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Manta ray tourism: interpersonal and social values conflicts, sanctions, and management

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ABSTRACT

Scuba diving and snorkeling with manta rays (*M. birostris, M. alfredi*) at sites in Hawaii, USA, have become popular, with upward of 30 tour boats and 300 participants daily. This article examined whether conflicts are occurring within and between these activities and if so, what types of conflict are prevalent and how would participants respond (support restrictions, sanction others). Data from surveys of 444 participants following evening trips to view manta rays showed that 79% of snorkelers experienced in-group conflict with other snorkelers, and 53% of scuba divers reported conflict with other divers. Most conflicts were interpersonal (physical interactions among individuals interfering with experiences). Conflict behaviors included bumping into people (up to 92%), not being aware (up to 73%), and blinding people with underwater flashlights (up to 56%). There were fewer out-group conflicts between different activities (snorkelers vs. scuba divers) and minimal social values conflicts (negative preconceptions, no physical interactions among individuals). Participants supported limiting numbers of snorkelers, scuba divers, and boats, and providing education on how to behave with others. Those experiencing conflicts were more supportive of these strategies and more likely to directly sanction participants causing conflicts, but were not more likely to indirectly sanction managers and operators.

Introduction

Viewing wildlife in marine environments continues to increase in popularity (Higham & Lück, 2007; Markwell, 2015). Participation in whale watching, for example, increased from five million people in 65 countries in 1994, to nine million participants in 87 countries in 1998, to over 13 million people in more than 119 countries in more recent years (Higham, Bejder, & Williams, 2014; O'Connor, Campbell, Cortez, & Knowles, 2009). Shark tourism is also a major industry with upward of 600,000 people each year paying to interact with sharks in the wild (Bentz, Dearden, Ritter, & Calado, 2014; Topelko & Dearden, 2005). Species of rays, such as stingrays and manta rays, have also become popular attractions with tourists primarily motivated by opportunities to view and photograph rays in their natural state, experience something new, and learn about marine species and environments (Lewis & Newsome, 2003; Newsome, Lewis, & Moncrieff, 2004; O'Malley, Lee-Brooks, & Medd, 2013; Semeniuk, Haider, Beardmore, & Rothley, 2009b; Shackley, 1998). Worldwide, more than one million people scuba dive or snorkel with manta rays each year, generating over US $140 million in direct economic

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impacts (O'Malley et al., 2013). Popular locations for manta ray tourism include Japan (O'Malley et al., 2013), Mozambique (Tibiriçá, Birtles, Valentine, & Miller, 2011), Maldives (Anderson, Adam, Kitchen-Wheeler, & Stevens, 2011), and Hawaii (Deakos, Baker, & Bejder, 2011; Osada, 2010).

Studies have shown that people swimming, scuba diving, and snorkeling with marine species such as rays can cause environmental impacts including habitat alteration, physiological stress, disease, injury, shifts in feeding ecology, and habituation of rays (Osada, 2010; Semeniuk, Bourgeon, Smith, & Rothley, 2009a). Marine wildlife tourism can also cause social impacts because some participants behave in ways that are viewed as unacceptable by others (Needham, 2013). These social impacts include crowding (Vaske & Shelby, 2008) and conflict among participants (Graefe & Thapa, 2004). Research has examined use levels, perceived crowding, and numbers of encounters among participants interacting with marine species (Bentz, Rodrigues, Dearden, Calado, & Lopes, 2015; Curnock, Birtles, & Valentine, 2013; Ziegler, Dearden, & Rollins, 2016). There are also many studies on human-wildlife conflict involving negative interactions between individuals participating in these experiences and the wildlife species being viewed (see Draheim, Madden, McCarthy, & Parsons, 2015 for a review).

Conflicts among people participating in marine wildlife tourism experiences, however, have received comparatively little empirical attention (Finkler & Higham, 2004; Markwell, 2015), especially in the context of scuba diving and snorkeling with manta rays. These conflicts involve competition over the same resources by activity groups, and incompatibilities between activity groups and their respective goals (Graefe & Thapa, 2004; Manning, 2011). Understanding conflicts among participants is important because it can inform management strategies designed to minimize depreciative impacts and maximize the quality of participant experiences (Vaske, Needham, & Cline, 2007). This article focuses on people scuba diving and snorkeling with manta rays in Hawaii. It examines whether conflicts are occurring within and between these activity groups and if so, what types of conflict are most prevalent and how would participants respond to these conflicts (e.g. support restrictions, sanction others).

Conceptual foundation

Types of conflict

Several types of conflict exist in tourism and recreation (see Graefe & Thapa, 2004; Manning, 2011; Needham, Haider, & Rollins, 2016 for reviews). *One-way* or *asymmetrical conflict* occurs when one activity group experiences conflict with or dislikes another group, but not vice versa. A study of snorkelers and scuba divers in Florida, for example, showed that snorkelers had less tolerance for scuba divers compared to scuba diver evaluations of snorkelers (Vaske, Heesemann, Loomis, & Cottrell, 2013). *Two-way conflict* occurs with resentment or dislike in both directions. Conflict between users engaging in different activities is *out-group conflict* (e.g. snorkelers vs. scuba divers), whereas conflict among participants within the same activity is *in-group conflict* (e.g. snorkelers vs. other snorkelers).

Research has predominantly examined these types of interactions in the context of *interpersonal* (i.e. *goal interference*) conflict where the physical presence or behavior of a group or individual directly interferes with the goals or experiences of another (Jacob & Schreyer, 1980; Vaske et al., 2007). A scuba diver, for example, may experience this conflict if he or she collides with snorkelers or other divers in the water. Studies have mainly examined interpersonal conflict between activities, such as hikers and mountain bikers (Carothers, Vaske, & Donnelly, 2001), skiers and snowboarders (Thapa & Graefe, 2004), skiers and snowmobilers (Vaske et al., 2007), and hunters and wildlife viewers (Vaske, Donnelly, Wittmann, & Laidlaw, 1995).

