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Tourist value orientations and conflicts at a marine protected area in Hawaii

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Abstract

Marine tourism is increasing in popularity, which may cause conflicts among tourists who value different aspects of settings and experiences. Visitors surveyed before and after tours to Molokini Shoal Marine Life Conservation District in Hawaii (USA) reported considerable (63%) in-group conflicts (bump into people and rude or discourteous) between snorkelers and other snorkelers. One third of scuba divers experienced conflicts with other divers. Most conflicts were interpersonal (interactions between individuals interfering with experiences). There were fewer out-group conflicts between snorkelers and divers (15–28%) and minimal social values conflicts (6–13%; negative preconceptions without interactions). Many visitors had strong biocentric and protectionist value orientations toward the environment and coral reefs, and these individuals were most likely to report conflicts.

KEYWORDS

conflict, marine protected area, marine tourism, Molokini, value orientations

1 | INTRODUCTION

Marine tourism is increasing in popularity (Orams & Lück, 2014; Spalding et al., 2017). Participation in marine activities such as snorkeling and scuba diving is also increasing (Needham & Szuster, 2013). The Professional Association of Dive Instructors, for example, has issued more than 25 million certifications since 1967 and averaged more than 900,000 diver certifications globally for each of the last 20 years (Professional Association of Dive Instructors, 2017). Participation in these activities can occur in coral reef areas, which are often threatened by anthropogenic stressors such as pollution, overfishing, global climate change, and ocean acidification (Abelson et al., 2016; Hoegh-Guldberg et al., 2007; Sheppard, Davy, & Pilling, 2009; Wolff et al., 2015). Marine tourism can also cause biophysical impacts to coral reefs through factors such as physical contact, anchor damage, oil discharge, and untreated sewage from boats and coastal destinations (Ong & Musa, 2012; Saphier & Hoffmann, 2005). Scuba divers and snorkelers in particular can directly cause damage, mostly unintentionally, through actions such as kicking coral colonies with fins, trampling or standing on reefs, and hitting colonies with loose equipment (Barker & Roberts, 2004; Hasler & Ott, 2008; Hawkins et al., 1999; Rouphael & Inglis, 1997). Some characteristics of participants that can lead to these impacts include poor buoyancy, weak swimming ability, inappropriate training, lack of awareness, and minimal experience. Damage to coral reef areas is of concern because these areas often take decades to restore, which is more challenging with the continued presence of anthropogenic and natural stresses (Davenport & Davenport, 2006; Hunt, Harvey, Miller, Johnson, & Phongsuwan, 2013; Sheppard et al., 2009).

Marine tourism can also cause experiential impacts because some participants behave in ways that are viewed as unacceptable by others. Conflict among user groups is one experiential impact that can occur as areas become popular. *Conflict* involves competition over the same resources by competing activity groups, incompatibilities among activity groups interfering with each other's respective goals, and philosophical or normative differences among groups (Graefe & Thapa, 2004; Lynch et al., 2004; Manning, 2011; Needham, Haider, & Rollins, 2016). Individuals may differ in their reported conflicts because they value different aspects of the settings and characteristics of their experiences. This has led researchers to emphasize the importance of grouping people into more meaningful homogeneous subgroups to understand these user differences. One approach for

grouping individuals is according to their value orientations (e.g., protection–use and biocentric–anthropocentric). *Value orientations* refer to general classes of objects (e.g., wildlife, forests, and coral reefs) and are revealed through the pattern, direction, and intensity of basic beliefs (Fulton, Manfredo, & Lipscomb, 1996; Kluckhohn, 1951; Vaske & Donnelly, 1999). Individuals with protectionist or nature-oriented values may be more concerned with impacts of tourism activities on environments such as coral reefs and so may be more sensitive to conflicts and other depreciative behaviors stemming from high use levels in these areas. This article examined conflicts reported by individuals visiting a popular coral reef area in Hawaii (USA) and how their value orientations toward the environment in general and coral reefs in particular may differentially influence these conflict evaluations.

2 | CONCEPTUAL BACKGROUND

2.1 | Conflicts between groups

There are several types of conflict. *Asymmetrical* or *one-way conflict* occurs when one activity or group experiences conflict or dislike with another activity or group, but not vice versa (Devall & Harry, 1981; Graefe & Thapa, 2004; Lynch et al., 2004). Vaske, Needham, and Cline (2007), for example, found asymmetrical conflict between skiers and snowmobilers where skiers were in conflict with snowmobilers, but snowmobilers were not in conflict with skiers. *Two-way conflict* occurs when there is conflict in both directions, such as snowboarders and skiers both feeling conflict or dislike toward each other (Gibbons & Ruddell, 1995). Conflict can also occur within and between activity groups. *In-group conflict* occurs within an activity group (e.g., snorkelers and other snorkelers), whereas *out-group conflict* occurs between groups (e.g., snorkelers and scuba divers; Graefe & Thapa, 2004). All four of these types of conflict usually stem from *interpersonal* or *goal interference conflict*, which is defined as conflict that results from the direct or indirect physical presence or behavior of one group interfering with the goals, expectations, or behaviors of another group (Jacob & Schreyer, 1980; Manning, 2011; Needham et al., 2016). An example of this would be a surfer colliding with a snorkeler. *Social values conflict*, on the other hand, is defined as conflict that occurs between groups who do not share the same norms, opinions, or values about an activity (Vaske, Donnelly, Wittmann, & Laidlaw, 1995). Social values conflict can occur without any contact between groups, such as wildlife viewers feeling negatively about hunters despite no direct encounters (Vaske et al., 1995, 2007).

