Table 4.5 are based upon descriptive, qualitative assessments of the individual aspects of each cost and not a precise calculation of transaction and transformation costs. These assessments are made based upon interview data, an analysis of archival documents such as legislative testimony, participant observation of public meetings, general knowledge gleaned from informal discussions, and being tangentially involved in Hawai‘i co-management processes for five years. A ‘Low’ ranking describes costs and activities that are currently accounted for in the regulatory regime; in other words, funds are allocated to this task and staff currently work to complete this as part of their work plans. Thus the transaction or transformation costs are low. A ‘Med’ or Medium ranking describes some extra costs incurred outside of the current regulatory regime or activities. For example, a ranking of ‘Med’ for the Free Riding subcomponent of Strategic costs describes extra costs that must be accounted for to reduce free riding by the community or the state, such as monitoring and incident reporting to report rules violations. A ‘High’ ranking describes significant costs, such as extensive longitudinal scientific studies, multiple public meetings, or several new full-time positions. The rankings reported for Centralized Management consider costs that have already been absorbed within the system. The current rankings for Centralized Management describe costs that must be disbursed to adequately address remedial regulatory deficiencies.



#### ***4.4.3 Transformation costs***

Transformation costs include the costs of changing citizen preferences about governance arrangements (i.e., transitioning to co-management). During the planning process, this includes the cost of changing citizen preferences using consensus-building processes. During the policy design stage it includes costs associated with funding the transformation and implementation of the new governance system. During the policy implementation stage it includes the costs to monitor performance, regulate patterns of use, and to enforce rules. It is important to note that the perceived costs are in many ways just as important as the actual costs. Moreover, there may be benefits (or perceived benefits) associated with the governance transitions as well.

Accordingly, the combination of these costs and benefits is what can create significant barriers to making the transition to a new governance arrangement.

Until the Hā'ena rules were signed into law on August 2015, the only other CBSFA in the Hawaiian archipelago was the pilot project at Mo'omomi on Moloka'i. Mo'omomi was only designated for a trial period of two-years. Designation of just one co-management area in 21 years, despite the presence of a legal mandate and at least two dozen highly engaged communities pushing for a transition to co-management provides some evidence of the barrier that high transformation costs present to co-management in Hawai'i. This analysis reveals a number of transformation costs. Respondents cited the lack of governmental support for coordination, site assessment, and information gathering, high strategic costs brought on by organized special interest groups, and an arduous and complicated administrative rulemaking process (Kittinger et al., 2012) as impediments to making the transition to co-management systems. Resource rules for centralized management and co-management must both pass through the Hawai'i administrative rulemaking process to become law, which may take up to six years, depending on the complexity of the proposed rules. For example, rules for recent revised bag and size limits on Maui took a total of six years, while the Hā'ena co-management rules took four years from inception to implementation. No matter how small, any new (or amended) rules must revisit the administrative rulemaking process. It took a highly engaged ten year effort by the Hā'ena community, active support by a local NGO (KUA), and a significant, multiyear funding investment in a state-level planning position by a local foundation (H.K.L. Castle Foundation)

dedicated to co-management to overcome high transformation costs and achieve a permanent CBSFA.

## **4.5 DISCUSSION**

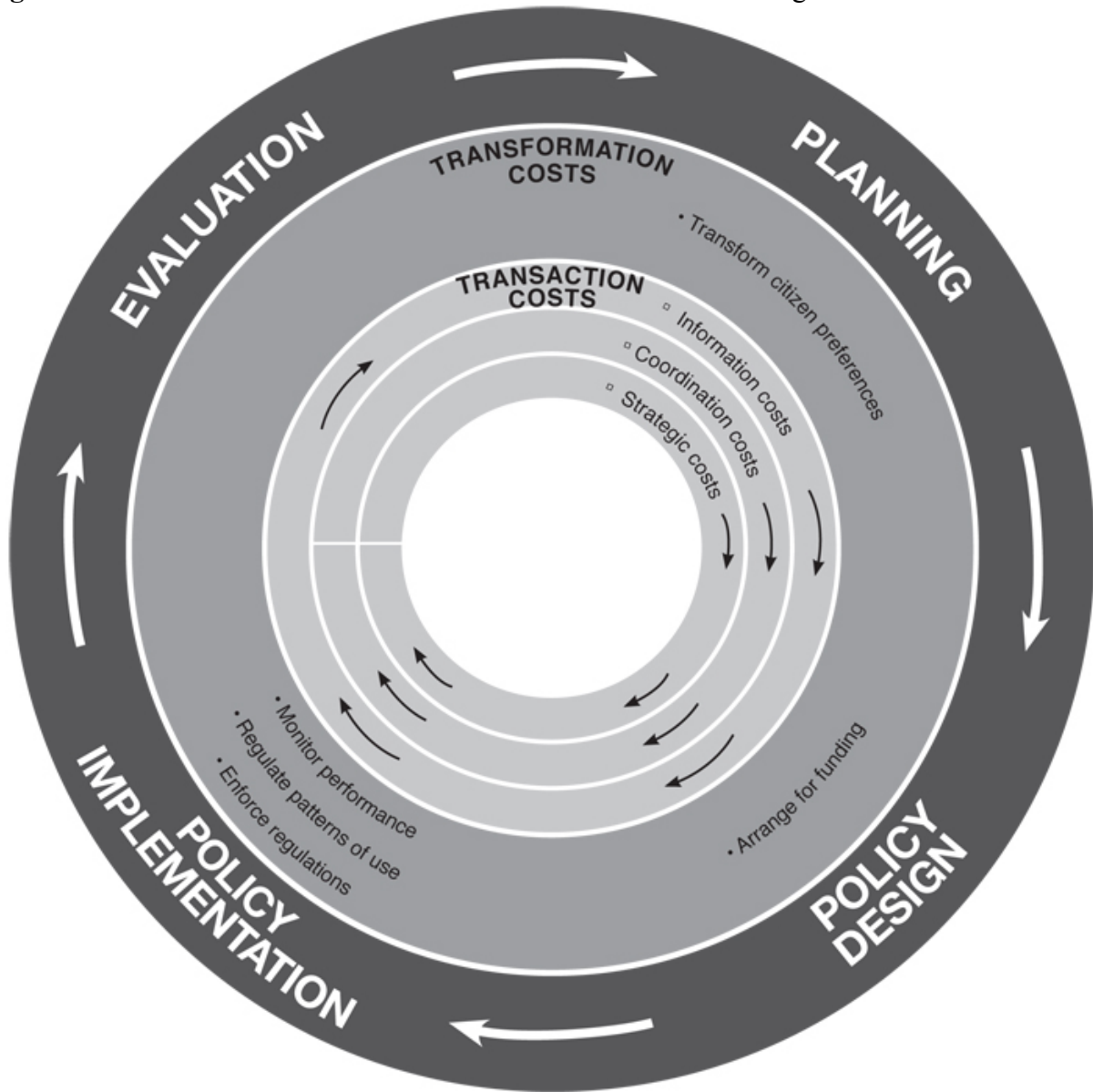
Despite the presence of enabling legislation, extensive community interest across the archipelago, and significant NGO/Foundation support, implementation of CBSFAs remains limited (Ayers and Kittinger 2014). This analysis suggests many possible explanations for the lack of progress, that are organized using the IAD framework. The transaction and transformation cost framework presented in Figure 4.1 helps explain why these problems manifest when transitioning to a new co-management governance system. The contribution of this framework is reviewed below.

### ***4.5.1 A framework for examining the transformation and transaction costs***

Figure 4.1 summarizes the framework created to structure the analysis of the transaction and transformation costs identified in this case study. A wide range of transaction costs (or benefits) occurred during the different stages of the governance transition process – planning, policy design, implementation, and evaluation (Ostrom et al. 1993; Imperial 1999). Information costs occur throughout the co-management life cycle, whereas coordination costs and strategic costs only occur from planning through implementation. There are also transformation costs that occur during each stage of the transition process except evaluation (Ostrom et al. 1993). During the planning stage there are costs to change citizen preferences so that the new governance system is viewed as being a legitimate, appropriate, and better system for managing the problem(s) than the status quo arrangement. During the policy design stage, transformation costs are also associated with the design of the new governance arrangement. This might involve changes in how the system is funded or how resources are allocated. It could also change who shoulders the burden (i.e., cost) to develop rules. Making newly designed policies operational can also generate a different set of transformation costs during the implementation stage by changing the allocation of costs to administer the program, collecting monitoring information, requiring changes in enforcement mechanisms, or producing different resource allocations. The upward

arrow in Figure 4.1 between transaction and transformation costs denotes a positive relationship, whereby higher transaction costs generate higher transformation costs for an institutional change.

**Figure 4.1.** The transformation and transaction costs associated with governance transitions



#### ***4.5.2. The configural nature of transformation and transaction costs and benefits***

When costs of institutional change exceed potential benefits, theories of institutional change postulate that there is no incentive for individuals to change rules so the rules remain unchanged (Basurto & Ostrom, 2009). This idea is also captured in one of Ostrom's design principles for enduring common pool resource institutions: "congruence between appropriation and provision rules and local conditions" (E. Ostrom, 1990, p. 90), which was later divided into two parts by other commons scholars to more accurately reflect the complexity of its two component parts: 1) tailoring rules to local conditions; and 2) the benefits received by resource appropriators are proportional to the costs incurred (Cox, Arnold, & Tomás, 2010). This may also be termed the configural nature of transformation and transaction costs or the combinations of costs and benefits incurred by different stakeholders. The ability to transition from one governance arrangement to another is influenced by how the pattern of costs and benefits shapes perceptions among stakeholders about the efficacy of the proposed governance arrangement, which in turn influences decisions about whether to participate, support, or oppose the governance transition.

Conversely, the distributional consequences of certain configurations can also create strong incentives for participants to work cooperatively to craft new governance arrangements that are win-win or at least win-no-lose in nature (Imperial and Kauneckis 2003; Kauneckis and Imperial 2007). In this case, the distributional pattern associated with the transition to co-management systems in Hawai'i creates formidable obstacles. For example, one of the problems with the design of the 1994 enabling legislation is that it shifts almost all of the cost associated with developing a CBSFA to the community partners. Communities pursuing co-management in Hawai'i are faced with the burden of gathering scientific and socio-economic information for a fishery, engaging stakeholders, navigating a complex administrative and political process, and securing a broad base of public support. Many of these communities are experiencing their own economic hardships. However, all residents of the state share the benefits of improved management of the fishery over the long-term. Fortunately, some communities found supporters in NGOs and other organizations willing to absorb some of the information and coordination costs. Without these organizations and their support, even less progress in co-management transitions may have occurred. If other communities are going to be successful, these

uncompensated costs must be reduced or redistributed to create stronger incentives for community participation.

#### ***4.5.3 Perceptions of costs and benefits***

Many of these transaction costs could be expressed in terms of person-days or person-hours but would be difficult to monetize. In Hā‘ena for instance, beach surveys documenting the frequency and location of tourist and recreational users in the area took two full summers to complete. These surveys involved several graduate students and community members. Data collection took substantial time and expertise was needed to analyze data and present findings. In another summer, a reef fish census survey was commissioned to document the numbers and types of fish present in a suspected juvenile fish nursery and habitat. Again, this data had to be commissioned by scientific experts. Co-management planning in Hā‘ena occupied a substantial amount of time for many members of Hui Maka‘āinana o Makana in addition to a large portion of time for a state-level planning position funded by The H.K.L. Castle Foundation, and several staff members of KUA. The investment in time and expertise needed to establish a single co-management area for a two-mile swath of coast in Hā‘ena, Kaua‘i was significant and almost none of it was funded by DLNR budgets.

However, perceived costs and benefits are also important drivers in the transition process because they provide strong incentives or disincentives to participate, support, or oppose the governance transition. In Hawai‘i, interview data suggests that opportunistic behavior is prevalent in areas under centralized management across the archipelago. Respondents shared a perception that many fishers take advantage of minimal enforcement presence by not complying with resource rules. Similarly, those that benefit from the current institutional arrangement are largely opposed to the development of CBSFAs because they fear that the new systems will impose new costs or constraints that interfere with their current use of the marine resources. Alternatively, the supporters of CBFSAs hope that the Hā‘ena community will increase social pressure on users to comply with rules, encourage reporting of incident violations to the state, and engage both the community and the DLNR in monitoring resource users. As a result, they hope that opportunistic behavior common in the current system, the so-called “tragedy of the commons,” will decrease, regulatory compliance can then improve, and better management of

marine resources will result. While there is little direct evidence as to whether either set of perceptions is correct, the combination of perceptions has framed the governance transition as a win-lose situation with the “losers” mounting well-orchestrated opposition to co-management.

#### ***4.5.4 Accrual of costs and benefits over time***

My analysis also suggests that it matters when costs (and benefits) occur over time. Generally speaking, it is difficult to develop and implement policies when great costs are incurred today for vague or unspecified gains in the future. Participants can also use very different discount rates, which mean that the costs (or benefits) are viewed in very different ways as a result of history, culture, or different worldviews. Discount rates refer to differing perceptions of present versus future values of fisheries resources. A low discount rate places a greater value on the future value of resources. Conversely, attaching a high discount rate to the value of resources may mean that it makes more sense to harvest resources now rather than in the future when their value has depreciated. Without understanding these different discount rates, it is difficult to make accurate predictions about the interactions among actors (e.g., the ability to absorb high transformational costs) or the outcomes for governance change (e.g., the adoption of new rules systems) (Gelcich et al., 2006; Hauck & Gallardo-Fernández, 2013; Raemaekers et al., 2011).

The case illustrates this point. Communities engaged in co-management planning have persisted for a decade or longer in spite of significant costs and seemingly few immediate benefits. However, many Native Hawaiians consider the health of local fisheries as an ancestral responsibility. Their motivation is to perpetuate key cultural practices and maintain a Hawaiian way of life for future generations (McGregor, 2007) despite significant social, economic, and technological change. Their use of a very low discount rate attaches importance to the long-term benefits and creates a willingness to incur larger upfront change costs. This is consistent with findings from elsewhere in the Pacific (Teh et al. 2011). These findings support the inclusion of cultural expression to the list of social responses in the typology presented in Chapter 3. The pursuit of rights to manage local resources is also congruent with historical marine tenure regimes in Hawai‘i that devolved management to local and regional scales (Beamer, 2014; Gonschor & Beamer, 2014).

Even though current co-management systems in Hawai‘i devolve little in the way of rights to resource users (see Chapter 2), the ability to advance place-based rules is congruent with historical management approaches. Alternatively, the stakeholders involved in organized opposition may use much larger discount rates which would attach more value to the current gains that result from the lack of enforcement and exploitation of marine resources. However, it is also possible that the same stakeholders do not perceive a problem with marine resources.

## **4.6. MANAGEMENT IMPLICATIONS**

### ***4.6.1 Resolve asymmetric cost distributions***

If co-management is to fulfill its promise, there must be a better understanding of the barriers associated with making governance transitions. The transformation and transaction cost framework presented in Figure 4.1 provides a means of identifying potential barriers. This framework can also be used to identify and evaluate strategies for modifying the configuration of transaction costs in ways that create greater incentives for participation by alleviating perceived inequities in the distribution of costs and benefits. One clear obstacle is the asymmetries of information and coordination costs. Communities carry the burden for the information and coordination costs needed to develop the CBFSA. The state, which is the other partner in the co-management arrangement, is a free rider in the transition process, but still becomes one of the main beneficiaries of the transition once it shifts implementation costs to the communities. Fortunately, strong support from foundations and NGOs offset the asymmetric cost allocation. However, if the state really wanted to encourage CBFSA development it should provide greater support for the transition process that helps offset the high costs at the community level. This could be achieved through planning grants, subsidizing scientific studies, or modifying the information and regulatory requirements that create high transaction costs.

The development of collaborative agreements like co-management systems also works best when all parties affected by the outcome lack a better alternative to the negotiated agreement (BATNA) (Fisher & Ury, 1991). This causes participants and stakeholders opposed to the proposal to negotiate in good faith and seek win-win or at least win-no-lose arrangements

(Imperial and Kauneckis 2003; Kauneckis and Imperial 2007). However, the current co-management rulemaking process creates an alternative to a negotiated agreement. Stakeholders opposed to CBSFA development do not have to bargain in good faith. If they fail to get their preferred negotiated agreement, they can exit negotiations and use the rule making procedures to prolong the process and exacerbate local coordination costs. However, local communities and stakeholders supportive of a CBSFA have no equivalent alternative other than a negotiated agreement. This power asymmetry allows a small group of stakeholders to block CBSFA development while they continue to engage in other costly forms of strategic behavior (e.g., illegal fishing) because the state does not invest in monitoring or enforcement.

#### ***4.6.2 Streamline co-management transitions***

Accordingly, if Hawai‘i wants to encourage co-management, it needs to modify the administrative rulemaking process or perhaps create a separate CBSFA approval process designed to minimize transaction costs. It could also minimize the opportunities for stakeholders to exit the transition process, which will encourage stakeholders to bargain in good faith. There are successful examples of transition processes that could serve as possible models including territorial user rights for fishing (TURFs) in Chile (Gelcich et al., 2010), community development quota funds used in Alaska (Ginter, 1995); fisher-government coalitions in the co-management of the lobster fishery in Maine (Acheson, 2003); and culturally-based co-management in *Aotearoa* (New Zealand) (Memon et al. 2003).

#### ***4.6.3 Build public support for co-management***

An overall change in strategy may also be needed. A major challenge is clearly transforming citizen preferences, particularly among those lacking Native Hawaiian ancestry. One way to do this is by using demonstration projects and phasing in CBSFA implementation by focusing on selected communities where strong support exists. Indeed, some community leaders and practitioners described the need to start small with successful demonstration projects in order to reopen this pathway and create a precedent for other communities. Since the state currently lacks the resources to subsidize large-scale development of CBSFAs, this strategy would also focus limited resources in a few selected communities to test whether co-management systems actually lead to improved marine resource management. Implementation experience will also help all



stakeholders to better understand whether the perceived costs and benefits are realized. Overtime, if the demonstration projects are successful, it could help alter citizen perceptions in favor of co-management. If they are unsuccessful, the state could pursue a different institutional arrangement to improve the management of its marine resources.

The results also demonstrate that changing citizen perceptions during governance transformations is critical when organized opposition from special interests is entrenched, politically powerful, and the transition process provides points of leverage that can be used to prolong the process. Building a broad base of support at the multiple scales – both at the community level and statewide – was critical in breaking two decades of path dependence and lock-in in Hawai‘i. The results also demonstrate that effective organization and construction of a broad base of support by the Hā‘ena community and their partners could overcome significant transaction and transformation costs. Other communities have not been as successful.

