



Bridging for Better Conservation Fit in Indonesia's Coastal-Marine Systems

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Efforts to improve the fit between conservation initiatives (e.g., marine protected areas, no-take zones) and the dynamic social dimensions of coastal-marine systems remain underdeveloped. We empirically illustrate here how opportunities to enhance “conservation fit” are influenced by bridging organizations that serve to (1) better align conservation initiatives with characteristics of the social context that influence conservation outcomes (e.g., institutions, culture, values, local practice), (2) foster coordinated and adaptive approaches to conservation that are reflective of multiple perspectives and knowledge, and (3) better connect people and conservation actions across jurisdictional and geographical boundaries. Qualitative methods were used in this research, including semi-structured interviews, observation of key events and meetings, and literature review. We draw from three coastal-marine conservation cases in Bali, Indonesia, that exemplify different approaches to bridging for conservation fit: the Bali MPA Network, the Nusa Penida MPA, and the East Buleleng Conservation Zone. Our synthesis of these cases identifies different strategies used by bridging organizations to deal with conservation fit issues, including their capacity to integrate actors and perspectives using flexible approaches, actualize hybrid forms of decision-making, build capacity and leadership, and foster cross-scale conservation and scale-bridging social networks. We also examine the limitations of bridging organizations and offer direction for future research for coastal-marine conservation in Indonesia specifically, and the Coral Triangle region generally. More broadly, this analysis contributes new insights on emerging forms of governance designed to deliberately fit conservation initiatives to coastal-marine social-ecological systems experiencing rapid change.

Keywords: bridging organizations, conservation, Coral Triangle, fit, governance, Indonesia, marine protected area, social-ecological system

INTRODUCTION

The success of marine conservation in southeast Asia's Coral Triangle (CT) requires modes of governance that deliberately fit conservation initiatives to underlying social dimensions. Insufficient consideration of social dimensions in conservation initiatives has contributed substantially to limited progress in this regard. To this end, we investigate the issue of “conservation fit,” which we refer to here as the dynamic alignment of the governing system for conservation and

the social dimensions of a system that influence the outcomes of conservation policy and practice.

Governance is an umbrella term that refers to the “...integrated system of formal and informal rules, rule-making systems, and actor-networks at all levels of human society...” (Biermann et al., 2009, p. 4). For our purposes, governance describes the interactions of different actors and networks that formulate and implement conservation. By social dimensions we refer to the multilevel patterns of interaction between actors and organizations, their values, interests and social customs, and the processes and instruments that drive, support or constrain the practice of conservation (*sensu* Galaz et al., 2008; Meek, 2013; Epstein et al., 2015). This characterization recognizes that governance systems affect, are affected by, and are also a part of the broader suite of social dimensions that make up coastal-marine social-ecological systems.

To examine the issue of conservation fit, we focus on the role of bridging organizations, which are entities that connect social actors or groups through some form of bridging process (Crona and Parker, 2012). These organizations link actors and actions to facilitate coordinated, integrated responses in contexts where resources or capacity are limited. However, few studies have explored their role in developing, implementing and adapting conservation initiatives, or their influence on conservation outcomes (e.g., Jamal et al., 2007; Schultz and Lundholm, 2010; Jacobson and Robertson, 2012; Bodin et al., 2014). Building on previous work in the region (Berdej and Armitage, 2016), this paper empirically demonstrates that bridging organizations can help to better align conservation initiatives with their social context, foster appropriate processes and instruments to pursue coordinated and adaptive conservation, and better connect people and conservation actions across scales and levels. However, as this paper also shows, bridging organizations are not without their limitations, and we identify a number of constraints or barriers that require further consideration.

Our focus here is on the congruence of the governing system for conservation and the other crucial social dimensions of a system that influence overall conservation effectiveness—what we term “conservation fit.” The concept builds on critiques of conservation initiatives that point to a lack of meaningful engagement with, and integration of, social dimensions such as socioeconomic or cultural context, stakeholder relations, knowledge diversity, or the multiplicity of political scales and domains of action (see CT: Clifton, 2009; Foale et al., 2013; Fidelman et al., 2014; von Heland et al., 2014). Where there is insufficient consideration (or “poor” fit)—as in cases where new conservation policies and rules are introduced without attention to local or indigenous legacies (Majors, 2008), or where trade-offs between biodiversity conservation and development are overlooked (Foale et al., 2013), problems of ineffective and inefficient conservation often result. As such, the concept of conservation fit is a useful frame to understand why certain

conservation initiatives may not work as intended and how they might be strengthened via bridging organizations.

Enhancing conservation fit in the CT is challenging because of the immense diversity of actors and interests across geographical and jurisdictional scales, and the differing socio-political, cultural and economic contexts (e.g., Mills et al., 2010; Fidelman et al., 2012; Foale et al., 2013; von Heland et al., 2014; Cohen and Steenbergen, 2015). In Indonesia, the partial decentralization of government has afforded greater opportunity for participatory approaches in conservation, but has also contributed to political tensions between levels, governance fragmentation and conflicting government policies (Patlis, 2005; Wiadnya et al., 2011). Further, marine conservation efforts in this region are facing rapidly expanding and increasingly mobile populations, emerging markets for marine commodities, and a limited ability to enforce rules and regulations (Majors, 2008). Many scholars across the CT have stressed the importance of connecting people and conservation practice in ways that communicate knowledge and foster learning, reconcile diverse objectives and views, and which forge relations across domains and governance levels (e.g., Fidelman et al., 2012; von Heland et al., 2014; Pietri et al., 2015). However, until recently, relatively little work has explicitly investigated the influence of bridging organizations in facilitating these needs in the CT, and none has examined their role in the practice of conservation in Indonesia (see Berdej and Armitage, 2016).

In the following section, we introduce the concept of conservation fit and examine bridging organizations as an organizational strategy to foster fit. We outline three categories of conservation fit that serve to frame the analysis, and highlight their key challenges in the CT. We then present three cases from Bali, Indonesia, that illustrate the role of bridging organizations in different conservation contexts, and draw on these cases to generate insights about key strategies applied by bridging organizations to influence conservation fit. Finally, we identify a number of constraints or barriers that require further consideration, and speak to commonalities underlying successful bridging approaches that are relevant beyond the particular conservation settings we examine here, recognizing that each case reflects a slightly different social, political and ecological context.

THEORETICAL BACKGROUND

Defining the Problem of “Conservation Fit”

Our concept of “conservation fit” emerges from a broader discourse on institutional and governance fit. For example, fit has been discussed as part of institutional dimensions of global environmental change (Young, 2002; Ekstrom and Young, 2009), resilience of social-ecological systems (Folke et al., 1998/2007; Galaz et al., 2008; Epstein et al., 2015), and common pool resources (Ostrom, 2007). Much has been written on how well governing systems “fit” ecological dynamics (e.g., Folke et al., 1998/2007; Ekstrom and Young, 2009), and, more recently, on the fit between governing systems and social dynamics (e.g., Brown, 2003; Meek, 2013; Pittman et al., 2015). However, exactly what constitutes a good fit and how such fit can be achieved remains a research puzzle

Abbreviations: CI-I, Conservation International Indonesia; CT, Coral Triangle; CTC, Coral Triangle Centre; CTI-CFE, Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security; RC-I, Reef Check Indonesia.

(Ekstrom and Young, 2009; Bodin et al., 2014). In particular, limited understanding of the conditions and implications of fit for the practice of marine conservation is a gap in the literature.

Conservation initiatives should be more effective in the long-term where the governance system is aligned with, and responsive to, the complexity and dynamism of the social system (e.g., Brown, 2003; Christie et al., 2003; Christie, 2004, 2011; Shackeroff et al., 2009; Ban et al., 2013; Kittinger et al., 2014; von Heland and Clifton, 2015). Our concept of fit responds to calls for more participatory and pluralistic conservation approaches that allow for learning and adapting (Berkes, 2007; Armitage et al., 2012), clarify hard-choices and trade-offs (Hirsch et al., 2011), and which seek social legitimacy and ethical imperatives in conservation (Brechtin et al., 2003; Mascia, 2003)—all of which have been difficult to actualize in practice, as detailed below.