2.2 | Value orientations

A number of studies have examined these conflicts among users in tourism settings (see Graefe & Thapa, 2004; Manning, 2011; Needham et al., 2016 for reviews). Researchers have predominantly examined differences in conflicts based on characteristics of different groups (e.g., activity groups). Although efforts to differentiate users on the basis of their value orientations (e.g., protectionist or nature-oriented and use- or human-oriented) are relatively common (e.g., Manfredo, Teel, & Bright, 2003; Needham, 2010; Vaske, Jacobs, & Sijtsma, 2011), relationships between these value orientations and user conflicts have received comparatively little empirical attention. This is especially true in the context of marine environments such as coral reef areas.

Value orientations have been reliably measured by asking individuals how strongly they agreed or disagreed with biocentric or protectionist belief statements and anthropocentric or use-related statements (e.g., Bright, Manfredo, & Fulton, 2000; Fulton et al., 1996; Needham, 2010; Vaske & Donnelly, 1999). Patterns in these beliefs factor into value orientation continuums, such as the biocentric–anthropocentric (e.g., Steel, List, & Shindler, 1994; Vaske & Donnelly, 1999), protection–use (e.g., Bright et al., 2000; Fulton et al., 1996; Vaske & Needham, 2007), mutualism–domination (e.g., Manfredo, Teel, & Henry, 2009), and affiliation (i.e., caring)–utilitarianism continuums (e.g., Vaske et al., 2011). A biocentric or protectionist orientation reflects a nature-centered approach where there is inherent value in ecosystems, species, and natural resources (Eckersley, 1992). Although human needs and desires are important, these are viewed and addressed within a greater environmental context. With this approach, the needs of the environment and natural resources may take precedence over the needs or desires of humans (Vaske et al., 2011). An anthropocentric or use-related orientation is a human-centered or utilitarian view of the nonhuman world that places value on resources based on how they benefit humans (Eckersley, 1992). This orientation views natural resources as materials for human use, with less recognition of nonhuman aspects of the environment (Scherer & Attig, 1983).

These orientations are not mutually exclusive, as they can be arrayed along a continuum with protectionist orientations at one end, use orientations at the other, and the midpoint representing a mix of these two extremes (Needham et al., 2016; Steel et al., 1994; Vaske & Donnelly, 1999). Users along this continuum can then be grouped into more homogeneous subgroups (e.g., Bright et al., 2000; Needham, 2010; Vaske & Needham, 2007). There have been several studies on value orientations toward wildlife, forests, and the environment in general (see Manfredo, Teel, & Bright, 2004; Milfont & Duckitt, 2010; Needham et al., 2016; Vaske & Manfredo, 2012 for reviews), but limited research has examined value orientations toward coral reefs (Ceurvorst & Needham, 2012; Needham, 2010). This article contributes to this literature.

This article also investigates whether there are any relationships between conflicts and these value orientations. With the exception of Rossi, Byrne, Pickering, and Reser (2015), who investigated relationships between park visitors' environmental values and perceptions of environmental and social impacts (including conflicts), limited research has examined any relationships between value orientations and tourism conflicts. Rossi et al. (2015) found that there appeared to be a relationship between differences in visitors' perceptions and their environmental values. For example, those with stronger ecocentric values were more likely to negatively perceive motorized

activities compared with those with more anthropocentric values (Rossi et al., 2015). In the context of tourism at coral reef areas, people with protectionist orientations may be more sensitive to conflicts because these physical interactions among users and high-density experiences can cause ecological impacts such as banging into or trampling corals (Barker & Roberts, 2004; Hasler & Ott, 2008; Hawkins et al., 1999; Rouphael & Inglis, 1997). It is important to understand any potential relationships between value orientations and user conflicts in areas such as coral reefs because it can help managers and researchers understand the diversity of people who visit these settings and explain underlying reasons why they may be more or less sensitive to experiential impacts such as conflicts in these areas.

This article addressed three research questions related to snorkeler and scuba diver value orientations and conflict experiences at a popular marine protected area in Hawaii with extensive coral reef habitat. First, are conflicts occurring within and between these activity groups, and, if so, what types of conflict are occurring (e.g., interpersonal, social values, in-group, and out-group)? Second, what are their value orientations toward the environment in general and coral reefs in particular, and can these users be grouped on the basis of these value orientations? Third, to what extent do any reported conflicts differ on the basis of these value orientations?

3 | METHODS

3.1 | Study site

Tourism is the largest source of investment and employment in Hawaii, producing approximately US $15 billion in annual economic contributions, almost 20% of the gross state product, and about 165,000 jobs (Department of Business, Economic Development, and Tourism [DBEDT], 2017; Hawaii Tourism Authority [HTA], 2015). Hawaii hosts approximately nine million visitors each year with about 40% engaging in marine activities such as snorkeling (more than three million participants annually) and scuba diving (more than 200,000; DBEDT, 2017; Friedlander et al., 2005; HTA, 2015; Waddell & Clarke, 2008). Molokini Shoal Marine Life Conservation District is visited by just under 400,000 snorkelers and scuba divers annually, making it the second most heavily visited marine protected area in Hawaii (Friedlander et al., 2005; Koike, 2018). Visitation to Molokini averages 23 vessels and 924 people per day (Filous et al., 2017). This islet generates more than US $20 million annually in tourism benefits, with more than US $4.5 million of this from direct expenditures (van Beukering & Cesar, 2004).

Molokini is located in the Alalakeiki Channel between the islands of Maui and Kahoolawe. This islet is approximately 3 mi. from Maui's Kihei coast, and its crescent shape provides a semi-enclosed area that produces relatively calm and clear waters and boasts 77 acres of coral reef (Friedlander et al., 2005). Access to this islet is only by boat and mostly with commercial tour operators (Bell, Needham, & Szuster, 2011). Commercial use of Molokini is restricted by a permitting system that is capped at 41 permitted commercial vessels and 26 day-use mooring buoys (Bell et al., 2011; National Oceanic and Atmospheric Administration [NOAA], 2014).