#### ***4.6.4 Manage conflict to avoid conservation stalemates***

While collaboration and co-management are often viewed in positive terms, it is important to remember that these governance strategies are not appropriate for addressing all resource management problems (Imperial 2005). For example, Wondolleck and Yaffee (2000: 58) examined nearly 200 contentious collaborative decision making processes and observed many of the same barriers observed in this study. Similarly, many Hawai‘i communities have had limited success in achieving the prerequisites for successful collaboration noted by Wondolleck and Yaffee (2000). In Hawai‘i, many stakeholders still have difficulty working together and problems and policy solutions are framed largely in terms of win-lose situations rather than win-win or win-no-lose situations that are more likely to encourage cooperative solutions (Imperial and Kauneckis 2003; Kauneckis and Imperial 2007). As a consequence, co-management transitions in Hawai‘i have largely resulted in a conservation or policy stalemate (Amy, 1983), highlighting the need for effective conflict resolution strategies built into the governance transition process in Hawai‘i (Fisher and Ury 1991; Forester 1987; Lowry, Adler, and Milner 1997).

## 4.7 CONCLUSIONS

Co-management is a promising and appropriate alternative to address some problems with top-down governance. However, the governance transition process required for establishing co-management regimes creates several significant barriers, including transaction and transformation costs that inhibit its development. In places where co-management transitions have been successful, the process has taken a decade or longer (Gelcich et al., 2010; Pinkerton, 1999; Yandle, 2003). There is no reason to believe that the transition to widespread use of co-management systems will happen quickly without addressing the structural attributes that create these barriers. This will likely require substantial investments in the transition process that balance the current inequities in the distribution of transaction and transformation costs. In addition to investments, targeted efforts are also needed to build public support and manage conflict surrounding the establishment of co-management areas. Doing so may help Hawai'i overcome many of the barriers currently impeding co-management planning and implementation.

## **Chapter 5.**

### **Many paths, one destination: developing community guidance in state-centric co-management**

Chapter 4 categorized the barriers to community-based subsistence fishing area implementation and indicated how communities and their NGO partners are absorbing most of the transaction costs associated with co-management transitions. Given the challenges associated with co-management governance transitions through CBSFAs, some other state-level marine management designations may offer an easier path to implementation. Although these state-level marine management designations were not designed for co-management, there are opportunities for extensive community involvement analogous to co-management governance. This chapter will combine institutional analysis, policy analysis, and semi-structured interviews to analyze six different non-CBSFA marine management partnerships in Hawai'i. First, existing marine management authorities are organized based upon community goals. Next, an institutional analysis is used to assess differences in community involvement, how property rights components are shared, and the operational rules present in each area. This chapter will conclude by considering six non-CBSFA and two CBSFA areas in the context of Elinor Ostrom's design principles for common pool resources. The findings of this chapter have important implications for common pool resource theory and co-management planning and implementation.

#### **5.1. INTRODUCTION**

Small-scale fisheries are important to millions of people worldwide for sustenance, livelihoods, and food security (FAO, 2015). Despite their importance, many small-scale fisheries are located in remote areas or are plagued by a lack of resources or capacity needed for effective management (Berkes, 2001). Co-management widely touted as solution for many of the capacity- and resource-related issues facing the world's fisheries (Gutierrez et al., 2011). Co-management involves an iterative learning process whereby a communities or resource users negotiate with the state to share management authority of a given area or resource system (Borrini-Feyerabend et al., 2000; Pomeroy & Rivera-Guieb, 2006). Co-management governance arrangements may exhibit significant diversity in terms of the shared property rights and

responsibilities between the state and communities or resource users (Schlager & Ostrom, 1992; Yandle, 2003).

Much co-management research examines communities that are actively involved in the management process, documenting policy implementation over time (Gelcich et al., 2010), conditions associated with success (Cinner et al., 2012; Olsson et al., 2004; Pomeroy et al., 2001; Sen & Nielsen, 1996), beneficial aspects of the co-management process (Berkes, 2009), barriers to implementation (Pinkerton, 1992; Vaughan & Caldwell, 2015), power dynamics (Nadasdy, 2003a), indigenous issues (Castro & Nielsen, 2001; Natcher, Davis, & Hickey, 2005; Vaughan, Ayers, & Thompson, Accepted), and regulatory capture (Singleton, 2000). Additionally, much research considers the proper or ideal roles of government, communities, and markets (Armitage et al., 2009; Jentoft, 2000b; McCay & Jentoft, 1998; Pomeroy & Berkes, 1997). However, little research explicitly describes the formal institutional arrangement for co-management, particularly in terms of how property rights are arranged and how authority is shared (see Chapter 2). Further, researchers rarely examine cases of state-centric co-management, where most power and authority is nested within an existing state-level bureaucracy. In state-centric co-management, the state may hold all marine tenure or property rights components (Carlsson & Berkes, 2005, p. 68). State-centric co-management is more prevalent in the developed world, where multiple jurisdictions, management agencies, and hierarchical legal and institutional structures may constrain devolution of rights to local resource users (see Chapter 2).

Although part of the United States, small-scale fisheries management in Hawai‘i is hampered by many of the same issues facing remote areas or developing nations (Ayers et al., In review). In Hawai‘i, small-scale coral reef fisheries have declined significantly since western contact (Kittinger et al., 2011) and most can be described as open access due to the absence of institutionalized enforcement and management presence (Finkbeiner et al., 2015; Jokiel et al., 2011). Many view contemporary centralized management in Hawai‘i to be ineffective and lacking legitimacy, leading as many 20 communities to pursue co-management or other institutional arrangements (Ayers et al., n.d.; Levine & Richmond, 2014). Although a legal pathway for co-management in Hawai‘i has existed for over 20 years via community-based subsistence fishing areas (CBSFAs) (Higuchi, 2008), to date, there has been just one two-year

pilot project in the late 1990s and one actively managed area designated in late 2015<sup>2</sup> (Vaughan & Caldwell, 2015). Co-management implementation (via CBSFAs) has been stymied by high transaction and transformation costs, process- and capacity-related challenges, and state-level reluctance to devolve management authority to communities (see Chapters 2, 3 and 4 for more information on these findings).

The lack of traction in co-management implementation via CBSFAs led some Hawai‘i practitioners, NGOs, and grantmaking organizations to consider whether many of the same co-management goals and objectives communities seek may be accomplished via existing state-level marine management designations. The State of Hawai‘i Department of Land and Natural Resources (DLNR) is authorized to designate the following marine management designations: Fishery Management Areas (FMAs); Marine Life Conservation Districts (MLCDs) – often described as Marine Protected Areas (MPAs); Fishery Replenishment Areas (FRAs); and Natural Area Reserve System (NARS). Although these management designations are not considered to be co-management per se, several communities across Hawai‘i have partnered with the State of Hawai‘i DLNR to assist in various management aspects including rule development, resource monitoring, public outreach and education, and reporting resource infractions to enforcement officers. I conducted a formal study in 2014-2015 to assess the level of institutional flexibility that exists for potential co-management partnerships within these alternative state-level marine management designations. I sought to examine how the level of community involvement, management rules, and property rights are shared within these alternative designations. I also examined the governance regimes using Elinor Ostrom’s design principles (E. Ostrom, 1990). The purpose of this study is twofold:

- 1) Can additional mechanisms that share management authority ease co-management implementation?
- 2) What do Ostrom’s Design Principles and a Property Rights analysis reveal about the design and implementation of eight co-management areas in Hawai‘i?

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<sup>2</sup> For more background about CBSFAs, see Chapter 3.

This research begins with a legal and institutional analysis of various state-level marine management designations, which formed the creation of a community-level co-management decision support tool. Next, I analyzed the level of community involvement in the designation process, the rules present, and the property rights devolved to communities (Schlager & Ostrom, 1992). Then, I assessed various marine management designations using Elinor Ostrom's design principles for enduring common pool resource governance regimes (E. Ostrom, 1990). The chapter concludes by considering the implications of the findings for both Hawai'i communities seeking co-management, for common pool resources theory, and for co-management implementation under state-centric co-management.

## **5.2. METHODS**

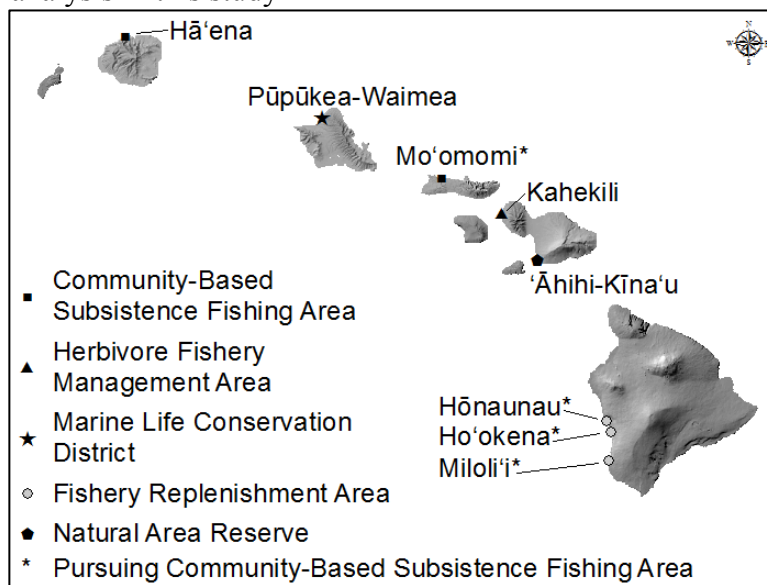
This research utilized a mixed methods research design (Creswell & Clark, 2007), combining legal and institutional analysis of state-level laws and governance regimes; administrative rules governing fishing areas; and semi-structured interviews of community members. The legal and institutional analysis began with a census of all 47 marine management designations and locations across the state of Hawai'i to capture variation in regulatory implementation present across sites. I reviewed fishing regulations from each of these sites to assess the full suite of rules currently implemented for each management area and submitted my analysis to a legal specialist in the Division of Aquatic Resources (DAR, the state-level agency responsible for marine resource management) to confirm my findings. Initial drafts of community-level decision support tools<sup>3</sup> were shared at a community workshop in December 2014. The community provided comments and suggestions to increase the utility of the tool for other communities interested in partnering with the state to change institutional arrangements.

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<sup>3</sup>The community level decision support tool was conceived to help communities decide which marine management designation fit their area given their management goals. A DAR planner piloted an early draft of the decision support tool with a focus group of community members in December 2014. The purpose of the meeting was to gather input about the CBSFA process, so it was a natural opportunity to discuss some alternative management pathways. As a result of the meeting the tool was modified to focus first on broad community-level goals, and then more specific community-level goals. Depending on community-level goals, the tool specifies which agencies a community should contact or involve in the process, along with some caveats for each pathway.

The initial list of 47 marine management designations was narrowed down to a subset of 21 areas with some level of community involvement. Community involvement was defined by: local representation on a management or advisory board; the formation of community group that was involved either in the designation or rulemaking process; or active participation via Makai Watch (an outreach, education, and incident reporting program). From the subset of twenty-one potential areas, a purposive sample of six was chosen for fieldwork based on a) amount and level of community involvement as described above; b) durability or uniqueness of the designation; c) some island and institutional variation; and d) some evidence of positive social and ecological outcomes. The six communities chosen for fieldwork were: Pūpūkea-Waimea on the island of O‘ahu (MLCD); Miloli‘i, Ho‘okena, Honaunau on Hawai‘i Island (FMAs/FRAs); Ka‘anapali/Kahekili on the island Maui (also an FMA, but the only herbivore no-take area in the state); and ‘Ahihi-Kīna‘u, also on Maui (the only marine NARs in the state – all other NARs are terrestrial). See Figure 5.1 for a map of the various communities and management areas. Purposive sampling of fieldwork sites allowed for representation among management designations (Patton, 2002).

**Figure 5.1.** Hawai‘i communities and marine management areas within the Main Hawaiian Islands chosen for analysis in this study



Field interviews were conducted via telephone and in-person between July 2014 and July 2015. In-person interviews were conducted whenever possible. Initial interviewees were selected based

upon their knowledge of and involvement with the designation or management process. Then, snowball or chain referral sampling (Creswell, 2007) was employed until sufficient data saturation was reached (new respondents repeated the same themes as those interviewed earlier without describing any new ones) (Bernard, 2013). This self-assessment of data saturation (Curry, Nembhard, & Bradley, 2009) was further confirmed by informal “talk story” conversations with other community members to confirm or crosscheck research findings. All interviews were recorded with participants’ consent and all data are reported anonymously or in the aggregate to comply with committee on human subjects research requirements. Recorded interviews were transcribed and iteratively coded, first based upon general themes related to questions (for example, lessons or suggestions for other communities), then participant responses were further broken down into more general themes and subthemes using qualitative data analysis techniques (Bernard & Ryan, 2009; Miles & Huberman, 1994).

**Table 5.1.** Total interviews by community and management designation

Field site	Management Designation	Total interviews
Ka‘anapali/Kahekili (Maui)	Herbivore FMA	10
Pūpūkea-Waimea (O‘ahu)	MLCD	6 (via focus group)
‘Ahihi-Kīna‘u (Maui)	NARs	4
Miloli‘i, Ho‘okena, Honaunau (Hawai‘i Island)	FMA/FRAs	3

Fishing regulations were analyzed using a Schlager & Ostrom (1992) property rights framework containing five primary components: access, withdrawal, exclusion, management, and alienation. Governance regimes were analyzed using Ostrom’s design principles (E. Ostrom, 1990), several of which have been separated into component parts to capture their complexity (Cox, Arnold, & Tomas, 2010). I used the revised Cox et al. (2010) design principles in this study.

### 5.3. BACKGROUND

The following section provides a short historical background on co-management in Hawai‘i via community based subsistence fishing areas and the administrative rulemaking process that precedes any rule change. A short synopsis of alternative co-management pathways that exist though state-level marine management designations is also included. Next, a brief description of



the communities chosen for fieldwork and their role in management is provided under each of their respective management designations.

### ***5.3.1 Co-management in Hawai‘i***

Co-management in Hawai‘i is typically thought of in terms of community-based subsistence fishing areas (CBSFAs). The pathway to CBSFAs was legislated in Hawai‘i in 1994, allowing communities to partner with the State of Hawai‘i to develop place-based and culturally rooted regulations for their ocean areas (Hawai‘i State Legislature, 1994, sec. 1). Although fishing regulations may be rooted in customary practices and values, the Hawai‘i State constitution ensures that rules apply equally to all users (Hawai‘i State Constitution, Article XI §6).

Communities may be creative in their rulemaking to ensure that regulations privilege certain fishing methods, so long as no one is excluded (Vaughan et al., Accepted). Moreover, any rules – CBSFAs included – must pass through the State of Hawai‘i Chapter 91 administrative rulemaking process (Kittinger et al., 2012). With few exceptions, any new rules, amendments to existing rules, or elimination of rules follow this process. Likewise, any citizen or community group may propose a rules change. However, for CBSFAs, the rules change must be proposed by a community group that includes group membership, a management plan, a monitoring and evaluation component, and funding sources (Zanre, 2014). The rulemaking process alone is long and daunting for many Hawai‘i communities and the results demonstrate just how difficult. There have been just two active CBSFAs in over 20 years since the legislation was passed. There was one two-year CBSFA pilot project at Mo‘omomi on the island of Moloka‘i in the late 1990s (Guth, 1999) until Hā‘ena, Kaua‘i became just the second active CBSFA in Hawai‘i in August 2015. Miloli‘i was designated a CBSFA via in 2005 but has yet to submit draft rules and a management plan to the Department. At this time, Miloli‘i retains its designation but is not currently an actively managed CBSFA.

### ***5.3.2 Chapter 91 administrative rulemaking process***

Before specifics of the different marine management designations are discussed, it is important to understand how fishing regulations become administrative rules in Hawai‘i. The State of Hawai‘i Administrative rulemaking process is a public process whereby state-level executive branch agencies such as the DLNR develop specific administrative rules to implement statutes.

The administrative rulemaking process is the same for any rules changes. In the case of the Hā‘ena CBSFA, the rulemaking process took four years from initial submission to final approval (Vaughan & Caldwell, 2015). Depending on whether impacts to small businesses are anticipated, the public has at least four opportunities to comment on the rules (see Figure 5.2), which significantly increases the transaction and transformation costs associated with the governance transition to co-management (see Chapter 4). Although there are multiple opportunities to comment on any regulations, there appear to be extra barriers and opposition to CBSFAs. Efforts are underway at the state level to streamline the rulemaking process. Recently completed, a community guidebook also clarifies what is expected of communities desiring a different management designation (Zanre, 2014). Some community practitioners and grantmaking organizations have speculated that some of the same goals might overlap with other management designations and perhaps these designations might offer an easier path to co-management.

### ***5.3.3 Marine management designations in Hawai‘i***

In recognition of differences in resources, habitat, geological features, and human uses across Hawai‘i, several different marine management designations are available to develop place-based rules. For coral reef fisheries under state jurisdiction, place-based regulations are primarily implemented through fishery management areas (FMAs), fishery replenishment areas (FRAs), and marine life conservation districts (MLCDs). FMAs offer the greatest rulemaking variation in rulemaking authority. FMA rules may focus on a single fish or *limu* (seaweed) species or may manage a large area for cumulative impacts like the entire west coast of Hawai‘i Island. FRAs are areas designated under Act 306 (1998) put in place to protect reef fish along 30% of West Hawai‘i Island from aquarium collection. MCLDs are primarily considered marine protected areas, although some areas do allow some fishing with specific gear types. NARS are areas protected for ecological and cultural uniqueness that are protected in perpetuity. They do not allow any extractive activities and offer the greatest protection among these areas. As mentioned earlier, there is one community-based subsistence fishing area (CBSFA) in Hā‘ena, Kaua‘i and one marine natural area reserve (NARS) at ‘Āhihi-Kīna‘u on Maui. Together these areas comprise under 2.6% of ocean area in Hawai‘i. Although this study focuses on these five areas, other special areas exist including Kaho‘olawe Island Reserve (a former target bombing range for the U.S. Navy that is now being restored for Native Hawaiian Cultural uses), a marine

laboratory refuge on Coconut Island in Kāneʻohe Bay on Oʻahu, a community fisheries enforcement unit in North Maui, a national historic park in Kalaupapa, Molokaʻi, and a wildlife sanctuary at Paikō Lagoon on Oʻahu.