There are other conflicts that have received less attention in tourism and recreation. *Social values conflict*, for example, occurs when one group has a negative preconception or opinion about another without these direct experiences (Vaske et al., 2007). Unlike interpersonal conflict, social values conflict transpires when there is no physical contact or direct interaction between activities, yet at least

one activity is still perceived to be problematic (Carothers et al., 2001). Some scuba divers, for example, may never interact directly with jet skiers in a given marine area, yet still report conflict because they philosophically disagree about the appropriateness of jet skiing and believe the activity is problematic in the area. The most well-known study of social values conflict was between hunters and wildlife viewers where these viewers did not see hunters or witness hunting behaviors (e.g. see animals shot, hear gunshots) in an area because zoning and rugged terrain and topography separated these activities (Vaske et al., 1995). Regardless, wildlife viewers still reported conflict with hunters, but based this on opinions about the appropriateness of hunting and perceptions that hunting was a problem in the area. Research has examined social values conflicts for other activities, including hikers and mountain bikers (Carothers et al., 2001), campers and windsurfers (Ruddell & Gramann, 1994), stock users in wilderness (e.g. horses, llamas; Blahna, Smith, & Anderson, 1995; Watson, Niccolucci, & Williams, 1994), and skiers and snowmobilers (Vaske et al., 2007).

Social values conflicts are somewhat similar to assigned values because they involve judgments about activity groups. *Assigned values* are judgments about the relative importance or worth of an object or issue to an individual or group, and are more situation-specific and changeable than held values (Brown, 1984; Jones, Shaw, Ross, Witt, & Pinner, 2016). *Held values*, on the other hand, are abstract and enduring cognitions concerned with desirable end states (e.g. freedom, success) and modes of conduct (e.g. honesty, fairness) that are shaped early in life, few in number, relatively stable over time, transcend situations, and guide decisions (Jones et al., 2016; Rokeach, 1973). For example, an individual may respect other forms of life across many contexts (held values), but the importance that he or she places on habitat preservation and non-consumptive tourism activities that protect species (assigned values) may vary among contexts.

Management as a response to conflict

Although studies of interpersonal and social values conflicts have reported the amount of conflict occurring within and between activity groups, they seldom included follow-up questions asking participants how they would respond or think conflict should be addressed. Some studies included general questions asking how managers could improve experiences, but these questions and their responses have seldom been linked directly to conflict situations (Andereck, Vogt, Larkin, & Freye, 2001; Ramthun, 1995). In most cases, researchers who found situations where respondents experienced conflict have simply suggested that management attention is required and then advocated approaches for resolving the issue. These strategies included using interpretation and education about certain activity groups to reduce social values conflict, or using zoning to separate incompatible groups or quotas limiting the number of participants in problematic activities to reduce interpersonal conflict (Graefe & Thapa, 2004; Manning, 2011; Needham et al., 2016). It is possible, however, that some participants could experience conflict, but not support certain management actions because they would restrict use.

Management strategies in tourism and recreation can be grouped into two broad categories. *Direct* strategies are formal regulations on behavior leaving little or no freedom of choice, and include mandatory use limits, fees, and prohibitions on activities (Manning, 2011; Needham et al., 2016). *Indirect* strategies are less formal attempts to influence behavior, such as hardening techniques (e.g. boardwalks, facilities) and voluntary interpretation and education programs (Manning, 2011; Needham et al., 2016). Measuring participant support or opposition toward these actions takes the guesswork out of interpreting strategies that may or may not be within their tolerance limits (Needham & Szuster, 2011). Participants who experience conflict, for example, may still oppose use limits or other restrictions on activities. As a result, managers may implement alternative approaches that may be more strongly supported, such as interpretation about how to interact properly with activity groups. Through research, therefore, managers are able to consider approaches supported by participants and avoid strategies that are opposed or controversial while still attempting to mitigate problems associated with conflict (Bell, Needham, & Szuster, 2011).

Sanctions as a response to conflict

Participants may not only respond to conflicts by supporting management strategies aimed at addressing these situations, but they can also respond by directly sanctioning individuals or groups causing the conflict (e.g. other participants) or indirectly sanctioning those in charge (e.g. managers, operators). In a social psychological context, *sanctions* are emotional or coercive actions felt internally or expressed toward others as forms of control (Blake & Davis, 1964; Grasmick, Blackwell, Barsik, & Mitchell, 1993). Internal sanctions can influence behavior through feelings such as shame or guilt, whereas external sanctions influence behavior through overt actions such as complaints, punishment, or rewards (Grasmick et al., 1993; Parsons, 1951). People are typically compelled to conform to standards of behavior due to formal (e.g. rules, laws) or informal sanctions (e.g. smile, frown, complain; Blake & Davis, 1964). In the context of conflict among tourism and recreation activities, it is possible for an individual to sanction other participants through confrontation, complaints, expressing personal values, or making negative facial expressions (Schuster, Hammitt, Moore, & Schneider, 2006).

Participants could also sanction managers or others in charge of areas where conflict occurs because these responsible authorities influence experiences through tactics such as use limits, fees, and zoning (Heywood, 2011; Manning, 2011). Smyth, Watzin, and Manning (2007) acknowledged that conditions in many tourism and recreation areas are a direct result of human behavior, and allowing conditions to reach unacceptable levels often lies within the behavior of managers or others responsible for these areas. Public institutions (e.g. agencies) and their representatives (e.g. managers) are at least partially obligated to adhere to societal standards and provide acceptable conditions. Managers or other responsible authorities can experience responses such as informal, external, and indirect sanctions (e.g. public disapproval, complaints) imposed by participants who experience conflict at unacceptable levels (Heywood, 2011; Smyth et al., 2007). It is often up to those in charge, however, to levy formal, external, and direct sanctions such as applying restrictions, permits, or other approaches to correct the situation and return conditions to acceptable standards (Heywood, 2011). Taken together, then, managers can sanction participants, and participants can sanction both managers and other participants.

Little research has empirically examined sanctions in relation to participant experiences in tourism and recreation, but researchers have called for measuring sanctions in these contexts (Heywood, 1996, 2011; Roggenbuck, Williams, Bange, & Dean, 1991). Sanctions associated with littering (Cialdini, Reno, & Kallgren, 1990) and conformance with ecotourism guidelines (Sirakaya & Uysal, 1997) have been examined, but sanctions associated with experiences such as conflict have received limited attention (Manning, 2011; Schneider, 2000; Schuster et al., 2006). Understanding sanctions associated with conflict is important because it provides those involved in tourism (e.g. managers, operators, participants) with information about direct and indirect responses to conflict situations, which can inform proactive strategies for diffusing these situations when they occur and preventing conflict situations in advance.