3.2 | Data collection

Data were collected via matching pretrip and posttrip questionnaires that were administered on-site face-to-face to people visiting Molokini on tour boat excursions during both high- and low-use periods, although there is marginal seasonal variation in visitation to Molokini (Markrich, 2004). To help ensure a representative sample, questionnaires were administered to random samples of passengers on boats departing for Molokini from all three access locations (Maalaea and Lahaina harbors and Kihei boat ramp). The boats included large boats mostly carrying snorkelers (up to 50 feet in length and 150 passengers) and smaller boats predominantly carrying scuba divers (often less than 30 feet in length with fewer than 15 people). Pretrip questionnaires were administered at the boat ramp or harbors prior to departure to Molokini, and the posttrip questionnaires were completed by the same visitors during the boat journey back from Molokini.

The pretrip sample was 712 visitors who completed questionnaires (95% response rate, 588 snorkelers, 101 scuba divers, and 23 other activity or did not report) and the posttrip sample was 423 of these visitors (79% response rate, 319 snorkelers, 94 scuba divers, and 10 other activity or did not report). This smaller sample size for the posttrip questionnaires was attributed to some last-minute trip cancelations due to inclement weather after some pretrip questionnaires had been completed. These sample sizes allow generalizations about the overall population of visitors to Molokini at a margin of error of ±3.7% (pretrip) to ±4.7% (posttrip) at a 95% confidence level (Vaske, 2008). About 85% of the questionnaires were completed on large boats and 15% on smaller boats, which is relatively proportionate to the distribution of use at Molokini (Markrich, 2004). Questions about conflicts were in the posttrip instrument because people needed to visit the site before providing informed responses. Value orientations were measured pretrip.

3.3 | Analysis variables

3.3.1 | Conflicts

Consistent with previous research (e.g., Carothers, Vaske, & Donnelly, 2001; Gibson & Fix, 2014; Needham, Szuster, Mora, Lesar, & Anders, 2017; Vaske et al., 1995, 2007), respondents were asked how often they observed snorkelers or scuba divers at Molokini: (a) being rude or discourteous, (b) being too close, (c) not looking where they were going, and (d) bumping into people. Responses were measured on 4-point scales of *never*, *once or twice*, *sometimes*, and *many times*. Respondents were also asked the extent that these same conflict situations were perceived to be a problem at Molokini on 4-point scales of *not a problem*, *slight problem*, *moderate problem*, and *extreme problem*. Identical to past research (Carothers et al., 2001; Needham

et al., 2017; Vaske et al., 1995, 2007), each scale was recoded into two categories (*observed* vs. *not observed* and *problem* vs. *no problem*).

Combining the observed behaviors (observed and not observed) with their corresponding perceived problems (no problem and problem) for each activity produced a typology consisting of no conflict, interpersonal conflict, and social values conflict for each of the four situations. If a respondent did not consider a situation to be a problem, irrespective of whether or not it was observed, no conflict was evident. Participants who witnessed a situation and believed it was problematic experienced interpersonal conflict. Those who never experienced the situation but still believed it was a problem were considered to be expressing social values conflict. This method resulted in four conflict situations (e.g., being rude or discourteous and bumping into people) for each activity (snorkeling and scuba diving) where participants were categorized as expressing no conflict, interpersonal conflict, or social values conflict. To obtain the overall proportion of participants experiencing each type of conflict with each activity, a function was applied where individuals who did not experience any type of conflict for any of the four situations were considered to have no conflict with the activity. For the remaining participants, the type of conflict expressed most frequently across the four situations determined what conflict they experienced most with the activity (interpersonal or social values). This approach is identical to that of Needham et al. (2017).

3.3.2 | Value orientations

Two types of value orientations were measured: (a) value orientations toward the environment in general and (b) value orientations toward coral reefs in particular. Ten items from the Revised New Ecological Paradigm (NEP) scale (Dunlap, Van Liere, Mertig, & Jones, 2000) were used for measuring general environmental value orientations. These items are listed in Table 1. Although aspects of the Revised New Ecological Paradigm scale merit reexamination, it is still a theoretically relevant and an analytically powerful tool (Bernstein, Szuster, & Philips, 2017). Identical to that of Ceurvorst and Needham (2012) and Needham (2010), 10 other items, also listed in Table 1, measured specific value orientations toward coral reefs. With the exception of context (coral reefs), these items are also consistent with those used in past studies of value orientations toward wildlife and forests (e.g., Fulton et al., 1996; Vaske & Donnelly, 1999). Items for both types of value orientations were measured on 5-point scales of *strongly disagree* to *strongly agree*. The full questionnaires are provided in Szuster and Needham (2010).

4 | RESULTS

4.1 | Respondent profile

In total, 52% of respondents were female and 48% were male. Scuba divers were significantly more likely to be male (62%), whereas snorkelers were slightly more likely to be female (56%; $\chi^2 = 8.97$, $p = .003$). The phi (ϕ) effect size, however, was only .15. Using guidelines from Cohen (1988) and Vaske (2008) for interpreting effect sizes, the magnitude of this difference can be characterized as "small" or "minimal," respectively. The average age of respondents was 40 years, and there was no significant difference between snorkelers ($M = 41$, $SD = 13$) and scuba divers ($M = 39$, $SD = 12$; $t = 0.75$, $p = .456$). Most respondents (81%) were visiting Molokini for the first time and only 19% were repeat visitors, but there were significantly more repeat visitors (42%) among scuba divers than there were for snorkelers (16%; $\chi^2 = 32.09$, $p < .001$, $\phi = .23$).