**Figure 5.2.** The Chapter 91 Administrative rulemaking process for the State of Hawai‘i.

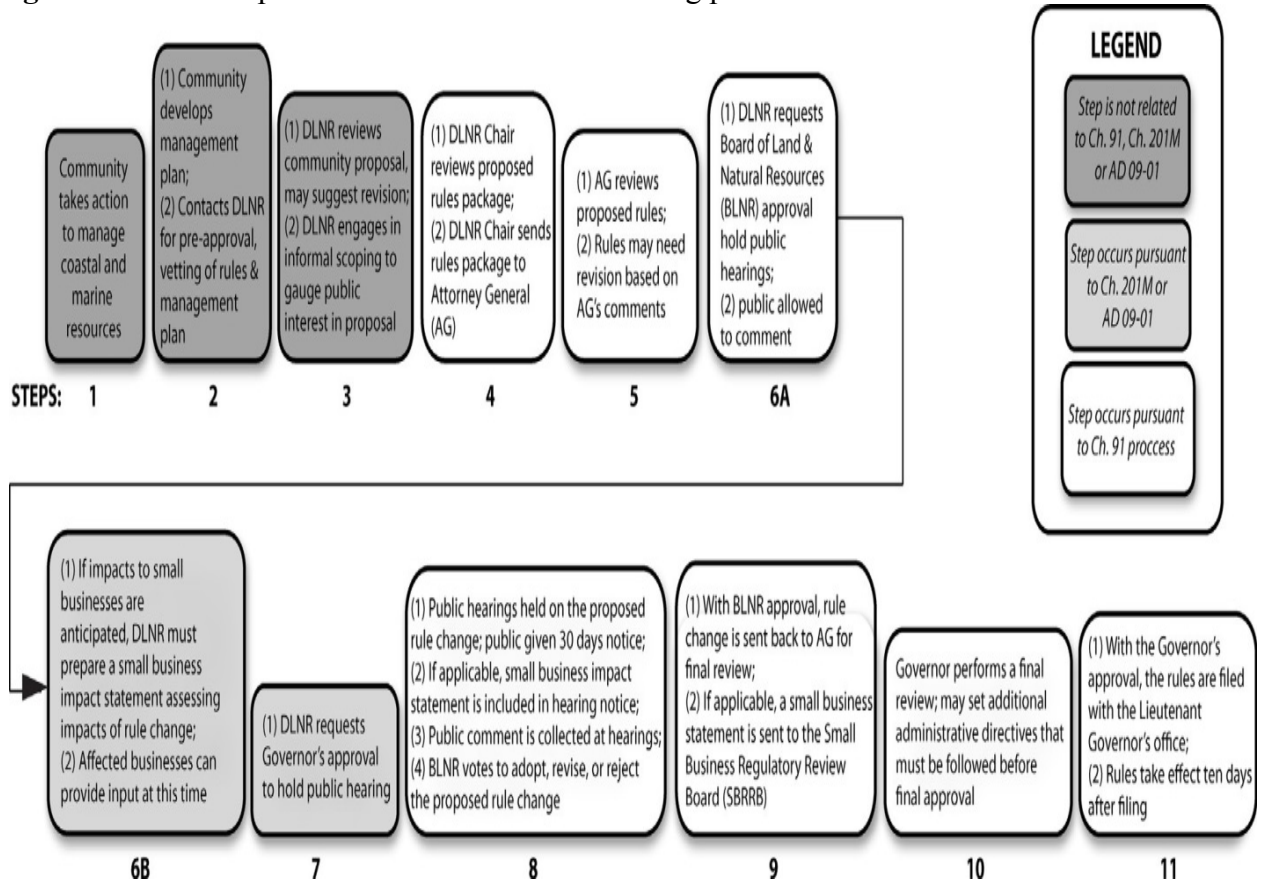


Figure source: Kittinger et al (2012)

#### ***5.3.4 Fishery Management Areas (FMAs) and Fishery Replenishment Areas (FRAs)***

Fishery Management Areas (FMAs) are the most prevalent marine management designation in the state. The authorizing statute for FMAs (HRS 188-53) provides significant leeway in terms of management areas. For example, one FMA manages a single species of edible *limu*, while a second prevents take of herbivorous reef fish, and a third provides a framework to manage the entire 235km coastline of West Hawai‘i (Capitini, Tissot, Carroll, Walsh, & Peck, 2004). There are 21 FMAs, 13 of which have some element of community involvement. Fishery Replenishment Areas (FRAs) are a subset of FMAs that only exist in West Hawai‘i and are closed only to commercial aquarium collecting. Hōnaunau, Ho‘okena, and Miloli‘i are the three areas chosen for fieldwork. Ho‘okena and Miloli‘i were both actively involved with FMA/FRA siting and regulations in the mid-late 1990s and are currently pursuing CBSFAs. Hōnaunau, which is adjacent to Ho‘okena, is a U.S. National Historical Park designated for its cultural and historical importance.

#### ***5.3.5 Marine Life Conservation Districts (MLCDs)***

There are 11 Marine Life Conservation Districts (MLCDs) in Hawai‘i, six of which have some degree of community-level management involvement. Although some MLCDs allow certain types of fishing, they are generally considered marine protected areas. The community group Mālama Pūpūkea-Waimea became the first active Makai (Ocean) Watch program in Hawai‘i in 2005, partnering with the Hawai‘i State DLNR to report rules violations and educate the general public regarding regulations for the Pūpūkea-Waimea MLCD, one of the field sites chosen for this research. Makai Watch has become a state-level program to involve communities in education, outreach, resource monitoring, and incident reporting to the Division of Conservation, Resources and Enforcement (DOCARE, the enforcement wing of the Department of Land and Natural Resources). Several interviewees described Makai Watch as a good ‘first step’ for communities looking to get involved in co-management

#### ***5.3.5 Natural Area Reserve System (NARS)***

The Natural Area Reserve System is primarily used to protect ecologically and culturally unique areas in perpetuity. The only marine NARS in the state is located at ‘Āhihi-Kīna‘u on the island of Maui. The ‘Āhihi-Kīna‘u NARS was designated to protect ecologically unique Anchialine

pools<sup>4</sup>, but the area receives thousands of tourist visitors annually, meaning that both land- and ocean-based access must be managed (Antolini, 2004). Beginning in 2008, a multi-stakeholder community group became very involved in a multi-year management plan review process for the area.

### ***5.3.6 Community-based Subsistence Fishing Areas (CBSFAs)***

Community-based subsistence fishing areas were legislated in 1994 based on the efforts of one rural Moloka‘i community. In 1993, Hawai‘i Governor John Waihe‘e commissioned a study that later found many Moloka‘i residents were dependent on land and ocean resources for subsistence (Matsuoka et al., 1994). The legislation created a pilot project on the Northwestern coastline of Moloka‘i, encompassing Mo‘omomi and Kawa‘aloha Bays. At the end of the two-year pilot project, the Mo‘omomi community and the State of Hawai‘i mutually agreed to terminate the project due to differences in management expectations. Nonetheless, Mo‘omomi’s rules are compared with other areas in Table 5.3. Hā‘ena, Kaua‘i was designated as the second active CBSFA in the State of Hawai‘i in August 2015 after a ten year planning and rulemaking process. These rules are also included and considered in Table 5.3.

## **5.4. RESULTS**

Below I present the results of a legal and institutional analysis of five Hawai‘i marine management designations, which was reviewed by the DAR planner and legal fellow. This analysis was also shared with the same focus group of community members that informed the creation of aforementioned community-level decision support tool (Table 3.2).

### ***5.4.1 Institutional and legal analysis of marine management designations***

The rules for the marine management designations in the following paragraphs represent a sample of the different models of how authority has been negotiated and formalized between communities and a state-level bureaucracy. An initial institutional and legal analysis reveals that significant overlap exists between marine management designations. For instance, Fishery

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<sup>4</sup> Anchialine pools are landlocked, brackish water areas that contain an underwater connection to the ocean.

Management Areas (FMAs) contain the following sub-designations: Fishery Replenishment Areas (FRAs), Public Fishing Areas, and Northwestern Hawaiian Islands Marine Refuge. Within these designations there are vast differences in the level of production, allowable human interactions, and fishing activities allowed. Some areas restrict temporal effort, such as no nighttime fishing for ornamental coral reef fish species within the West Hawai‘i Regional Fishery Management Area (WHRFMA) and restrictions on the take of certain herbivorous fish and sea urchins in the Kahekili Herbivore FMA. FRAs are limited to the WHRFMA and share a collective set of rules that restrict some commercial activities, temporal, gear types, take, and overall effort. FMAs primarily prohibit fishing methods such as fishfeeding or snagging, and certain gear types that include gill nets and number of fishing poles).

Marine Life Conservation Districts (MLCDs) differ statutorily from other management designations in that they specifically regulate anchoring, mooring, and boating activities, and restrict the take of geological features or biological specimens. However, HRS 190-3 allows the DAR to apply rules “either generally throughout the state or in specified districts or areas”, which provides the agency with extensive rulemaking authority under this designation. Although an initial reading of the statute indicates the protection and preservation goals of this designation, some extractive activities are allowed in with a permit. For example, some MLCDs such as Wailea Bay allow fishing with a permit. The Pūpūkea-Waimea MLCD allows pole and line fishing from shore along and the netting of seasonal finfish, opelu (*Decapterus spp.*) and akule (*Selar crumenophthalmus*) within Waimea Bay.

The Natural Area Reserve System (NARS) are administered by the Division of Forestry and Wildlife (DOFAW) and is primarily limited to terrestrial areas, with ‘Āhihi-Kīna‘u as the lone joint marine/terrestrial area designation in the state. The ‘Āhihi-Kīna‘u NARS is preserved in perpetuity and any rules adopted by DOFAW/DAR must first be approved by the NARS commission, whose members are appointed by the Governor and are intended to represent a diverse group of stakeholder interests (e.g. academics, hunters, hikers, and cultural practitioners). Ex officio members include the DLNR chairperson, Office of Planning Director, the Board of Agriculture Chairperson, and the University of Hawai‘i President or their designated

representative. Although the NARS system offers very strong protections, the DAR can potentially devise rules that are just as strong through FMAs or MLCDs.

Even though the DAR (and DOFAW in the case of the NARS) have a broad authority to develop rules and manage marine resources in Hawai‘i, in general, there is minimal variation in rules within marine management designations, including those with community involvement. For instance, there is no variation in rules for FRAs and little variation across MLCDs. Although DAR has the authority to implement more stringent rules within the various marine management designations, any new or amended rules would still have to go through the Chapter 91 administrative rulemaking process. If communities endeavor to devise special rules that as of yet have not been implemented via an FMA, HRS187A-5 and HRS 188-53 allow the State of Hawai‘i the authority to approve, modify, or reject them. Likewise, if a community was looking to partner with the State and wanted take a more active role in rulemaking or stewardship, there is nothing in any of the statutes that would prevent them from pursuing that route.

#### ***5.4.2 Decision support tool for Hawai‘i communities pursuing co-management***

The results of the institutional and legal analysis were shared with a focus group of community members to increase the focus of the tool for future use in other communities. Community members changed the focus of the tool from a selection of management tools to how broad goals could potentially be addressed by regulatory agencies and management designations. Following community input, I added the agencies and management tools or designations that may best match up with community goals. The results of this analysis are presented below in Table 5.2.



**Table 5.2.** Decision support tool for Hawai‘i communities pursuing co-management

<b>Potential Management Goals</b>		<b>Agency Responsible, Available Management tools or designations</b>	<b>Caveats</b>
Limit/restrict access	Land-based access	<b>Office of Conservation and Coastal Lands (OCCL):</b> Special Management Areas (SMAs)	See responsible management agency (Hawai‘i CZM) or owner/landowner
	Ocean-based access	<b>Division of Aquatic Resources (DAR)*</b> if access restrictions are needed to manage, conserve, and restore the state’s unique aquatic resources and ecosystems: Marine Management Designations: CBSFA* - if access impedes traditional fishing practices from being exercised, FMA, MLCD <b>Division of Forestry and Wildlife (DOFAW):</b> NARS* - if area must be protected & preserved in perpetuity	Limiting access may be possible but must apply equally to all community members
		<b>Obtain available permits: State Office of Planning:</b> Limited Entry, Special-Use, SMA Major & Minor, Commercial activity permits	If justified, limiting access may be possible through permitting
Limit extractive uses		<b>DAR:</b> Bag and size limits, Gear restrictions, Marine Management Designations: FMA, MLCD, CBSFA* - if extraction prevents traditional fishing practices from being exercised	Limiting extractive uses may be possible but must apply equally to all community members
Restrict boating & recreation activities	*mitigate non-extractive user conflicts	<b>Division of Boating and Ocean Recreation (DOBOR):</b> Ocean Recreation Management Area (ORMA)	Non-extractive uses fall under DOBOR jurisdiction
	*mitigate extractive user conflicts	<b>DAR:</b> FMA, CBSFA* - if activities impede traditional fishing practices from being exercised	Extraction of living resources: DAR
		<b>OCCL -</b> Special Area Management Plans (SAMPs)	Non-living resources: OCCL
*mitigate boating impacts on resources	<b>Day-use mooring</b> - permits may be needed from: <b>Army Corps of Engineers (ACOE); DOBOR; OCCL; Environmental Protection Agency (EPA);</b> <b>DAR:</b> MLCD, CBSFA* - if impacts marine resources and are important to native Hawaiian subsistence, culture or religion		
Limit commercial activities		<b>DAR:</b> CBSFA, FMA, MLCD <b>DOFAW:</b> NARS *only if area is ecologically and culturally unique and the area must be protected in perpetuity	May be subject to regulation when they impinge upon cultural/natural resource or public use
Address unsustainable fishing practices		<b>DAR:</b> FMA, CBSFA, Makai Watch	

Promote <i>pono</i> (right or just) behavior and values/Inspire people to <i>malama</i> (care for) resources	<b>DAR:</b> Makai Watch	
Protect important species or habitat	<b>DAR:</b> MLCD, CBSFA* - if species or habitat is important to traditional fishing practices carried out for Native Hawaiian subsistence, culture and religion	May need to demonstrate species or habitat importance through scientific research
Mitigate or reduce land-based impacts/pollution *water quality	<b>OCCL:</b> Special Management Area (SMA) <b>DOH:</b> Clean Water Branch (CWB)	See management agency or landowner responsible for impacts
Allow population recovery	<b>DAR:</b> MLCD, FMA, CBSFA* - if species or habitat is important to traditional fishing practices carried out for the purpose of Native Hawaiian subsistence, culture and religion	Must document population changes over time
Mitigate invasive species	*No designation needed	May remove if other marine resources are not impacted during extraction
Improve rules compliance	<b>DAR:</b> Makai Watch	Makai Watch volunteers cannot enforce regulations.
Protect marine resources important to traditional practices	<b>DAR:</b> CBSFA	
Existing regulations/rules are ineffective	<b>DAR</b> Marine Management Designations (MLCD, FMA, CBSFA)	May need to justify ineffectiveness of existing regulations/rules
Restore ecosystem dynamics/address changes in habitat, species or composition	<b>DAR:</b> MLCD	May need to justify restoration efforts

The decision support tool in Table 5.2 provides a set of 14 potential goals communities might pursue, the agencies whose jurisdictions those goals fall under, available management tools, and some caveats to consider. Many goals align with multiple management options under the jurisdiction of one agency, while other goals such as land-based pollution and water quality may require collaboration with less apparent agencies such as the Department of Health, Clean Water Branch and Office of Coastal and Conservation Lands Special Management Areas. Also, communities looking to address fishing impacts or limiting extractive or commercial uses in their adjacent marine areas have several different management designations to consider. The decision support tool highlights some important nuances within certain designations. For example, there is

nothing in the suite of marine management statutes that would prohibit culturally based management rules if cultural expression is part of community goals. The caveats section is brief, but does raise some important issues for communities to consider. For instance, communities dealing with land-based or point-sources of pollution in a marine area may need to extend partnerships beyond the state to include private landowners within their specific watershed. Altogether, the decision support tool presents an institutional map that summarizes different authorities responsible for potential community-level goals.

#### ***5.4.3 Property rights analysis of communities pursuing state-centric co-management***

Table 5.3 presents several of the communities designated as marine management areas currently partnering with the State of Hawai‘i, including the year they were instituted, the specific community group involved, and their main focus. The table also displays the property rights held by the community, the current rules governing the area, and whether or not they are currently pursuing a CBSFA. The table also includes the Hā‘ena and Mo‘omomi CBSFAs to provide a comparison with other marine management designations in terms of property rights, rules, and community involvement (see Table 5.3).

**Table 5.3.** Comparison of eight Hawai‘i marine management designation, community involvement, property rights, rules, whether the group is currently pursuing a CBSFA

Marine Management Designation	Management Area and year instituted	Community group and year founded	Focus of community group	Property rights held by community	Current rules	Currently pursuing a CBSFA?
Herbivore Fishery Management Area (HFMA)	Kahekili (2009)	Kā‘anapali Makai Watch (2010)	Outreach, education and incident reporting of rules violations	Access, Withdrawal (limited)	To injure or remove sea urchins, rudderfish, parrotfish or surgeonfish; Fish feeding prohibited except for permitted marine life	No
	Miloli‘i (1998)	Pa‘a Pono Miloli‘i (1980)	Community-based group focused on improving the quality of life in the area	Access, Withdrawal, Management (limited)		Yes
Fishery Management Area (FMA) /Fishery Replenishment Area (FRA)	Ho‘okena (FRA, 1998) (FMA, 1999)	Kama‘āina United to Protect the ‘Āina (KUPA) (1998)	Conservation-based organization focusing on sustainability and the protection of Hawaiian gathering rights in South Kona	Access, Withdrawal	All fishing activities allowed except: aquarium fishing in exclusion zones; lay nets; fish feeding activities; multi-panel nets must be registered with the state.	Yes
	Kalako-Hōnaunau (1998); Napo‘opo‘o-Honaunau (1999)	Ka ‘Ohana ‘O Honaunau (1998)	Preserve coastal shoreline and natural resources via ecosystem-based management; educate community & visitors	Access, Withdrawal		Yes
Community-based subsistence fishing area (CBSFA)	Hā‘ena (2015)	Hui Maka‘āinana o Makana (1998)	Community-based group with the goal of restoring Native Hawaiian values and stewardship practices	Access, Withdrawal, Management (limited)	Small no-take area; gear restrictions based upon Customary Native Hawaiian practices	-
Community-	Mo‘omomi	Hui Mālama o	Maintain	Access,	Permitted	Yes

based subsistence fishing area (CBSFA)	(1995-1999)	Mo‘omomi (1994)	natural resources at sustainable levels, educate novice fishers in customary methods and values; blend local knowledge and experience with modern scientific data collection	Withdrawal, Management (limited)	fishers must submit monthly catch reports; Pole-and-line fishing, throw net, scoop net and hand-harvesting allowed in Zone 1; Daytime spearfishing allowed, nighttime spearfishing prohibited and akule netting allowed in Zone 2.	
Marine Life Conservation District (MLCD)	Pūpūkea-Waimea (1983); Rules revised in 2003.	Mālama Pūpūkea-Waimea (2005)	Support, strengthen rules; outreach and education; discover pollution threats; develop funding streams for long-term support of organization	Access, Withdrawal (limited), Management (limited)	All fishing activities and take of geological features or specimen, except: Allowed to take up to two lbs of limu per day, per person; to take finfish from pole and line in Waimea Bay only; To take ‘opelu by net in August and September; To take akule by net in October and November;	No
Natural Area Reserve System (NARS)	‘Āhihi-Kīna‘u Initially established in (1973); Management plan reviewed in	‘Āhihi-Kīna‘u Natural Area Reserve/Keone‘ōio Advisory Group (2004)	Multi-stakeholder group	Access (limited)	Preserve unique ecological, geological, and cultural resources	No

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2008, approved  
in (2013)

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*A. Management area, level of community involvement, focus*

The community-based management projects analyzed in this study are situated on five of the eight main Hawaiian Islands. Just two of the eight areas analyzed were designated in the last 20 years (Kahekili and Hā'ena). The majority were designated in the late 1990s (Miloli'i, Ho'okena, Honaunau, Mo'omomi), with one in 1980s (Pūpūkea-Waimea), and one the early 1970s ('Āhihi-Kīna'u). However, both Pūpūkea-Waimea and the 'Āhihi-Kīna'u statutes were significantly revised with community input in the 2000s and the 2010s, respectively. Newly formed community groups drove these revisions. Newly formed community groups motivated by changing social-ecological conditions were also involved in the management designation processes in other areas. Even though the official establishment of the community group may have occurred after the designation, community members were involved in the scoping or planning process.

