

Managing Endangered Species within the Use/Preservation Paradox: Understanding and Defining Harassment of the West Indian Manatee (*Trichechus manatus*)

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*As the popularity of interacting with marine mammals in the wild increases, managers face the challenge of providing use while simultaneously protecting the target species. Because the West Indian manatee (*Trichechus manatus*) is protected from harassment by formal legislation, there is some concern regarding manatee encounters in Crystal River, Florida, USA, where tourists swim with the endangered animals. This study examined how the construct of harassment is defined and specifically applied to manatee encounters. Three major themes emerged: stakeholders impose their own values when interpreting formal definitions of harassment; a definition of harassment is difficult to apply in the field; and enforcement efforts are confounded by these and other variables in the setting. Thus, the issue of harassment is not a technical one but largely an issue of social value. Management implications are discussed and a management framework is recommended to find common ground and establish best practices.*

Keywords harassment, human-wildlife interactions, limits of acceptable change, *Trichechus manatus*, West Indian manatee

Introduction

Disturbance resulting from nonconsumptive uses of wildlife can result in changes in wildlife physiology, behavior, reproduction, population levels, and the community's species composition (Hammit & Cole, 1998). In the United States, marine mammals are formally protected from harassment by the Marine Mammal Protection Act (MMPA) of 1972, and endangered species are further afforded protection under the Endangered

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Species Act (ESA) of 1973. These formal definitions of harassment are designed to incorporate all endangered species under the ESA and all marine mammals under the MMPA. Because of the broad scope of these definitions, enforcing policy on harassment can be problematic when applied to particular species in particular contexts.

As the popularity of interacting with marine animals in the wild increases (Hoyt, 2001), wildlife managers are faced with the challenge of providing use while simultaneously protecting the target species. This is the case in Crystal River, Florida, USA where over 350 endangered West Indian manatees (*Trichechus manatus*) migrate to Kings Bay each winter to thermoregulate in its naturally warm springs. Visitors take advantage of the easy access and good visibility to observe and encounter manatees. According to the Marine Mammal Commission's (MMC) Annual Report to Congress (2001), this phenomenon draws nearly 100,000 participants each year. The manatee encounter is a unique experience, providing participants with the opportunity to interact with a large, docile marine mammal. Participants often touch, pet, and even "play" with manatees during encounters.

With the popularity of the manatee encounter comes increased concern from some in the manatee protection community regarding the potential deleterious impacts that can result from the perceived harassment of manatees. For example, the MMC (2001) noted that despite efforts of the U.S. Fish and Wildlife Service, "reports of divers attempting to grab, ride, and chase manatees continue" (p. 125). Despite this growing concern, there is no research that implicates encounters as harmful to the fitness of individual manatees or the Crystal River population. Moreover, there is little agreement about behaviors that constitute harassment.

The purpose of this article is to examine the concept of harassment in the context of a specific human-wildlife interaction. In the face of growing concern in the manatee protection community over encounters, the community's perceived economic dependence on these encounters, and the lack of science examining manatee responses to human interaction, this article examines how stakeholders define and apply the concept of harassment to human-manatee interactions in Crystal River and the resultant management implications.

Literature Review

Opportunities to view and interact with marine animals in the wild have increased significantly in the past decade. Worldwide, activities in which people "see, swim with, and/or listen to any . . . species of whales, dolphins and porpoises" have increased from over 4 million in 1991 to 9 million in 1998 (Hoyt, 2001). In the United States, nonresidential wildlife watching has increased 63% between 1980 and 1995 (U.S. Department of Interior, 1999), with an estimated 23.7 million Americans participating in 1995. Of these nonresidential wildlife watchers, an estimated 3.5 million (14.8%) specifically participated in marine mammal viewing (U.S. Department of the Interior, 1997). The May 2001 issue of *Skin Diver* magazine, which featured a section on "big animal encounters," including articles on swimming with humpback whales, Orcas, great white sharks, West Indian manatees (see also Sorice, 2001), dolphins (see also Samuels, Bejder, & Heinrich, 2000), and manta rays (see also Tisdale, 1999), illustrated the growing number of opportunities to encounter marine wildlife and their market appeal.