This article extends this literature by examining four research questions in the context of people scuba diving and snorkeling with manta rays in Hawaii. First, is conflict occurring within and between these groups and if so, to what extent? Second, what types of conflicts are occurring (one-way, two-way, in-group, out-group, interpersonal, social values)? Third, are participants who experience conflict more supportive of strategies for managing use compared to those not experiencing conflict? Fourth, are those who experience conflict more likely to impose sanctions in response?

Methods

Study area

Tourism is the largest source of investment and employment in Hawaii, producing US $15 billion in annual economic contributions, over 20% of the gross state product, and more than 175,000 jobs (Department of Business, Economic Development, and Tourism, 2014;
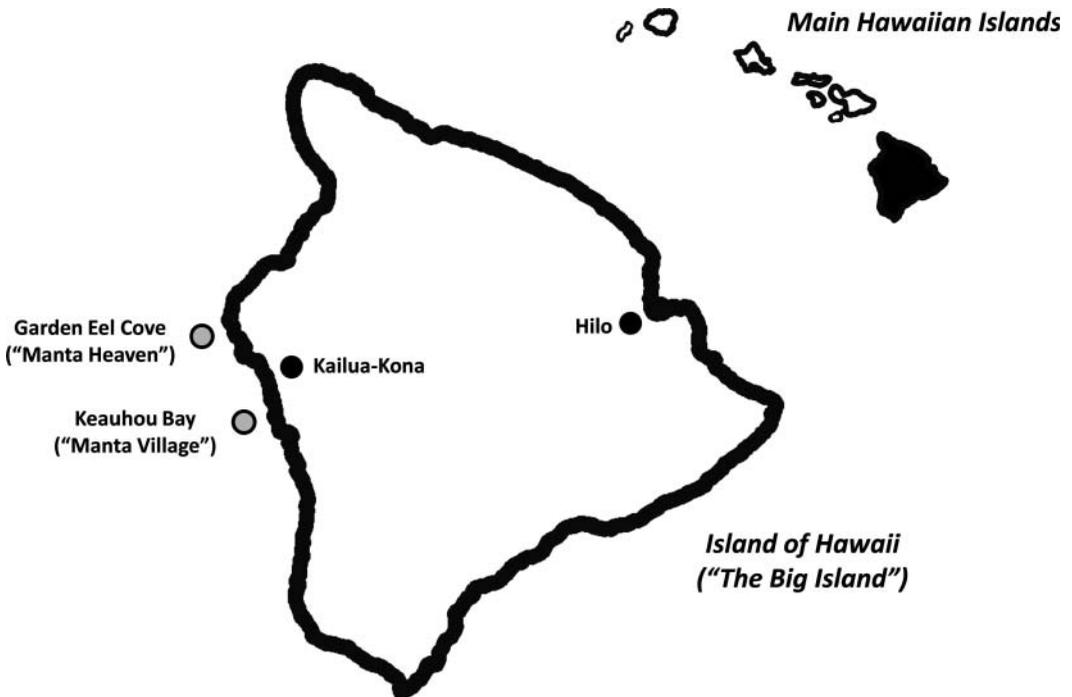
Figure 1. Map of the most popular sites for manta ray viewing in Hawaii.

Hawaii Tourism Authority [HTA], 2014). Hawaii hosts more than eight million visitors each year with approximately 40% engaging in marine activities such as snorkeling (over three million annually) and scuba diving (over 200,000; Friedlander et al., 2005; HTA, 2014). Manta rays are one species viewed by these groups, and the most popular sites are Keauhou Bay (i.e. "Manta Village") and Hoona Bay and adjacent Makako Bay (i.e. Garden Eel Cove or "Manta Heaven"; Figure 1). Both sites are offshore of Kailua-Kona on the west coast of the Big Island of Hawaii, and are accessed mainly by tour boats from nearby harbors (e.g. Keauhou, Honokohau).

Snorkeling and scuba diving began at these sites in 1984 and have increased dramatically since this time with at least 42 operators now conducting manta ray tours at these sites, using boats ranging in capacity from six to 40 passengers (Marine Science Consulting, 2015). On average, 12 or 13 boats visit each site at a time, although the maximum number at the busiest times is double this average (26–30 boats 5%–10% of the time; Marine Science Consulting, 2015). Tours last 3–5 hours in duration, cost an average of US $110 per person, and the number of participants at each site ranges from 100 to over 300 at a time (Marine Science Consulting, 2015). The Hawaii Department of Land and Natural Resources (DLNR) has jurisdiction over these resources, but there has been relatively unregulated growth and minimal monitoring and enforcement at the sites (Manta Pacific Research Foundation, 2013; Marine Science Consulting, 2015). In response, operators established voluntary safety and stewardship guidelines (e.g. moorings, no touching rays), but these contain little information about minimizing conflicts among participants (Manta Pacific Research Foundation, 2013).

Viewing occurs in the evening after sunset. Scuba divers sit on the seafloor, snorkelers float and swim at the surface, and manta rays feed on zooplankton in the water column between these groups. Participants are provided with underwater flashlights that attract and concentrate zooplankton in high densities, which in turn attract manta rays to the area. To minimize getting lost in the darkness and ocean swells, participants wear color-coded safety lights matching their specific boat, and operators monitor clients by identifying these lights. Participants from the same boat also try to remain in proximity to each other, as some scuba divers sit next to their fellow tour participants and some

snorkelers hold onto floating rafts or circular rings with fellow participants from the same boat. However, this does not always occur and participants can stray away and swim freely among those from other boats. In addition, groups from each tour boat do not operate in their own separate areas. Instead, they all share a relatively small localized area to help concentrate the zooplankton and manta rays, which causes participants from several boats to come into close contact with each other (Marine Science Consulting, 2015).

Data collection

Data were obtained from an onsite (face-to-face) survey of snorkelers and scuba divers participating in manta ray tours at the Garden Eel Cove site ("Manta Heaven"). Questionnaires were administered nightly in March and April 2012 at Honokohau harbor, which is the departure point for all but a small number of tours (the remaining boats leave Keauhou harbor to visit the "Manta Village" site). Immediately prior to the departure of tour boats, passengers were briefed by researchers and encouraged to complete a questionnaire after their trip. Upon their return, passengers were approached by researchers and asked to complete a questionnaire using a lighted clipboard because it was dark by that time. Administering questionnaires immediately after the activity minimizes recall bias. In addition, passenger contacts (e.g. addresses, telephone numbers) are not collected by most operators, so other survey methods were not feasible (e.g. mail, Internet, telephone). Questionnaires were completed by 444 participants (89% response rate), ensuring a margin of error of $\pm$ 4.6% at the 95% confidence level (Vaske, 2008). Of these participants, 284 were snorkeling and 160 were scuba diving on their tour, which is relatively proportionate to the distribution of use at this site (Marine Science Consulting, 2015). The average questionnaire completion time was 10 minutes.