A “poor” fit, as mentioned, can undermine the effectiveness of conservation initiatives by resulting in inadequate understanding of contentious social issues, unintended negative consequences, missed opportunities for positive change, and an incomplete understanding of the system (Christie et al., 2003; Christie, 2011). Situations of “poor” fit (or misfit) can arise, for example, where governance underplays community norms and livelihood needs (Clifton, 2009; Ferse et al., 2010), or is unable to account for diverse worldviews and belief systems (Majors, 2008; Clifton and Majors, 2012). Alternatively, a “good” fit should contribute to the salience of conservation by generating meaningful benefits, improving perceived legitimacy and sense of ownership, and by reducing the probability of negative impacts. Positive examples include cases where conservation initiatives are hybridized with local or customary practice (Cinner and Aswani, 2007), social networks are built to connect local management to higher-level policy-making (Cohen et al., 2012), or where governance learning networks are created to bridge cultural and jurisdictional boundaries (Pietri et al., 2015).

Improved conservation fit alone may be necessary, but not sufficient for conservation success. Even where conservation initiatives are compatible with social dimensions, they may not adequately provide for ecological dimensions or “ecological fit.” Although, our focus in this paper is on social dimensions, we join other authors in affirming the importance of engaging both dimensions in the context of developing and ongoing conservation initiatives (e.g., Epstein et al., 2015). There is also no “ideal” conservation fit since social systems and the factors that influence them differ and are constantly changing. Instead, fit is a means to an end, not an end in itself. For analytical purposes, we distinguish three general categories of conservation fit associated with: (1) aligning conservation initiatives with characteristics of the social context (e.g., institutions, culture, values, local practice), (2) enabling governance processes and instruments to bring together and meaningfully engage actors, their interests, norms and knowledge to pursue coordinated and adaptive conservation, and (3) effectively linking conservation initiatives and social actors across scales and levels (Table 1). We make no claim to have

articulated all social dimensions influencing conservation policy and practice at this point. Rather, these categories are reflective of the main issues from the literature on fit theory, and which are derived from applicable cases and lessons-learned from across the CT.

Attempts to identify strategies to expand the inclusion of social dimensions in conservation in the CT have been plentiful (e.g., Lowry et al., 2009; Mills et al., 2010; Green et al., 2011; Foale et al., 2013; Weeks et al., 2014a,b; Berdej and Armitage, 2016), and a number of relevant conceptual frameworks are proposed (e.g., Ban et al., 2013; Kittinger et al., 2014). All are useful when discussing issues of conservation fit. However, there is limited practice-based guidance on how to move from recognition of the need for greater inclusion of social dimensions to actual operationalization of best practices in different contexts. Practice-based strategies to grapple with conservation fit issues (via e.g., trade-off analysis, ecosystem-based management, integrated coastal zone management) have been slow to emerge and face a range of implementation barriers (e.g., Folke et al., 1998/2007; Christie, 2011; Hirsch et al., 2011; Kittinger et al., 2014). In the next section we introduce bridging organizations as one potential way to help actualize the conditions and processes necessary to enhance conservation fit.

Bridging Organizations for Fit

Bridging organizations can help to improve conservation fit by taking on a number of roles and responsibilities. A bridging organization, as mentioned, is defined as an entity that connects diverse actors or groups through some form of strategic bridging process (Crona and Parker, 2012). These organizations come in many shapes and sizes, as well as levels of formalization. Brown (1991) argued that bridging organizations are central players in an increasingly multi-sectoral paradigm and hold a critical role in liaising actors to solve problems that neither would have been able to solve on their own. These organizations can provide an arena for knowledge co-production, trust building, sense making, social learning, vertical, and horizontal collaboration, and conflict resolution (e.g., Hahn et al., 2006; Olsson et al., 2007; Berkes, 2009; Schultz and Lundholm, 2010; Crona and Parker, 2012). Furthermore, they can fill technical and financial gaps by linking experts and expertise across levels of society, and by mobilizing ideas, resources and leadership.

Inherent in bridging different social actors is often a need to overcome some degree of mistrust. Hence, consensus building and conflict resolution are important features in governance, but can be difficult to establish and maintain (Folke et al., 2005). Bridging organizations can facilitate depoliticized arenas that contribute to lowering institutional and cultural barriers between stakeholder groups and aligning their interests (Crona and Parker, 2012). Kowalski and Jenkins' (2015) case study on the science-policy interface of ocean management showed that bridging organization leadership coordinated collective action and resolved group issues within and among scientific and policy communities. Developing neutral space is advantageous for dealing with the ambiguity of multiple objectives, entrenched

TABLE 1 | Categories of conservation fit and their key challenges in the Coral Triangle based on literature review^(a).

Fit category	Explanation	Key challenges	CT-related references and examples ^(b)
Aligning with social context	Governance should strive to align with the dynamic socio-political, cultural and economic characteristics of the social system in shaping conservation initiatives	Identifying and integrate patterns of resource use, norms, interests, and priorities How to ensure appropriate and fair incentives for conservation (economic, social, political) How to merge existing informal/customary management systems and science-based conservation Valuing and incorporating local expertise and stakeholder/traditional knowledge systems	Cinner and Aswani, 2007; Majors, 2008; Clifton and Majors, 2012; Cohen and Steenbergen, 2015; Glaser et al., 2015
Use of appropriate governance processes and instruments	Need to foster appropriate collaborative and adaptive processes and instruments in developing, implementing and adapting conservation initiatives	Broadening meaningful stakeholder engagement and deliberation Need to foster capacity for (local) stewardship, empowered governance, and strong leadership Identifying and negotiating trade-offs btw objectives for e.g., biodiversity, fisheries, food security Platforms are needed for knowledge exchange & fostering learning networks Mechanisms are needed for conflict resolution	Cohen et al., 2012; Fidelman et al., 2012; Foale et al., 2013; Pietri et al., 2015
Linking across scales and levels	Social actors and actions for conservation should be connected, coordinated and supported across scales and levels of governance	Overcoming scale-dependency to allow for multi-lateral actions, and cross-scale/multi-level linkages Resolving jurisdictional and functional overlaps btw governance units at different levels Fostering social networks needed to e.g., leverage resources, expertise and capacities across scales and levels	Lowry et al., 2009; Mills et al., 2010; Green et al., 2011; Rosen and Olsson, 2013

^(a) This list is not intended to be inclusive of all issues of fit in the CT.

^(b) Many of the authors and examples listed here are applicable to multiple fit categories simultaneously.

conflicts, and for navigating power differentials among social actors.

Important contributors to successful conservation often include government and intermediary non-governmental organizations (NGOs), as well as local actors such as community groups, civil society organizations, and customary decision-making bodies. By building linkages to external social actors, bridging organizations help those at the local level to cross geographical and political scales in ways that would have otherwise been difficult, if not impossible. Hahn et al. (2006) showed how a bridging organization linked local actors with other levels of governments to generate legal, political and financial support in a wetlands landscape in Sweden. Through bridging, communities and others are able to gain access to non-local expertise and resources, including technical and financial resources, sources of technology, donors, and alternative trading networks (Folke et al., 2005). Such access can enable capacity building for more engaged or empowered involvement in conservation (e.g., Jamal et al., 2007).

However, the literature also suggests a need for a more sophisticated understanding of the influence of bridging organizations on social interactions and social networks for governance generally (Crona and Parker, 2012), and for conservation governance specifically (Berkes, 2007; Jacobson and Robertson, 2012). Despite an increased scholarly interest in bridging organizations, few have empirically addressed their function and implications in conservation contexts (e.g., Hahn et al., 2006; Jamal et al., 2007; Jacobson and Robertson, 2012). This investigation builds on our recent work in the region, in which we report that bridging organizations contribute in several ways to positive governance outcomes by nurturing social networks and interactive processes (Berdej and Armitage, 2016). Here, we seek to further examine their capacity to deal with issues of conservation fit. We also expand the discussion of bridging organizations to assess the different ways through which they develop, implement, and adapt conservation initiatives to fit a broad range of social dimensions associated with conservation of coastal-marine systems (e.g., cultural context, local politics, knowledge systems, multiplicity of scales and levels).

MATERIALS AND METHODS

Research Context and Sites

The Coral Triangle (CT) comprises marine waters of Indonesia, Philippines, Malaysia, Papua New Guinea, Solomon Islands, and Timor-Leste. The region is globally regarded for its extraordinary marine biodiversity (Allen, 2008) and its exceptional importance to local economies and societies (CTI Secretariat, 2009). As part of efforts to address marine resource decline, the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (CTI-CFF) was established in 2009—a collaboration among the six nations to better manage the region's coastal and marine resources. The CTI-CFF sets out a diverse set of goals for the region, from an ecosystem approach to management of fisheries to climate change adaptation. The establishment and effective management of marine protected areas (MPAs) are seen as a key conservation tool in this regard, and comprise the CTI-CFF's third goal.