Wildlife Impacts

As people place increasing value on experiencing animals in the wild, there is increased concern over the resultant negative impacts that may occur to the target species as well

as its habitat (Roe, Leader-William, & Dalal-Clayton, 1997). However, the relationship between recreation and tourism and wildlife impacts is not well understood due to the lack of systematic examination that explores the effect of varying numbers of visitors on wildlife and of comparative studies examining pre- and post-recreation wildlife populations (Hammit & Cole, 1998). In addition, impact studies have been unable to adequately control for natural environmental variables (e.g., population dynamics; Hammit & Cole, 1998; Shackley, 1996).

Wildlife responses to recreation and tourism are difficult to study because they are influenced by a number of variables: the type of activity; the behavior of the recreationist as well as the behavior's predictability; and the frequency, magnitude, timing, and location of the activity (Knight & Cole, 1995). In addition, the characteristics of the wildlife species itself have a significant influence on the magnitude of an impact. Time of year (e.g., breeding season), age, habitat type, and an individual's level of habituation to recreationists influence a species' tolerance level to human activity (Hammit & Cole, 1998; Olson, Gilbert, & Squibb, 1997). Knight and Temple (1995) noted that wildlife responses to recreational activities may change over time, moving among habituation, attraction, and avoidance.

Classifying Impacts

Impacts to wildlife can be classified along two dimensions. First, impacts may be direct or indirect (Hammit & Cole, 1998). Direct impacts involve "primary disturbances" from interactions with humans. Indirect impacts result from disturbance to a species' habitat that occurs as a result of recreational use, including changes in soil, vegetation, or aquatic systems (Cole & Landres, 1995). Second, impacts can be classified as selective or non-selective (Hammit & Cole, 1998). Selective impacts can result from activities that focus on a specific wildlife species (e.g., white-tailed deer hunting). Nonselective impacts can result from recreational activities in which interactions are broadly directed at wildlife and/or occur incidentally (e.g., viewing various wildlife species while hiking).

In contrast to indirect impacts, which are mostly restricted to habitat modification, direct impacts can be further divided into harvest and harassment (Hammit & Cole, 1998, see also Figure 1). Harvest includes hunting and fishing activities in which an animal is actually removed from the environment. Harassment is altogether more ambiguous, suggesting the potential for lasting harm to an animal or species due to human activity. Defined by Neil, Hoffman, and Gill (1975), harassment is "any activity of man . . . which increases the physiological costs of survival or decreases the probability of successful reproduction of wild animals" (p. 1). Ream (1980) conceptualized harassment more generally as human "disturbance" that "produces stressful situations for wildlife" resulting in a myriad of negative outcomes for an individual or species including "excitement and/or stress, disturbance of essential activities, severe exertion, displacement, and sometimes death" (Ream, 1979). The common focus of these harassment definitions is on the potential for human behavior to have a significant negative effect on an individual's fitness. These authors distinguish between intentional and unintentional harassment (Hammit & Cole, 1998).

Because of its potential to significantly alter the fitness of an individual, population, or species, harassment has been incorporated into U.S. policy pertaining to wildlife protection. Three regulatory acts contain harassment regulations applicable to manatees. Both the ESA of 1973 and the MMPA of 1972 prohibit the "take" of animals under their jurisdiction. The term "take" includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting protected animals (see the ESA, 16 USC 35 §1532.19 or the MMPA, 16 USC 1362 §3(r)(1)). The actual definitions of

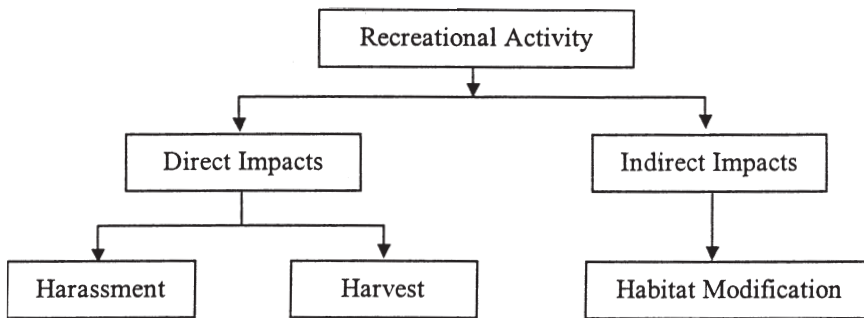


Figure 1. Classification of wildlife impacts resulting from recreation. (Source: Hammitt and Cole, 1998.)

harassment, however, differ between the two acts (Table 1). While the ESA focuses on the potential for injury to an animal, the 1994 amendments to the MMPA partition harassment into two types: “Level A” harassment is defined as having the “potential to injure a marine mammal . . . in the wild.” “Level B” harassment is defined as having the “potential to disturb a marine mammal . . . in the wild.” The third regulatory act prohibiting manatee harassment is the Florida Manatee Sanctuary Act (FMSA) of 1978. This state law shares the same definition of harassment as the ESA except that it is specific to manatees and explicitly lists feeding as a harassing behavior.