Analysis variables and strategy

Consistent with past research (Carothers et al., 2001; Vaske et al., 1995, 2007), respondents were asked how frequently they observed five conflict behaviors ("being rude or discourteous," "not being aware of other people," "bumping into people," "blinding people with lights," "bubbles distracting other people") caused by two activity groups during their manta ray tour (snorkelers, scuba divers). Responses were on 4-point scales of "never," "once or twice," "sometimes," and "many times." For analysis purposes and identical to past research (Carothers et al., 2001; Vaske et al., 1995, 2007), responses were recoded into the behavior being observed (at least once) or not (never saw). Participants were also asked if they believed each of these behaviors for each activity was a problem on 4-point scales of "not a problem" to "extreme problem." Identical to previous research (Carothers et al., 2001; Vaske et al., 1995, 2007), these were also recoded into two categories for analysis purposes (no problem, problem).[1]

Combining the observed behaviors (observed, did not observe) with their corresponding perceived problems (no problem, problem) for each activity produced a typology consisting of no conflict, interpersonal conflict, and social values conflict. If a respondent did not consider a behavior to be a problem, irrespective of whether or not it was observed, no conflict was evident. Participants who witnessed a behavior and believed it was problematic experienced interpersonal conflict. Those who never saw the behavior, but still believed it was a problem, were considered to be expressing social values conflict. This typology is shown in Figure 2 and identical to previous studies (Carothers et al., 2001; Vaske et al., 1995, 2007). Consistent with more recent research by Vaske et al. (2007), however, participants categorized as experiencing interpersonal conflict were classified further based on their agreement with the statements "just knowing that snorkelers are at the manta ray sites bothers me, even if I never see snorkelers there" and "just knowing that scuba divers are at the manta ray sites bothers me, even if I never see scuba divers there." Participants who were initially categorized as experiencing interpersonal conflict with an activity, but agreed with the statement, were

Perceived Problem

Figure 2. Conflict evaluation typology (modified from Vaske et al., 2007).

reclassified as expressing both interpersonal and social values conflicts with the activity, whereas those who disagreed experienced only interpersonal conflict. This approach is identical to Vaske et al. (2007).

This method resulted in five conflict behaviors (e.g. being rude or discourteous, bumping into people) for each activity where participants were categorized as expressing no conflict, interpersonal conflict, social values conflict, or both interpersonal and social values conflicts. To obtain the overall proportion of participants experiencing each type of conflict with each activity, a function was applied where those who had no conflict for all five behaviors were considered to have experienced no conflict with the activity. For the remaining participants, the type of conflict expressed most frequently across the five behaviors determined what conflict they experienced most with the activity (interpersonal, social values, or both).[2]

To measure responses toward management strategies, participants were asked the extent they supported or opposed three possible direct strategies at the manta ray site ("limit the number of snorkelers allowed," "limit the number of scuba divers allowed," "limit the number of boats allowed") and one indirect strategy ("educate visitors more about how to behave with other visitors"). These strategies were identified based on consultation with the DLNR and some operators. Responses were on 5-point scales of "strongly oppose" to "strongly support" and recoded into two categories for analysis purposes (not support [neither, oppose], support).[3]

To measure sanctions, participants were asked if they were to experience more people or conflict with others than they would tolerate at the manta ray site, how likely would they "express my opinions about the situation to other visitors causing the situation" (direct sanction) and "express my opinions about the situation to people in charge such as managers, boat operators, or boat owners" (indirect sanction). Responses were on 4-point scales of "very unlikely" to "very likely" and recoded into two categories for analysis purposes (unlikely, likely).[4]

Results

The most common behaviors observed by snorkelers were other snorkelers bumping into people (92%), not being aware of other people (73%), and blinding people with lights (44%; Table 1). Significantly fewer scuba divers (9%–30%) observed snorkelers engaging in conflict behaviors, $\chi^2 = 12.07$–181.10, $p < .001$. Phi (ϕ) effect sizes ranged from .19 to .66. Using well-established guidelines for interpreting effect sizes, the magnitude of these differences between snorkelers and scuba divers can be

Table 1. Observed snorkeler and scuba diver behaviors.

	Snorkelers[a]	Scuba divers[a]	χ^2-value	p-value	phi (ϕ)
Snorkeler behaviors					
Being rude or discourteous	35	15	19.46	<.001	.21
Not being aware of other people	73	29	76.15	<.001	.43
Bumping into people	92	30	181.10	<.001	.66
Blinding people with lights	44	27	12.07	<.001	.19
Their bubbles distracting other people	24	9	14.05	<.001	.20
Scuba diver behaviors					
Being rude or discourteous	10	26	17.85	<.001	.21
Not being aware of other people	14	53	67.53	<.001	.41
Bumping into people	10	65	136.51	<.001	.58
Blinding people with lights	22	56	47.25	<.001	.34
Their bubbles distracting other people	48	33	9.60	.002	.15

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

considered as "medium" to "large" (Cohen, 1988) or "typical" to "substantial" (Vaske, 2008). Similarly, the most common behaviors observed by scuba divers were other divers bumping into people (65%), blinding people with lights (56%), and not being aware (53%). Fewer snorkelers (10%–22%) observed scuba divers engaging in these behaviors, $\chi^2 = 47.25–136.51$, $p < .001$, $\phi = .34–.58$. These behaviors, therefore, were most frequently observed in-group, but significantly more snorkelers (48%) than scuba divers (33%) observed bubbles exhaled from scuba divers distracting people, $\chi^2 = 9.60$, $p = .002$, $\phi = .15$ (i.e. out-group). Identical patterns emerged for beliefs about each of these behaviors being a problem for each activity (Table 2).