Each of the CT nations has unique ecological, socio-cultural and governance arrangements for defining and establishing MPAs and other conservation initiatives. In Indonesia, the Government has committed to establish 20 million hectares (or 6.5% of territorial waters) of marine conservation area by 2020. MPAs here are declared and administered by national, provincial, and regency or municipal governments, and take on a number of forms (see White et al., 2014). In addition, there are a growing number of community-based conservation areas. Of the 15.7 million hectares of MPAs already designated, however, the majority of MPAs (>85%) offer little to no protection due to budgetary constraints, governance weakness, lack of marine management capacity, and political will (Burke et al., 2012; White et al., 2014). As stated above, these challenges are compounded by a deficit of understanding and incorporation of the social dimensions of conservation (Clifton, 2009; Foale et al., 2013; Fidelman et al., 2014; von Heland et al., 2014).

Our research focused on three cases across Bali, Indonesia (Table 2). Cases were selected based on literature review and consultations with Indonesian partners and other experts using geographic and thematic criteria of relevance (e.g., Indonesia, marine, conservation, bridging, coastal-resource management, sharing, learning). Additional details on rationale for selection of bridging organizations can be found in Berdej and Armitage (2016). The use of the term MPA in our cases refers to a type of Indonesian conservation strategy entitled “Kawasan Konservasi Perairan” (literally translated to “aquatic conservation area”), whose definition encompasses both marine and freshwater areas that are managed by a zoning system.

Data Collection and Analysis

Data was collected over eight-months in 2013–2014, with a follow-up visit in January–February 2015. A case study approach (Yin, 2003) was used and included semi-structured interviews ($n = 53$ Nusa Penida, $n = 54$ East Buleleng, $n = 20$ Bali MPA Network), participant observation of key meetings ($n = 5$) and a literature review. Interviewees included individuals from

government ($n = 17$), NGOs ($n = 12$), resource user groups ($n = 19$), other community groups ($n = 11$), traditional bodies ($n = 3$), private sector businesses ($n = 14$), universities ($n = 1$), and other ($n = 1$). Some of these organizations were affiliated with more than one study site. A combination of snowball sampling and purposive (or judgmental) sampling methods (Hay 2010) were used to identify participants. Snowball sampling is a technique whereby the current participant nominates subsequent participants (Hay, 2010). The approach is helpful to identify “hidden populations” or key individuals that might have otherwise not been known. Purposive sampling occurs where the researcher purposefully identifies individuals from the population based on her/his own knowledge and judgment.

Themes covered in interviews included basic organization details, affiliations and relationships, conservation management and implementation processes, interactions and perceptions of bridging organizations, and constraints and barriers. Interviews were conducted face-to-face in English or Bahasa Indonesia with the aid of a local research assistant. The majority of interviews were recorded by handwritten notes, given that a digital voice recorder was deemed inappropriate to the context. Key public meetings were observed related to each of the cases on the topics of marine planning and MPA socialization. A literature review was conducted to complement and validate data collected, and focused on thematic areas stated above. Documents included annual reports, policy briefs, copies of presentations and newspaper articles.

Data analysis was framed around the three conservation fit categories outlined in the previous section (Table 1). These categories were developed from a review of relevant literature on fit theory, and using applicable cases and lessons-learned from across the CT. Analysis of qualitative data from the field (including interviews, participant observation and some document collection) was carried out using an inductive approach to provide insights into emerging patterns of strategies used by bridging organizations. These findings were sorted and grouped, and then linked to one of the three conservation fit categories. We acknowledge that the use of pre-defined categories may overlook or restrict other themes. To counter this, we intentionally chose broad categories to allow for findings to emerge as unrestrained as possible from the raw data, while also linking them to the theoretical base driving the research.

This research was carried out with approval from the Office of Research Ethics at the University of Waterloo (Ethics Approval Number 17930). All participants gave verbal consent prior to conducting interviews. An information sheet explaining the purpose of the research and how data would be used was read and/or translated verbally to participants. Participants were made aware of their right to withdraw participation from research at any time.

CASE STUDIES

We introduce three cases below that are illustrative of the diverse ways bridging organizations can influence conservation fit in Bali. This section is organized by case, as opposed to fit

TABLE 2 | Study site summaries.

	Location	Type of conservation initiative	Management status	Active bridging organization(s)
Bali MPA Network	Across all regencies, Bali Province (head office in Denpasar)	MPA Network	Initiated (2011)	Conservation International Indonesia
Nusa Penida MPA	Klungkung regency	Regency-level MPA	MPA established (finalized March 2014) ^(a)	Coral Triangle Center
East Buleleng Conservation Zone	Buleleng regency (Tejakula sub-district)	Local marine management areas & regency-level MPA	LMMA established (2008–2009) MPA declared (August 2011) ^(a)	Reef Check Indonesia & The Indonesian Nature Foundation

^(a)The difference between an “established” MPA and a “declared” MPA is the state of its spatial zoning and management plans.

category, to give the reader a more holistic understanding of the conservation setting and of how bridging organizations are situated therein. Each sub-section briefly outlines the context, followed by an introduction of the bridging organization or organizations, and an overview of their roles and responsibilities. Results are synthesized according to each of the fit categories of our framework in the section that follows.

Toward a Bali MPA Network—Crossing Scales, Crossing Boundaries Context

The province of Bali is located in the westernmost end of the Lesser Sunda Islands, covers almost 565,000 hectares, and comprises the main island of Bali and a series of satellite islands. High marine biodiversity is documented in the area (Mustika et al., 2012), and important habitats include coral reefs, mangrove forests and seagrass beds. There are over four million people in the province, spread across eight administrative regencies and the capital city of Denpasar. Coastal and marine resources are a cornerstone of Bali’s economies and societies, supporting livelihoods such as fisheries, ornamental fish collection, mariculture (e.g., shrimp, fish, seaweed) and a burgeoning marine tourism industry.

Partial decentralization, as mentioned earlier, has led to fit challenges associated with poor coordination between levels of government, policy inconsistencies, and non-conformities in the licensing, policing and use of coastal-marine resources between regencies (see Patlis, 2005). The inequitable distribution of assets and access to these resources has fueled ongoing conflicts between villages, between regencies, and between sectors. Together, these have hindered efforts to address pressures from overfishing and destructive fishing practices, marine litter and nutrient run-off, and the rapid development of coastal areas and watersheds (Mustika et al., 2012). In this context, the environmental NGO Conservation International Indonesia has emerged as a key player in the movement toward coordinated, cross-scale conservation practice.

Conservation International Indonesia (CI-I)

Since 2010, Conservation International Indonesia has been a driver behind the development of a Bali MPA Network (hereafter “Network”; Indonesian: Jejaring Kawasan Konservasi

Perairan). CI-I has been active in Indonesian seascapes in general since 2004 with a mission of “building upon a strong foundation of science, partnership and field demonstration, [to empower] societies to responsibly and sustainably care for nature, our global biodiversity, for the well-being of humanity” [CI-I (Conservation International Indonesia), 2015: website]. In Bali it has taken on a number of roles and responsibilities, including: biological monitoring to inform Network design; identification and engagement of partners; coordination of activities related to Network planning; and facilitated development of a management planning document (hereafter “Blueprint”).

To initiate planning for the Network, CI-I and its partners facilitated a multi-stakeholder workshop in 2010 and together identified 25 sites across Bali for possible inclusion. Site selection was informed by some 66 representatives from government, universities, NGOs, private sector, and community and traditional leaders in attendance from across the province. Marine Rapid Assessments were then carried out by CI-I in each of the proposed sites with data collected about marine biodiversity, coral reef community structure, and current condition of coral reefs and related ecosystems (see Mustika et al., 2012). This was combined with earlier assessments (Allen and Erdman, 2008) and used to inform the evolving design of the Network. Included was the recommendation of nine of the 25 sites for priority as MPAs due to their high ecological, economic and cultural value.

The Network was formally initiated in 2013 through a memorandum of understanding signed by all ten heads of marine affairs and fisheries agencies in Bali—comprising nine regency agencies and one provincial agency. Its overall vision is “the creation of harmony and synergy between national, provincial and regency governments in Bali in the management of aquatic resources, with strong support and participation of the community and other institutions, and for the sustainable enhancement of social, economic and cultural benefits” (Gunawan and Dewantama, 2014, p. 7 translated). In practice, the Network is intended to foster cross-boundary coordination to synergistically align all aquatic-related efforts of regencies with the province, while at the same time, respecting the autonomous rights of regencies to manage programs in their territorial waters (CI-I staff, personal communication 2014).