4.2 | Value orientations

On average, respondents agreed with the biocentric belief statements measuring general environmental value orientations and disagreed with the anthropocentric statements (Table 1). Respondents agreed most strongly with the biocentric statement "plants and animals have as much right as humans to exist," and disagreed most strongly with the anthropocentric statement "humans were meant to rule over the rest of nature." Cronbach alpha reliability coefficients, when greater than approximately .60 or .65, indicate internal consistency among variables, suggest that variables are measuring the same concept, and justify combining them into indices (Nunnally & Bernstein, 1994; Vaske, 2008). Cronbach alphas were high for the anthropocentric (.83) and biocentric (.86) orientation indices, suggesting the variables reliably measured their respective orientation. Deletion of any variable would not improve reliability of its respective index, and reliability of the final combined environmental value orientations scale was high at .85.

K-means cluster analyses were then performed on the two indices measuring these orientations (anthropocentric and biocentric) to classify respondents into subgroups. A series of two- to six-group cluster analyses were run and indicated that a two-group solution was the most suitable fit for the data. Two analyses validated and confirmed the stability of this solution. First, the data were randomly sorted, and a cluster analysis was conducted after each of three random sorts. These analyses supported the solution identifying two distinct groups of individuals based on their value orientations. Second, discriminant function analysis was conducted to determine how well the 10 environmental value orientation variables predicted the two cluster groups generated from the two indices. All of the variables significantly predicted the groups (Wilks' lambda $U = .587$ to $.896$, $F = 75.01$ to 451.87, $p < .001$). The variables correctly classified 95% of Cluster 1 and 98% of Cluster 2 respondents. Overall, 96% of respondents were correctly classified.

The groups were labeled "weak biocentric orientation" (Cluster 1) and "strong biocentric orientation" (Cluster 2). There were no discernable mixed or anthropocentric orientation groups revealed by the cluster analyses. Respondents with a weak biocentric orientation had slight agreement with the biocentric index and slight disagreement with the anthropocentric index, whereas those with a strong biocentric orientation agreed strongly with the biocentric index and disagreed strongly with the anthropocentric index. In total, 44% of

TABLE 1 Reliability analyses of general environmental value orientations (NEP scale items) and specific value orientations toward coral reefs

Orientations and variables	Mean (*M*)[a]	*SD*	Item total correlation	Alpha if deleted	Cronbach alpha
General environmental value orientations (NEP scale items)[b]					
Anthropocentric orientation					.83
Humans have the right to modify the natural environment to suit their needs	−0.83	1.10	.62	.79	
Humans were meant to rule over the rest of nature	−0.91	1.15	.66	.77	
The so-called "ecological crisis" facing humankind has been greatly exaggerated	−0.81	1.05	.65	.78	
The balance of nature is strong enough to cope with impacts of modern industrial nations	−0.83	1.01	.67	.77	
Biocentric orientation					.86
The earth is like a spaceship with very limited room and resources	0.58	1.12	.55	.86	
We are approaching the limit of the number of people the earth can support	0.37	1.08	.65	.83	
The balance of nature is very delicate and easily upset	0.75	1.01	.71	.82	
When humans interfere with nature, it often produces disastrous consequences	0.78	0.98	.70	.83	
Plants and animals have as much right as humans to exist	0.92	1.04	.60	.84	
Humans are severely abusing the environment	0.85	0.97	.69	.83	
Specific value orientations toward coral reefs[c]					
Use orientation					.95
Humans should manage coral reef areas so that only humans benefit	−1.23	1.05	.81	.94	
The needs of humans are more important than coral reef areas	−1.17	1.07	.84	.94	
The primary value of coral reef areas is to provide benefits for humans	−1.31	1.00	.90	.93	
Recreational use of coral reef areas is more important than protecting the species that live there	−1.38	0.94	.89	.93	
Coral reef areas exist primarily to be used by humans	−1.39	0.95	.85	.94	
Protectionist orientation					.84
Coral reef areas should be protected for their own sake rather than to simply meet the needs of humans	0.77	1.43	.48	.83	
Coral reef areas should have rights similar to the rights of humans	0.42	1.27	.55	.80	
Recreational use of coral reef areas should not be allowed if it damages these areas	1.00	1.07	.72	.75	
It is important to take care of coral reef areas for future generations	1.39	0.88	.72	.76	
Coral reef areas have value whether humans are present or not	1.36	0.92	.68	.76	

Abbreviation: NEP scale, Revised New Ecological Paradigm scale.

[a]Variables measured on 5-point recoded scales of −2 (*strongly disagree*) to +2 (*strongly agree*).

[b]Overall Cronbach alpha reliability = .85.

[c]Overall Cronbach alpha reliability = .89.

respondents had a weak biocentric orientation, and 56% had a strong biocentric orientation. There were no significant differences in orientations between activity groups, with the majority of both snorkelers (54%) and scuba divers (62%) having a strong biocentric orientation ($\chi^2 = 2.16$, $p = .142$, $\phi = .07$).

Specific value orientations toward coral reefs were also measured and were particularly important because reefs are a main attraction at Molokini. Similar to the general environmental value orientations, respondents, on average, agreed with the protectionist orientation statements toward coral reefs and disagreed with the use orientation statements (Table 1). Respondents agreed most strongly with the protectionist statement "it is important to take care of coral reef areas for future generations" and disagreed most strongly with the use orientation statement "coral reef areas exist primarily to be used by humans." Cronbach alphas were high, as they were .95 for the use orientation, .84 for the protectionist orientation, and .89 for the combined scale. Deletion of any variables from their respective orientations would not improve reliability.