Understanding formal U.S. policy on harassment in the context of human interactions can be problematic. For example, in a discussion on whale watching, Atkins and Swartz

Table 1
Comparing three definitions of wildlife harassment as defined
in U.S. state and federal statutes and regulations

Endangered Species Act 1973, U.S. Code of Federal Regulations 50 CFR 17.3	Florida Manatee Sanctuary Act 1978, Florida Administrative Code 68C-22.002(24)	Marine Mammal Protection Act 1972 (amended in 1994) 16 USC 1362 §3(r)(1)
An intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.	Any intentional or negligent act or omission which creates the likelihood of causing an injury to a manatee by annoying it to such an extent as to disrupt normal behavioral patterns which include breeding, feeding, or sheltering. The intentional provision of any type of food to manatees not in captivity shall be considered harassment under this definition, unless authorized by a valid federal or state permit.	Any act of pursuit, torment, or annoyance which: (A) has the potential to injure a marine mammal or marine mammal stock in the wild; or (B) has the potential to disturb a marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

(1989) wrote that the problem with the MMPA harassment regulation is that it defines harassment as “disturbing or molesting” animals, disrupting their “normal” behavior, but it provides no further definitions of “normal” behavior, “disturbance,” or “molestation.” Beach and Weinrich (1989) also discussed harassment in terms of the MMPA definition as it applies to whale watching. While it works well for instances where direct harm occurs, they said, “most whale-vessel interactions don’t cause direct physical injury. Rather they produce avoidance behavior by the whale . . . or changes in such activities as feeding, resting, or socializing. In these circumstances, it becomes more difficult to assess a vessel’s effect on whales” (p. 86). It would be ideal, they suggested, if whales exhibited a behavior that could be unequivocally interpreted as response to harassment, but the same behaviors that may indicate disturbance are also components of social displays.

Regardless of the difficulty of identifying cause and effect as well as the ambiguity associated with harassment policy, interactions with wildlife and their resultant impacts are a concern for managers because both direct and indirect impacts can have short-term and long-term effects on wildlife. These impacts can affect individuals, populations, and even wildlife communities (Anderson, 1995; Gutzwiller, 1995).

Impact Studies

Direct harassment of wildlife is a concern because it can affect a species’ behavior, reproductive success, and fitness. In a terrestrial example, Johns (1996) found that group size directly influenced the responses of chimpanzees (*Pan troglodytes schweinfurthi*) to tourists in Uganda. The simple presence of people has been found to affect breeding success in shorebirds and bird rookeries (Burger, Gochfeld, & Niles, 1995). The presence of tourist buses was found to be a negative factor in cheetah (*Acinonyx jubatus*) hunting success, but may aid the success of other species such as hyenas (Haysmith & Hunt, 1995, and references therein). A study on Asian rhinos (*Rhinoceros unicornis*) found that close approaches of less than 10 meters by elephant-riding tourists disrupted the rhinos’ feeding behavior and frequently displaced the animals (Lott & McCoy, 1995). Another study examined habituation, comparing the impacts of human activity on habituated and nonhabituated brown bears (*Ursus arctos*) in Alaska (Olson, Gilbert, & Squibb, 1997). The authors found that, when human activities extended a week longer (than usual) into the bear’s fall salmon feeding period, nonhabituated bears reduced their activity while habituated bear use remained similar to past years. A study in Chile found that the presence of humans on the coast interfered with the abundance and spatial and temporal distribution of seabirds (Cornelius, Navarrete, & Marquet, 2001).

Gabrielsen and Smith (1995) reviewed the physiological responses of wildlife to human disturbance, concluding that the most “dramatic” responses occur as the result of human out-of-vehicle approach. A study on wading birds at J.N. “Ding” Darling National Wildlife Refuge in Florida also showed that birds were affected by the level of use (Klein, Humphrey, & Percival, 1995) and that they were more likely to flee when approached on foot; photographers were the most likely user group to approach them (Klein, 1993). Concern for the effect of close approaches to birds by watercraft led to one Florida study in which the flush distances of waterbirds were examined to determine buffer-zone distances (Rodgers & Schwikert, 2002).