Conflict evaluations were operationalized by combining responses from questions in Tables 1 and 2. For all five behaviors, most scuba divers (70%–86%) experienced no conflicts with snorkelers (Table 3). Conversely, large percentages of snorkelers experienced conflicts with other snorkelers, especially bumping into people (76%), not being aware of others (66%), being rude or discourteous (41%), and blinding people with lights (40%). Most of these snorkeler interactions with other snorkelers represented interpersonal conflicts. For example, 71% of snorkelers experienced interpersonal conflict associated with other snorkelers bumping into people. Similarly, 73%–80% of snorkelers experienced no conflicts with scuba divers for most behaviors, but many scuba divers experienced conflicts with other divers, especially bumping into people (45%), not being aware (44%), and blinding people with lights (44%), with almost all of these representing interpersonal conflicts (Table 4). Differences in conflicts between snorkelers and scuba divers for four of the five behaviors across both activities were significant, $\chi^2 = 11.16–120.17$, $p = .011$ to $< .001$, $V = .16–.53$. There were, however, no statistical differences between groups in conflict associated with participant bubbles distracting others. In fact, slightly more snorkelers (40%) than scuba divers (33%) experienced conflicts associated with scuba diver bubbles, with most of these being interpersonal.

Table 2. Perceived snorkeler and scuba diver problem behaviors.

	Snorkelers[a]	Scuba divers[a]	χ^2-value	p-value	phi (ϕ)
Snorkeler behaviors					
Being rude or discourteous	41	25	10.75	<.001	.16
Not being aware of other people	66	30	47.58	<.001	.34
Bumping into people	76	31	80.64	<.001	.45
Blinding people with lights	40	26	7.65	.006	.14
Their bubbles distracting other people	21	13	3.70	.049	.09
Scuba diver behaviors					
Being rude or discourteous	21	24	.77	.381	.04
Not being aware of other people	24	44	16.01	<.001	.20
Bumping into people	22	45	22.80	<.001	.24
Blinding people with lights	27	43	11.01	<.001	.17
Their bubbles distracting other people	40	34	1.77	.184	.07

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

Table 3. Perceived conflicts with snorkelers.

Snorkeler behaviors	Snorkelers[a]	Scuba divers[a]	χ^2-value	p-value	Cramer's V
Being rude or discourteous			17.17	<.001	.19
No conflict	59	75			
Interpersonal conflict	25	11			
Social values conflict	14	14			
Both interpersonal and social values conflict	2	0			
Not being aware of other people			64.98	<.001	.39
No conflict	34	70			
Interpersonal conflict	57	20			
Social values conflict	6	10			
Both interpersonal and social values conflict	3	0			
Bumping into people			120.17	<.001	.53
No conflict	24	70			
Interpersonal conflict	71	19			
Social values conflict	2	11			
Both interpersonal and social values conflict	3	0			
Blinding people with lights			11.16	.011	.16
No conflict	60	73			
Interpersonal conflict	27	17			
Social values conflict	11	10			
Both interpersonal and social values conflict	2	0			
Their bubbles distracting other people			4.22	.238	.09
No conflict	80	86			
Interpersonal conflict	10	8			
Social values conflict	9	6			
Both interpersonal and social values conflict	1	0			

[a]Cell entries are percentages (%).

These conflict responses across the five behaviors were combined to obtain the overall proportion of participants experiencing each type of conflict with each activity. In total, 79% of snorkelers experienced conflict with other snorkelers, whereas 36% of scuba divers experienced conflict with snorkelers, $\chi^2 = 91.35$, $p < .001$ (Table 5). The Cramer's V effect size of .47 suggests this difference between activities was "large" (Cohen, 1988) or "substantial" (Vaske, 2008). Most of this conflict was

Table 4. Perceived conflicts with scuba divers.

Scuba diver behaviors	Snorkelers[a]	Scuba divers[a]	χ^2-value	p-value	Cramer's V
Being rude or discourteous			16.95	< .001	.21
No conflict	80	76			
Interpersonal conflict	4	15			
Social values conflict	15	9			
Both interpersonal and social values conflict	1	0			
Not being aware of other people			45.15	< .001	.34
No conflict	76	56			
Interpersonal conflict	8	35			
Social values conflict	15	9			
Both interpersonal and social values conflict	1	0			
Bumping into people			78.75	< .001	.44
No conflict	78	55			
Interpersonal conflict	6	41			
Social values conflict	15	4			
Both interpersonal and social values conflict	1	0			
Blinding people with lights			32.78	< .001	.29
No conflict	73	56			
Interpersonal conflict	13	37			
Social values conflict	13	7			
Both interpersonal and social values conflict	1	0			
Their bubbles distracting other people			4.82	.186	.10
No conflict	60	67			
Interpersonal conflict	33	26			
Social values conflict	6	7			
Both interpersonal and social values conflict	1	0			

[a]Cell entries are percentages (%).

Table 5. Overall perceived conflicts with snorkelers and scuba divers.

	Snorkelers[a]	Scuba divers[a]	χ^2-value	p-value	Cramer's V
Conflict with snorkelers			91.35	<.001	.47
No conflict	21	64			
Interpersonal conflict	68	24			
Social values conflict	8	12			
Both interpersonal and social values conflict	3	0			
Conflict with scuba divers			21.05	<.001	.23
No conflict	54	47			
Interpersonal conflict	27	46			
Social values conflict	18	7			
Both interpersonal and social values conflict	1	0			

[a]Cell entries are percentages (%).

interpersonal with few participants expressing social values conflict (8%, 12%) or both types of conflict (≤3%). Conflict with scuba divers was more balanced with 53% of scuba divers and 46% of snorkelers reporting conflict with divers, $\chi^2 = 21.05$, $p < .001$, $V = .23$. Almost all conflict between scuba divers and other divers was interpersonal, whereas 27% of conflict with scuba divers experienced by snorkelers was interpersonal and 18% represented social values conflict. Few participants (≤1%) reported both types of conflict with scuba divers. Given that so few participants (≤3%) reported both types of conflict with each activity, they were removed from the remaining analyses.

Participants who experienced conflict were more likely to support the direct (i.e. limit numbers of snorkelers, scuba divers, boats) and indirect management strategies (i.e. educate users about how to behave; Table 6). Those in each group who experienced interpersonal conflict with each activity were most likely to support each strategy, followed by those who expressed social values conflict. Participants who did not report conflict were least supportive of each strategy. For example, 42% of snorkelers who reported no conflict with scuba divers supported limiting the number of divers, 69% of snorkelers who expressed social values conflict with scuba divers supported limiting the number of divers, and 76% of snorkelers who experienced interpersonal conflict with scuba divers supported limiting the number of divers. This pattern was consistent across all 16 comparisons and statistically significant for 11 of these, $\chi^2 = 5.45$–22.69, $p = .049$ to <.001, $V = .16$–.31.