K-means cluster analyses of these use and protectionist orientation indices had the same pattern as those for the general environmental value orientations. Using the same methods, a two-group solution was the best fit for the data, and these groups were labeled "weak protectionist orientation" (Cluster 1) and "strong protectionist orientation" (Cluster 2). There were no mixed or use orientation groups revealed by these analyses. Three random sorts validated and confirmed the stability of this two-group solution. In addition, discriminant function analysis determined how well the 10 variables measuring value orientations toward reefs predicted the two cluster groups

generated from the use and protectionist indices. All of these variables significantly predicted the groups (Wilks' lambda $U = .563$ to $.881$, $F = 87.09$ to 498.68, $p < .001$) and correctly classified 98% of respondents in each cluster and overall. These analyses validated this two-group solution. In total, 39% of respondents had a weak protectionist orientation toward reefs, and 61% had a strong protectionist orientation. Both snorkelers (58%) and scuba divers (68%) had more respondents in the strong protectionist cluster ($\chi^2 = 2.94$, $p = .087$, $\phi = .09$).

4.3 | Conflicts between groups

In-group conflict behaviors were most commonly observed, particularly among snorkelers (Table 2). The most common behaviors observed by snorkelers were other snorkelers bumping into people, being too close, and not looking where they were going (73–75%). Few snorkelers observed conflict behaviors with scuba divers (2–4%). Scuba divers observed higher conflict behaviors with other divers (i.e., also in-group, up to 36%) than with snorkelers, although 22–25% of divers did observe snorkelers not looking where they were going, bumping into people, and being too close. With the exception of being rude or discourteous, the differences between snorkelers and scuba divers in their observed behaviors were statistically significant and had a "medium" to "large" (Cohen, 1988) or "typical" to "substantial" (Vaske, 2008) effect size ($\chi^2 = 47.11$–83.07, $p < .001$, $\phi = .38$–$.46$). Identical patterns emerged for whether these behaviors were perceived as problems at Molokini (Table 2).

A majority of both snorkelers (81%) and scuba divers (82%) did not experience any conflicts from snorkelers being rude or discourteous (Table 3). Most scuba divers (74–75%) did not experience any other conflicts with snorkelers (i.e., being too close, not looking where they were going, and bumping into people), but those who did said they experienced slightly more interpersonal (14–15%) than social values conflicts (10–12%).

In contrast, the majority of snorkelers experienced in-group conflicts from other snorkelers bumping into people (57%), being too close (54%), and not looking where they were going (53%). Almost all of these conflicts were interpersonal (48–51%), with few snorkelers reporting social values conflicts with other snorkelers (4–6%). With the exception of snorkelers being rude or discourteous, conflicts associated with snorkeler behaviors were statistically different between snorkelers and scuba divers and had "medium" (Cohen, 1988) or "typical" (Vaske, 2008) effect sizes ($\chi^2 = 39.02$–40.51, $p < .001$, $V = .30$–$.31$).

Most snorkelers (89%) and scuba divers (82%) also did not experience any conflicts from scuba divers being rude or discourteous

TABLE 2 Snorkeler and scuba diver observed and perceived problem behaviors

	Snorkelers	Scuba divers	χ^2 value	*p* value	phi (ϕ)
Observed behaviors[a]					
Snorkeler behaviors					
Being rude or discourteous	21	7	12.08	.001	.16
Being too close	74	22	81.72	<.001	.45
Not looking where they are going	73	25	67.48	<.001	.41
Bumping into people	75	23	83.07	<.001	.46
Diver behaviors					
Being rude or discourteous	2	5	2.07	.150	.08
Being too close	4	32	47.11	<.001	.38
Not looking where they are going	4	35	57.81	<.001	.42
Bumping into people	3	36	65.85	<.001	.45
Perceived problem behaviors[b]					
Snorkeler behaviors					
Being rude or discourteous	18	18	0.01	.924	.01
Being too close	54	25	24.35	<.001	.24
Not looking where they are going	54	26	21.89	<.001	.23
Bumping into people	57	25	29.36	<.001	.27
Diver behaviors					
Being rude or discourteous	12	18	2.16	.141	.08
Being too close	13	26	8.66	.003	.16
Not looking where they are going	12	30	14.08	<.001	.20
Bumping into people	12	26	10.32	.001	.17

[a]Cell entries are percentages (%) of participants in each activity who observed the behavior one or more times.

[b]Cell entries are percentages (%) of participants in each activity who perceived the behavior to be a problem.

TABLE 3 Perceived conflicts with snorkelers and scuba divers

	Snorkelers (%)	Scuba divers (%)	χ^2 value	*p* value	Cramer's *V*
Snorkeler behaviors					
Being rude or discourteous			1.95	.377	.07
No conflict	81	82			
Social values conflict	8	11			
Interpersonal conflict	11	7			
Being too close			40.51	<.001	.31
No conflict	46	75			
Social values conflict	4	10			
Interpersonal conflict	50	15			
Not looking where they are going			39.02	<.001	.30
No conflict	47	74			
Social values conflict	5	12			
Interpersonal conflict	48	14			
Bumping into people			40.21	<.001	.30
No conflict	43	75			
Social values conflict	6	10			
Interpersonal conflict	51	15			
Scuba diver behaviors					
Being rude or discourteous			2.32	.313	.08
No conflict	89	82			
Social values conflict	11	15			
Interpersonal conflict	1	2			
Being too close			28.90	<.001	.30
No conflict	87	74			
Social values conflict	11	7			
Interpersonal conflict	2	20			
Not looking where they are going			33.29	<.001	.33
No conflict	88	70			
Social values conflict	11	10			
Interpersonal conflict	2	20			
Bumping into people			36.30	<.001	.34
No conflict	88	74			
Social values conflict	11	7			
Interpersonal conflict	1	20			

(Table 3). In addition, almost all snorkelers did not experience conflicts from scuba divers being too close, not looking where they were going, and bumping into people (87–88%). Among snorkelers who did experience conflict with scuba divers, most reported that these stemmed from differences in social values (11%). In addition, 27–30% of scuba divers experienced in-group conflicts from other divers being too close, not looking where they were going, and bumping into people. Most of these were interpersonal conflicts (20%) rather than social values conflicts (7–10%). Conflicts from these three scuba diver behaviors statistically differed between the two activity groups, and the effect sizes were "medium" (Cohen, 1988) or "typical" (Vaske, 2008; χ^2 = 28.90–36.30, p < .001, V = .30–.34).