Similar concerns have been raised with regard to marine viewing and interaction. For example, tourist activities in the Great Barrier Reef Region include reef walking, snorkeling, diving, coral and fish viewing, and boating. Concern here relates to the physical damage done to the reef as well as the impacts of collecting reef organisms, overfishing, and the disturbance of seabirds, whales, and fish (Hammit & Cole, 1998). Additionally,

concern exists over the growing worldwide popularity of whale watching (Hoyt, 2001) as well as dolphin observation and swim-with programs (see Samuels, Bejder, & Heinrich, 2000, for a review). Watkins (1986) noted from 25 years of observations that human activities have caused whale species to change behavior over time, with some species changing from positive to negative interest in human activities and vice versa. In 1988, in an effort to create policy, a conference on whale watching addressed impacts on whales (Atkins & Swartz, 1989). Concerns in this case surrounded the vulnerability of whales to injury and disturbance by boats. For example, increased vessel traffic in Hawaii was blamed for female humpbacks (*Megaptera novaeangliae*) and their calves abandoning certain areas.

Recreational interactions between humans and dolphins can affect the health and welfare of the animal. Over time, bottlenose dolphins (*Tursiops truncatus*) have habituated to human presence in Panama City, Florida, spending 77% of the time researchers observed them engaged in interactions with humans (Samuels & Bejder, 1998). Time spent interacting with humans decreases the time they spend foraging, increases their dependency on human food, and makes them more susceptible to injury from boats (Bryant, 1994). In addition, Spradlin et al. (1999) notes the public safety issue that surrounds swim-with-dolphin programs. Dolphins may become aggressive in response to interactions, and instances of human injury and even death have been reported (Frohoff & Packard, 1995).

Many individual dolphins and dolphin groups are habituated to humans through food provisioning, but the spinner dolphin (*Stenella longirostri*) is an example of a species that may be disturbed or harassed by entrepreneurial tourism operators without food provisioning. The spinner dolphin uses protected bays in Hawaii to rest and socialize out of reach of larger predators (Trevor Spradlin, personal communication, 2000). Tourism operators have discovered this pattern and now regularly provide swim-with-dolphin tours. Research on this species has raised concern that swim-with-dolphin tours may have permanently displaced some spinner dolphins and may repeatedly disrupt the resting behavior of those that use these areas, causing reduced energy levels (Samuels, Bejder, & Heinrich, 2000, and references therein). In 2002, concern for spinner dolphins and other human–marine mammal interactions led the National Marine Fisheries Service to seek public comment on a proposal to create regulations regarding potentially harassing human activities that target these species (67 FR 4379).

In the manatee realm, Shackley (1992) first raised concern about human–manatee interactions in Crystal River, proclaiming this sort of tourism as perhaps the “final nail in the manatee’s coffin.” Abernathy (1995a) observed manatee encounters and concluded that manatees may be hyperstimulated by interactions, resulting in greater frequencies of sexual behaviors. Abernathy (1995b) found a positive correlation between human presence and increased manatee activity: resting decreased, while swimming behaviors increased. Thus, human interaction may result in greater energy expenditure. Wooding (1997) studied human–manatee interactions at Three Sisters Spring in Crystal River and noted that manatees tended to leave the area when boats arrived in the morning. However, in a few instances, no manatees left the area when boats arrived and in some cases they left “well before” the first boat arrived. Buckingham et al. (1999) found that manatee use of Kings Bay was influenced by boating activity, concluding that the number of boats and manatee avoidance of boats are positively correlated. Finally, King (2002) observed manatee use of protected areas was significantly correlated with the number of swimmers and boaters in the area.

Despite concerns for wildlife, few studies have addressed the long-term impacts of different scales of encounters. For example, Samuels, Bejder, and Heinrich (2000) reviewed 151 articles on swimming with wild cetaceans and concluded that, for animals

habituated to human interactions, “there is virtually no research that specifically addresses the short- or long-term impacts of regular swim-with operations on the behavior and well-being of habituated individuals or affected cetacean communities” (p. 16). For unhabituated cetaceans, the authors noted that some studies provide “anecdotal” evidence that swim-with operations disrupt the behavior of the targeted species. Further longitudinal studies are beginning to show that tourist activity does have a “detrimental” effect on targeted dolphin species (Samuels, Bejder, & Heinrich, 2000). For example, Constantine (2001) found that wild bottlenose dolphins increased avoidance responses to swimmers in a New Zealand swim-with-dolphins tourism program.