A multi-stakeholder, multi-agency task force was established for Network planning, comprising 28 representatives from provincial and regency government (including tourism, environment, planning, and marine and fisheries agencies), existing parks and reserves, traditional councils, and NGOs (see Bali Gov. Decree, 2013). The task force is chaired by the head of the Bali Ministry of Marine Affairs and Fisheries, and network members have described the role of CI-I as project lead and coordinator. Other groups such as local governments and civil society organizations are not members of the Task Force. However, they are expected to contribute to individual working groups on policy-making, spatial planning, and funding as part of the ongoing planning process (which has yet to begin; see Gunawan and Dewantama, 2014).

The MPA Network is based on the principle of “One Island, One Management” through which Bali is viewed as a singular ecosystem comprised of terrestrial, marine and aerial space that requires integrated, cross-scale management to deal with conservation challenges. This has been described as a “...need to manage as an island instead of eight or nine separate entities within the island...[where regencies] have to sit down together to talk about general issues and the environment” (anonymous personal communication 2014). Objectives are set for ecological and social connectivity to “...braid cooperation between MPA managers in Bali for more effective, efficient, comprehensive and sustainable management and conservation” (Gunawan and Dewantama, 2014, p. 21 translated). This is a means for actors to share their experiences, lessons learned and capacities.

Three pillars inform the ideology the Network—scientific evidence, rule of law, and culture. A series of Balinese “local wisdoms” have been adopted, including: “Nyegara Gunung” (translates to “ridge to reef” that signify the integration of mountains and sea), “Tri Hita Karana” (a philosophy on sustainability emphasizing interrelation and harmony of human, God and nature), and “Sad Kerti” (six strategies to maintain the balance of nature that are comprised of soul, human, forest, lake or fresh water, sea and the universe). In practice, this translates to a fixed inclusion of local and cultural values, as well as cultural seascapes, in the design and implementation of MPAs. The inclusion of Balinese wisdoms is also intended to uniformly strengthen the “cultural sovereignty of Balinese in conservation” (CI-I staff, personal communication 2014).

To support coordination and operation of the Network, a Blueprint document was created to provide consistency in approaches and laws in the planning of aquatic areas across Bali, as well as in setting minimum standards of compliance. These guidelines are to serve in part as reference in developing protected areas (marine or terrestrial) at the level of regency, and include ecological, socio-economic and governance considerations (see Gunawan and Dewantama, 2014).

Still, there are numerous challenges facing the actualization of the Bali MPA Network. Cooperation from governments and stakeholders remains problematic given conflicting interests, high turnover of government staff that inhibits relationship-building, and a general lack of trust between groups. An NGO representative was careful to make the distinction between those organizations or agencies in the MPA Network that were “happy” to be included but rarely participate, and those

who were “enthusiastic” in moving the process forward by actively participating (local NGO rep., personal communication 2014). Many regencies still do not have dedicated staff, nor sufficient budget, for MPA planning and implementation. In addition, concern has also been raised about the possibility of conflict where the “One Island, One Management” idea could be interpreted by some as an attempt by the province to regain power over coastal-marine decision-making (national NGO rep., personal communication 2014).

Nusa Penida MPA—Pluralism and Multiple-Use in Conservation Context

The Nusa Penida MPA is located southeast of the Balinese coast comprising three islands: Lembongan, Ceningan, and Penida. Its 46,000 inhabitants are distributed across 16 administrative and 46 customary village divisions. Major livelihood activities include capture fisheries (≈850 local fishers in 40 fishers’ associations), seaweed production (≈308 ha of farms), and marine tourism (over 200,000 tourists per year; Ruchimat et al., 2013). The area is well known among divers for its large charismatic species such as the ocean sunfish (*Mola mola*) and manta ray (*Manta birostris*).

Nusa Penida is part of the Klungkung Regency, Bali Province. In addition to regency and village administrative laws, there is customary law implemented by local traditional bodies (Indonesian: *Adat*) and a Tribes’ Council (Indonesian: *Majelis Alit*). This law is focused on religious and cultural activity, but can also include rules and sanctions associated with natural resources. In Lembongan, for example, customary law forbids logging of mangroves or collection of sea sand. Other regulatory bodies on the islands include a newly formed consortium of diving businesses, and separate fishers’ and seaweed farmers’ associations through which activities are regulated socially.

Intensive utilization of coastal resources and overlapping or competing income-generating activities in a relatively small region such as the one presented here, has posed challenges to fit, and contributed to many ecosystems becoming overexploited (see Welly, 2009). These too have fueled conflicts between various user groups (e.g., tourism and fishers, tourism and seaweed farmers). Here an NGO bridging organization has taken on the central role of facilitating the region’s many stakeholders and uses in creating and managing the MPA.

The Coral Triangle Center (CTC)

The Coral Triangle Center, an Indonesian environmental NGO focused on capacity building, has been the lead facilitator of the Nusa Penida MPA since it was initiated in 2008. At the time, CTC was a subsidiary of the US-based NGO The Nature Conservancy, but became an independent foundation in 2010 and now operates in multiple sites across Indonesia. A key objective of CTC is to “...stimulate partnerships with leaders in sectors such as tourism, fisheries, agriculture, and business development, recognizing that holistic and inclusive approaches are necessary for the sustainability of coastal ecoregions and health and economy of local communities” [CTC (Coral Triangle Center), 2011, p. 2]. The major roles of CTC in the MPA include: identification and engagement of local partners; collection of

stakeholder inputs and data to inform MPA design; coordination of activities related to MPA planning; and technical advisory and training.

Preceding the declaration of the MPA, CTC coordinated a series of 33 public consultations to gather input and mutual agreement on MPA establishment—some 1200 individuals from 16 villages participated between 2009 and 2010 (CTC staff, personal communication 2014). This information would later inform MPA design. In 2010, the Nusa Penida MPA was officially declared by decree of the Head of the Klungkung Regency Government (decree no.12/2010). In an effort to better align benefits to local stakeholders with marine conservation, three objectives were established: (1) biodiversity protection, (2) sustainability of fisheries, and (3) sustainability of marine tourism. A multi-agency, multi-stakeholder working group was created and tasked with disseminating information and undertaking preparations for the MPA.

The MPA design process was informed by scientific data (biological assessments and socioeconomic surveys), policy assessments of law and regulation, and stakeholders' input. To be inclusive of the many stakeholder groups, and their interests and knowledge, CTC conducted an additional 30 public stakeholder meetings at the village and regency levels about boundaries and zoning preferences. According to CTC staff, one of its major roles is to “*bring people together*” (CTC staff, personal communication 2013)—it engaged and included stakeholders from regency (Klungkung Regency) and central governments, NGOs, community groups, tourism operators, traditional leaders, teachers, youth groups, and local fishers' and seaweed farmers' associations.

The resulting MPA zoning system consists of four maritime zones and a series sub-zones: (1) core zone for education and research purposes (469 ha), (2) sustainable fisheries zone—including traditional fisheries sub-zone (16,916 ha), temporally controlled special use sub-zone (905 ha) (see below), and seaweed farming sub-zone (464 ha), (3) utilization zone—including marine tourism sub-zone (1221 ha) and marine harbor sub-zone (35 ha), and (4) other zone—including traditional sacred sub-zone (47 ha). This zoning system integrates utilization activities and cultural perspectives alongside biodiversity conservation, and in balance.

To ensure impacts on local fishers were minimized, some 80% of MPA waters remain accessible either as prioritized fishing grounds or in multiple use zones. Existing seaweed-farming territories on each island were allocated their own zones. A desire to protect and integrate Balinese culture into planning led to the creation of a “traditional sacred zone,” which limits speedboat and tourist access in waters located adjacent to an important temple on the coast. To minimize conflicts between fishers and marine tourism operators in a number of areas along the north coasts of Nusa Penida and Nusa Lembongan, “special use zones” were created to allow temporally controlled access. Between the hours of 4 p.m. and 9 a.m. fishing is permitted in these areas, however, outside of these hours only marine tourism activities are permitted.

A pluralist management unit comprised of representatives from various actor groups was formalized in 2013 to allow

for representative decision-making, and is supported by a joint patrol team, and biophysical and socioeconomic monitoring teams facilitated by CTC. Team representatives include those from regency government, traditional village police, fishers' associations, the Indonesian Navy, the Indonesian Police Unit, local dive operators, the Tribe's Council, and associated NGOs and community groups. Joint patrols and monitoring are conducted monthly. In addition, CTC coordinates annual reef health monitoring surveys in 12 sites across the islands together with the Management Unit and local partners, and conducts community perception and engagement surveys every two years. These activities are meant to both build skills and capacity for local stewardship (via training and certification of locals by CTC), as well as foster learning that feeds back into the ongoing development of the MPA.