Among snorkelers, 63% reported conflicts with other snorkelers, and only 15% reported conflicts with scuba divers (Table 4). For divers, 33% reported conflicts with other divers, and 28% reported conflicts with snorkelers. In other words, there were more in-group than out-group conflicts between activity groups. Most conflicts were interpersonal between snorkelers and other snorkelers (57%). Few snorkelers experienced interpersonal conflicts with scuba divers (2%). Slightly more snorkelers reported social values conflicts with

TABLE 4 Overall perceived conflicts with snorkelers and scuba divers

	Snorkelers (%)	Scuba divers (%)	χ^2 value	*p* value	Cramer's *V*
Conflict with snorkelers			53.95	<.001	.36
No conflict	37	73			
Social values conflict	6	13			
Interpersonal conflict	57	15			
Conflict with scuba divers			39.16	<.001	.35
No conflict	85	67			
Social values conflict	13	10			
Interpersonal conflict	2	23			

divers (13%) than they did with other snorkelers (6%). Although scuba divers experienced more conflict with snorkelers (28%) than snorkelers did with scuba divers (15%), a majority of divers (73%) still experienced no conflict with snorkelers. Divers who did experience conflicts with snorkelers reported relatively equal proportions of interpersonal (15%) and social values conflicts (13%). Among the 33% of scuba divers who reported conflicts with other divers, a larger proportion (23%) reported interpersonal conflicts than social values conflicts (10%). These differences in reported conflicts between the two activity groups were statistically significant, with "medium" (Cohen, 1988) or "typical" (Vaske, 2008) effect sizes (χ^2 = 39.16–53.95, p < .001, V = .35–.36).

4.4 | Relationships between conflicts and value orientations

Conflicts not only differed between activity groups, but also differed in some cases based on value orientations. Respondents with strong biocentric environmental value orientations generally reported more conflict than those in the weak biocentric group (Table 5). For snorkeler encounters with other snorkelers, 66% of those with strong biocentric value orientations reported conflicts compared with 60% of those with weak biocentric orientations. This pattern was also found for scuba diver encounters with snorkelers (35% of strong biocentric group reported conflict vs. 16% of weak biocentric) and other divers (40% vs. 24%). The largest proportions of those in the strong biocentric group who reported conflict experienced interpersonal conflicts. This pattern in conflicts between those with strong and weak biocentric environmental value orientations was significant for two of these three comparisons (χ^2 = 6.47–6.94, p = .031–.039, V = .15–.26). The relationship between value orientations and conflict from scuba diver encounters with other divers was not statistically significant, but this was likely influenced by the small sample size of divers who reported conflicts with other divers (n = 30). The effect size (V = .16) suggests a "small" or "minimal" to "medium" or "typical" relationship (Cohen, 1988; Vaske, 2008). However, this pattern was not found for snorkeler encounters with scuba divers (13% of strong biocentric group reported conflict vs. 15% of weak biocentric), and this may be influenced by the relatively small sample size of snorkelers who experienced conflicts with divers (n = 45).

Respondents with strong protectionist value orientations toward coral reefs generally reported more conflict compared with the weak protectionist group (Table 6). For snorkeler encounters with other snorkelers, 64% of those with strong protectionist value orientations reported conflicts compared with 61% of those with weak protectionist orientations. This pattern was also found for scuba diver encounters with snorkelers (32% of strong protectionist group reported conflict vs. 17% of weak protectionist group) and other divers (36% vs. 26%). The largest proportions of those in the strong protectionist group who reported conflicts experienced interpersonal conflicts. This pattern in conflicts, however, was not statistically significant for any of these comparisons, but this was also likely influenced by the small samples in some of the cells, and three of the four effect sizes (V = .15 to.22) suggested "small" to "medium" (Cohen, 1988) or "minimal" to "typical" (Vaske, 2008) relationships. Similar to general environmental value orientations, a pattern was not found for snorkeler encounters with scuba divers (11% of strong protectionist group reported conflict vs. 18% of weak protectionist group).

5 | DISCUSSION

From a management perspective, Molokini is characterized by a considerable amount of in-group conflict. Overall, 63% of snorkelers experienced conflict with other snorkelers, most of which was interpersonal. In addition, 33% of scuba divers experienced conflict with other divers, and again it was mostly interpersonal. The most commonly observed behavior for snorkelers and divers was other visitors bumping into people (75% for snorkelers and 36% for divers). There was a relatively minimal out-group conflict, with 28% of scuba divers experiencing conflict with snorkelers and 15% of snorkelers experiencing conflict with scuba divers. This outcome can be expected because snorkeling often occurs inside the crescent-shaped islet where the waters are shallower and calmer, whereas scuba diving sometimes takes place at the tips of the islet or as a drift dive along the back wall of Molokini.

