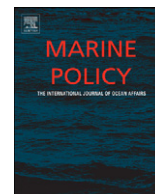




ELSEVIER

Contents lists available at [SciVerse ScienceDirect](http://www.sciencedirect.com)

Marine Policy

journal homepage: www.elsevier.com/locate/marpol

Evaluating marine protected areas for managing marine resource conflict in Hawaii

Todd C. Stevenson*, Brian N. Tissot

Washington State University Vancouver, School of the Environment, 14204 NE Salmon Creek Avenue, Vancouver, WA 98686-9600, USA

ARTICLE INFO

Article history:

Received 24 August 2012

Received in revised form

16 November 2012

Accepted 17 November 2012

Available online 20 December 2012

Keywords:

Marine resource conflict

Aquarium fisheries

Recreational dive industry

Ornamental fish trade

Marine protected areas

Hawaii

ABSTRACT

Conflict surrounding commercial fisheries is a common phenomenon when diverse stakeholders are involved. Harvesting reef fish for the global ornamental fish trade has provoked conflict since the late 1970s in the State of Hawaii. Two decades later the state of Hawaii established a network of marine protected areas (MPAs) on the west coast of the island of Hawaii ("West Hawaii") to protect and enhance the fish resources and alleviate conflict between stakeholders, principally between commercial dive tour operators and aquarium fishers. The perceptions held by these stakeholders on West Hawaii and Maui were evaluated to understand how MPAs influenced conflict dimensions, as the former location had a well-established MPA network designed to alleviate conflict, while the latter did not. This was accomplished by analyzing the following questions: (1) perceptions about the effectiveness of MPAs to alleviate conflict and enhance reef fish; (2) perceived group encounters and threats to coral reefs; (3) willingness to encourage fishing; and (4) value orientations toward the aquarium fish trade. The results indicate the MPAs in West Hawaii were moderately effective for alleviating conflict, encounters between stakeholders occurred on both islands, dive operators strongly opposed commercial fishing and perceived aquarium fishing as a serious threat to the coral reef ecosystem, and polarized value orientations toward the aquarium fish trade confirms pervasive social values conflict. The conflict between these groups was also asymmetrical. MPAs are inadequate for resolving long term conflict between groups who hold highly dissimilar value orientations toward the use of marine resources. Future marine spatial planning and MPA setting processes should include stakeholder value and conflict assessments to avoid and manage tensions between competing user groups.

© 2012 Elsevier Ltd. All rights reserved.

1. Introduction

The commercial capture of marine resources has been fraught with conflict since the early part of the 20th century when the participation in commercial fisheries proliferated [1]. Fisheries conflict typologies have focused on describing: who controls fisheries; how fisheries are controlled; relations between fishery users; relations between fishers and other users of the aquatic environment; and relations between fishers and non-fishery issues [2,3]. Although these typologies are useful for identifying incompatibilities between groups, they do not explain why the incompatibilities occur, which is paramount for understanding when conflict for common pool resources develops at a deeper, more cognitive level [4].

Another approach for examining conflict requires an investigation of social values and interpersonal conflict dimensions. Social values conflict may occur when individuals or groups of

people do not share similar norms and values about an activity [5,6], and it can occur even when there is no physical contact between conflicting individuals or groups [7]. Values serve as the foundation for attitudes and beliefs, where the pattern, direction and intensity of basic beliefs form value orientations toward things such as fish and coral reefs [8,9]. Vaske et al. [5] empirically described a classic case of social values conflict between wildlife viewers and hunters in Colorado, United States. Despite spatial separation via topography and management regulations, the wildlife viewers simply oppose hunting the animals they enjoyed viewing. This value difference engendered a social values conflict between hunters and wildlife viewers.

Interpersonal conflict may occur when the presence or behavior of an individual or group interferes with the goal of another individual or group [10]. For example, interpersonal conflict may arise when a novice fisher encroaches and disturbs the space of a more experienced one. In this example, interpersonal conflict may occur when two fishers vie for the same resource; one fisher seeks solitude while another seeks company with other fishers; when a more experienced fisher believes the less experienced one may diminish the chance of catching fish. To examine social values and

* Corresponding author. Tel.: +1 360 546 9454; fax: +1 360 546 9064.
E-mail address: tcstevenson@wsu.edu (T.C. Stevenson).

interpersonal conflict more systematically, Vaske et al. [6] suggested researchers evaluate whether opposing groups observe each other while undertaking their respective activity and if they perceive each other as a problem (Fig. 1).

These conflict dimensions have never been quantitatively described between commercial fishers and other stakeholders in Hawaii's nearshore marine environment.

The direction in which conflict occurs is also important. Symmetrical conflict, or two-way conflict, occurs when both groups observe and perceive each other as a problem, while asymmetrical conflict, or one-way conflict, may occur when one group observes the other and perceives them as a problem [11]. Asymmetrical conflict is widely documented between recreational groups, such as between canoeist and motorboaters, hikers and trailbikers, oar-powered and motor-powered whitewater rafters, cross-country skiers and snowmobilers, backpackers and horsepackers, water skiers and anglers, and hunters and wildlife viewers [11].