Although communities were involved in the designation process in each case, the focus of the community groups varied. The 'Āhihi-Kīna'u group convened as part of a management plan review and still meets regularly to review updates on any changes planned for the area. Pūpūkea-Waimea provides outreach and education every Saturday on the coastline fronting a popular reef area. Ka'anapali Makai Watch in Kahekili focuses on incident reporting, outreach and education. The Ka'anapali Makai Watch contact for the area often coordinates community events in the West Maui area, focusing on marine environmental issues and awareness. Miloli'i, Honaunau, Ho'okena, and Mo'omomi communities are all currently pursuing CBSFAs. Mo'omomi was the first active CBSFA in the late 1990s, but its status was not made permanent and terminated in 1999. At this time, it is unclear what Mo'omomi's revised rules will contain, but previous regulations for their area included a small no-take area, prohibitions on scuba spearfishing and night diving; and gear restrictions. The Mo'omomi community is currently updating their management plan and rules package. Miloli'i, Honaunau, and Ho'okena are also working to build community support behind CBSFA proposals. Miloli'i is a legislatively designated CBSFA, but has yet to submit a rules package to the state for review.

### *B. Property rights and current rules*

Federal and State laws state that rules apply equally to all citizens, which restricts the types of rules local communities may adopt at the local level. In terms of management rights, communities are ceded some management authority (rulemaking authority only), provided that rules apply equally to everyone. Hā‘ena, Mo‘omomi, Miloli‘i, and Pūpūkea-Waimea all actively worked with the DAR to devise local rules for their adjacent marine areas and thus hold limited management rights. Each of these four areas possesses access and withdrawal rights, but these rights are also not exclusive. Anyone entering these areas possesses the same rights to access and withdraw resource units subject to area rules. However, the rules governing the eight areas do diverge.

As a natural area reserve that functions to protect unique cultural and ecological resources in perpetuity, rules governing ‘Āhihi-Kīna‘u prevents any extractive activities and restricts access in many areas. Rules in the NARS are enforced by DOCARE. In the Kahekili herbivore fisheries management area, rules restricts the take of any herbivorous reef fish. Honaunau, Miloli‘i, and Ho‘okena areas all have areas that restrict the take of ornamental reef fish targeted for aquarium collection. Hā‘ena’s rules include regulations that mandate fishers abide by cultural fishing practices specific to that area. Thus, rules privilege fishers in Hā‘ena proficient in those practices without excluding anyone from fishing. Formal enforcement is provided by DOCARE for all areas. Informal enforcement via Makai Watch is present for all areas except the ‘Āhihi-Kīna‘u NARS.

### *C. Currently pursuing a CBSFA*

Four of the eight communities involved in a marine management partnership with the state of Hawai‘i are currently pursuing a community-based subsistence fishing area. Many communities across Hawai‘i look at the resource successes of the past as a model for the way forward. As described in Chapter 2, in the Hawaiian Kingdom, autonomy to manage coral reef fisheries was devolved to the local level. Decisions to harvest species were made in consult with expert local fishers and outsiders could not enter and harvest marine resources without express permission; this practice continued, albeit informally, into the recent past (Vaughan & Ayers, 2016). One



community described their involvement in another marine management designation in terms of an intermediary step towards a CBSFA and, ultimately, modernization of customary management plans. Regardless of opportunities presented through other marine management areas for co-management, many communities still choose to pursue Community based Subsistence Fishing Areas due to a perception that it is a step towards greater local autonomy and, eventually, Native Hawaiian sovereignty (Vaughan & Caldwell, 2015). Although not all community-state partnerships analyzed shared the same goals, many of the most engaged communities pursuing co-management may have loftier goals than collaborating to write new fisheries regulations.

#### ***5.4.4 Ostrom's design principles for common pool resources***

Based on over 100 case studies of common pool resources across the world, Elinor Ostrom devised eight design principles or 'rules of thumb' for enduring common pool resource institutions (E. Ostrom, 1990). Since then, scholars have used the design principles to evaluate common pool resource governance regimes across the globe. Twenty years after the original design principles were published, some scholars conducted a review of 91 studies that had used her design principles. After conducting the analysis, the authors found the design principles to be theoretically sound, but found a need to divide concepts contained in three of the principles in order to unpack some of their complexity (Cox, Arnold, & Tomas, 2010). Below in Table 5.4, Ostrom's design principles are used to evaluate each of the eight areas presented in Figure 5.1 and Table 5.2.

**Table 5.4.** Analyzing eight Hawai‘i marine management designation using Elinor Ostrom’s Design Principles revised by Cox et al (2010)

		Area, Management Designation and (Community group responsible)							
		Kahekili herbivore FMA (Ka’anapali Makai Watch)	Miloli‘i FMA/FRA (Pa‘a Pono Miloli‘i)	Ho‘okena FRA, FMA (KUPA)	Kalako-Hōnaunau FMA; Napo‘opo‘o-Honaunau FRA (Ka ‘Ohana ‘O Honaunau)	Hā‘ena CBSFA (Hui Maka‘āinana o Makana)	Mo‘omomi CBSFA (Hui Mālama o Mo‘omomi)	Pūpūkea-Waimea MLCD (Mālama Pūpūkea-Waimea)	‘Āhihi-Kīna‘u NARS (Keone‘ōio Advisory Group)
Design Principles	Clearly Defined boundaries for local resource rights	X	X	X	X	X	X	X	X
	Resource boundaries are clearly defined	X	X	X	X	X	X	X	X
	Appropriation rules correspond with local conditions	X	X	X	X	X	X	X	X
	Benefits are proportional to the inputs	-	-	-	-	-	-	-	-
	Collective choice arrangements	X	X	X	X	X	X	X	X
	Monitoring is present for resources and behavior	X	-	-	-	X	X	X	X
	Monitors are accountable to or are the appropriators	X	-	-	-	X	X	X	X
	Graduated sanctions for rule-breakers	X	X	X	X	X	X	X	X
	Conflict resolution mechanisms	-	-	-	-	-	-	-	-
	Rights to devise local institutions unchallenged by external groups	-	-	-	-	-	-	-	-
Nested enterprises	X	X	X	X	X	X	X	X	

*A. Clearly Defined boundaries for local resource rights;*

*B. Resource boundaries are clearly defined;*

Regulations are clear for resource access and extraction in all of the marine management designations analyzed in Table 5.4. The United States and the State of Hawai‘i constitutions specify that resource rules must apply equally to all users. The geographic boundaries for each area are also clearly defined geographically, with coastal landmarks and latitude and longitude to delineate boundaries.

*C. Appropriation rules correspond with local conditions*

Specific rules exist for each of the marine management areas analyzed in this study. However, rules were tied more closely to local conditions in the ‘Āhihi-Kīna‘u Natural Area Reserve, Hā‘ena and Mo‘omomi CBSFAs, Kahekili Herbivore FMA, the Pūpūkea-Waimea MLCDC because regulations were specifically designed for those areas. The FMAs in Miloli‘i, Ho‘okena, and Honaunau also have specific rules tied to particular fishing practices. However, the FRAs in Miloli‘i, Ho‘okena, and Honaunau were created to meet the requirements of Act 306, a legislative mandate to protect 30% ornamental reef fish along the West Hawai‘i coastline from aquarium collection. Yet, in general, the marine management designations were created to tailor specific rules to local conditions and the areas in this study mostly meet these criteria.

*D. Benefits are proportional to the inputs*

At this time, there is no evidence to show that local communities that partner with the State of Hawai‘i are receiving, have received, or will receive resource benefits proportional to their time and effort. Most of the communities (and their NGO partners) analyzed in this chapter invested substantial resources to improve the stewardship of their areas. Community resources include opportunity and material costs of spending time to mobilize community members, organize meetings, and gather place-based social and ecological data. Often NGO partners assist by spending staff time on writing grants to enable stewardship and meeting activities, and to document community meetings. NGO partners also support communities by conducting or funding scientific studies such as resource monitoring. Despite the lack of resource benefits, communities and NGO partners persist in investing their time, money, and efforts to partner with the state of Hawai‘i. This observed behavior runs counter to this design principle and other

theories of institutional change that postulate that individuals will not invest in collective action if the costs exceed the expected returns (Basurto & Ostrom, 2009; E. Ostrom, 1990). This assumption does not hold true for the cases analyzed in this chapter.

Although Hawai‘i communities may not receive benefits in the economic sense, the benefits they expect to receive are intertwined within a different worldview. Deep attachment to place and *kuleana* (responsibility) is a likely explanation for the sustained community investment and increased community involvement across Hawai‘i. Ceding responsibility to *mālama* (care for) their area is simply not an option for many Hawai‘i communities. There are stories from all over Hawai‘i (activism and civil disobedience to end the bombing of Kaho‘olawe are but one example) that detail the sacrifices people have made to *mālama ‘āina* in an attempt to restore culture and place. It is much deeper than just cultural expression. Beyond cultural expression, the attachment or connection to place is both tangible and spiritual for Hawai‘i communities. For example, many Native Hawaiians believe certain animals are *‘aumakua* or an actual physical embodiment of their ancestors. Belief in *‘aumakua* are but one example of the connection exists between *kanaka* (Native Hawaiians), the *‘āina* (land and sea) and the many species that inhabit it. Additionally, stories from the recent past and Hawaiian legends may be embedded with knowledge that prescribe how to harvest in a *pono* (righteous) manner to ensure sustained, mutually beneficial relationships between people and the environment. So this *kuleana* is deeper than just place-based ecological and cultural restoration. It is a worldview in which people are a part of, not apart from the environment. Many Native Hawaiians tie the physical health of their communities to the health of their local environment. Viewed this way, there is almost no limit to what some Hawai‘i communities will do to protect and preserve the *‘āina*, despite an absence of more tangible, monetary benefits.

### *E. Collective choice arrangements*

Collective choice arrangements are present in each of these cases, with one major caveat: any community can suggest new operational rules subject to approval via the administrative rulemaking process. Although anyone may propose rules, the administrative rulemaking process is so long and burdensome (from start to finish, rulemaking processes may take several years) that only the most committed and resourceful communities see their rules approved by the Board of Land and Natural Resources (BLNR), the *de jure* collective choice level of decision making. The BLNR is a seven member, appointed body that presides over any administrative rules changes. If a majority of BLNR board members approve a rules proposal, then their recommendation is forwarded to the Governor of Hawai‘i for final approval and signature. This bureaucracy may present an impediment to local collective choice. For example, Hā‘ena’s rules sat on the governor’s desk for nearly ten months before he signed them and they became formal administrative rules.

### *F. Monitoring is present for resources and behavior*

#### *G. Monitors are accountable to or are the appropriators*

Communities and the state perform resource-monitoring activities in all areas, but not always on a regular basis. Community members may perform more regular informal monitoring, which is not currently accepted by the State of Hawai‘i as valid data for rulemaking. For example, the State of Hawai‘i DAR determined that observational data and local knowledge could not justify closing a small area to fishing and diving within the Hā‘ena CBSFA. To local Hā‘ena fishermen and women that fish and monitor the area often, the area was a well-known juvenile fish habitat. The community had to partner with the University of Hawai‘i to perform an ecological study that confirmed community claims (Friedlander, Goodell, Schemmel, & Stamoulis, 2013). This data was later used to justify the creation of a small protected area.

Monitoring of behavior (fishing or extractive activities) is present in five of the eight cases described in Table 5.4. Although monitoring should be present in all cases, state-level capacity is hampered by low budgets for environmental management. As a result, monitoring and enforcement actions are limited in most areas. To make up for this shortfall, monitoring and enforcement is supplemented in many of these cases through community-level Makai Watch

programs. Makai Watch empowers communities to perform outreach and education activities and report incident violations to the Division of Conservation and Resource Enforcement (DOCARE), the enforcement wing for the Department of Land and Natural Resources. Although a comprehensive examination of compliance has not been conducted across Hawai‘i, there is anecdotal evidence in these communities that a community level presence deters rule infractions. A community-level presence may include signage that displays area rules and volunteers to inform resource users of the current rules and regulations. If community volunteers recognize infractions, they can engage fishermen with educational materials or report them to DOCARE. In Kahekili, Ka‘anapali Makai Watch volunteers attempt to ensure fishers are not taking any of the prohibited herbivore reef fish. Since most coral reef fisheries species exhibit relatively low mobility, many of the Ka‘anapali volunteers that frequently swim and snorkel the area were able to recognize and name individual parrotfish. Volunteers know immediately when individual fish go missing due to predation or poaching, resulting in a very high degree of behavioral and resource monitoring in this area. Miloli‘i, Ho‘okena, and Honaunau do not have an active Makai Watch program but may benefit from some type of volunteer engagement with the state in the future.

#### *H. Graduated sanctions for rule-breakers*

In the majority of management areas, graduated sanctions for resource infractions are available. In 2015, the State of Hawai‘i became just the second state in the U.S. (along with Vermont) to institute an environmental court system. The environmental court employs specialized judges with knowledge of environmental cases and instituted a civil penalty system for resource infractions. If the rules infraction is minor, the defendant may pay a small fine in lieu of a costly court appearance. Additionally, if a rules infraction is more serious, then the rule-breaker could be required to pay a large fine; perform community service in support of an environmental issue or program; or serve jail time. Informally, some communities will intercept rules violators and explain why their rule-breaking behavior is not *pono* (right or just). If community members know the violator, they may also employ shaming tactics. Whether formal only or in combination with informal interventions, graduated sanctions exist in each of these cases.

### *I. Conflict resolution mechanisms*

At this time, other than the court system, there is no formal conflict resolution present in any of the areas. There are no formal and established conflict resolution programs in place at the state level. However, informal meetings occur between DAR planners or other agency officials, which may address some disputes over rulemaking. In some instances, informal conflict resolution may exist at the community level through site-based interventions between community members. Another special type of conflict resolution is Ho‘oponopono, an indigenous conflict resolution process. However, Ho‘oponopono is dependent on willing participants and a skillful practitioner.

### *J. Rights to devise local institutions unchallenged by external groups*

In Hawai‘i, the right to devise local institutions is frequently challenged by external groups. Chapter 4 demonstrated that organized interests present a significant barrier to co-management in Hawai‘i. Since rights to organize are challenged, transaction costs become a significant barrier. Communities and their NGO partners are faced with the burden of gathering scientific information, gathering public input, and organizing at the community level (see Chapter 4). Until recently, the State of Hawai‘i has largely stayed out of co-management planning. Historically, the partnering agency for marine resources, the Division of Aquatic Resources, has been very reluctant to support any proposals where opposition is present. Recent approvals such as Hā‘ena and Kā‘upulehu (two areas met by organized resistance of varying levels) provide some evidence that DAR’s stance is changing. Yet greater state-level investments to offset local-level transaction costs or softening of the data requirements may be necessary to shorten the time from planning to implementation for co-management.

### *K. Nested enterprises*

Hawai‘i, like much of the United States, can be characterized as a polycentric governance system, with multiple, fragmented, and formally independent centers of decision making authority (V. Ostrom, Tiebout, & Warren, 1961). Although co-management and the partnerships described in this chapter involve communities of resource users and the State of Hawai‘i DAR, there are several other jurisdictions that may complicate or influence rulemaking, as evidenced in Table 5.2. At the state level, co-management regulations that fall under the jurisdiction of another state-level branch must go through a completely different public review through the

Chapter 91 rulemaking process. For instance, there is no mechanism to allow community-developed rules that prohibit boating or recreation in addition to fishing effort to enter an integrated approval process. Yet at this time, proposed boating and recreation regulations must go through a separate rulemaking process. This significantly increases the transaction costs associated with more encompassing or integrated management at the community level.

This is significant because recreational businesses have become entrenched interests with compelling claims to many ocean resources. These businesses pay taxes, employ local people, and are largely non-extractive, even if they impact ecosystems in some manner. Cumulatively however, recreational businesses may impede customary practices or interfere with the behavior of certain species like marine mammals. The Marine Mammals Protection Act protects marine mammals such as Spinner Dolphins (*Stenella longirostris longirostris*) and Humpback Whales, and the National Oceanic and Atmospheric Administration regulates any human and recreational impacts to the species. Communities in West Hawai‘i were alarmed at the increasing number of businesses bringing tourists to swim with the dolphins, which rest and sleep during the day and may be disturbed by constant interactions with tourists. Communities also believe that these tours may also affect the behavior of schooling coastal pelagic fish species, and interact with the local fishermen trying to catch these fish.

The interactions with marine mammals described above highlight just one of the many complex, interconnected issues that arise between the diverse activities of marine tour operators, the livelihoods of local communities, and the health of marine resources. Although nested enterprises exist in Hawai‘i, human values, marine resource uses, and different epistemologies often come in conflict in what may be deemed a complex environmental commons (Kauneckis & Imperial, 2007). In a complex environmental commons, fragmented, overlapping centers of authority may significantly complicate rulemaking. The fragmented nature of the commons and competing interests complicates the missions of Hawai‘i communities seeking partnerships with the state to improve stewardship.



## 5.5 DISCUSSION

Analysis of existing marine management designations, a property rights analysis, and comparison of design principles for eight different marine management designations yielded some important findings for the theory and practice of co-management. First, depending on the scope of proposed co-management rules, fragmented marine management authority may provide new opportunities for co-management or complicate implementation. Second, analysis of property rights and community fieldwork uncovered a tension between co-management and underlying community goals. Co-management devolves relatively little formal rights and some communities analyzed in this study are interested in increasing local management authority. Lastly, results of an institutional analysis of the design principles for each area revealed some important findings for both co-management implementation and common pool resource theory. This section concludes by considering some additional ways forward for co-management.

### ***5.5.1 Fragmented marine management authority and co-management implementation***

Institutional and legal analysis of legal statutes and how they are implemented may yield multiple marine management possibilities for co-management. Several marine management designations are available that may accomplish very similar community goals in co-management. On the surface, marine management designations in Hawai‘i are seemingly well defined, yet the same goals could be accomplished by two or more marine management designations. In contrast, there is little variation in terms of regulatory or permitted activities being implemented within a given designation. Thus the authorizing statutes for the different marine management designations allow for opportunistic communities to construct rules in new and creative ways. For example, statutes allow permitting authority via MLCDs and FMAs. Permits could create a de facto managed access, whereby fishers would have to complete an educational course. Permits could be issued with priority to ancestral or local residents of a given area first or grandfathered in, which has been shown to an incentive to collective action in other studies (Anderson, Arnason, & Libecap, 2011). Permits are currently used in some Hawai‘i freshwater fishing areas via Public Fishing Areas. Theoretically, permits could also be applied to marine management areas.