Previous studies have suggested separating people through spatial zoning for addressing interpersonal conflicts (see Graefe & Thapa,

TABLE 5 Relationship between conflicts and general environmental value orientations

	Weak biocentric (%)	Strong biocentric (%)	χ^2 value	*p* value	Cramer's *V*
Snorkeler encounters with					
Snorkelers			6.47	.039	.15
No conflict	40	35			
Social values conflict	8	3			
Interpersonal conflict	52	63			
Scuba divers			0.40	.819	.04
No conflict	85	87			
Social values conflict	13	11			
Interpersonal conflict	2	2			
Scuba diver encounters with					
Snorkelers			6.94	.031	.26
No conflict	84	66			
Social values conflict	13	13			
Interpersonal conflict	3	22			
Scuba divers			2.45	.294	.16
No conflict	76	61			
Social values conflict	9	11			
Interpersonal conflict	15	29			

TABLE 6 Relationships between conflicts and specific value orientations toward coral reefs

	Weak protectionist (%)	Strong protectionist (%)	χ^2 value	*p* value	Cramer's *V*
Snorkeler encounters with					
Snorkelers			1.47	.481	.07
No conflict	39	36			
Social values conflict	7	4			
Interpersonal conflict	54	60			
Scuba divers			5.42	.067	.15
No conflict	82	89			
Social values conflict	14	10			
Interpersonal conflict	4	1			
Scuba diver encounters with					
Snorkelers			5.41	.067	.22
No conflict	83	68			
Social values conflict	14	12			
Interpersonal conflict	3	20			
Scuba divers			2.90	.235	.17
No conflict	73	63			
Social values conflict	13	8			
Interpersonal conflict	13	28			

2004; Manning, 2011 for reviews). An example of this approach at Molokini would be to require minimum distances between those participating in the same activity groups while still maintaining their safety because the boats are in relatively fixed positions based on where the mooring buoys are located. Minimum distances along with other spatial zoning techniques (e.g., no access zones and restoration zones) have been successful in managing interactions among snorkelers and other tourists at different marine protected areas (Lynch

et al., 2004; Roman, Dearden, & Rollins, 2007). The challenge at Molokini is that larger commercial vessels can carry up to 150 snorkelers, and U.S. Coast Guard regulations require all snorkelers and scuba divers to surface within 100 feet of their vessel (or be within 100 feet of a dive float). Requiring visitors to maintain a minimum distance from one another might not be feasible based on safety concerns, the number of snorkelers per vessel, and difficulty for users to estimate distances between each other.

Temporal zoning, such as staggering visitation times, is another solution that has proven effective in managing interpersonal conflict (see Manning, 2011; Needham et al., 2016 for reviews). Having fewer people in the water at a given time could possibly reduce the amount of conflict experienced. This approach, however, could be problematic at Molokini given that weather (e.g., wind) and ocean conditions often get more extreme and unpleasant later in the day.

Another approach for managing interpersonal conflict could be to implement a quota system where numbers of snorkelers, scuba divers, tour boats, and/or operators are limited to help address carrying capacity-related issues such as conflict and crowding (Bell et al., 2011; Inglis, Johnson, & Ponte, 1999; Lankford, Inui, & Whittle, 2008; Needham & Szuster, 2013; Needham, Szuster, & Bell, 2011; Roman et al., 2007; Shelby & Heberlein, 1986). This approach is controversial and usually should only be used as a last resort because it leaves little freedom of choice for the stakeholders involved (Needham & Szuster, 2011). Although controversial, this approach of limiting use through a permitting system, along with increasing user fees to maintain tour operator viability, has been successful at reducing impacts such as conflict and crowding at some other marine areas (Catlin, Jones, & Jones, 2012; Davis & Tisdell, 1995; Lankford et al., 2008; Leujak & Ormond, 2007; Musa, 2002; Needham et al., 2017; Smith, Newsome, Lee, & Stoeckl, 2006). At Molokini, there is a permitting system that is capped at 41 commercial vessels and 26 day-use mooring buoys (Bell et al., 2011; NOAA, 2014). Based on this study, current conflict levels at Molokini, especially among snorkelers, are high enough to warrant consideration of limiting the number of vessels, size of vessels, or number of snorkelers even further than these existing permit quotas.

Findings on value orientations also have important management implications. Understanding value orientations may help to explain or predict behaviors and attitudes toward natural resources such as coral reefs (Fulton et al., 1996; Needham, 2010). Value orientations may also help to inform support for management decisions, such as zoning, by providing information about users (Rossi et al., 2015). Results indicated that the majority of visitors to Molokini had strong biocentric value orientations toward the environment (56%) and protectionist value orientations toward coral reefs (61%), whereas the minority had weaker biocentric and protectionist orientations. Few visitors who were surveyed had purely anthropocentric or use-related orientations. Knowing the proportion of people who belong to each value orientation group can help predict possible reactions to different management actions (Vaske & Needham, 2007). Those with biocentric or protectionist orientations are often more receptive to management actions in support of the environment (Needham, 2010; Rossi et al., 2015). At Molokini, knowing that most users who were surveyed had biocentric or protectionist orientations suggests that management efforts in favor of protecting or conserving marine resources, such as coral reefs, will likely be supported. Educating visitors about proper conduct around reefs (e.g., beware of touching, trampling, and kicking) should still remain a priority among managers because even with biocentric or protectionist orientations, snorkelers and scuba divers still unintentionally damage reefs (Needham, 2010; Wiener, Needham, & Wilkinson, 2009).

Results also suggested a relationship between value orientations and perceptions of conflict. Although not all comparisons were statistically significant, clear patterns were found showing that those with stronger biocentric and protectionist orientations were more likely to report conflict, especially interpersonal conflict. These findings may help managers at Molokini anticipate that taking more drastic measures in management (e.g., implementing a quota system) should not only help to address interpersonal conflict issues at the site, but will also likely be supported due to the majority of users having strong biocentric and protectionist orientations.