Given the dearth of research based on data that address how human interaction might “significantly disrupt normal behavioral patterns” of manatees (as defined in the ESA and FMSA), questions persist about the meaning and application of the term harassment in Crystal River, Florida, and other manatee encounter sites. This study addressed some of these questions by evaluating how different stakeholder groups viewed the concept relative to the manatee and then by analyzing data to determine how applying and enforcing harassment policy might be implemented in this context.

Methods

Between January and March of 2000, data on manatee encounters were collected in Crystal River through participant observation, interviews, and document analysis using the snowball sampling method (Babbie, 1998).

Participant observation involved direct observation of the participants in the setting with a focus on use levels as well as what people were doing and saying about manatee encounter experiences. Throughout data collection, the investigator moved between roles as a complete participant, participant-as-observer, observer-as-participant, and complete observer (Lindlof, 1995). For example, as a complete participant the investigator spent time snorkeling, swimming with manatees, kayaking, and observing and listening to participants.

Thirty-four unstructured and semistructured in-depth interviews were conducted with state and federal wildlife research and management agency employees, agency volunteers, manatee tour operators and other manatee-related businesses in Crystal River, tourism officials, advocacy groups, and participants (Table 2). The emphasis of the interviews was on trying to understand how the manatee encounter experience was perceived by interested parties, including the current physical, managerial, and social setting in which it occurs, with an emphasis on identifying the areas of social and resource concern. To ensure anonymity all study participants were assigned first and last name pseudonyms. This allowed participants to speak more candidly about their perceptions and attitudes.

Table 2
Stakeholders interviewed about human–manatee interactions

Participants	Business community	Research/management agencies	Advocacy
14-year veterans 3-year veteran	Citrus County tourism agency	U.S. Fish and Wildlife Service	Save the Manatee Club
	Gift shop managers Encounter tour operators	USGS Sirenia Project Florida Marine Research Institute	

Finally, document analysis was used to enhance observations, to verify interview data, and to provide historical context. Newspaper archives from the *Citrus County Chronicle* and the *St. Petersburg Times* were analyzed from 1996 to 2000. The county's Tourism Development Council provided general tourism literature and tour operators provided advertising materials. Videotapes also were analyzed, including the informational video produced by the U.S. Fish and Wildlife Service, *Manatee Manners*, as well as documentaries filmed in or relevant to Crystal River.

It is important to note that in this study local residents are absent from the stakeholder list. Although many study participants are also residents of Crystal River, the snowball sampling technique did not lead to any contacts with residents who were not directly related to the manatee encounter arena. This suggests that residents are not incorporated as a major stakeholder in the manatee tourism/protection arena.

Data were systematically analyzed using Spradley's (1979) domain analysis technique and then coded using Atlas.ti, a qualitative data analysis software package (Muhr, 2000). During this coding process the investigator wrote analytical memos, which served to identify inchoate themes. Data were then analyzed, looking for instances that supported or negated the validity of the emerging themes.

Setting

This study was conducted in Crystal River, Florida, USA, which is situated 6 miles inland from the Gulf of Mexico, approximately 70 miles north of Tampa, Florida. The city is situated on Kings Bay, which contains more than 30 artesian springs that serve as the headwaters for the Crystal River (Figure 2). The springs' water temperature remains a fairly constant 23–24°C throughout the year (Hartman, 1979). Because manatees generally must maintain their body temperature above 20°C to avoid physiological stress that can ultimately lead to death (O'Shea, 1995), they congregate in the bay when the Gulf of Mexico water temperature drops below 20°C—usually between November and March—for the primary purpose of thermoregulation.

The manatee is an herbivorous marine mammal that averages 3 meters in length and 1,000 kilograms, but can reach 4 meters and up to 1,590 kilograms (U.S. Fish and Wildlife Service, 2001). It has been formally protected as an endangered species since 1967 (32 FR 4061). Habitat loss due to coastal development in Florida is a significant threat to manatees; however, collisions with watercraft are the predominant human-caused threat to its survival.

Over the past two decades, the number of manatees wintering in Crystal River has increased from 114 in 1981–1982 (Powell & Rathbun, 1984) to over 350 in 2001 (U.S. Fish and Wildlife Service, unpublished data). According to the U.S. Fish and Wildlife Service, Kings Bay “constitutes one of the most important natural warm-water refuges for manatees, a federally listed endangered species” (63 FR 55553) and serves as the largest natural manatee aggregation site in the United States (Kochman, Rathbun, & Powell, 1985).