In addition to the aforementioned bodies, the process of MPA development has helped to connect several new social networks within different interests in Nusa Penida. For example, an association of local dive operators was founded to link businesses and self-regulate dive tourism practices through agreed codes of conduct. Likewise, a mangrove tourism association to connect local fishers arose out of CTC-led efforts to develop community-managed mangrove ecotourism. In addition, a memorandum of understanding was recently signed with the management unit of Nusa Penida MPA to enable CTC to use the area as an “MPA Learning Site” and living laboratory for learning exchanges and training visits among practitioners and sites across the CT region.

However, the MPA faces a number of new and ongoing challenges moving forward. Unsurprisingly, building stakeholder relationships is a work-in-progress. Some respondents made note of ongoing tensions between and within groups, particularly between on- and off-island fishers or tourism operators, and between snorkeler and dive operators. Both cultural and language barriers persist between some stakeholder groups. Concern has also been raised about the burgeoning tourism industry and the ability to regulate and enforce tourist carrying capacities on reefs given the number of informal and off-island operators.

East Buleleng Marine Conservation Zone—Scaling-Up Empowered Community Conservation Context

The Marine Conservation Zone resides along 26 km of coastline located in northeastern Bali. This is the province's richest area for fish diversity (Mustika et al., 2012) and includes important habitat for marine life such as whale sharks, sea turtles and dolphins. Its 54,000 inhabitants are distributed across ten administrative and 60 customary village divisions that comprise the Tejakula sub-district. Coastal communities rely on fisheries (\approx 2000 local fishers in 47 fishers' associations), the marine aquarium trade, aquaculture (shrimp, fish, seaweed) and tourism to meet subsistence and livelihood needs [DKP (Dinas Perikanan and Kelautan, Pemerintah Kabupaten Buleleng), 2015]. According to the head of the ornamental fishers association and NGO field staff, there are less than 100 ornamental fishers in the sub-district.

Tejakula is part of the Buleleng Regency, Bali Province. Similar to Nusa Penida, coastal-marine regulations here stem from regency and village administrative laws, as well as customary law. Other regulatory bodies include fishers' and ornamental fishers' associations, and community groups responsible for Locally Managed Marine Areas (LMMAs) (Indonesian: *Daerah Perlindungan Laut*). Major challenges to fit here include intra- and inter-community tensions associated with overlapping use and access. For example, the ongoing development of beachfront hotels has meant increasing exclusion of fishers and ornamental fishers from marine spaces. Local people are highly dependent on coastal-marine systems and livelihood alternatives are limited. In addition, capacity to combat environmental threats such as coral mining and pollution, as well as destructive and illegal fishing practices, is limited. Two environmental NGOs have played central, but differing, roles in supporting a transition toward community empowered conservation practice in this region: Reef Check Indonesia and the Indonesian Nature Foundation.

Reef Check Indonesia (RC-I)

Reef Check Indonesia, a chapter of a US-based environmental NGO of the same name, has been active in the Buleleng region since 2006. The NGO embodies a philosophy of “integrated coastal and marine ecosystem management to enhance the welfare of coastal communities” [RC-I (Reef Check Indonesia), 2015: website] and was founded on three pillars of activity: science and technology, collaborative management, and education and awareness. Their main office is located in south Bali, but at the time of data collection a member of RC-I staff was also housed semi-permanently in the office of the Ministry of Marine Affairs and Fisheries, Buleleng. RC-I has taken on a number of roles in the region, including: support of LMMA planning; facilitation of traditional guards; community capacity building and training; and coordination of MPA design and development.

Between 2008 and 2009, RC-I worked together with community members and local governments in developing a series of LMMAs in villages across the sub-district, with the aim to curb illegal activities and promote sustainable resource use. LMMA zoning was guided by a mix of local knowledge and scientific data collected by RC-I on coral reef health. According to staff, this involved “*sharing sessions*” held with different organizations—such as fishers' associations, traditional authorities, community groups, local NGOs and tourism operators—to better understand and integrate their interests in conservation solutions that “*accommodate collective importance*” (RC-I staff, personal communication 2014). Zoning was undertaken on a village-by-village basis and includes categories for: core zones where extraction activities are prohibited, buffer zones where limited fishing is permitted, and utilization zones where non-destructive activities are permitted.

As well as establishing LMMAs, community-based organizations were created for each, and take on the majority of responsibility to implement, manage and monitor these spaces. The head of one such organization described its purpose as helping to create a more sustainable marine environment, while at the same time educating their community and improving

community welfare (LMMA rep., personal communication 2014). In this context, RC-I has directed effort to building local capacity—it conducts training on practice and theory of marine ecology and conservation, diving skills (general and scientific), and ecological monitoring techniques (snorkeling and diving). Local fishers are taught and certified to identify and record the health of their coral reefs and fisheries, and have been actively collecting data both independently and alongside RC-I over the last 5 years (LMMA rep., personal communication 2014). Dive training has served the dual purpose of conservation and ecotourism: several LMMA organizations are also tourism dive centers.

RC-I has sought to strengthen local stewardship by inaugurating certified diver fishers into community groups called “Pecalang Segara” or “traditional guardians of the sea.” The marine-based Pecalang are an extension of the terrestrial-based traditional body (i.e., *Adat*). Following training, they are tasked with undertaking surveillance and enforcement of regulations in LMMAs. According to the head of an LMMA organization, the enacting of Pecalang strengthens the community’s “*cultural responsibility*” to protect the environment (LMMA rep., personal communication 2014).

In 2011, RC-I partnered with the Ministry of Marine Affairs and Fisheries, Buleleng to facilitate the designation of the East Buleleng Marine Conservation Zone, part of a regency-level MPA that would include the already-established LMMAs. The process of scaling-up began in 2013 through a series of public consultations at the village and sub-district levels to gather input and mutual agreement on MPA zones, boundaries, and allowable activities. In attendance were members from fishers' and ornamental fishers' associations, hotels and spas, government, local NGOs, community associations and others. A regency government official explained that MPA zones are meant to align with those in existing LMMAs so that one would strengthen the other (government rep., personal communication 2014).

At the time of data collection, substantial progress had been made in zoning, but finalization had yet to take place. The zoning system will include four categories: (1) core zone—for protection of ecosystems, traditional cultural sites, and research and education; (2) limited use zone—for tourism and recreational activities, as well as research and education; (3) sustainable fisheries zone—for non-destructive catch and cultivation of fish, tourism and recreational activities, as well as research and education; and (4) other zone—for specific purposes such as port harbors, rehabilitation of specific marine biota or traditional territories. Similar to the Nusa Penida MPA, this zoning system is meant to balance utilization activities and cultural perspectives alongside objectives for biodiversity conservation.

However, the creation of LMMAs and subsequent MPA has not been embraced or accepted by all. Numerous fishers and ornamental fishers voiced discontent about their exclusion or the extent of their exclusion from coastal areas. There is also persistent belief among some community members that the word “conservation” implies absolutely no use activities permitted. One business owner explained that it will be difficult for some fishermen to see the benefit of the MPA because they tend to think

short term, and MPA benefits will be a long-term gain (business owner, personal communication 2014).

The Indonesian Nature Foundation (LINI)

The Indonesian Nature Foundation has been active in the Buleleng Regency since 2008, with many of its staff having operated in the Regency since 2000. LINI is an NGO from south Bali with a mission to “...work with marginalized coastal communities to reverse the degradation of Indonesian coral reefs and raise awareness about responsible and sustainable marine resource use” [LINI (The Indonesian Nature Foundation), 2015: website]. It works most closely at the community level, particularly with the villages of Les and Penuktukan, to foster a sustainable marine ornamental fishery as part of wider conservation efforts. LINI subscribes to the idea that “...you cannot force people to protect the environment, [rather], you have to start by helping them with livelihoods and understanding (education)” (LINI staff, personal communication 2013). In this respect, it has taken on a number of roles, including: community capacity building and skills training on reef restoration and ornamental fishery; biological and socioeconomic data collection; identification and engagement of local partners and partnerships.