Although multiple pathways exist for co-management in Hawai‘i via the different management designations, fragmented authority may complicate integrated management. Institutional and legal analysis originally focused on four alternative state level management designations for co-management: FMAs, FRAs, MLCs, and NARS. Once an early draft of the decision support tool was shared with community members, they voiced a desire to address impacts outside of the marine areas. The community members viewed recognized that many of the impacts to their marine areas originate from the land, via runoff from sedimentation and agriculturally-based pollution. As a result, they felt a need to view the impacts to marine areas in a holistic manner, similar to the traditional management regime in Hawai‘i under the *ahupua‘a* system. *Ahupua‘a* were ecologically aligned, culturally appropriate, and spatially bounded areas once used by Native Hawaiians to maximize land and ocean productivity while minimizing negative impacts (Gonschor & Beamer, 2014). Many resource management entities acknowledge the effectiveness of *ahupua‘a* management or integrated management (Vaughan, Thompson, & Ayers, 2016).

To address all potential community goals and modernize *ahupua‘a* management, community members may need to work with as many as eight different agencies and an undetermined number of private sector business or landowners. All of these potential partners exert some authority via uses or property rights. The fragmented authority creates a daunting task for communities and their NGO partners seeking integrated mountain (*mauka*) to sea (*makai*) management. Thus multilateral collaboration – between communities, state and federal agencies, landowners, and private sector businesses – is needed if integrated management is to occur. The areas where integrated management is currently being implemented (for example, Waipā on Kaua‘i), are places where one land owner owns most or all of the *ahupua‘a*. In instances such as Waipā, where Kamehameha Schools owns the land, agreements are much easier to reach and transaction costs are vastly reduced due to fewer parties present in the negotiation or public process.

If community goals seek to address impacts from *mauka* to *makai* in areas with multijurisdictional authorities, then perhaps building conflict management strategies into multilateral collaborations or negotiations may be necessary (Kauneckis & Imperial, 2007). In

complex, multi-party watershed collaborations, Kauneckis and Imperial (2007) suggested multi-party collaborations are inherently conflict-filled processes and therefore collaborators needed to establish trust with one another; develop a shared definition of the problem; find mutual interests; balance power and authority; and increase the number diversity policy solutions available. Adding these strategies to manage conflict of multi-party collaborations along with implementation of conflict resolution strategies within governance regimes should help increase the likelihood of meeting the goals of integrated management.

### ***5.5.2 Tension between co-management and underlying community goals***

Similar to the findings in Chapter 2, examination of the property rights uncovered relatively limited amount of rights devolved to communities. Although communities were involved in a variety of different ways, just four of the eight areas analyzed in Table 5.2 exhibited shared management rights at the community level (also see Figure 5.1). Two of these areas were CBSFAs (Mo‘omomi and Hā‘ena), one was an FMA (Miloli‘i), with limited rules to protect traditional *opelu* (pacific mackerel scad, *Decapterus spp.*) fishing practices. The other was an MLCD (Pūpūkea-Waimea), or marine protected area. This area still allows some fishing with specific gear types within its boundaries. Regulating gear types, resource uses, and culturally important species have likely created value for all resource users. Yet exclusive rights were not devolved to communities in any of the other areas that involved community-state partnerships. Anyone entering those areas shares the same rights as their adjacent communities. Despite the relative lack of exclusive local rights and the theorized stewardship incentives that accompany them, there is still significant interest in grassroots marine resource management.

Over 20 Hawai‘i communities have reported interest in CBSFAs for the marine areas (Higuchi, 2008). As described in this chapter, 21 other communities are partnering with the state in some capacity via other marine management designations. Of the eight communities analyzed in this study and compared in Table 5.2, four of them involved in a non-CBSFA partnership with the state are actively pursuing a CBSFA. For these communities, a CBSFA designation is an expression of their cultural practices, knowledge, and stewardship. As Hā‘ena’s rules have demonstrated, it can also be a creative way to manage and limit access to their area, thus privileging local residents that are proficient in traditional harvesting practices. There is a

perception among these communities that CBSFAs are a pathway to strengthening local level rights. One Hawai'i community organizer led off community meetings with an explanation that CBSFAs were not about sovereignty or *konohiki* rights. Only later on did the organizer understand how much community efforts were intertwined with Native Hawaiian sovereignty efforts (Vaughan & Caldwell, 2015, p. 56). Erroneous or not, there is a perception among communities that a CBSFA designation will confer more rights to communities than other designations. Likewise, efforts to increase local level stewardship via CBSFAs may be embedded within a larger Hawaiian cultural renewal, resistance against U.S. occupation, and a rejection of western-based property rights that do not allow exclusive local level fisheries rights. Thus for some Hawai'i communities, a CBSFA designation may be viewed as an act of resistance to this system and a small step towards sovereignty.

### ***5.5.3 Ostrom's Design Principles and Hawai'i Co-management***

Elinor Ostrom's design principles have been used to evaluate the robustness of common pool resource governance for nearly three decades. Case studies from around the world have used this framework to guide common pool resources inquiry and there is now a significant amount of data available to evaluate how different configurations of design principles perform in different resource settings. The design principles have also been parsed from a list of eight, to eleven by Cox et al (2010) in order to disambiguate many of the elements in the original list. In light of revisions to the design principles, recent scholarship has re-examined their efficacy for effective governance of common pool resources. A group of researchers re-coded a large *N* dataset of case studies in order to test Ostrom's design principles across a variety of areas, contexts, and scales (Baggio et al., 2016). Among 69 case studies analyzed with complete data on design principles and governance outcomes, the researchers found that areas with nine or more (out of eleven total) design principles present all had successful governance regimes (Ibid). Conversely, Baggio et al (2016) also found that fisheries cases were never successful without the combination of rules that match local conditions; benefits that are proportional to inputs; accountability of those monitoring the resource; and graduated sanctions. Although these findings do not present the final word on different configurations of design principles, they provide ever-stronger evidence for certain combinations.

Five of the eight areas analyzed in this study exhibited the presence of eight design principles, with six principles present in the other three cases (Table 5.3). Monitors were accountable in five of eight areas, and graduated sanctions are present in all of them. Additionally, rules match local conditions in all of the areas. However, the benefits are not proportional to community-level inputs. In Hawai‘i co-management, communities and their NGO partners have invested significant time, effort, and resources towards co-management planning and implementation, with relatively little investment or contribution by the State of Hawai‘i (see Chapter 4). Until recently, the cost-benefit incongruence can be partly explained by a State government that was reluctant to cede any authority to or investment in communities. The lack of State Government investment notwithstanding, perhaps the biggest explanation for the imbalance between inputs and benefits has been transaction costs (see Chapter 4). Transaction costs are a large barrier to co-management implementation in Hawai‘i, but as of yet, they have not deterred communities from pursuing co-management partnerships. Depending on how benefits are defined, common pool resource theory (cost-benefit accounting) would say that resource users would not labor to change operational rules if the costs of their efforts exceed the potential returns. In Hawai‘i, this perceived imbalance (in traditional cost-benefit accounting) may in part be explained by a deep *kuleana* or responsibility to take care of their local areas. Although the benefits to these efforts may not be measured in an economic sense, clearly perceptions of increased local authority are one benefit. These efforts may have cultural and spiritual benefits, since many individuals view themselves and their ancestors as an integral component of the health of that system.

To date, the design principle most likely responsible for slowing co-management transitions in Hawai‘i has been the right to devise institutions that are not challenged by outside groups or government officials. In Hawai‘i, rights to organize and develop rules are vigorously challenged by organized interests and governments alike. This opposition occurs regardless of the marine management designation. With four or five opportunities for public comment on any rules changes, the rulemaking process itself presents challenges to local rights to organize and devise rules. Some communities have overcome this significant obstacle, but it has taken up to ten years to do so (Vaughan & Caldwell, 2015). Likewise, outside of the court system, formal conflict resolution mechanisms are absent in all eight cases analyzed.

Many of the rural communities involved in co-management planning (for example, Mo‘omomi, Miloli‘i, Hā‘ena, Ho‘okena, Honaunau) fall under the group size threshold (500-600 individuals) thought to be the upper bound for collective action in co-management (Agrawal, 2001; Agrawal & Goyal, 2001; Cinner et al., 2007). Yet with the addition of multiple stakeholder interests, that number is substantially increased. Add in the overall population size of the islands within which the co-management areas reside and planning becomes much more complicated. In addition, the island-level populations do not include tourists (that also visit and access areas) and public meeting processes substantially increase the complexity of public planning and rulemaking processes. Due to these factors, the number of relevant users or stakeholders can be exceedingly difficult to assess (on the state side) or engage (on the community side). This may be further complicated by the heterogeneity of ethnic groups, cultures, interests, and worldviews in Hawai‘i (Umemoto, 2001).

#### ***5.5.4 Additional ways forward for co-management***

Co-management is most often described as a partnership between community of resource users and a resource management agency. In Hawai‘i however, additional institutional complexity via overlapping state and federal rules and private property rights considerably complicates this arrangement. Co-management in Hawai‘i is more akin to ‘multi-party co-management’ that are typified by multiple competing interests and multi-party agreements (Brown, 2003; Pinkerton, 1994). In this way, co-management in Hawai‘i may more closely resemble watershed or large landscape partnerships present on the U.S. mainland (Imperial, 2005). In these commons situations, scholars have posited that conflict management mechanisms may be necessary to increase the likelihood of successful collaboration (Kauneckis & Imperial, 2007). In Lake Tahoe, California, regional plan development and a problem-solving coalition helped usher in collaborations that encouraged cooperation from groups that were once at odds. As a result of this process, participants were able to identify new funding sources for their work, and move away from regulatory approaches that were ineffective (Imperial & Kauneckis, 2003). Land acquisition and upland habitat restoration were two specific cooperative approaches that were effective in improving environmental quality in Lake Tahoe. Neither of these projects involved new regulation, but instead focused on creative problem solving. Perhaps cultural and ecological restoration projects could help address disputes inherent to differing perceptions of natural

resource uses, values, and ways of knowing in Hawai‘i. Cooperative approaches such as restoration projects could identify funding sources and build trust to help overcome the inertia often present in early collaborative efforts.

Given the scale of interests, institutions, and complexity present in Hawai‘i coral reef fisheries management, perhaps network governance might be an alternative or supplement to co-management (Bixler, McKinney, & Scarlett, 2016). Network governance can take a variety of forms so it is important to define and distinguish between them. For this case, I use the definition provided by Provan and Kenis (2008). They define network governance as “groups of three or more legally autonomous organizations that work together to achieve not only their own goals but also a collective goal” (Provan & Kenis, 2008, p. 3). Network governance may be necessary in situations where existing problem-solving capacity is low, collective action or collaborations may be necessary, and opportunities for mutual benefit exist (Scarlett & McKinney, 2016).

Hawai‘i marine management is hampered by low capacity (Levine & Richmond, 2015; Levine & Richmond, 2014). As described in Imperial & Kauneckis (2003), identifying mutually beneficial (win-win or at least no-lose) restoration projects among an organizational network could jump start collaboration, build trust, and help address many of the difficult capacity-related and cross-jurisdictional issues identified by communities. The decision support tool could be a starting point for communities looking to partners for these collaborations. However, network governance, like any governance solution, is not a panacea for complex common pool resource issues (E. Ostrom, 2007). For network governance – or any collaborative governance – to be successful, it must support existing institutions, find mutual interests, share power, and devise new creative solutions to complex problems (Kauneckis & Imperial, 2007).

## 5.6. CONCLUSION

Co-management has emerged as a novel natural resources governance arrangement in response to ineffective or nonexistent centralized management. Yet many early co-management transitions have been stymied by a reluctance on the part of the state or governance network to adequately cede rights or decentralize authority (Cinner, Daw, et al., 2012; Pomeroy & Berkes, 1997). For progress to be made in state-centric or multi-party co-management, there must be spaces for dialogue, communication, and learning (Plummer & Armitage, 2007). This is particularly in areas such as Hawai‘i, where local authority is vigorously challenged and government authority is rarely ceded. While communities or resource users may have longer term goals of increased management authority, working within the rules and pursuing different pathways to co-management can be a viable option for communities so long as their goals remain simple and solely focused on fisheries or marine resources. More ambitious, integrated co-management initiatives will likely require longer time commitments, collaboration across multiple government agencies and the private sector, and strategies to manage conflict in order to ensure the likelihood of a fruitful collaborative process. Even if the scope of community goals remains small and focused on fisheries, networked governance may be a viable option in Hawai‘i and other geographies with diverse and complex actors, institutions, organizations, jurisdictions, and values are present.



## **Chapter 6. Reexamining leadership in fisheries co-management**

Thus far throughout the dissertation, the chapters have utilized a number of institutional frameworks to better understand governance transitions to co-management. Previous chapters examined how rights to fisheries have changed over time (Chapter 2); the emergence of co-management governance (Chapter 3); the barriers to co-management planning and implementation (Chapter 4); and some potential alternative co-management pathways (Chapter 5). Leadership is one aspect of co-management planning and implementation that is often described to be important for planning, governance transitions, and for driving positive social-ecological outcomes. Scholars have posited that leadership may enhance trust and cooperation, help guide collective processes, and lower the costs of governance transitions. Viewed in this way, leadership could have been a continuous thread throughout this dissertation. Other chapters have referenced it or alluded to it, but it has not been explored in depth. In conducting this dissertation research, it became apparent that leadership in Hawai'i co-management deserved its own distinct chapter separate from the others. In this chapter I will take a deeper look into the role of leadership in Hawai'i co-management planning and implementation. I will examine the role of leadership in Hawai'i co-management transitions by presenting the results of semi-structured interviews ( $N=41$ ) with community members, practitioners, planners, and government employees involved in co-management. Then I will identify which leadership types are effective for co-management. I will also examine which aspects or dimensions of leadership are most important in the context of co-management planning and implementation in Hawai'i. This chapter will conclude by relating the findings back to theories about leadership in co-management and considering the significance of the findings for practice.

## 6.1 INTRODUCTION

Many societal and environmental problems such as large marine ecosystems and watersheds are exceedingly complex or exist at a scale that necessitates collaboration or collective action (Imperial, 2005; Kauneckis & Imperial, 2007; E. Ostrom, Burger, Field, Norgaard, & Policansky, 1999). The ineffectiveness of bureaucracy-based, command and control approaches in many resource settings has led to several governance innovations to increase collaboration (Parlee & Wiber, 2014). Co-management is one of the most promising collaborative governance innovations for global fisheries because it offers the possibility of adapting institutions to local contexts, enhancing rule compliance, improving stakeholder engagement, and empowering participants to participate in the regulatory process (Acheson, 2003; Carlsson & Berkes, 2005; Jentoft, 2005; Jentoft et al., 1998). Much research has examined how co-management emerges (Ayers & Kittinger, 2014; Basurto et al., 2012) and transitions or ‘transforms’ from the existing governance regime into co-management (Gelcich et al., 2010; Olsson et al., 2006; Olsson, Folke, & Hahn, 2004; Westley et al., 2011). Other research has focused on understanding the conditions associated with successful governance transformations and management outcomes (Cinner, McClanahan, et al., 2012a; Olsson et al., 2006; Pomeroy et al., 2001).

In a global review of co-managed fisheries, the presence of leadership was considered to be the largest driver of successful co-management governance (Gutierrez et al., 2011). Leadership or leaders are sometimes conceptualized as policy entrepreneurs that can anticipate windows of opportunity (Baumgartner & Jones, 2009; Kingdon, 1995). Leaders may also be conceptualized as social entrepreneurs or change agents (Purdue, 2001). There is a line of scholarship that describes leadership in terms of institutional entrepreneurs that change existing institutions (Rosen & Olsson, 2013; Westley et al., 2011). From a structural perspective, leaders are sometimes described as brokers or key individuals with access to large social networks (Bodin, Crona, & Ernstson, 2006; Bodin & Crona, 2008). Leadership is thought to lower the strategic costs associated with governance transformations (E. Ostrom et al., 1993) and is highly associated with self-organization activities (E. Ostrom, 2009), which is a precursor to collective action and institutional change (E. Ostrom, 1990). Leaders are thought to give credibility to agreements (Cudney-Bueno & Basurto, 2009), create shared thought structures (Westley &

Vredenburg, 1997), and provide access to information flows and networks of relationships (Bodin et al., 2006). In large collaborative settings such as watersheds, leaders may play different roles or multiple leaders may exist that drive processes, coordinate events, or facilitate meetings (Born & Genskow, 2001). Due to their ability to increase trust, local leaders are thought to decrease the transformation costs associated with institutional change (E. Ostrom et al., 1999). The credibility of leaders is also increased when they exhibit knowledge of resource dynamics or social-ecological systems (Berkes, Colding, et al., 2000; E. Ostrom, 2009). Leadership is often described as an essential component of successful co-management processes and outcomes (Berkes, 2009).

In summary, the academic literature on leadership in co-management and collective action describes leaders in three major categories. The first is sometimes referred to as charismatic or transformative leadership, where leaders may inspire or influence participants to act (Bass & Riggio, 2006). This form of leadership follows more a traditional leader-follower archetype. Institutional entrepreneurs, policy entrepreneurs or social entrepreneurs/change agents can be placed in this category. The second type is collaborative leadership, which is notable for its absence of a single leader. In collaborative leadership, participants take turns leading and following to reach a shared vision, goals, and decisions (Imperial et al., 2016). This type of leadership focuses more on process skills such as coordinating events, facilitating meetings, and emphasizing the credibility of processes. The third leadership category in co-management or collective action focuses on the structural or personal attributes necessary for effective leadership (Bodin et al., 2006; E. Ostrom, 2009). The attributes may include trust-building, providing access to information or possessing networks of relationships.

To define leadership in the context of co-management, I choose the broader definition offered by Evans et al. (2015) that examined the role of leadership in the environmental sciences. The authors conceived of leadership as: "...people, e.g., leaders, entrepreneurs, champions, brokers, and organizations or groups, and associated characteristics, roles, and actions that affect environmental outcomes" (Evans et al., 2015). Although there seems to be wide agreement that leadership is beneficial in much of the academic literature, leadership studies in the environmental sciences primarily focuses on the presence of leadership in one individual (Case

et al., 2015; Evans et al., 2015). This may be conceptualized as the heroic individual or ‘great man’ (Case, French, & Simpson, 2011). Scholars rarely capture the complex and evolving role of leadership in collaborative governance settings (Imperial et al., 2016). Likewise, the nuance of leadership is rarely captured in the context of social movements and collective action, which is the origin of many community-based co-management efforts (Melucci, 1996). Moreover, there is a lack of inquiry into how leadership “emerges, evolves, or practically achieves results such as knowledge building, trust-building, and conflict management” (Case et al., 2015, p. 14). Many of the same questions have plagued leadership scholarship for decades (Pfeffer, 1977).