Many coastal regions in the tropics have experienced a shift away from fishing and trade economies toward tourism-dependent ones. This often pits burgeoning tourism against fisheries in the competition for ocean space and resources [3,12–15]. Conflicts between tourism and fishing industries were documented in Jamaica [16], the Philippines [13–15], Tanzania [17], the Caribbean [12,18], the Galapagos Islands [19], Australia [20] and the United States [21,22]. Marine protected areas (MPAs) are an effective tool for protecting biodiversity and important habitats, and enhancing fisheries [23]. More recently, however, MPAs have also been employed as a spatial tactic for separating incompatible user groups [18,22,24–26]. Using MPAs in this context can leave some stakeholders feeling marginalized when they are excluded from areas they commonly use while others maintain access and use benefits [13,22,27]. This perceived marginalization can hinder conflict resolution and sometimes inflame tensions, particularly when conflicting party values are unclear or ignored [13,22,27]. For example, Oracion et al. [13] describe a situation in which conflict developed between the dive tourism industry and fishers over the perceived economic advantages the former party enjoyed from the implementation of MPAs in the Philippines. Broad and Sanchirico [28] found that groups reliant on tourism are more likely to support spatial management, such as MPAs, because they are seldom excluded from these areas. Although using MPAs may work to alleviate conflict, especially interpersonal conflict, between opposing marine stakeholders, its efficacy has rarely been empirically examined in a marine system.

Harvesting reef fishes for the global aquarium trade involves 45 countries and removes approximately 30 million fish per year from tropical coral reef ecosystems [25,29]. Conflict between aquarium trade fishers and the tourism sector was reported in

Australia [30], Fiji [30], Maldives [25] and Hawaii [22], with overharvesting reef fish populations as the most common complaint [30]. Bruckner [31] suggested using spatial zoning and closures for managing multiple stakeholder conflicts when associated with marine aquarium fisheries, which was done in Hawaii.

The aquarium fish trade in Hawaii started on Oahu in the 1950s and rapidly expanded to other islands in the 1970, with the largest share of the annual catch originating from the west coast of the island of Hawaii (hereinafter “West Hawaii”) [32]. Conflict between aquarium fishers and other stakeholders in Hawaii as a result of perceived overharvesting of reef fishes was first documented in 1978 [33]. The conflict nearly erupted into violence in the late 1990s before the public pressured the state to intervene [34]. In July 1998, the State of Hawaii passed House Bill 3457, which upon approval became known as Act 306, and called for management to ensure resource sustainability, enhance nearshore fish resources and minimize conflicts [34]. Act 306 resulted in the designation of the entire 235 km of West Hawaii's coastline as a Fishery Management Area, and later allowed for the creation of nine MPAs (regionally termed Fish Replenishment Areas). These MPAs prohibited the harvest of reef fish for the aquarium trade along ~35% of the coastline, which included ~7.4% of coastline previously protected. In 1997, Tissot and Hallacher [35] observed significant depletions in West Hawaii reef fish in areas where aquarium fishing occurred, suggesting that MPAs might assist in recovery of fish populations. Act 306 also authorized the creation of the West Hawaii Fisheries Council, a volunteer community advisory group established to receive community input on co-managing nearshore fisheries with state fishery managers [22,36]. These accomplishments were the result of a collaborative effort between the State's Division of Aquatic Resources (DAR), the dive tourism sector, nonprofit organizations, aquarium fishers, academics, residents and other stakeholders.

More recently, hard-line animal rights activists from Maui attempted to ban, or severely restrict the aquarium fishery using multiple state legislative bills that were subsequently rejected [37,38]. However, unlike on West Hawaii, where there are approximately 40 active aquarium fishers [39], state records report ≤ 5 active aquarium fishers on Maui [40] and the coastal MPA spatial coverage around Maui is $< 2\%$ [41]. Animal rights activists vehemently oppose the trade despite the small size of the fishery and the lack of any direct evidence suggesting it is a serious threat to the island's marine ecosystem [42].

Here, the effect of MPAs on the dimensions of conflicts between aquarium fishers (hereinafter “fishers”) and dive operators on West Hawaii and Maui are examined by investigating the following questions: (1) Do fisher and dive operator perceptions on West Hawaii differ regarding the effectiveness for MPAs to alleviate conflict and enhance reef fish populations? (2) Do fisher and dive operator perceptions differ on West Hawaii and Maui regarding encounters with the opposing group and threats to coral reefs? (3) Are fishers and dive operators on Maui and West Hawaii equally willing to encourage recreational, subsistence, and/or commercial fishing? and (4) Do dive operators and fishers on West Hawaii and Maui hold similar value orientations toward the aquarium fish trade? These stakeholders were selected as research subjects not only because there is a history of conflict between fishers and dive operators on West Hawaii [22,34,43], but also because they both exploit reef fish for commercial purposes: fishers generate revenue from harvesting the resource, while dive operators generate revenue from clients who come to observe the resource. Focusing on these stakeholders does not negate the importance of others in Hawaii's coastal marine ecosystem. To our knowledge, this is the first attempt to empirically evaluate whether MPAs are an effective tool for improving values conflict between two commercial entities, such

		Perceived Problem	
		No	Yes
Observed	No	No Conflict	Social Values Conflict
	Yes	No Conflict	Interpersonal and Social Values Conflict Interpersonal Conflict

Fig. 1. Theoretical matrix for evaluating social values and interpersonal conflict (adapted from Ref. [6]).

Download English Version:

<https://daneshyari.com/en/article/7491981>

Download Persian Version:

<https://daneshyari.com/article/7491981>

[Daneshyari.com](https://daneshyari.com)