Table 6. Relationships between perceived conflicts and support for potential management strategies.

	No conflict[a]	Social values conflict[a]	Interpersonal conflict[a]	χ^2-value	p-value	Cramer's V
Snorkeler conflict with other snorkelers						
Educate about how to behave with others	70	78	87	5.45	.049	.16
Limit number of snorkelers allowed	51	65	78	13.17	<.001	.24
Limit number of scuba divers allowed	47	53	58	2.06	.357	.09
Limit number of boats allowed	53	61	65	1.27	.529	.07
Snorkeler conflict with scuba divers						
Educate about how to behave with others	83	84	91	1.51	.472	.08
Limit number of snorkelers allowed	65	78	84	7.78	.020	.18
Limit number of scuba divers allowed	42	69	76	22.69	<.001	.31
Limit number of boats allowed	54	69	74	7.96	.019	.18
Scuba diver conflict with snorkelers						
Educate about how to behave with others	60	78	83	6.57	.037	.21
Limit number of snorkelers allowed	38	56	60	5.78	.048	.20
Limit number of scuba divers allowed	44	56	69	7.23	.026	.22
Limit number of boats allowed	53	58	67	1.21	.546	.09
Scuba diver conflict with other scuba divers						
Educate about how to behave with others	58	64	79	7.31	.026	.22
Limit number of snorkelers allowed	36	46	58	6.81	.033	.22
Limit number of scuba divers allowed	39	55	66	10.29	.006	.26
Limit number of boats allowed	49	55	67	4.51	.105	.18

[a]Cell entries are percentages (%) who supported the strategy.

Table 7. Relationships between perceived conflicts and likelihood of potential sanctions.

	No conflict[a]	Social values conflict[a]	Interpersonal conflict[a]	χ^2-value	p-value	Cramer's V
Snorkeler conflict with other snorkelers						
Express opinions to others causing situation	62	78	80	4.99	.047	.16
Express opinions to people in charge	49	42	51	.54	.762	.05
Snorkeler conflict with scuba divers						
Express opinions to others causing situation	70	76	85	5.92	.039	.16
Express opinions to people in charge	53	41	49	1.92	.383	.09
Scuba diver conflict with snorkelers						
Express opinions to others causing situation	71	83	92	7.13	.028	.21
Express opinions to people in charge	49	56	43	.84	.657	.08
Scuba diver conflict with other scuba divers						
Express opinions to others causing situation	68	73	89	9.63	.008	.25
Express opinions to people in charge	42	64	57	3.53	.171	.16

[a]Cell entries are percentages (%) who would be likely to take this action (sanction).

Participants who experienced conflict would also be more likely to respond by directly sanctioning individuals causing the problematic situation, but would not be more likely to indirectly sanction those in charge (e.g. managers, operators; Table 7). Participants in each group who experienced interpersonal conflict with each activity would be most likely to directly sanction other participants causing the situation, followed by those who expressed social values conflict. Those who did not report any conflict would be least likely to sanction other participants. For example, the percentages of scuba divers likely to sanction other participants causing a problem was 68% of those who reported no conflict with other scuba divers, followed by 73% of those who expressed social values conflict with other divers, and 89% of those who reported interpersonal conflict with other divers. This pattern was consistent and statistically significant across all four comparisons, $\chi^2 = 4.99$–9.63, $p = .047$–.008, $V = .16$–.25. There were no statistical relationships, however, between any conflict experiences and likelihood of indirectly sanctioning managers, operators, or owners.

Discussion

Management implications

These results have implications for both management and research. From a management perspective, results showed that manta ray tourism at this site is characterized by considerable conflicts, with most involving direct physical interactions among participants in the same activity. Overall, 79% of snorkelers experienced conflict with other snorkelers and most of this was interpersonal. Similarly, 53% of scuba divers reported conflicts with other divers with most of this also being interpersonal. The most commonly observed and problematic behaviors were participants bumping into each other (up to 92%), not being aware of others (up to 73%), and blinding people with underwater flashlights (up to 56%). These results are somewhat predictable given that this manta ray viewing occurs in the water after sunset where darkness and ocean swells can cause people to lose their bearings. Participants are also encouraged by tour operators to remain in close proximity to each other for safety reasons and concentrate their lights to attract zooplankton and manta rays in a localized area. Previous studies suggested that separating people through spatial zoning can be effective for mitigating interpersonal conflicts (Graefe & Thapa, 2004; Manning, 2011). An example of this approach at the manta ray viewing site could be to require minimum distances between participants to slightly spread out use while maintaining safety and the density of zooplankton and manta rays. Minimum distances and other spatial zoning techniques have been successful for managing interactions among groups such as anglers along popular rivers (Martinson & Shelby, 1992) and snorkelers and other tourists at heavily used marine protected areas (Roman, Dearden, & Rollins, 2007). Minimum distances, however, may not be feasible at this manta ray site because they would be challenging to monitor given that use occurs in the dark and there is little formal regulation and enforcement by the DLNR

(Marine Science Consulting, 2015). In addition, it would be difficult for participants to estimate distances between each other, especially at night and when concentrating on viewing manta rays.

Other possible strategies for addressing these conflicts involve temporal zoning. Examples include staggering visitation times throughout the evening (rather than most boats visiting at the same time) or limiting access by alternating nights (instead of every boat visiting each night). These strategies could reduce the number of people in the water at any one time and possibly reduce conflict. Staggering visitation times could, however, be problematic because this may increase the total amount of time each evening that people are interacting with manta rays, presenting potentially negative impacts on the rays (e.g. stress, habituation, shifts in feeding; Osada, 2010; Semeniuk et al., 2009a). Alternating nights could benefit participants and rays by having fewer people in the water each night (Osada, 2010), but this could have negative economic implications on operators by reducing their passenger loads and profitability. Operators could potentially compensate for this loss by increasing passenger fees (i.e. tour costs).