I intend to contribute to the understanding of leadership in collaborative settings by examining a case study of co-management transitions in Hawai‘i coral reef fisheries. In Hawai‘i, an institutional pathway exists that allows communities to partner with the State of Hawai‘i to co-manage coral reef fisheries via community-based subsistence fishing areas (CBSFAs) or co-management. CBSFAs allow communities to collaborate with the State of Hawai‘i to develop rules and management plans for nearshore coral reef fisheries for the purpose of “subsistence,” or “the customary and traditional Native Hawaiian uses of renewable ocean resources for direct personal or family consumption or sharing” (Higuchi, 2008; Levine & Richmond, 2014). However, few successful co-management partnerships have emerged in the past 25 years despite enabling legislation, a set of highly motivated communities, significant NGO and foundation support, and a multitude of individuals widely identified as excellent local leaders. Outside of CBSFAs, 21 Hawai‘i communities have developed partnerships analogous to co-management outside of the defined CBSFA (co-management) pathway (see Chapter 5).

In the resilience literature, transformability refers to the ability of a complex social, ecological or economic system to ‘transform’ the existing system (Folke et al., 2010). In Hawai‘i, a transformation pathway was opened in the early 1990s when a few loosely organized communities self-organized in response to resource depletion and increasing conflict over increasingly scarce marine resources (see Chapter 3). Since then, the transformation has transitioned into an increasingly coordinated purposive social movement of about 30 Hawai‘i communities seeking a larger role in marine resource management (Berkhout et al., 2004;

Pinkerton, 1993). I will explore the role of leadership in these governance transformations and over the past 25 years and in the context of increasing coordination in this past decade.

In a review of global fisheries, Gutierrez et al (2011) found that leadership was the biggest driver of successful management. However, the study has been criticized because it coded cases based upon the presence or absence of leadership, thus removing any context from analysis. This research intends to provide greater clarity regarding the role of leadership in collaborative fisheries management at the community level through a case study of co-management transitions in the Hawaiian Islands. The three guiding research questions are:

- 1) What is the role of leadership in facilitating shared management authority in Hawai'i co-management transitions?
- 2) What types of leadership are effective in Hawai'i communities in the context of fisheries co-management?
- 3) What are the personal attributes that contribute to successful leadership in community based management?

The findings should contribute to better understanding of effective leadership in fisheries co-management and which types of leadership are more effective in collaborative resource management settings.

## **6.2 METHODS**

### ***6.2.1 Research approach***

This research utilized a qualitative approach. A total of 41 interviews were conducted over four years from 2012-2015 with individuals from fishing communities, non-governmental organizations (NGOs), foundations, state and federal governments, environmental consulting, and academia. The fieldwork was conducted in two stages. First, several key individuals were identified during informal conversations over a two year period between May 2010 and March 2012. The informal conversations informed a purposive sampling approach, whereby individuals were selected based upon their topical expertise in fisheries co-management planning across

Hawai‘i. Purposive sampling involves selecting and studying information rich cases that directly relate to the purpose of the research (Patton, 2002, p. 46). In this case, information rich cases were communities achieving some degree of success in partnering with the state of Hawai‘i to co-manage marine resources. The individuals purposefully identified for interviews included community leaders, fishermen involved in community-level rulemaking, state- and federal-level planners and administration, and NGO employees involved in Hawai‘i co-management processes. Purposive sampling is useful in case study research, where phenomena are studied in depth, in context, and other sampling methods are not appropriate or feasible (Patton, 2002). Following initial interviews, chain or network sampling was used to identify additional knowledgeable individuals until theoretical saturation was reached, in other words, no new themes or categories were noted during data collection (Bernard, 2013, p. 533). A total of 18 interviews were conducted in this first phase between March and December 2013.

The second stage of fieldwork entailed in depth interviews with 23 individuals from six communities purposively selected for the amount and quality of community involvement in co-managing nearshore marine resources with the State of Hawai‘i (see Table 6.1). Out of a possible 22 communities currently actively involved in co-managing nearshore marine resources in some capacity with the state of Hawai‘i, a total of six communities were selected for fieldwork due to the durability and quality of their relationship with the state. Put another way, their partner relationship is ongoing and has lasted several years; variation in terms of the marine management designations currently in use and the island(s) in which they are situated; and some level of social-ecological success. Early informal conversations with individuals in these communities led to identification of key informants and specialized informants with specific expertise related to durable fisheries co-management implementation across Hawai‘i (Bernard, 2013, p. 171). Similar to the first phase of fieldwork, these individuals identified additional respondents for interviews via chain or network sampling until themes collected in the interviews converged. These interviews were conducted over one year from July 2014 and June 2015. Interview questions remained the same for both stages of fieldwork.

The interview questions utilized an inductive approach. Respondents were asked to describe what leadership meant to them and which types of leadership were most effective. These

questions were asked without presenting them with any constrained choices. The responses to the questions were analyzed inductively, using a grounded theory approach (Corbin & Strauss, 2008). Next, interview respondents were asked about six different attributes or dimensions of leadership. Specifically, they were asked to describe whether they were important in the context of Hawai‘i co-management. These questions focused on the dimensions of leadership developed from a literature review of relevant academic publications describing leadership. The dimensions included: access to resources, knowledge of social-ecological resource system dynamics, trust-building capability, ability to guide collective choice processes, ability to navigate the bureaucratic and policy process; and access to networks of relationships (Born & Genskow, 2001; Chaskin, 2001; Leach & Pelkey, 2001; Olsson et al., 2006; Wondolleck & Yaffee, 2000). Full interview questions can be found in the Appendix.

**Table 6.1.** Interview respondents by sector

Phase One		Phase Two	
Interviewee sector	Total interviews	Field site	Total interviews
State government	6	Ka‘anapali/Kahekili (Maui)	10
NGO/Foundation	4	Pūpūkea-Waimea (O‘ahu)	6 (via focus group)
Community	3	‘Ahihi-Kina‘u (Maui)	4
Federal government	2	Miloli‘i, Ho‘okena, Honaunau (Hawai‘i Island)	3
Academia	2		
Consulting	1		

### 6.2.2 Data analysis

With informed consent, all interviews were audio recorded and transcribed, then analyzed using NVivo 9 qualitative data analysis software. Data analysis followed an iterative process whereby interview transcripts were first coded by question type then later by patterns and themes (Miles & Huberman, 1994). Next, responses for each leadership dimension were flagged based upon whether the respondent identified them to be important for co-management planning and implementation. Themes created during the coding were categorized and counted to provide a general idea of commonality or disparity among themes. These themes are only generalizable to

theory or theoretical propositions (Bernard & Ryan, 2009). However, findings reported from these Hawai'i case studies selected for their durable and successful partnership with the state can generate some important insights that can expand and generalize to theory (Yin, 2009) or better contextualize the role of leadership in co-management transitions. Likewise, the findings may help add context to tools such as the social-ecological systems (SES) framework (Epstein et al., 2013; E. Ostrom, 2009).

## **6.3 RESULTS**

The findings are presented below in two parts. First, some respondent quotes are presented regarding leadership and of leadership types in co-management. The interview quotes are presented along with some explanation to provide context to the raw responses. The next section, leadership dimensions, displays findings to interview questions on the various dimensions of leadership from the academic literature. The leadership dimensions section displays findings from coding based upon six leadership types deemed to be important components of leadership in the context of co-management transitions.

### ***6.3.1 Leadership and leadership types in co-management***

Many interview respondents explained that leadership was an important component of successful co-management. However, a majority of these individuals stated that co-management worked best when leadership responsibilities are shared by the group and not exclusive to just one individual. Respondents often cited the importance of process-based skills such as building capacity and support; ensuring community members are engaged, with an emphasis on outreach and developing a shared vision at the community level. Although a majority of individuals cited the importance of collective leadership, others still highlighted a more mainstream view of what most people think of when they hear leadership in the U.S. I'm calling this type of leadership 'western-based leadership' since it closely resembles the conventional leader-follower archetype. Responses in this group typically described leaders that exhibited authority and used it to influence others to follow their lead. Although community or local level leadership was the focus of this study, co-management involves a partnership between two entities: communities or user groups and the government. Several respondents noted this and described the need for leadership



in government to be successful. Below, I present some findings organized into the general themes of collective leadership, western-based leadership, and leadership in government. The quoted responses are followed with some context and a short interpretation of their meaning relative to leadership in Hawai‘i co-management transitions.

### *A. Collective leadership*

The following quote outlined many of the issues facing communities engaged in co-management planning. This individual emphasized some leadership pitfalls followed by a description of a process in which a diversity of values must be considered in order to avoid stakeholder marginalization. The individual highlighted how overreliance on one individual can be detrimental and that co-management works best when all voices are heard:

I think that you run the risk when you pin too much on individuals, you do two things: you run the risk of placing too much responsibility and dependence on an individual, which is really dangerous; and secondly, this is what I feel sort of in my na‘au, my gut: you go against the tenets of what collaborative management is about. Collaborative management, where it works, is essentially a democratic process... When the folks who would otherwise be ignored are able to raise an idea or are heard – I mean not listened to, but heard – those smallest voices resonate in a management decision making framework. Any voice. Whether it be a youth, a young fisherman, a woman, where those voices are often marginalized and disenfranchised from decision making, even traditionally are heard... by relying too much on our kūpuna or our community leaders we actually hold back what I believe – in my limited life experience – is one of the most potent aspects of co-management. This is a very unpopular opinion to have here in these islands, or in any island community. We keep trying to remind people that leadership is important but you cannot view it as a necessary condition nor can you really allow leadership voices to override fishermen – even the younger, less experienced fishermen. What we’ve seen is where leadership is focused on increasing participation and bringing a diversity of voices to the table, that’s effective. Where leadership is focused on providing its own voice and serving as a consistent voice and a source of knowledge, which essentially becoming a bottleneck, it does the opposite. It has the reverse.

This first part of this quote illustrates the risk that communities face when they allow influential, respected members within their community to do too much – even kūpuna or elders that are honored and respected across Hawai‘i. The respondent went on to describe how leadership in co-management was overvalued; that the process was the most important part. The respondent also explained how co-management planning processes are most effective when they value all voices, and not just respected elders or experienced fishermen.

Another interviewee felt that leadership was important, but not in the traditional sense that most citizens, environmental scholars, NGOs, or even community members may typically view it. In somewhat of the same vein as the previous interviewee, when asked about the importance of leadership, the person replied:

...it is. I think it absolutely is, but it's not how you typically view it. It's one leader? That won't work here. That's a big problem here in fact. And that's a big...it's been a big limiting factor, a big cause of a lot of problems...A good leader is willing to step off their platform to get a shared platform. That's true leadership. And get shared leadership with other members of the community. That to me is more important...I think what's happening in Hawai'i is people have tried to step up as almost like I'm diffusing the Western system too much. I'm the leader. And it's not, I don't think it has a chance of working. I mean, I've seen it fail two, three times in two, three communities. Leadership I think is extremely important, but they need a different word other than leadership. Collective. It's the collective that's got to be more important. And that's why you have to be willing to come around, consensus around shared objectives – and these are people who may hate each other – but if they can agree, they can you know, on these things that might help bring them together.

Similar to the first quote presented, this individual also cites how overreliance on one person or leader has been problematic in Hawai'i co-management transitions. However, this person takes a step further by describing how overreliance on one individual typically identified as a 'leader' was a major reason why two or three communities were successful. The respondent clarified the comment by introducing the concept of a collective leadership. This runs counter to how leadership may be viewed in the western sense in terms of transferring authority to one individual. Although the previous quote went into detail to describe the pitfalls of more western-based leadership and its connection to the outcomes of co-management processes, it is important to note that the distinction between western-based leadership and collective leadership is one being drawn by these interview respondents. There is a large academic literature on collaboration, collectives, and collective action that is largely 'western' in origin. To these respondents, western-based leadership may be viewed more in the traditional or bureaucratic sense in which leaders are individuals who try to influence their followers to follow their chosen or preferred path. This stands in contrast to a collective or shared leadership that emerges organically from a process that includes diverse participants and considers multiple viewpoints in order to find common ground together.

Similar to the first two respondents another individual simply explained the risk of overreliance on one individual: "...you know.... sometimes you get into a position of power and you get blinded." So there was a perception among several interviewees that overreliance on one individual could jeopardize a community process and the opportunity to solidify a partnership with the State of Hawai'i.

In terms of the how leadership can be shared effectively, one individual explained the different roles individuals played by leaders in their community:

No, we get strong leaders. But within that family, to go and talk in front of the legislature or public hearing is hard for them. Whereas that guy is already experienced and he has knowledge, it's natural to him. That's his asset, his skill, whereas yours is doing this [fishing, knowledge of marine resources]. So everybody get their place, their part.

This above quote describes how leadership tasks are delineated or shared within a community: knowledge of bureaucratic and policy processes, public speaking, and knowledge of resource dynamics. Then the individual explains how the distribution of tasks plays to the strengths of different individuals and contributes to the level of collective leadership in the community. This type of specialization allows individuals to assume the role(s) in which they are most comfortable.

In terms of leadership and institutional change, another individual described the importance of organizing a group to work collectively on changing gear-based fishing rules for an entire Hawaiian island:

When [named two elected state officials] came to [names Hawaiian Island] and they had the bright idea of closing 20% of the main island shorelines to fishing [in 2005, 2006] and that pissed me off...because they...never tried a whole bunch of conservation rules, but all they wanted to do was shut down fishing... So we made a community group. We went to the Governor's advisory council. We asked the Governor to have DLNR ban lay nets and that's how the lay net ban got started and that's how I became more active.

In this case, the individual highlighted the importance of organizing fishermen and developing a shared goal: to enhance conservation without shutting down fishing areas. Fishing is an important cultural, non-commercial, and subsistence activity for many island residents (Glazier,

Carothers, Milne, & Iwamoto, 2013; Glazier, 2006). To add some context, the process described in the above quote to ban lay gill nets on one Hawaiian Island took six years. The group pushing for institutional change had to demonstrate the number and diversity of voices behind the policy – and sustain it for nearly six years – in order to pass rules that improved stewardship.

Following the collective or group theme, another community member described the role of leadership in terms of the role of the state and community level participation:

Yeah, [the state's role should be scaled back]. I can see the whole process of it. [Another community member], he's a more diplomatic guy than I am... you got to get the people that live here to participate. And we did that. We had meetings with the community. [But] when you go approach DLNR [the resource management agency], 'okay you can have that, but it has to be this way, not how you like it. It got to be constitutional. It has to be legal.' This changed a lot.

The importance of leadership in the context of a community-driven process was apparent in this quote. However, in this person's opinion it may have been less important than an understanding of larger legal and institutional issues. Likewise, leadership and community participation may not be sufficient if the state is unwilling to cede greater co-management rulemaking authority to the community (see Chapter 2).

Several individuals explained the importance of what are described as 'brokers' in the social network literature. These are individuals that possess a large network of relationships that are beneficial for collective action and institutional change. One respondent described the importance of possessing a network of relationships in order to build trust at the community level:

I think it's critical [having a network of relationships]. That's how you build trust. Move things forward. And it's somewhat unfortunate, but in Hawai'i and I imagine all of the world, it's not really what you know, it's who you know a lot of times. And it makes a huge difference. If you go out to a community somewhere and start talking about resource management, generally you don't know shit, who the hell are you to tell us, you know, this and that, but suddenly it's like their nephew who is out there talking all about it... It's just, 'oh, yeah, no, this boy, he knows, you know, he grew up here, et cetera, et cetera.'

This quote illustrates the significance of relationships. As this quote highlights, accessing a large network of relationships may increase the credibility of individuals involved in a process and open communication lines that may lead to the collective action often necessary for co-management transitions. Also, being local matters in Hawai‘i. A meeting among locals can reference shared events and cultural norms.

### *B. Western-based leadership*

Although many individuals described the importance of collective leadership and the pitfalls of overreliance on one person to fulfill leadership needs, several interview respondents still highlighted the importance of western-based leadership. Western-based leadership may be best thought of as a person in charge that sets an agenda and uses their authority to influence or rally others to follow behind them. This type of leadership is most often focused on the individuals in leadership positions, often describing ‘strong’ leaders. One respondent highlighted this point:

Given that we don’t have mayors, given that we don’t have village councils, given that we don’t have that, what you end up with is that it’s only going to succeed if you have strong leaders at the community level that the community understands, respects, will listen to, and line up behind.

This individual shared an important perspective. The respondent described some different administrative structures that are missing at the local level in many areas of Hawai‘i. Local or municipal governments in Hawai‘i are organized at the County level through a Mayor-Council system. O‘ahu has neighborhood boards, but neighboring islands do not. Maui County includes the islands of Lāna‘i and Moloka‘i. Although these islands are small, they do not have a mayor. Municipal representation for both islands is limited to a single seat on the Maui County Council. In their view, the absence of these village or neighborhood level administrative structures has resulted in a paucity of local leadership. To this individual, leadership is about respect, leading from example, and authority. Community members will follow a leader in a position that they respect, whether their official position is formal or informal. Described in this manner, leadership to this person is more about organization and management than leadership.

Another respondent emphasized the significance of leadership at the informal level, in terms of respected local fishers. These fishers were integral to the designation of new marine management area on one island:

[Name of respected local fisher] agreed almost immediately to stop fishing there while we worked on the process of designating it. He was really supportive and because he's such a prominent figure in commercial fishing on that [side of the island] in particular, I think it was helpful having him aboard.

This quote presents the concept of key individuals leading by example. To this respondent, the behavior of a well-respected fisherman was integral to the designation of a particular area. Although this fisherman may have been important for the process, it seems that the leader in this case may have been the interviewee and not the fisher that is being described. After all, this person gained the support of the fisherman in the process.

Other respondents described leadership in terms of a visionary individual. In this vein, effective leadership is that which is focused on accomplishing a goal or ensuring an outcome is met. One interview quote indicative of this described a leader as a visionary, committed to achieving a set purpose:

But if you talk to me, the leader is usually someone with vision. He is visionary and has passion. And the leader...comes from a person having a vision and having a passion to do something for the better good. And with that, you'll have commitment, persistence, determination, all of that will fall into place with the leader, with someone that believes.

Again, this quote describes the importance of one specific individual – a man – exhibiting leadership qualities. However, it highlights a different aspect of western-based leadership, namely the role that one person can play in defining goals and a new vision for a place. Through this vision and passion, others are inspired to follow behind them. Although this version of leadership may well be significant, another respondent made an important point about relying too heavily on one individual:

Without [names noted Hawai'i community leader] – I think about this all the time – what's going to happen to [names Hawai'i community] when [leader's name] is not there anymore? Because out of the two community-based organizations that are working in partnership there, they have all said to him that he's the fishery guy. He's the marine guy. And he's responsible for anything under the sun that has to do with marine resources. So

when he's gone, what the heck are they going to do? There's nobody that's been shadowing him, there's nobody...maybe one of students he had will step into place, but I don't know. It scares the hell out of me.