From a research perspective, characteristics of respondents (e.g., age, male/female, and repeat visitation) were consistent with other studies of visitors to Molokini (Friedlander et al., 2005; Markrich, 2004), suggesting that respondents were generally representative of visitors to this site. Results also showed that the majority of conflicts (up to 57%) were attributed to the physical presence or behavior of other individuals that interfered with user goals and experiences (i.e., interpersonal or goal interference conflict), whereas there was much less social values conflict (up to 13%). This finding is consistent with Needham et al. (2017), who also found high levels of interpersonal conflict and minimal social values conflict among snorkelers and scuba divers at a different site. These results differ from Vaske et al. (1995), however, who found more social values conflict between hunters and wildlife viewers. Social values conflict is more likely to occur when participants have different goals, intentions, and philosophies (e.g., hunters vs. wildlife viewers), whereas interpersonal conflict occurs more often when participants share similar goals and values (Vaske et al., 2007). Snorkelers and scuba divers share similar interests (e.g., underwater exploration and viewing species), which may explain the minimal social values conflicts reported at Molokini (Needham et al., 2017).

Findings also indicated that most of the conflict experienced was in group (e.g., snorkelers vs. other snorkelers), which is consistent with Needham et al. (2017), who also found more in-group conflict with snorkelers and scuba divers, and Thapa and Graefe (2004), who found that skiers experienced more conflict with other skiers than with snowboarders. In-group conflicts at Molokini are somewhat predictable because snorkelers and divers are sometimes physically separated (i.e., snorkelers inside the islet in shallower water and divers near the tips of the islet), which minimizes some direct out-group contact between activities (e.g., bumping into people). This situation, however, is not consistent across all areas and activities, so researchers are encouraged to examine all possible types of conflict for a given situation. Research is also required to understand what types of situations and activities produce different types of conflict.

Findings on value orientations also have implications for research. This study identified weak and strong biocentric value orientations toward the environment in general, and weak and strong protectionist value orientations toward coral reefs in particular. The results did not, however, identify any mixed, anthropocentric, or use-related groups, so the full range of value orientations along the continuums did not emerge. This is consistent with both Ceurvorst and Needham (2012) and Needham (2010), who also examined marine tourists. Although research has examined this continuum relative to wildlife and forests, these resources have a more obvious consumptive or use component with wildlife providing meat for human consumption and forests providing lumber for houses and paper. Although some of the questions used for measuring value orientations toward coral reefs included recreation as a use and reefs are sites for occasional fishing and specimen collecting for aquariums, the direct use component for coral reefs is less obvious, and this seems to be reflected in user value orientations. In addition, many people visiting coral reef areas have similar goals in viewing these reefs and their inhabitants. Although anglers and spearfishers are restricted from Molokini because it is a marine life conservation district, it would be advisable to include these types of activity groups in studies conducted in other areas where direct consumption behaviors associated with coral reefs exist. This would gain a different perspective and improve understanding of the full continuum of value orientations toward the environment in general and coral reefs in particular.

Although conflict and value orientations are well-established research topics, limited research has specifically investigated relationships between them in tourism settings, especially in marine environments. Rossi et al. (2015) examined relationships between national park visitors' personal environmental values and patterns of visitation, user activities, and user conflicts and found that their environmental values shaped how they perceived other park users and the appropriateness of their activities. For example, Rossi et al. (2015) found that visitors with stronger ecocentric values were more likely to negatively perceive motorized activities compared with those with more anthropocentric values. In this study here, the findings showed similar patterns, as respondents with stronger biocentric and protectionist value orientations were often more likely to report conflict situations. Similarly, Ceurvorst and Needham (2012) found that snorkelers and scuba divers with stronger protectionist value orientations were less tolerant of increasing use levels in coral reef areas. Both sensitivity toward conflict and intolerance of high use levels in coral reef areas could reflect situations that may jeopardize the health of reef resources, which conflicts with biocentric and protectionist value orientations. More research is needed to confirm these conceptual relationships in different settings and with different groups.

Not all of these relationships between conflict and value orientations were statistically significant, but tests of statistical significance can be affected by sample size (Cohen, 1988; Nunnally & Bernstein, 1994; Vaske, 2008). The total sample for this study was quite large, but the analyses required segmenting the sample by activity (i.e., snorkelers and scuba divers), value orientations (e.g., weak and strong biocentric), and the type of conflict experienced (i.e., none, interpersonal, and social values). This reduced some cell counts, which decreased statistical power. Among all respondents, for example, there were 94 scuba divers in the posttrip sample (when conflict was measured), and 30 of these reported conflicts with other divers, which were divided even further when comparing types of conflicts between the value orientation groups. Future research should collect data from even larger samples to confirm relationships among concepts.

Studies examining interpersonal and social values conflicts have developed and tested a number of situational indicators of conflict, and there remains considerable diversity in methods used for measuring this concept (see Graefe & Thapa, 2004; Manning, 2011 for reviews). The four indicators used here (e.g., rude or discourteous and bump into people) and methodological approaches such as recoding scale responses (e.g., never observed to observed many times) into dichotomous categories (not observed and observed) are identical to those employed in past studies (Carothers et al., 2001; Needham et al., 2017; Vaske et al., 1995, 2007). Examining individual behavioral or situational indicators is important because it identifies specific problems that may warrant management attention. Given the complexities of understanding conflict, researchers should continue investigating multiple site-specific and activity-specific indicators of problem situations and behaviors, and also test various approaches for measuring and analyzing conflict.

These findings on conflicts, value orientations, and relationships between these concepts are limited to the context of a single popular marine protected area in Hawaii and may not generalize to other places. This study, for example, does not represent all coastal and marine environments that are managed for other purposes, such as beach parks or areas with designated consumptive uses (e.g., fishing piers). Therefore, the applicability of these findings to other geographical areas and activity groups remains a topic for further empirical investigation.

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