Another possible strategy for managing these conflicts at the manta ray site would be to implement a quota system limiting the numbers of snorkelers, scuba divers, tour boats, and/or operators. Although use limits are controversial because they leave little or no freedom of choice and should usually be used as a last resort (Hall & Lew, 2009; Manning, 2011; McCool, 1978; Needham & Szuster, 2011), these direct strategies were supported by many respondents, especially those experiencing interpersonal conflict (up to 84%). Decreasing use could impact operators by reducing their number of passengers and profits, but, again, any losses could be offset by increasing participant fees (i.e. tour costs). This approach of limiting use through a licensing or permit system, coupled with fee increases, has been successful at reducing impacts (e.g. conflict, crowding, depreciative behavior) and attracting more conscientious participants at several tourism and recreation destinations (Catlin, Jones, & Jones, 2012; Lankford, Inui, & Whittle, 2008; Rollins, 1998; Smith, Newsome, Lee, & Stoeckl, 2006; Weaver, 2008).

In addition to these in-group interpersonal conflicts, results showed some out-group conflicts between snorkelers and scuba divers. For example, 46% of snorkelers experienced conflicts with scuba divers, with most of these caused by distractions from bubbles created by scuba divers exhaling. This finding is not surprising given that scuba divers sit on the seafloor while snorkelers float and swim at the surface, and diver bubbles float upward through the water column. One option for addressing this issue is to separate the two activity groups (i.e. spatial zoning), but this could make it difficult to concentrate lights that are needed for attracting zooplankton and manta rays. Another approach is to educate snorkelers before purchasing and beginning the tour by informing them about the bubbles and other conditions to expect when participating.

Education might also reduce social values conflicts between snorkelers and scuba divers. In fact, results showed strong support for educating participants about how to behave with others (up to 91%).The largest amount of social values conflict, however, was only 18% and involved snorkeler evaluations of scuba divers; about one in five snorkelers believed that scuba diving at this manta ray site is problematic and they philosophically disagreed about the appropriateness of scuba diving at this site. Studies have suggested that when conflict stems from differences in values, education through the use of interpretation tends to be most effective (Carothers et al., 2001; Vaske et al., 2007). Interpretation captures attention and conveys information with the goal of educating people (Ham, 2013; Littlejohn, Needham, Szuster, & Jordan, 2016). Interpretation exists in various forms (e.g. signs, lectures, brochures), should go beyond conveying facts to revealing relationships and meanings, and is essential for achieving both entertainment and educational outcomes (Lück, 2015; Weaver, 2008). Providing interpretation to users before they purchase and begin the tour to educate them about the appropriateness and importance of each activity may help to mitigate these minor social values conflicts at the site.

Findings also showed relationships between experiencing conflict and likelihood of directly sanctioning other participants causing problems, especially among those experiencing interpersonal conflicts (up to 92%). Participants taking conflict situations into their own hands is problematic and could

spiral out of control (Manning, 2011). Managers and operators, therefore, should use interpretation to educate participants about other approaches for dealing with negative interactions, as well as potential avenues for reporting any negative events that happen. In some heavily used tourism and recreation areas, for example, industry codes of conduct have included outlets such as telephone hotlines and internet blogs for people to report negative situations and allow managers to address these issues instead of participants taking situations into their own hands (Pomeranz, Needham, & Kruger, 2013). Although there were no relationships between experiencing conflict and likelihood of expressing opinions to those in charge of the manta ray site (e.g. managers, operators), managers and operators could encourage participants to report events instead of directly sanctioning fellow participants.

Taken together, there is clearly no perfect "one size fits all" solution to minimize conflicts at this manta ray site. Instead, there are a number of interventions that managers could take with each having advantages and disadvantages. As a first step, however, temporal zoning (e.g. alternating nights) could be implemented alongside fee increases to reduce interpersonal conflicts and maintain operator profitability. In addition, interpretation before beginning the tour to educate users about conditions to expect and the appropriateness and importance of each activity could be enhanced to reduce out-group and social values conflicts. If these interventions are unsuccessful, then managers could increase fees and implement quota limits through a licensing or permit system to reduce numbers of snorkelers, scuba divers, boats, and/or operators while maintaining profitability. Regardless of strategies that could be adopted, implementation should be followed by continuous monitoring and periodic biophysical and social science research, otherwise this site may become a "sacrifice area" of high use where the quality of the natural environment and participant experiences may become severely compromised (Bell et al., 2011).

Research implications

From a research perspective, results showed that almost all conflicts among participants were attributed to the physical presence or behavior of individuals interfering with the goals and experiences of others (interpersonal or goal interference conflict), whereas there were minimal social values conflicts. This finding is consistent with Carothers et al. (2001) who found that interpersonal conflict was the main source of contention between hikers and mountain bikers, but differs from Vaske et al. (1995) who found that conflict between hunters and wildlife viewers was largely attributed to differences in values and beliefs. Social values conflicts are likely to dominate when individuals differ dramatically in activity participation patterns, goals, and philosophies (e.g. hunters, wildlife viewers), whereas interpersonal conflicts are more likely when individuals share similar goals and beliefs (Vaske et al., 2007). Snorkelers and scuba divers share similar interests (e.g. underwater exploration, viewing species) and sometimes recreate close together, which may explain the minimal social values conflicts when viewing manta rays. Research is needed, however, to understand the underlying predictors of interpersonal and social values conflicts, and the extent these drivers are similar or different across types of conflict.

Results also showed few (≤ 3%) snorkelers and scuba divers simultaneously expressing both interpersonal and social values conflicts for each behavior (e.g. being rude or discourteous, bumping into people) and across the behaviors combined. This finding is consistent with Vaske et al. (2007) who did not find clear groups of skiers or snowmobilers reporting both types of conflict. Additional research is needed to determine whether this pattern is consistent across other activities. This study also used similar measures as Vaske et al. (2007) to reclassify respondents as expressing both interpersonal and social values conflicts (e.g. "just knowing that scuba divers are at the manta ray sites bothers me, even if I never see scuba divers there"), but more research is needed to test this and other possible measures for classifying respondents who experience both types of conflict to determine if results generalize across activities, settings, and methods.

Research has also focused more on out-group conflicts (e.g. hikers vs. mountain bikers) than in-group conflicts (Graefe & Thapa, 2004; Manning, 2011). Findings here, however, showed that the majority of conflicts were not out-group. Instead, most conflicts were in-group between snorkelers

and other snorkelers (79%), and scuba divers and other divers (53%). This finding is similar to Thapa and Graefe (2004) who found that skiers were more likely to attribute conflict to other skiers than to snowboarders. In-group conflicts at the manta ray site are somewhat predictable because snorkelers and scuba divers are slightly physically separated (i.e. divers on seafloor, snorkelers at surface), which minimizes 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.