Because Kings Bay is designated critical habitat, the manatee is protected through the enforcement of boating speed zones, no-entry manatee sanctuaries, and the enforcement of harassment regulations. The U.S. Fish and Wildlife Service is the primary enforcement agency and maintains a presence via the Crystal River National Wildlife Refuge, which is 36 acres in size and is comprised of 18 noncontiguous parcels of land in and around the bay.

Visitors are drawn to Crystal River to observe and encounter manatees because the animals are unusual yet charismatic; they predictably occur in the bay in the winter; they are approachable, readily seen, and tolerant of humans; and they are rare yet locally

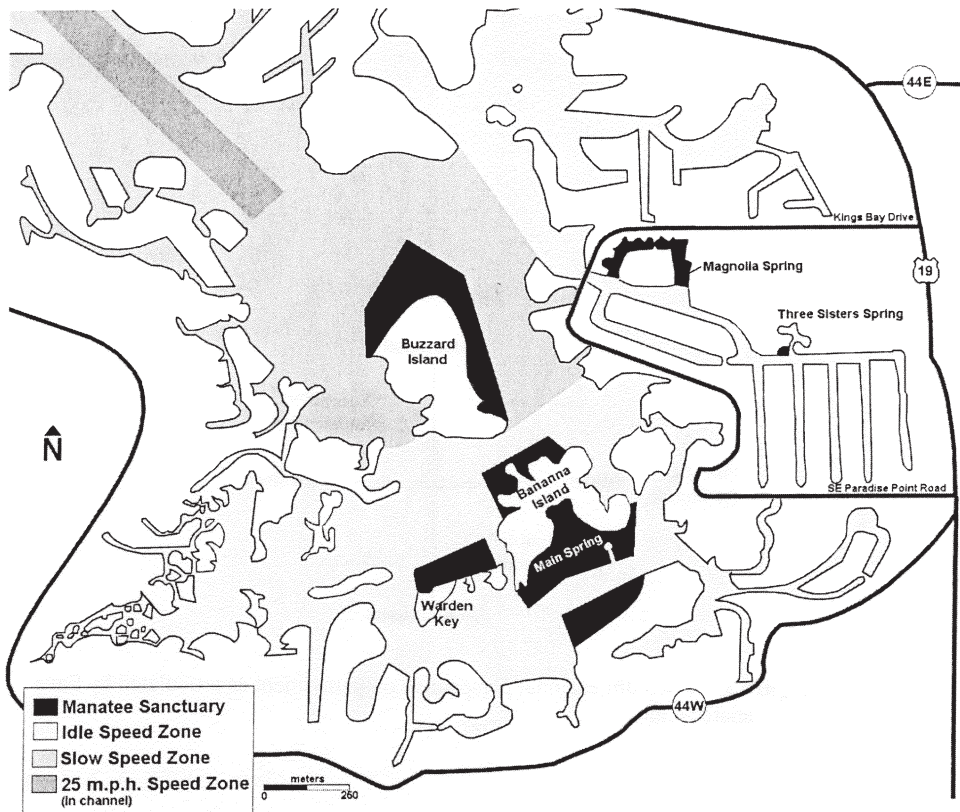


Figure 2. Kings Bay, a warm-water aggregation site for manatees in Crystal River, Florida, USA. (Source: Adapted from a U.S. Fish and Wildlife Service pamphlet for Crystal River National Wildlife Refuge.)

abundant in the winter. These same general factors are delineated by Reynolds and Braithwaite (2000) as components of wildlife tourism attractions. Consequently, private dive shops have become tour guides and have established a successful manatee tourism industry providing tours that allow customers to have, as one operator describes, a “for-real wildlife encounter.”

A manatee encounter involves more than just the passive observation involved in many other wildlife tourism experiences. One tour operator described the difference between “seeing” and “encountering” manatees during an educational seminar in which he provided suggestions to his participants on how to have a successful encounter:

Now encountering manatees is different than seeing manatees. If you want to see manatees today you can probably stand on the front of the boat and I’ll point out some manatees. You’ll see their noses coming up. You’ll see their backs porpoising. They’ll probably swim past the boat at some point. So you’ll be able to see them. But, if you want to encounter a manatee, which is to have it roll around and take its picture and rub its belly and stuff, then there’s a couple of things you need to do. . . .