Certain individuals possess skillsets that uniquely position them to be community leaders. But, as this interviewee mentioned, investing the success of a process on one individual can place community efforts and co-management processes at risk.

### *C. Leadership in government*

The individuals interviewed were asked about the role of leadership at the community level. Yet several of them asserted that co-management is a partnership and leadership was also needed in government. So in contrast – or in addition – to the collective leadership described in the previous section, the quotes in this section highlight the need for leadership in government. As important as community-level leadership may be to many of those interviewed, in theory, co-management is a partnership involving shared management authority. One respondent cited the lack of leadership at the state government agency as an impediment to co-management:

I think we could do more with what we have, but it takes leadership. And that's the key. Right now there's none so people are off doing their own little thing. There's no concerted effort to focus on various things. If we had an administrator that said "hey, Hā'ena is moving a long ways, they've got to get this going, you and you and you need to go over there and work with the community [prior to Hā'ena's CBSFA designation] and help come up with some drafts and let's move forward with creating those rules, then it would get done right? But nobody is doing that right now and as far as I can tell, there's no light at the end of tunnel, not in the near term anyway.

Even though the above quote may describe a special situation where the agency went without an administrator for nearly three years, it illustrates the importance of leadership both at the top of the agency and leadership devolved to agency employees on other islands. The individuals in these island-level offices exhibited leadership, but only because some agency-level decision-making authority had been devolved to them. Another individual brought up a similar point:

Government, especially our agency, we don't really have a real solid chain of command and levels of leadership. You know, it's basically, right now in particular, completely lax leadership [the Division of Aquatic Resources went almost three years without hiring an administrator]...So it wasn't like somebody said, all right, let's rearrange our priorities and focus in on this. It was more an internal decision on [names outer Hawaiian island] among ourselves to go this route with some support from administration.

It appears that the absence of leadership at the top of the agency may have unintentionally opened spaces for co-management via unintentional devolution of authority to island-level employees. Without specific direction from higher levels, the island-level agency officials worked with communities on their own to allow co-management initiatives to flourish in a few specific areas. While this devolution of authority to outer islands enabled some communities to be successful, it likely also prevented community partnerships and co-management transitions at a larger scale. According to one individual, a potential remedy of this may have been found in the organizational structure present in ‘Āhihi-Kīna‘u, a natural area reserve on the island of Maui. This individual explained that leadership there was needed at multiple levels:

But with the NARS, there was an advisory group and there’s a commission who was appointed by the governor. So that commission had the ability to push that department hard, hard, hard. And the advisory group to push the department hard, hard, hard. So you had two outside forces pushing the department. Without those two things going on, not a lot of things are going to happen.

Although just one individual made this statement, it suggests that leadership at multiple levels – within a government-appointed decision-making commission and a stakeholder advisory group – were instrumental in revamping the management plan for a culturally and ecologically important marine area. The government-appointed decision making commission was composed of members from across the state, including the chairperson of the DLNR. The stakeholder advisory group was comprised of individuals from multiple sectors with vested interests. This individual reported that it took all these individuals and multiple levels of leadership to secure passage of new regulations.

### ***6.3.2 Leadership Dimensions***

In addition to the importance of leadership and the effectiveness of different leadership types, respondents were also asked about specific aspects of leadership practice or leadership dimensions. These six different leadership dimensions were identified from a review of the academic literature and are thought to be integral in common pool resource settings. The dimensions included: capacity to guide collective choice processes; trust building; access to resources; access to networks of relationships; knowledge of resource dynamics; and, ability to navigate the bureaucratic and policy processes. Findings on these dimensions derived from the



literature are provided below. A summary of their responses is provided below in Table 6.2. It is important to note some variance in the findings between the first and second set of interviews. The first set of interviews interviewed key respondents knowledgeable about co-management on a macro level. Some were specific to certain communities but many were familiar with the community dynamics influencing multiple processes and outcomes. The second set of interviews focused almost entirely on community members and community-level practitioners. Perhaps due to a more macro-level view of co-management transitions, individuals from the first set of interviews were more likely to report that access to resources, access to networks of relationships, and knowledge of resource dynamics were important than those interviewed during the second set of interviews. Otherwise levels of support for the other dimensions were similar between the two sets of interviews.

#### *A. Capacity to guide collective choice processes*

Capacity to guide collective choice decision-making processes is considered to be a key component of leadership in the context of self-organization at the community level (E. Ostrom, 2009). Collective choice processes are an indication of inclusive or democratic natural resource planning processes (Olsson et al., 2006). This leadership dimension was the most frequently noted code in the transcribed interviews and was mentioned 31 times by respondents.

#### *B. Trust-building*

Trust-building is thought to be a key component of leadership in addition to overcoming conflict-ridden processes, and building consensus (Gruber, 2010). Trust-building garnered the second highest frequency of leadership dimensions, with 22 interviewee mentions.

#### *C. Access to resources*

In this study, access to resources can be defined as access to human or financial resources integral to co-management planning, collective action, and institutional change (R. S. Pomeroy et al., 2001). Interview respondents mentioned access to resources 19 times.

*D. Access to networks of relationships*

Scholars have demonstrated how access to networks of relationships, sometimes described as ‘brokers’ in the social network literature, are important to connect together various groups that may be necessary in collective action and co-management transitions (Bodin et al., 2006).

Individuals cited the importance of access to networks of resources 17 times during interviews.

*E. Knowledge of resource dynamics*

Knowledge of resource dynamics refers to an understanding of ecological processes and marine resource dynamics; this may also be called mental models of the ecosystem (E. Ostrom, 2009).

Respondents mentioned knowledge of resource dynamics 15 times during coded interviews.

*F. Ability to navigate bureaucratic and policy processes*

Ability to navigate bureaucratic and policy processes is thought to be an important part of leadership practice in co-management (Olsson, Folke, & Berkes, 2004). Understanding policy processes, including public testimony, legislative committee hearings, and the overall rulemaking process are practical skills that leaders may need in this arena (Baumgartner & Jones, 2009; Kingdon, 1995). Interview respondents described ability to navigate bureaucratic and policy processes 15 times during interviews.

**Table 6.2.** Counts of thematically coded participant responses regarding various dimensions of leadership ( $N=41$ )

Leadership dimension	Number of mentions		Total
	First set of interviews ( $N=18$ )	Second set of interviews ( $N=23$ )	
Capacity to guide collective choice processes	13	18	31
Trust-building	12	10	22
Access to resources	13	6	19
Access to networks of relationships	12	5	17
Knowledge of resource dynamics	10	5	15
Navigating the bureaucracy and policy process	6	9	15

## 6.4 DISCUSSION

With the advent of the social-ecological system framework (E. Ostrom, 2007, 2009), documentation of conditions associated with success (Cinner, McClanahan, et al., 2012a; Pomeroy et al., 2001), and meta analyses that have examined the importance of multiple variables in co-management regimes around the world (Gutierrez et al., 2011), leadership has emerged as an increasingly salient variable associated with success. However, much scholarship describing leadership operates under the assumption that leadership is well understood. Likewise, there is a lack of understanding about which leadership types are most effective for co-management, which types of leadership practice or competencies are essential, or how leadership functions in different cultural and sociopolitical settings (Evans et al., 2015). This study attempted to address some of these deficiencies by examining the importance of leadership, which types of leadership are effective, and by asking practitioners, managers, planners, and community members to describe the significance of various leadership dimensions. The implications of these findings are considered in the remainder of this section. First the findings on leadership types and co-management are presented. Then, the leadership dimensions are considered in the context of co-management planning and implementation. This section concludes by considering the overall importance of leadership in collective action and co-management transitions.

### *6.4.1 Leadership types and co-management*

Nearly all respondents stated that leadership was necessary for co-management to be effective. However, this case study emphasizes some important nuance in the role of leadership in co-management transitions. A majority of individuals interviewed described the need for collective leadership. This type of leadership puts the group ahead of the individual, with leadership being shared among multiple individuals. Several others, although not as many, highlighted the importance of western-based leadership. This is more akin to what most of the environmental sciences literature describes when considering leadership, for example, an influential individual that employs their charisma, vision, or authority to drive along a process (Evans et al., 2015). Conversely, a number of others described the need for leadership in government, at multiple levels. Since many of the barriers to co-management in Hawai'i reside within government (see

Chapter 4), it makes sense that interviewees would call for more leadership at different levels of government. Below, I consider some of the different themes that emerged from analyzing the interview quotes and assess their meaning in the context of coral reef fisheries co-management in Hawai‘i.

#### *A. Collective leadership*

A majority of interviewees reported some variation of collective leadership being the most effective type of leadership in Hawai‘i co-management. These individuals even described instances where dependence on one individual had derailed a co-management process.

Individuals describing successful co-management partnerships cited successes where collective leadership was present, where community members did not try to do too much.

This type of finding is rarely found in the co-management literature. Scholars often call for the need for strong leadership without considering that co-management may also be diffused within a collective or a group. Data gathered in this study suggest that leadership works best in Hawai‘i coral reef fisheries co-management when individuals are able to put aside their own interests in favor of a collective approach where mutual shared interests are developed. This finding is consistent with other studies on collaboration, which suggest that collaborative skills and approaches are necessary to be successful (Imperial et al., 2016).

#### *B. Western-based leadership*

Even though a majority of individuals interviewed mentioned the importance of the collective, several still conceived of leadership in terms of traditional leader-follower model. In this study, this is called western-based leadership. Despite the shortcomings of this type of leadership described in the previous section, interviewees offered some reasons why western-based leadership is effective. Respondents described how the support of a single respected individual can help mobilize support behind a process. Another highlighted the need for strong, recognized community leaders that can build broad-based support. Other individuals stressed the importance of specific, influential individuals to lead by example or visionary leaders that are able to communicate a vision and rally people to get behind them.

Clearly there is value in individuals that possess and practice leadership skills. In rare instances, an individual may possess knowledge of resource dynamics, have access to resources, retain a large network of relationships, the organizing skills to build trust and initiate collective processes, and ability to navigate bureaucratic and policy processes. Even if a person possesses and practices these skills, community members may not feel as inclined to get involved and view a co-management process if it is framed as one person's pet project. Likewise, the process could collapse if that person were no longer involved. The problem with this leader-follower model for co-management is that co-management efforts must be sustained over time. What if something happens to that individual? Can the community weather the loss of their skills? That is why this type of leadership is often unsuccessful without an accompanying social movement. Western-based leadership may work for the short-term in co-management but it is more likely to lose its effectiveness over time (Doubleday, 1989; Pinkerton, 1993).

### *C. Leadership in Government*

Co-management can be conceived as an iterative, collaborative process between communities or user groups and the government (Pomeroy & Rivera-Guieb, 2006). For collaborative processes to be effective, participants on both sides must possess process-related skills (Wondolleck & Yaffee, 2000, p. 64). It stands to reason that the current staff on the government side at the resource management agency – staff with biological and ecological expertise – may lack some of the skills necessary for collaboration and co-management. According to interviewees, the leadership missing in Hawai'i co-management transitions was often related to this concept. Where leadership in government was deemed to be effective, there were individuals at multiple levels that engaged in collaborative activities with communities. For co-management to be effective, the resource management agency must develop process-related skills within their current staff as well as hire individuals with these skills when new positions come available. This will ensure that partnerships do not lag on the government side of the process.

#### **6.4.2 Leadership dimensions and co-management**

Findings from this study provided evidence for all leadership dimensions deemed important in the academic literature. Among the six leadership dimensions respondents were queried about, initiating collective choice processes received the strongest support (31/41 respondents). Trust

building was also mentioned by more than half of all interviewees (22/41). Each of the six dimensions was referenced at least 15 times, providing evidence in favor of their inclusion and importance. Most of the individuals interviewed were involved in what could be considered successful collective action and co-management transitions. Although many identified multiple leadership dimensions they felt were necessary, many also spoke in terms of what did not work. Mainly, these individuals cited a lack of collaborative skills. Similarly, some described the leadership dimensions they felt were missing either in the communities in which they live or work.

To address deficiencies in leadership practice collaboration scholars called for the development of process skills that facilitate the leadership dimensions described in this study. These process skills include conflict resolution, communication and facilitation, negotiation, participatory decision-making, and adaptive management (Gruber, 2010, p. 8; Wondolleck & Yaffee, 2000, p. 65). Since collaboration, participatory processes and decision-making, conflict, and negotiation are such a key component of co-management in this system and elsewhere, it is not surprising many of the individuals interviewed in this study highlighted some of the same skills and qualities. No single leadership dimension was mentioned less than 15 times or more than 31 times, perhaps emphasizing the importance of multiple skills needed for effective leadership practice. A focus on practical skill development through workshops or outreach courses could help build leadership practice in Hawai‘i communities. Internships or camps could assist the younger generation to build these skills. There is a strong tradition of teaching fishing skills to *keiki* (children) in Hawai‘i during *lawai‘i* (fishing) camps. If leadership is indeed as important as most respondents reported, then perhaps leadership skills building could be included in these camps. These and other creative ways that help foster leadership skills and practice should be explored for community members of all ages (Mehana Blaich Vaughan & Caldwell, 2015).

Perhaps viewing leadership dimensions as a portfolio investment strategy could help manage transaction costs and ease co-management transitions. A portfolio strategy often looks to manage risk throughout an investment portfolio. Overinvestment in the leadership dimensions practiced by one individual could expose a community or a co-management process to higher risk if interpersonal conflicts exist between them and other community members or the state. Likewise,

work, health, or family obligations could also impact a single individual's time and commitment to leadership practice. If leadership is indeed something that is practiced (Evans et al., 2015) then training and skill-building opportunities in resource management, legal and policy analysis, and networking could help develop new leaders in communities. Communities could potentially self-assess their current leadership dimensions and identify areas in which they are proficient and others where they need to build capacity. Communities could even look to outsource some leadership dimensions such as understanding of bureaucratic or policy processes to NGOs or other specialists. Viewing and practicing leadership in this way could help shorten co-management transitions in Hawai'i and elsewhere. Lastly, as demonstrated in Chapter 4, co-management transitions in Hawai'i are not happening without a core group within a community or a community organization (and potentially their NGO partners) that is willing to absorb significant transaction and transformation costs. Theoretically, leadership is thought to help lower or manage transaction costs through community-level proficiency in the leadership dimensions examined in this study (E. Ostrom et al., 1993). Proficiency in the leadership dimensions described in this study lower the time and expenditures needed to gather information as well as convey it saliently to policymakers, stakeholders, and the general public.

#### ***6.4.3 Leadership, collective action, and co-management transitions***

Similar to recent leadership scholarship, findings from this research indicate that the views of leadership, its role, and relative importance may be different than those found in much of the co-management and environmental sciences literature (Case et al., 2015; Evans et al., 2015). This could be because practitioners and others deeply involved in co-management planning were queried about leadership directly instead of coded by research teams after the fact (Gutierrez et al., 2011). Gruber, (2010) found a marked difference in the relative importance of leadership when practitioners were asked about it versus research teams in case studies of community-based natural resource management. Researchers that ask about the presence of leadership rather than the practice of leadership skills may help explain this difference. Likewise, many researchers or community members may not consider process skills to be leadership practice. Another explanation for the discrepancy is the publication bias present in the academic literature. Scientific journal articles tend to be biased towards positive results in social science or biomedical fields, particularly those with a quantitative focus; negative or null results are rarely

published (Franco, Malhotra, & Simonovits, 2014). Although there is no evidence at this time, it is possible that authors did not publish instances where strong leadership was present but co-management transitions were not successful. In these cases, the focus of the study may instead be institutional barriers rather than the absence of collective leadership practice.

Although more critical views of leadership discourse may suggest leadership is described in excessively positive frames (Case et al., 2015), interview data gathered and analyzed in this study provides evidence that leadership is indeed worthy of a positive narrative and important for collective action and co-management transitions – just important in a manner not often explicitly described in the published literature. Some recent leadership scholarship has highlighted the importance of collaborative leadership (Evans et al., 2015; Imperial et al., 2016), but other studies have defined the specific dimensions of leadership practice while leaving the term leadership unqualified and nebulous for other to disentangle. Future case studies examining leadership in some capacity should describe the leadership type present and ideally, the types of leadership dimensions. This would ease coding in meta-analyses that could eventually parse out, quantitatively, which types of leadership and which leadership dimensions are most important in certain resource systems and contexts.

## **6.5 CONCLUSION**

Common pool resources such as fisheries remain challenging to manage effectively, but innovations such as co-management have demonstrated great promise where centralized management is ineffective. Leadership is considered to be a fundamental component of successful co-management and affecting institutional change, but its role in improving co-management outcomes is not well understood. This study provides evidence that collective leadership and leadership practice that emphasizes process skills may be more reliable and effective than other leadership types for co-management transitions. In order to improve leadership practice, investments should be made to develop and improve leadership skills and practice in both communities and in the government. Future scholarship examining leadership should be careful to include more nuance by displaying a better understanding of leadership



dimensions and concepts to develop a more thorough understanding of leadership and its role in improving environmental management.

## Appendix 6A: Interview questions

1. **(Leadership, collective action)** Who helped to lead the community through this process? What strategies were employed by this leader(s)?  
If yes, who were they and what sort of things did they do to lead and motivate the community to come together? Could the community have made it this far in the process/completed the process without this leader(s)? Why or why not? Can you highlight the qualities that compel you to identify this individual as a leader?
2. **(Trust)** Were the leader/leaders able to increase the community's trust in:
  - a) the community?
  - b) the community organization or group?
  - c) The process?
  - d) What about trust in working with the government or other organizations, if they assisted towards the designation?
  - e) What about government trust in the community?
3. **(Understanding of the resource)** How well did the leader(s) understand the ecology/environment in your area? How well did they understand of community dynamics? How did this help the community to develop a process that would benefit both people and their resources?
4. **(Access to resources, network)** Did this leader or these leaders have relationships outside the community that helped support the community through the process? Did the leader(s) have access to financial support or have relationships with those with financial resources (e.g., *to perform scientific studies, hold community meetings and events, and travel to meet with, testify, and lobby legislators*)?

## **Chapter 7.** *Improving ocean governance*

### **7.1 INTRODUCTION**

This dissertation research merged multiple theoretical frameworks to examine the key factors affecting collaborative coral reef fisheries management emergence and evolution over time. The purpose of this dissertation research has been to investigate and better understand the practical and theoretical issues associated with co-management governance transitions via an embedded case study approach in the main Hawaiian Islands. The mixed methods approach allowed multiple data sources and theoretical frameworks to complement one another and triangulate research findings.