In addition to revealing the presence or absence of conflicts, this study showed empirical relationships between these conflicts and responses to potential management actions. Previously, researchers typically suggested that management attention is needed and then advocated approaches for addressing conflict, without actually asking respondents for their opinion (Graefe & Thapa, 2004; Manning, 2011). Participants who experienced interpersonal conflict were most supportive of education and limiting use at the manta ray site (58%–91%). Many participants who experienced no conflict, however, still supported these strategies (36%–83%), which may be explained by the fact that the survey questions focused more broadly on managing use and experiences in general rather than managing conflict in particular. This finding suggests that other issues in addition to conflict could be problematic at this manta ray site. Although speculative, these issues could include crowding, noise, and other depreciative behaviors commonly studied in tourism and recreation (Hall & Lew, 2009; Manning, 2011; Needham et al., 2016; Weaver, 2008). Researchers should refine these measures and examine if this relationship between conflict and support for management generalizes across other activities, settings, and methods.

Participants who experienced conflict would also be more likely to sanction individuals causing problems, but not more likely to sanction those in charge (managers, operators). Limited research has examined sanctions in relation to tourism and recreation experiences such as conflict (Cialdini et al., 1990; Sirakaya & Uysal, 1997). Schneider (2000) and Schuster et al. (2006) focused on coping mechanisms in general and not sanctions in particular, and found that few wilderness visitors talked to managers or engaged in what they called "confrontive coping" (e.g. stood ground, expressed anger) after experiencing conflict. Most wilderness visitors opted to restrain themselves and accept the situation. Results at the manta ray site, however, showed much greater likelihood among those experiencing social values (up to 83%) and interpersonal conflicts (up to 92%) to express their opinions directly to those causing problems. Although speculative, these differences among studies may be explained by the fact that most participants pay over US $100 to snorkel or scuba dive with manta rays and this experience could be considered a "once in a lifetime" opportunity for many, potentially producing more aggressive responses to negative experiences. By comparison, wilderness recreation can be less costly and more frequently accessible. In addition, many participants who experienced no conflict would still be likely to impose sanctions (42%–71%), which could be explained by the fact that the survey questions asked how participants would respond if they experienced more people or conflict than they would tolerate. These questions were not specific to just conflict, but also included use levels, suggesting that both use and conflict are problems at this site. Researchers are encouraged, therefore, to enhance the specificity of questions measuring sanctions and examine whether this relationship between conflicts and sanctions extends to other situations.

Studies examining interpersonal and social values conflicts have developed and tested a number of behavioral indicators of conflict, and there remains considerable diversity in methods for measuring this concept (Graefe & Thapa, 2004; Manning, 2011). The five indicators used here (e.g. rude or discourteous, bump into people) and methodological approaches such as recoding scale responses (e.g. never observed to observed many times) into dichotomous categories (not observed, observed) are consistent with those employed in previous studies (Carothers et al., 2001; Vaske et al., 1995, 2007). Examining individual behavioral 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.

Conclusion

In conclusion, this article examined the extent that conflicts are occurring within and between people scuba diving and snorkeling with manta rays at a site in Hawaii, what types of conflict are prevalent, and how participants would respond (support restrictions, sanction others). The majority of snorkelers experienced in-group conflict with other snorkelers, and scuba divers reported in-group conflict with other divers. Most of these conflicts were interpersonal (e.g. bumping into each other, blinding people with underwater flashlights). There were fewer out-group (e.g. snorkelers vs. scuba divers) and social values conflicts. Understanding these conflicts can inform management strategies to minimize depreciative impacts and maximize the quality of experiences (e.g. temporal zoning, education, quota). Most participants, for example, favored limiting numbers of snorkelers, scuba divers, and boats, and providing education on how to behave with others. Those experiencing conflicts were more supportive of these strategies and would be more likely to sanction participants causing problems. Applicability of these patterns of findings to other activities and geographical settings remains a topic for further empirical investigation.

Notes

1. These scales were collapsed into dichotomous categories to match the exact methodological procedures of almost all studies measuring both interpersonal and social values conflicts (e.g., Carothers et al., 2001; Vaske et al., 1995, 2007), allow comparisons across studies, and test the typology in Figure 2. To validate this approach, discriminant function analysis determined how well the original 4-point scales predicted the proportions of participants calculated as experiencing each type of conflict with each activity (e.g., no conflict, interpersonal conflict, social values conflict). All of the original scales significantly predicted these conflict groups, Wilks' lambda $U = .358$–$.942$, $p < .001$. These scales correctly classified 98%–100% of respondents reporting no conflicts, 67%–80% of those experiencing social values conflicts, and 78%–93% of respondents reporting interpersonal conflicts. Overall, 89%–93% of respondents were correctly classified, suggesting that collapsing responses into dichotomous categories yielded almost identical results compared with retaining the original scales.
2. Vaske et al. (2007) used cluster analysis of conflict behaviors to obtain overall proportions of respondents experiencing each type of conflict. A challenge with their approach, however, is there are not always consistent patterns in cluster centroids or clear differentiations between clusters representing each type of conflict. In addition, cluster analysis weights all conflict behaviors relatively equally and focuses on patterns across these behaviors, which could cause some conflicts to be underestimated or overestimated, and could also be problematic when only a few behaviors are highly prevalent and commonly reported.
3. These scales were collapsed into dichotomous categories and reported as percentages instead of means to simplify description and interpretation of results. The majority of respondents (55%–78%) supported or strongly supported each management strategy, comparatively few (<30%) selected the scale midpoint (i.e., neither), and even fewer opposed each strategy (<14%). In addition, ancillary analyses retaining the original scales and using means instead of percentages showed the same pattern of results as those in Table 6. Respondents in each group who experienced interpersonal conflict were most supportive of each strategy, followed by those who expressed social values conflict. Participants who did not report conflict were least supportive. For example, among snorkelers who reported no conflict with scuba divers, the mean response for limiting the number of divers was $M = 3.34$, followed by $M = 3.90$ for those expressing social values conflict and $M = 4.10$ for those experiencing interpersonal conflict. Collapsing responses into dichotomous categories, therefore, yielded identical patterns of results compared with retaining the original scales.
4. This scale had no midpoint (e.g., neither, neutral).

Disclosure statement

No potential conflict of interest was reported by the authors.

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