Results

Different stakeholders and stakeholder groups maintain diverse views on manatee encounters. These perspectives are derived from their fundamental views on wildlife pro-

tection, and issues surrounding manatee encounters (i.e., harassment) arise from clashes between these views. Three major themes emerged regarding the concept of harassment as it applied to manatee encounters in Crystal River. First, even though harassment is formally defined by state and federal legislation, stakeholder groups impose their own values in interpreting and applying the definitions. Second, the negative responses of manatees to harassing behaviors as well as the resultant negative impacts are difficult to detect. Finally, effective enforcement of harassment regulation is confounded by these and other variables in the physical, social, and managerial setting.

Defining Harassment

The definitions of harassment found in the ESA and the MMPA are ambiguous enough to be open to a variety of interpretations when applied in the field. Each stakeholder believes in the principle that harassment in Crystal River needs to be controlled, but disagreement occurs over what human behaviors constitute harassment. Thus, each stakeholder interprets harassment based on their own values. Three stakeholder groups—the U.S. Fish and Wildlife Service, the Save the Manatee Club, and the manatee encounter tour operators—serve to illustrate this point.

U.S. Fish and Wildlife Service. The U.S. Fish and Wildlife Service (USFWS) is the primary management agency involved in endangered species recovery; thus, it is officially responsible for interpreting and applying the concept of harassment to manatee encounters. The service has interpreted the harassment definition of the ESA in a way that permits participants to physically interact with manatees as long as the participants allow the manatee to dictate the encounter. It has derived its interpretation strictly from the ESA, rather than the MMPA, definition because, as David Wilcox, a manager with the service explained, there has been more “legal application” of the terms “harm” and “harass.” The MMPA, he said, is “largely untested.” Table 3 contains the guidelines the Service provides to manatee encounter participants, listing the specific behaviors it may interpret as harassment. This interpretation is not restricted to Crystal River or manatees; it is applied on a service-wide scale. That is, a person who follows these general guidelines can interact with any endangered species without harassing it (Sorice, 2001).

This interpretation of harassment is primarily influenced by what is enforceable given the ESA definition. According to one USFWS law enforcement officer: “The more black and white [regulations] can be, the easier they are to enforce. The grayer they are

Table 3

U.S. Fish and Wildlife Service manatee interaction guidelines as delineated in the Crystal River National Wildlife Refuge pamphlet

Avoid harassing manatees. Harassment is defined as any activity which alters the animal’s natural behavioral characteristics including:

Approaching a manatee before the animal first approaches and touches you.

Actively pursuing/chasing (swimming after) or cornering a manatee while swimming or diving.

Poking, probing, stabbing a manatee at any time with any object. This includes but is not limited to a person’s hand and/or feet.

Any activity which would separate a cow from her calf or an individual from a group.

Any attempt to snag, hook, hold, grab, pinch, or ride a manatee.

Any attempt to feed a manatee.

Touching or disturbing a resting manatee.

the more difficult they are to enforce. Harassment is a real gray one.” In order to enforce this regulation the Service must “be able to go to court and say . . . beyond reasonable doubt that that person *significantly* altered their breeding, sheltering, or feeding behavior and that can be difficult” (emphasis added). The resultant guidelines are thus based on what the service believes it can successfully articulate as harassment in court.

Save the Manatee Club. The Save the Manatee Club (SMC) is the primary manatee advocacy group in United States. Its role in the manatee management arena (including manatee encounters) is as a watchdog group. Whereas agencies’ protection efforts tend to be influenced by outside pressure, SMC is uninhibited by such constraints and is able to push for stronger manatee protection regulations.

This group makes decisions regarding manatee protection by focusing on humans as the primary variable in the manatees’ survival equation. Consequently, when SMC makes decisions regarding manatees, it removes humans from the equation and imagines how manatees survived without human influence.

SMC believes the potential costs of the growing attraction of manatee encounters in Crystal River are greater than any benefit it provides manatees in the long run. Thus, SMC demands that the physical contact component of the manatee encounter be prohibited, suggesting instead that passive observation be the only type of interaction allowed.

Because the club’s “what’s good for the manatee” perspective centers around removing human influence from the equation, its overall definition of harassment is very narrow. It believes, as Stephanie, an upper level 10-year SMC employee, explains, that any human interaction is harassment:

[If] there’s a person right here and it has to make an evasive maneuver to get around that person, I consider that harassment. I think that anything that alters not just natural behavior, which is the standard, but just gets in their way, is harassment for me.