LINI has been a leader in building capacity for community-driven coral reef restoration. It trains local fishers in the production and installation of various types of artificial reef structures, including fish domes, shrimp pods, and “roti buaya” (rough logs of artificial substrate). These are made, deployed and occasionally designed by villagers themselves. With help from LINI, fishers from Les village have taken on stewardship of reef restoration in the area since 2010. As of January 2014, over 100 fish domes and 1000 shrimp pods had been installed on the reef in multiple sites in East Buleleng (ornamental fisher, personal communication 2014). These structures serve the dual purpose of encouraging coral re-growth, and providing nurseries for the marine aquarium trade to fuel local livelihoods.

Alongside reef restoration activities, LINI has sought to foster human and institutional capacity in coastal communities for a sustainable ornamental fishery, including sea and land-based aquaculture development. The gathering of ornamental fish has a rich history in the region, but it has tended to come with destructive practices such as cyanide use (e.g., Frey and Berkes, 2014). LINI delivers practical skills training about e.g., marine conservation, fish collection methods, post-harvest handling techniques, fish rearing and mariculture, and diving (general and scientific). It has assisted in the development of an ornamental fish export business by community fishers, including the building of land facilities for a fish rearing program (ornamental fisher, personal communication 2014). Construction has recently been completed on a new Aquaculture and Training Centre in Les village designed to offer skills training, research and work experience in marine conservation and aquaculture.

In addition, LINI plays an important role in collecting and distributing information across scales. It has described itself as “...a big knowledge hub, and a trafficker of information” (LINI staff, personal communication 2014). The NGO has established and maintained an extensive database on ornamental fish harvests, fisheries catches, supply chains, and aquaculture

data from the village to regional scales. As well, it has been monitoring the progress of reef restoration by recording numbers and species of fish. This information is collected by LINI staff, community members, or with other NGOs such as RC-I. LINI works with regency government on the use of such data to inform fisheries quotas in the region.

However, despite strides in the advancement of a sustainable ornamental fishery, some concerns have been raised about its long-term viability in the region. An ornamental fisher explained that many stakeholders in the area—including some local authorities and tourism operators—continue to be suspicious of the activities of ornamental fishers (ornamental fisher, personal communication 2014). It has an unfavorable image, he explained, even though methods have changed significantly. In addition, there are far fewer ornamental fishers than pelagic fishers and, subsequently, their position in the region may not be as strong.

RESULTS: CONTRIBUTIONS OF BRIDGING ORGANIZATION TO CONSERVATION FIT

Results are organized here according to the three main categories of conservation fit outlined in our framework earlier in the paper. These include: (1) aligning conservation initiatives with characteristics of the social context (e.g., institutions, culture, values, local practice), (2) facilitating governance processes and instruments to bring together and meaningfully engage actors to pursue coordinated and adaptive conservation, and (3) effectively linking conservation initiatives and social actors across scales and levels. We identify and discuss in detail the strategies used by bridging organizations to promote and sustain aspects of conservation fit, which are summarized in **Table 3**. To this end, we draw on specific examples and evidence (e.g., from interviews, document review) from the cases above, as well as surveyed responses from participants about bridging organization contributions (**Table 4**). As illustrated below, however, not every strategy was employed in every case or to the same degree.

Alignment with Social Context Integrating Actors and Interests

Bridging organizations help to identify and represent multiple social actors and their various and often divergent interests. It is widely acknowledged that the long-term success of a conservation intervention hinges in part on its integration with (local) people, and by association of their needs for livelihood and wellbeing (see Ferse et al., 2010; Glaser et al., 2015). Our cases in Nusa Penida and East Buleleng show how bridging organizations use public meetings, community consultations, and focus group discussions to identify and elicit information about the interests and resource use patterns of affected stakeholder groups. To accommodate this heterogeneity in conservation initiatives, we observed that bridging organizations exercised flexibility in design and implementation.

Indeed, all bridging organizations examined in this paper showed some degree of flexibility in their integration of multiple alternative objectives. In East Buleleng, for example, a process of

TABLE 3 | Summary of results.

Fit category	Bridging strategy	Examples of use by bridging organization(s) ^(a)
Aligning with social context	Integrating actors and interests	<ul style="list-style-type: none"> • Identification and flexible integration of diverse users and use objectives (livelihoods, culture, conservation) in conservation initiatives—via multi-use spatial and temporal zoning (CTC and RC-I, advocated by CI-I), social-ecological synergies (LINI)
	Knowledge diversity	<ul style="list-style-type: none"> • Multiple knowledge systems and perspectives informing conservation initiatives—via integrating local wisdoms and philosophies (CI-I), mixing science and culture in planning and design (CTC and RC-I), and/or utilizing experiential knowledge (LINI)
Use of appropriate governance processes and instruments	Hybridizing and inclusiveness	<ul style="list-style-type: none"> • Supported creation of pluralist governing structures—via multi-stakeholder, multi-party working groups, task forces, management units (CI-I, CTC) • Integration of customary institutions and territorial authorities in governance arrangements—via inclusion of adat, adat councils and/or Pecalang Segara (CI-I, CTC, and RC-I) • Opportunities for meaningful participation and input—via public meetings, group discussions, and/or membership on monitoring teams, patrol units, and joint committees (all)
	Capacity building	<ul style="list-style-type: none"> • Human and institutional capacity increased in resource use planning, management, monitoring and/or enforcement—via technical training, certification, practical experience (CTC, RC-I, and LINI) • Support of locally-empowered and/or decentralized leadership—via LMMAs (RC-I) and community-driven programming (LINI)
Linking across scales and levels	Connectivity	<ul style="list-style-type: none"> • New and strengthened horizontal and vertical linkages between diverse social actors (all) • Development of issue-specific sub-networks (CTC) and cross-scale learning networks (CI-I and CTC)
	Scaling	<ul style="list-style-type: none"> • Conservation initiative appropriately scaled across boundaries to foster coordinated responses—via MPA Network (CI-I) • Local initiatives scaled-up and supported from higher-levels—via nested LMMAs in regency MPA (RC-I)

^(a) CI-I, Conservation International Indonesia; CTC, Coral Triangle Center; RC-I, Reef Check Indonesia; and LINI, Indonesian Nature Foundation.

TABLE 4 | Responses for top contributions of bridging organization to marine conservation and management processes by case^{(a)(b)}.

Conservation International Indonesia	Coral Triangle Center	Reef Check Indonesia	Indonesian Nature Foundation
■ Facilitating collaboration (82%)	■ Facilitating collaboration (61%)	■ Capacity building and training (67%)	■ Capacity building and training (74%)
■ Knowledge building & learning (47%)	■ Knowledge building and learning (57%)	■ Knowledge building & learning (54%)	■ Facilitating collaboration (68%)
■ Other ^(c) (47%)	■ Education and awareness (53%)	■ Facilitating collaboration (42%)	■ Knowledge building and learning (58%)
■ Capacity building and training (23%)	■ Conflict resolution (32%)	■ Conflict resolution (33%)	■ Education and awareness (53%)
	■ Other ^(c) (32%)	■ Education and awareness (33%)	

^(a) Respondents were asked, “how does [X] bridging organization contribute to marine conservation and management processes in the [region/initiative]?”

^(b) The initial categories included here were further refined and consolidated in line with the main themes in **Table 1**.

^(c) The “other” category included contributions listed such as funding, administrative tasks, technical facilitation, creating new rules, providing checks and balances, and supplying data.

multi-use zoning was used in order to represent and integrate the different interests of social actors related to biodiversity protection, sustainable fisheries, ornamental fisheries, marine tourism and culture. A community member here explained,

I don't want to do just conservation. I want conservation for all—for people, for culture. There needs to be balanced conservation that includes nature, but also people and their needs, their culture, their recreation, and their economic status. There needs to be a balance between nature conservation and social conservation. (community member, personal communication 2014)

fishers, seaweed farmers and marine tourism activities. Other strategies, such as the utilitarian approach applied by LINI, explicitly identified synergies between social and ecological objectives. A representative of LINI stated,

Absolutely “no-take” areas are problematic. They are not feasible according to the Balinese way of living. That would mean no fisheries, no tourism. [...] In Indonesia, people have the philosophy that “nature is there for us to use.” Conservation must consider this. (LINI staff, personal communication 2014)

The CTC similarly orchestrated multi-use spatial and temporal zoning in Nusa Penida to resolve overlapping objectives between

These actions are in line with calls from across the CT for greater flexibility in conservation, where solutions seek to balance the

immediate needs of resource users with conservation or long-term sustainability agendas (see Foale et al., 2013; von Heland et al., 2014; Weeks et al., 2014a).