#### ***7.1.1 Summary of dissertation chapters***

Chapter 2 sought to examine how rights to manage and administrative structure have changed from Hawaiian Kingdom times to present day. This chapter compared three resource management regimes across two time periods in Hawai‘i. During the first time period, I examined historical marine tenure. In the second time period, I analyzed two contemporary management regimes: centralized management at the state level and shared management authority via co-management. Chapter 3 examined which events drove co-management emergence as an alternative management paradigm across the state by drawing upon examples from three Hawai‘i co-management processes. Chapter 4 characterized the barriers faced by communities and government partners at different stages of the policy process over the past twenty years. This chapter also described which transaction costs were incurred by co-management partners at different stages of the policy process. Chapter 5 examined the possibility of co-management alternatives outside of the typical co-management pathway by analyzing legal statutes and administrative rules in areas where communities were significantly involved. This chapter also analyzed eight different marine management cases using Ostrom’s design principles and a property rights framework. Chapter 6 investigated the role of leadership in co-management transitions, by investigating the effectiveness of different leadership types and dimensions of leadership practice across Hawai‘i.

The research described in the chapters above was driven by five general research questions, each of which was addressed in its own chapter. The major findings of these chapters are presented in the sections below.

### ***7.1.2 Who has the right to manage? Distribution of property rights affects equity and power dynamics in co-management***

This chapter was driven by the question: How have the rules hierarchy and property rights for small-scale fisheries in Hawai‘i changed over time in Hawai‘i, and given the historical change in these institutions, what limitations and opportunities exist for incorporating rights-based approaches in co-management? The findings from this chapter indicate that administrative complexity has persisted throughout two centuries of social and political turmoil and institutional change. However, local level property rights for marine resources have changed significantly. Property rights and resource management decisions once devolved to the local or ahupua‘a level are now mostly concentrated in an administrative bureaucracy, even in co-management. The concentration of property rights in a centralized bureaucracy has coincided with coral reef ecosystem declines across Hawai‘i. This chapter demonstrates the importance of increasing participation in resource management and devolving rights to the local level, where appropriate, to improve coral reef fisheries management. The findings from the Hawaiian Kingdom time period are consistent with recent social-ecological systems research that discovered that many successful coral reef management regimes (areas with higher biomass than predicted) were found to have strong local property rights, greater participation in management, and a higher dependence on resources (Cinner et al., 2016). Although coral reef ecosystems across the main Hawaiian Islands may be degraded up to 50% compared to pristine areas, many communities across Hawai‘i view elements of the past as a viable path forward for their adjacent marine areas.

### ***7.1.3 Emergence of co-management governance for Hawai‘i coral reefs***

This chapter examined the question: How does co-management emerge at the community-level in Hawai‘i? Findings from multiple methods of inquiry pointed to social-ecological drivers that led to the emergence of co-management at the community level. Resource depletion in marine areas adjacent to subsistence fishing communities resulted in disputes and protracted conflict over harvesting and access rights. This conflict drove community members to self-organize,

build consensus on actionable objectives, and collectively act to pursue institutional change via co-management. Understanding the creation story behind co-management transitions like this case in Hawai‘i may help uncover how planning processes affect social-ecological outcomes.

#### ***7.1.4 Making the Transition to Co-Management Governance Arrangements in Hawai‘i: A Framework for Understanding Transaction and Transformation Costs***

This chapter focused on the question: What are the barriers to implementation when communities attempt to change institutions and authority from a centralized bureaucracy? This chapter revealed four general barriers faced during co-management transitions in Hawai‘i, which were further supported by an institutional analysis of transaction and transformation costs. The framework can help communities and government partners to anticipate and plan for which costs occur at different stages of the policy process, from planning through policy design, implementation, and evaluation. The analysis revealed that communities and their NGO partners have absorbed most of the transaction costs in Hawai‘i co-management with little tangible benefits. This goes against theories of institutional change that state resource users will not work to change rules if the costs exceed the benefits. Many Hawai‘i communities have deep cultural, spiritual, and religious connections to place. This deep *kuleana* (responsibility or accountability) to care for their area may be why Hawai‘i communities have been willing to give up so much in time, effort, and resources with seemingly little in return.

#### ***7.1.5 Many paths, one destination: developing community guidance in state-centric co-management***

This chapter addressed the question: What types of co-management partnership opportunities exist for communities outside of the defined community-based subsistence fishing area co-management pathway? The communities and management designations examined in this study exhibited a diversity of goals for their marine areas. This chapter demonstrated the potential to pursue co-management via marine management designations other than community-based subsistence fishing areas. However, four of the eight communities analyzed in this study that are partnering with the state through these alternative designations are currently pursuing community-based subsistence fishing areas. Also, eight different areas were compared using Ostrom’s design principles and an analysis of property rights. Similar to the findings of the

property rights analysis in Chapter 2, very few rights were devolved to communities. Similar to the findings in Chapter 4, the design principles analysis uncovered that community claims to marine resources are contested by outside groups and the government, which substantially increases the transaction costs of co-management transitions.

### ***7.1.6 Reexamining leadership in fisheries co-management***

This chapter addressed the question: What is the role of leadership in co-management planning and implementation? Findings from this chapter indicated that leadership in co-management worked best when it was about the collective and less about the individual. Similarly, an overreliance on one person may place community efforts at risk or even stunt co-management transitions. Solid support was found for six leadership dimensions of practice identified to be positively associated with co-management. Since it may be rare for one individual to possess all six qualities and risky to place a co-management proposal on the shoulders of one person, this finding may signal a need to view leadership differently in the context of co-management. Leadership that emphasizes process skills may work best for co-management transitions. Developing process skills within communities may help speed up co-management transitions in Hawai‘i.

## **7.2 KEY INSIGHTS**

The specific theoretical contributions from this dissertation research from each chapter are presented below. Some of the key theoretical contributions include the administrative complexity of Hawaiian Kingdom resource governance; the planning process model for co-management emergence; a framework for understanding transaction and transformation costs; the exclusive focus of exclusion and withdrawal rights in Hawai‘i co-management, independent of community goals; and leadership as a temporally dependent portfolio strategy. These findings are described in more detail in the following sections.

### ***7.2.1 Administrative complexity of Hawaiian Kingdom resource governance***

Scholars describing Hawaiian resource management often describe the *kapu* system that existed before Kamehameha I passed away in 1819, focusing on social stratification and the stiff penalties for breaking resource rules that often included death. Likewise, much research explains how resource decisions after 1819 were left to wise resource managers or *konohiki* at the local level. However, the academic literature describing this governance system rarely acknowledges how a *konohiki* would devise operational rules to manage a fishery by making decisions in consultation with *hoa‘āina* (ahupua‘a residents) or *kilo* (master fishers) at the collective choice level or how resource coordination and trade between *ahupua‘a* might affect resource rules. Likewise, the *konohiki* position could also be tenuous and subject to changes in the larger political landscape. As political appointees, *konohiki* were accountable to both the *hoa‘āina* and the *ali‘i ‘ai ahupua‘a* (ahupua‘a-level chief) and the *ali‘i ‘ai moku* (moku or district-level chief). The findings from the institutional analysis of historical marine tenure in Chapter 2 reveal the administrative complexity and the polycentric institutional structure that was present in Hawaiian Kingdom governance.

### ***7.2.2 Planning process model for co-management emergence***

The planning process model described in Chapter 3 is a novel attempt to explain how co-management emerges at the community level. Much of the academic literature on social-ecological systems or common pool resources begin their analysis with community-level self-organization, in other words, a community has already sufficiently coordinated to begin planning for collective action. Analyzing commons or social-ecological systems in this manner ignores the drivers that precede the community-level self-organization process. The research presented in Chapter 3 is a first attempt to describe how this process unfolds. Through a simply typology, I describe how resource depletion led to conflict and eventually, self-organization, consensus-building, and collective action at the community level. Although this process may be implied in other studies, this dissertation research is novel in that it attempts to characterize the specific events in this process, using a grounded theory approach and mixed research methods.

### ***7.2.3 A framework for examining transaction and transformation costs***

Previous scholarly research has described which costs are associated with different governance arrangements (Imperial, 1999; E. Ostrom et al., 1993). Yet there is no description of which costs occur at different stages of the policy process. The framework presented in Chapter 4 provides a novel attempt to illustrate the transaction and transformation costs incurred during co-management governance transitions. Academics and practitioners can use this framework to better understand and anticipate different costs at different times. This framework could also be used to determine which costs co-management partners shared or incurred. Chapter 4 utilizes this framework to show how Hawai‘i communities and their NGO partners are subsidizing most of the costs associated with co-management transitions. This finding may help explain the co-management implementation gap that exists in this system.

### ***7.2.4 Fragmented authority complicates integrated Hawai‘i co-management***

An analysis of community-level goals for co-management uncovered as many as eight State and Federal agencies that communities may need to partner with to address these goals. The complexity of rules and fragmented management authority complicates integrated *ahupua‘a* management. Multi-party co-management or network governance may be necessary to address threats such as land-based impacts to marine resources. However, increasing the number of parties involved in co-management will likely also increase the transaction costs associated with co-management transitions.

### ***7.2.5 Collective leadership and the dimensions of leadership practice***

In the academic literature on co-management, leadership is often viewed through a traditional leader-follower frame. Viewed this way, leaders may exert their authority to rally others behind a vision. Some scholarship focuses on the desirable qualities or skills that were found to be effective (Olsson et al., 2006; Westley et al., 2013). Little scholarship views leadership in terms of a collective, where groups share leadership responsibilities and practices. Chapter 6 found support for collective leadership in Hawai‘i co-management. Likewise, support was found for all six leadership dimensions of practice found to be important in previous studies, with the strongest support for ‘capacity to guide collective choice processes.’ Many community members explained that community members played different leadership roles at different times. This



finding may suggest the need to view leadership as a portfolio. It may be rare to find a resource user or community member that possesses all six leadership dimensions, which indicates that leadership in co-management may necessitate multiple leaders, whose skills may be most useful at different times. If these dimensions are indeed important for co-management as the data in Chapter 6 suggest, then perhaps a collective leadership model may be a better lens through which to view and understand leadership in co-management.

### **7.3 PLANNING AND POLICY IMPLICATIONS**

This dissertation research raised several planning and policy implications important for co-management transitions. The most relevant of which include: devolution of management authority; sharing costs during co-management transitions; network governance for integrated co-management; process legitimacy; and developing process skills to facilitate co-management transitions. These planning and policy relevant findings are discussed below.

#### ***7.3.1 Devolution of management authority***

Institutional analysis of historical marine tenure confirmed that management authority was devolved to the local level during Hawaiian Kingdom times. In theory, co-management involves shared management authority between communities or user groups. However, in Hawai‘i co-management, communities are only allowed to devise place-based rules subject to government approval. Communities are not allowed to exclude others from entering, accessing, or harvesting in their adjacent marine areas. This is a major issue complicating co-management implementation in Hawai‘i. Communities and NGO partners have invested a tremendous amount of resources to organize, plan, and change local level resource rules.

#### ***7.3.2 Sharing costs during co-management transitions***

Much research frames co-management in terms of reducing transaction costs after initial startup costs are incurred due to increasing levels of trust, improved regulatory compliance, and sharing of management tasks. However, Hawai‘i has taken 22 years to implement just a handful of co-management areas, likely due to the significant transaction and transformation costs. Up until this point, communities and their NGO partners have seemingly contributed much more than what they have received back in terms of resource benefits. This contradicts existing theories of

institutional change which state resource users should receive benefits that are proportional to incurred costs (Basurto & Ostrom, 2009; E. Ostrom, 1990). Why do communities persist when theory says they should quit? Ethnographic and interview evidence suggest that a cultural, spiritual, and social connection may be a wellspring from which, no matter the barrier or the cost, people will continue to care for their areas. For these communities, connection to the land and sea reproduces a sense of cultural identity and provides a purpose for action that is guided by *kuleana* or a deep responsibility to care for place. Fortunately, a wellspring of dedicated community effort is available in many areas, along with strong support from foundations and NGOs. The combination of dedicated community effort and outside support help offset the asymmetric cost allocation at this time. However, not all communities may share this cultural wellspring or NGO/Foundation support. If other communities are going to be successful in partnering with the state, these uncompensated costs must be reduced or redistributed to create stronger incentives for community participation.

### ***7.3.3 Network governance for integrated co-management***

A focus group of community members identified goals for their areas that stretched beyond the purview of coral reef fisheries regulations. There was a wide recognition of the connection between land-based impacts and coral reef ecosystem health. However, multiple government agencies and private landowners may need to collaborate in order to holistically manage impacts facing coral reef ecosystems. Network governance may be one solution. In network governance, multiple parties collaborate to solve complex, shared problems that they cannot address alone. The challenge however, will be to incentivize and sustain cooperation among multiple parties until agreements and solutions can be reached (Imperial et al., 2016).

### ***7.3.4 Process legitimacy***

Data presented in this dissertation supports the notion that legitimate processes lead to successful co-management initiatives. Processes perceived to be illegitimate, such as Miloli‘i in the mid-2000s, were dominated by a few individuals, lacked widespread community support, and as a result, stalled for many years. Alternatively, processes like Hā‘ena – and more recently, Ka‘ūpūlehu – were successful because the community reached out to stakeholders and the broader community and meticulously documented their efforts. Their process has become a

roadmap for other Hawai'i communities to follow and an example of how a legitimate planning process can lead to a successful co-management initiative.

### ***7.3.5 Developing process skills to facilitate co-management transitions***

The findings from Chapter 6 indicated that leadership in co-management may be best viewed collective in order to manage risk from overinvesting in one person, facilitate wider community involvement, and to identify areas for leadership skill development. Co-management may be best viewed as a collaborative planning process where process skills such as negotiation, mediation, conflict resolution, and participatory decision-making may be most useful. Investments in building these skills or even determining if certain skills could be outsourced to NGO partners could enhance leadership within communities and the government to better facilitate co-management transitions.

## **7.4 RESEARCH LIMITATIONS**

Like most scholarly research, this dissertation has its limitations, the biggest of which include the generalizability of research findings and the lack of outcome data to measure co-management transitions. These two issues are examined in greater detail below.

### ***7.4.1 Generalizability of research findings***

The snowball or network sampling approach employed in this research to identify individuals for semi-structured interviews is not statistically representative. Similarly, its findings may not necessarily be generalizable to other contexts, but are consistent with existing propositions in dealing with open access property regimes. However, a statistically significant sampling protocol that treated all respondents equally would have run the risk of omitting some information rich perspectives, including other individuals whose perspectives may not have been as valuable. Moreover, good qualitative or mixed method research is not concerned with representativeness; instead it is concerned with increasing its analytical power and overall persuasiveness (Creswell & Clark, 2007; Guba & Lincoln, 1994). An unrelated but also important issue with small-N comparative case study research is the method for dealing with rival explanations or

counterfactuals. Each of the chapters could have devoted more time to address rival explanations that challenge or run counter to the research findings.

#### ***7.4.2 Lack of outcome data to measure co-management transitions***

This dissertation research was conducted over four years from 2012-2015. Since most of the co-management areas across Hawai‘i are still in the planning stages or early in their transition to co-management, this research approach was limited to formative (process-based) assessments. For the co-management areas early in their transition, the biological or ecological data was either unavailable or it was too early to definitively examine management impacts. So, most of this research examined the rules governing resources, which rights were shared, or the administrative hierarchy, without being able to assess their attendant social-ecological effects.

### **7.5 DIRECTIONS FOR FUTURE RESEARCH**

Findings from any research may lead to as many questions as they answer. Below, I will describe what I consider to be some of the most fruitful areas of future inquiry that have emerged while conducting this dissertation research. Among them are: integrating planning theory into social-ecological systems and institutional analysis frameworks; testing the planning process model and collective leadership practice in other resource systems; and using the transaction and transformation costs framework to measure the costs associated with co-management transitions.

#### ***7.5.1 Integrating planning theory into social-ecological systems and institutional analysis frameworks***

Currently the social-ecological systems framework does not include any variables associated with planning for co-management transitions. Additional variables such as community-level consensus-building and decision making structures, level of community engagement, and procedural or process fairness could help compare the effects of different processes on governance structures and, eventually, resource outcomes.

#### ***7.5.2 Testing the planning process model and collective leadership model in other settings***

The planning process model and the collective leadership practice approach could be empirically tested in other settings, perhaps through a medium- or large-N meta-analysis (where data is

available). This could help determine if the planning process model has any explanatory power beyond the cases examined in this resource system and whether a collective leadership approach is an effective leadership strategy in co-management transitions.

### ***7.5.3 Using the transaction and transformation costs framework to measure costs of co-management transitions***

The transaction and transformation costs framework could be used to: a) assess how costs are shared by different partners in co-management; and b) quantify the costs associated with governance transitions in different settings. Comparative work could examine how costs vary across the development spectrum or how different cost configurations affected incentives to participate throughout the policy process. Additionally, evaluative criteria (such as economic efficiency, fiscal equivalence, redistributive equity, accountability, and sustainability) could be used to assess how different cost configurations may lead to tradeoffs among these criteria.

## **7.6 CONCLUSION**

This dissertation research attempted to answer some broad questions associated with transitions to co-management in Hawai‘i. Different analytical methods and theoretical frameworks were combined to increase its analytical and explanatory power and overall persuasiveness. This research has shown the role of history in shaping contemporary co-management solutions in Hawai‘i. Specifically, the administrative complexity and coordination present during Hawaiian Kingdom fisheries governance may be surprising to scholars unfamiliar with the Institutional Analysis and Design Framework. Contemporary co-management strategies could be improved by employing many broad principles uncovered during historical marine tenure, including devolving decision making to the local level, and increasing coordination but still allowing for multiple, overlapping centers of authority. This research also developed a planning process model for co-management emergence, which describes the drivers for emergence and the social responses through a linked typology. The nature of the social responses – self-organization, consensus-building, collective action – only account for emergence at the community level. More planning, collaboration, and design must still occur for a co-management transition to be

complete. Thus it is important for communities and their state partners to be realistic about the lengthy timelines that accompany co-management transitions. Two of the most significant factors contributing to lengthier timelines during co-management transitions are transaction and transformation costs. Many of these costs occur throughout the policy process and extend through implementation and evaluation. Many public policy proposals do not adequately consider or forecast implementation costs, which may further stall co-management transitions. Although there has been much scholarly attention devoted to community-based subsistence fishing areas as co-management pathways in Hawai‘i, less attention has been focused on multi-party co-management or network governance to accomplish integrated *ahupua‘a* management. These fragmented authority present in Hawai‘i highlight the need for greater collaboration across government and private landowners to enhance co-management transitions.

Analysis of the rights sought by communities pursuing co-management across all co-management areas examined in this study reveals that relatively little authority is currently being devolved to Hawai‘i communities. Exploration of leadership across all cases examined in this study indicates that co-management may require a different leadership paradigm. In Hawai‘i co-management, effective leadership is about the group, not the individual. Similarly, solid support for six different leadership dimensions shows that it would be exceedingly difficult for one individual to be proficient in all of these dimensions simultaneously. This finding backs up an alternative leadership strategy that shares authority among the group and focuses on process skills. Developing a collective leadership portfolio may help shelter a community from the risk of overinvesting in one person and could help identify points of weakness to improve upon.

Independent of any theoretical contribution, I hope that the findings presented in this dissertation have some practical value to practitioners, community members, and government planners or managers, particularly in easing co-management transitions that hold much promise to improve social-ecological outcomes.

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