Knowledge Diversity

Bridging organizations help to integrate knowledge systems and perspectives from different social spheres. Scholars advocate drawing from, and combining, multiple types of knowledge to better understand the conservation context and problem (e.g., Majors, 2008; Clifton and Majors, 2012). A representative from RC-I described this process as finding the “*right mix of science and culture*” for conservation initiatives (RC-I staff, personal communication 2013). Another interviewee commented on the inseparability of the two: “*when we talk about Bali, you cannot avoid the culture...once you talk about marine, you talk about terrestrial, you talk about the people, about culture*” (CI-I staff, personal communication 2014). The incorporation of scientific and technical knowledge in our cases was achieved where bridging organizations connected to universities, local research institutes, NGO scientists, and/or managers. Each bridging organization also included its own research-oriented activities to collect scientific data: CI-I undertook marine rapid assessments, CTC carried out biophysical and socioeconomic baseline surveys, and RC-I and LINI collected data on the state of coral reef health and fisheries.

The incorporation of local and traditional knowledge in our cases was achieved where bridging organizations involved the expertise of those with long-standing ties to the area—community members, traditional leaders, resource users, teachers, etc. For example, the experience-based knowledge of ornamental fishers in East Buleleng has been used to guide the installation of some artificial reef structures, and traditional custom (i.e., *Adat*) has been incorporated and reinforced in MPA planning in Nusa Penida through the creation of a sacred zone. Likewise, “local wisdoms” such as “Tri Hita Karana” and “Nyegara Gunung” have been integrated into the Bali MPA Network so as to merge scientific ideas of conservation (e.g., ecological connectivity, social networks) with the Balinese cultural perspective (e.g., “ridge to reef” thinking, harmony between human and nature). A government official added, “*If BMN (Bali MPA Network) is applied with awig-awig (customary law), it will work very strongly because most Balinese think of the ocean and beach as sacred place*” (government rep., personal communication 2014: translated).

Facilitating Appropriate Governance Hybrids and Inclusiveness

Bridging organizations help actualize hybrid forms of decision-making that combine different sets of public, private and civil society actors. Hybrid approaches reflect recognition that many coastal-marine resources are too complex to be governed by a single social actor or agency (Berkes, 2009). One interviewee commented, “*we cannot do conservation alone. It requires a long process of negotiation and compromise between many groups of stakeholders*” (government rep., personal communication 2014). One way bridging organizations in our cases pursued inclusiveness was to support co-governance

arrangements, consisting of collaboration and interplay between diverse representatives from across sectors and scales. In Nusa Penida this took the form of a multi-stakeholder, multi-agency working group (now management unit), and in the Bali MPA Network this was expressed as a 28 member joint Task Force. Hybridizing was also pursued in merging local institutions as part of governance frameworks. In East Buleleng, for example, RC-I helped integrate aspects of customary institutions (i.e., *Adat*) with conservation governance by extending and incorporating the Pecalang Segara as traditional territorial authorities in LMMAs. This was similarly carried out in the Nusa Penida MPA.

A general consensus is that broadening meaningful participation, especially of local communities, is indispensable for the success of marine conservation in the CT and beyond (Christie et al., 2003; Mascia, 2003; Clifton, 2009; Ferse et al., 2010; Glaser et al., 2015). In expressing greater inclusion, a community member in Nusa Penida stated, “*...CTC provides a link between government and [us]. They give us a voice*” (community rep., personal communication 2014). Opportunities for stakeholder inclusion and input facilitated by bridging organizations in our cases ranged from participatory mapping of resource use, public meetings and focus group discussions on zoning, to membership on monitoring teams, patrol units, and joint committees. In practice, such opportunities become venues for discussion and debate, coordination, sharing information, mobilizing resources, and organizing training activities.

Capacity Building

Bridging organizations aid in building requisite knowledge, skills and capacity for conservation practice and governance, especially where sub-national or local governments lack the capacity (or desire) to fill gaps. Methods observed to foster (local) capacity and leadership ranged from formal to informal. Capacity building activities undertaken by RC-I in East Buleleng, for example, have enabled LMMA managers to actively participate and assume increasing responsibility for planning, implementation, ecological monitoring, and enforcement in their coastal-marine areas. The NGO described an aim of its activities to “*...broaden the roles of community members from fishers to tourism operators and reef protectors*” (RC-I staff, personal communication 2014). Enlisting resource users in data collection and analysis educates participants, builds capacity and can foster trust (Mascia, 2003).

Likewise in Nusa Penida, joint patrol and monitoring teams now perform the tasks of enforcement and data collection following facilitation and training by CTC. In describing their interactions, a representative from a local community organization stated,

CTC has provided training to us and have built our capacity to make collaborations and strengthen management. [...] We now serve as a facilitator for the socialization and communication of the MPA and work with various stakeholders about conservation issues in the context of the MPA. (community organization rep., personal communication 2014)

Some bridging organizations also advocated local leaders, and not just involvement, in conservation governance. An NGO member expressed the importance of fostering “local champions” to facilitate on-the-group relationships and build stewardship over conservation initiatives (international NGO rep., personal communication 2014). Attempts to decentralize leadership included those where bridging organizations sought to empower locally based organizations (as in the case of LMMAs) and where initiatives were managed and implemented by community members (as in the case of reef restoration). As well, the embedding of key community or traditional leaders in conservation planning and implementation teams, such as working groups, management units or patrol teams, strengthens the overall involvement and conservation leadership of community members.

Alignment of Scales Connectivity

As entities that connect others, bridging organizations convene a diversity of social actors to create and hold together scale-bridging social networks for conservation. Social networks are important to embrace diversity of perspectives and knowledge representing multiple social actors across seascapes to facilitate adaptive thinking (cf. Folke et al., 2005; Armitage et al., 2009). Through bridging efforts, horizontal linkages have been cultivated across, for example, regency government agencies (as in the case of CI-I) and community groups (as in the case of the CTC). Vertical linkages meanwhile have been fostered between, for example, communities and governments (as in the case RC-I and CTC), and between resource use associations and market actors (as in the case of LINI). Bridging organizations were also the catalyst for the formation of sub-networks of stakeholders focused on particular issues such as dive tourism and mangrove ecotourism in Nusa Penida MPA.

Some bridging organizations in our cases have worked collaboratively in the region for upwards of a decade strengthening connectivity between social actors. This is an important pre-condition for coordination, communication, and learning in conservation across the CT (see Lowry et al., 2009; Cohen et al., 2012; Pietri et al., 2015). For example, the CTC connects Nusa Penida MPA to a wider “learning network” of MPAs, which allows managers and practitioners to share knowledge and experiences between sites in the CT and beyond. Similarly, under the guidance of CI-I, a key function of the Bali MPA Network is to connect MPA managers across the province to enable the exchange of experiences and knowledge:

There are many, many NGOs and other organizations that work in Bali, and have not always coordinated. [...] The Bali MPA Network is good to share lessons. It serves as an umbrella for multiple organizations to collaborate and connect...it is about sharing knowledge. (national NGO rep., personal communication 2014)

Coordination with other stakeholders is difficult because each stakeholder has their own interest, and sometimes this leads to conflicts. BMN (Bali MPA Network) will support information exchange between each regency's DKP (Ministry of Marine Affairs and Fisheries), and conflicts caused by misunderstandings or lack

of information could be reduced. (provincial government rep., personal communication 2014)

Scaling

Bridging organizations help foster cooperation to appropriately scale conservation initiatives across geographic and governance boundaries. As urged elsewhere in the CT (Lowry et al., 2009; Green et al., 2011), bottom-up as well as top-down conservation ingenuity is needed. This is shown in the Bali MPA Network, where transboundary conservation is planned to foster coordination across provincial, regency and city units of governance, as well as across sector boundaries (tourism, environment, planning, fisheries). In explaining the challenge, one interviewee stated,

Administrative separation by regency has causes differences in managerial decisions and policies between regencies. Bali is a small island, therefore the marine area around Bali is ecologically connected [...]. This means regency management will not work without synchronization with other regencies. This is where BMN (Bali MPA Network) is needed to unite marine management systems in Bali. (NGO rep., personal communication 2014)

Here, provincial-level prescriptions are a starting point to identify spatial priorities and provide guidelines for the process of MPA design and implementation, which can be scaled-down and adjusted to accommodate local context and opportunities. Alternatively, under the guidance of RC-I, LMMAs in East Buleleng are being scaled-up and reinforced by higher-level governance units through the development of a regency-level MPA. Aligning conservation initiatives with the regency unit of governance was needed to enforce and implement rules that are beyond the reach of community sanctions, and to resolve inconsistencies and conflicts between LMMAs.

DISCUSSION: OBSERVATIONS ON BRIDGING AND STRENGTHENING CONSERVATION FIT

The cases presented in this paper illustrate that bridging organizations can and do promote and sustain aspects of better conservation fit, although with some limitations. In this regard, conservation fit is a means to an end, not an end to itself. By enacting bridging strategies that integrate actors and interests using flexible approaches, actualize hybrid forms of decision-making, build capacity and leadership, and foster cross-scale conservation and scale-bridging social networks, bridging organizations are indeed successfully enhancing aspects of conservation fit. The outputs of these efforts include conservation initiatives that are better aligned with their social contexts, which bring together and empower various public, private and civil society actors, and which better connect people and actions across scales and levels in ways that are locally beneficial.

Our findings show that not all bridging organizations made use of the same bridging strategies or did so to the same degree. In part, this is because bridging organizations and the conservation fit issues they seek to address vary with context.

Most bridging organizations have distinct identities, priorities and strengths or weaknesses that undoubtedly come into play (see Berdej and Armitage, 2016). This implies that different bridging organizations may have different niches with regards to addressing conservation fit issues. Simultaneously, issues of fit can vary by strength, complexity, urgency and/or scale. Recognizing this variation is important to understand how different bridging organizations can be engaged in different ways to address particular conservation *misfits*.

We observed that bridging organizations share a number of unique features that make them well poised to grapple with conservation fit issues. First, the organizations we studied are able to work across the political or jurisdictional, programmatic and scalar boundaries that tend to serve as organizational barriers to collaboration and information sharing elsewhere. Second, the bridging organizations examined here are positioned at the intersection of diverse actors, and so they are able to draw on broader collections of partners—and their expertise, knowledge and resources—to work together in overcoming barriers and finding common ground. Third, these organizations embody a high degree of organizational flexibility, meaning they tend not to be under the same kind of bureaucratic restrictions or silos as government actors. This allows them to be more nimble in responding to emerging issues, shift programming according to needs, and alter their roles to suit current challenges.

Our cases have also brought to light a number of new and ongoing constraints or barriers that indicate the challenges in achieving conservation fit. Social systems in the CT are invariably dynamic and heterogeneous, comprising multiple sub-groups with differing values, interests and priorities that can change and shift over time (see Fidelman et al., 2012, 2014). Bridging strategies that are successful in one place and time and with one set of stakeholders may not be successful elsewhere. By the same token, a bridging organization is subject to competing demands of various stakeholders, not all of whom have equal ability to voice concerns or exert influence. A major obstacle to fit then is overcoming power asymmetries (see also Clement, 2013). In Bali, for example, tourism is a main source of the province's revenue, creating imbalances with other sector interests such as fisheries. As well, corruption remains an ongoing issue (Fidelman et al., 2014), and curbing it is a priority if long-term conservation successes are to be achieved.

Differing ideologies and understandings of conservation pose a sizable challenge to bridging organizations in the pursuit of better fit. Social groups embody unique knowledge of marine environments, and can have differing ideas of how resources should be conserved, used, or exploited (e.g., von Heland and Clifton, 2015). A business owner in East Buleleng explained this as: “...a balance between a village life that has been established for centuries, and the rather new and fanciful idea that we need to protect reefs, which has not been understood or grasped in its entirety meaning by the local people” (business owner, personal communication 2014). The integration of differing ideologies can be difficult in the CT given an overreliance on a western conservation narrative (Berdej et al., 2015), general lack of social science data generation, and limited involvement of domestic (social science) academics (Fidelman et al., 2014;

von Heland et al., 2014). Bridging organizations may not possess comparable expertise on, for example, economic development, poverty alleviation, or urbanization (cf. Foale et al., 2013). Moreover, bridging organizations themselves, as mentioned, have their own ideologies, agendas and priorities that can favor particular viewpoints and narratives (see Berdej et al., 2015). There is therefore strong need for additional research on the political and ecological dimensions of bridging organizations in the region.

Lastly, the pursuit of conservation fit can be time-consuming and costly. There are significant costs associated with bridging activities, including funding, time commitments, staffing, and resource expenses. Funding and capacity for conservation is limited in Indonesia, as elsewhere in the CT, and many government bodies do not have staff or budget to engage sufficiently—plans are often made but not followed on the ground (cf. Mills et al., 2010). Decades of disempowerment have also constrained the capacity of many local institutions and communities to organize, innovate and act. This raises questions about the long-term sustainability of conservation fit outcomes in the absence of bridging organizations. For the time being, a reliance on foreign aid has caused tensions, including those related to implementation of conservation activities based on donor timelines (cf. von Heland et al., 2014). One interviewee voiced frustration over donor timeline expectations that do not align with the reality of building relationships and conducting activities on the ground (anonymous personal communication 2014).

CONCLUSIONS: FUTURE DIRECTIONS AND INSIGHTS FOR THE CT

Efforts to improve the fit between conservation initiatives (e.g., marine protected areas, no-take zones) and the dynamic social dimensions of coastal-marine systems are still rare. This research offers empirical insights for conservation practitioners and policy-makers into the social complexity behind coastal-marine conservation in Bali, and in the CT more broadly, and how bridging organizations can improve navigating this complexity. We contribute understanding of the advantages and limitations of bridging organizations as a governance strategy to foster more robust conservation measures that fit underlying dynamic and shifting social contexts. In Indonesia, decentralized governance has presented both the opportunity and challenge to involve multiple social actors and sectors of society, and work on how bridging organization navigate conservation fit issues such as social context, appropriateness of governance and scale holds promise.

Our findings demonstrate key strategies applied by bridging organizations to deliberately address major conservation fit issues faced in the region. These findings have broader relevance to other regions of Indonesia and the CT, who are challenged by similar social and institutional barriers to achieving positive conservation momentum (see Mills et al., 2010; Foale et al., 2013; Fidelman et al., 2014; von Heland et al., 2014; Weeks et al., 2014a). In demonstrating the efficacy of bridging organizations to operationalize conservation fit, we offer the following insights:

- (1) Exercising flexibility in conservation planning and practice is important to align efforts with the reality of complex social contexts across the CT. A bridging organization by its nature is situated in a central position where diverse social actors meet and knowledge flows, and so provides space where multiple institutions or practices, perspectives, and alternative objectives might be shared, debated and balanced.
- (2) Pluralist structures and inclusive decision-making arrangements involving diverse social actors are an important dimension of efforts to govern coastal-marine resources. A bridging organization can fill requisite capacity gaps to operationalize and institutionalize hybrid governance arrangements through opportunities for inclusion and local leadership, technical advisory and skills training, and/or access to non-local expertise and resources.
- (3) Interaction among and across scales and levels is a conservation priority. Through its connections, a bridging organization extends the reach of conservation initiatives by bridging together public, private and civil society actors in social networks for conservation, and by working across geographic and governance or bureaucratic boundaries for coordination.
- (4) A bridging organization is not without limitations. Such organizations must contend with obstacles such as changing social contexts, corruption and competing stakeholder demands, as well as ideological differences, power dynamics, influence of donor and funding agendas, and diverse conservation narratives. Some of these may prove especially challenging to overcome in practice. Even still, our findings indicate that bridging organizations have strong capacity to shape conservation strategies in ways that make them more inclusive, adaptive and cross-scale, and which will ultimately lead to higher likelihood of success.

Moving forward, our findings highlight a need for additional research to understand the implications of bridging organizations for the long-term ecological and social success of conservation initiatives. In many of our cases, for example, the conservation initiatives fostered by bridging organizations are not yet institutionalized and further analysis is needed to understand how that process may evolve under different conditions or in their absence. As such, there is a need to undertake a large “n” comparative analysis of bridging organizations in

geographically differentiated marine conservation contexts that reflect different social, political and institutional realities. As mentioned, critical political and ecological analysis is needed of how bridging organizations influence social processes such as power, agenda setting and policy narratives that shape conservation (as per Berdej et al., 2015). We do not claim that bridging organizations are guaranteed to enhance conservation fit, but our evidence indicates that they play an important role in leading the conservation process forward, and in fostering multi-actor strategies that meaningfully engage with the social dimensions of marine conservation.

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Conception or design of the work (SB, DA); acquisition of data (SB); analysis or interpretation of data for the work (SB, DA); drafting the work or revisiting it critically (SB, DA); final approval of the version to be published (SB, DA).

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The reviewer LT declares that, despite previously collaborating with the author DA as part of a large research project, their contributions to the research project were independent, the review process was handled objectively and no conflict of interest exists.

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