The investigator described one incident to Stephanie from an experience as a kayaker in Kings Bay where he, unknowingly, coasted over a resting manatee, evidently causing it to depart. Was this harassment? Yes, she responded, because the manatee was “bothered.” However, she described the incident as “on the minor scale” and “permissible” because it was unintentional and almost “unavoidable.” She also added that this type of harassment is probably “tolerable” for the manatees because it was a nonmotorized boat and, “if it happened very often they’d pick another place to sleep.”

Thus, Stephanie tends to judge harassment along two dimensions: the intention of the participant and the potential for impact. Intentional behavior that causes direct harm to manatees can be considered “egregious” harassment—behaviors such as riding, chasing, and poking that all stakeholders agree is harassing. In contrast, Stephanie described unintentional behavior that has little potential for impact as harassment and labeled it as “permissible.” Figure 3 depicts a representation of SMC policy toward harassment as articulated by Stephanie. SMC places harassment along two dimensions, intent to disturb and level of intensity, and suggests that interactions be judged on these two dimensions in determining if the harassment was egregious and impermissible or incidental and permissible.

A printed brochure and web page entitled *If You Love Me Please Don’t Disturb Me* conveys SMC’s official position on manatee encounters: “Save the Manatee Club is not opposed to being in the water when manatees are present. However, we are concerned about people interacting with manatees” (Save the Manatee Club, 2002). It includes touching among other forms of interactions (e.g., riding and feeding) that “may be con-

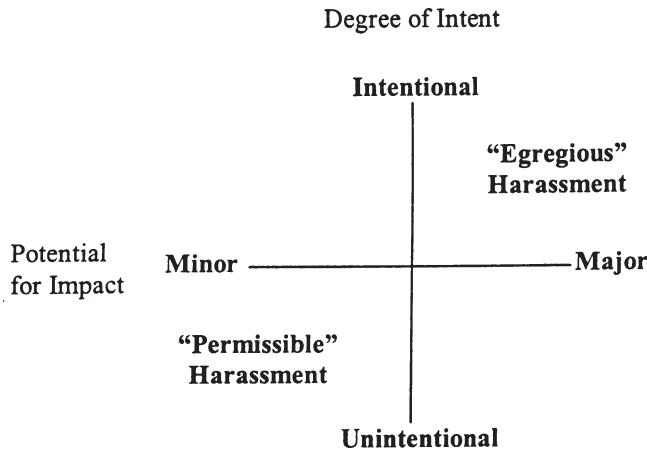


Figure 3. A two-dimensional perspective on harassment as articulated by Save the Manatee Club.

sidered harassment under the Endangered Species Act (ESA).” Save the Manatee promotes passive observation and advises people that it “is the best way to protect manatees and all wildlife.” The “look, but don’t touch” ethic still provides great benefits to the observer: “By quietly observing manatees, you will get a rare opportunity to see the natural behavior of these unique animals.”

Manatee Encounter Tour Operators. Tour operators provide access to manatees through guided tours and the provision of rental boats. They are usually the first and sometimes the only contact a participant has with the manatee encounter community. Moreover, operators often act as de facto managers at the encounter areas. In this capacity, they educate participants, enforce regulations, and act as stewards for manatee protection (Sorice, 2001). However, operators vary in their level of respect for manatees and manatee protection.

Although operators differed in their conception of harassing behaviors, they tended to view harassment as human behavior that results in observable, physical harm to the animal rather than resulting in the animal altering its course of travel or leaving an area. For example, when Operator 1, a manatee encounter operator highly regarded by the Fish and Wildlife Service, was asked about manatee displacement resulting from encounters with humans, the owner replied that manatees could not be displaced because the Service has “roped off all the warm water” (i.e., created sanctuaries). The owner also discussed disturbance saying that there is no “real consequence” from causing a manatee to move 25 yards to another feeding spot. She asked, “How could there be? There are more manatees than ever.” Other operators seem to agree and see no harm to manatees because they have never been “pet to death.” One operator commented “People aren’t hurting the manatees. You don’t see snorkel tubes sticking out of their heads or anything, right?”

Some encounter operators demonstrated awareness of harassment regulations by providing participants with behavioral guidelines: Do not dive down on manatees; no more than six people can interact with any one manatee (to avoid surrounding); do not kick your fins (to avoid pursuing the animal). However, operators vary in the extent to which they educate participants. Some operators only show the required USFWS *Manatee Manners* video, while others provide extensive manatee encounter programs (Sorice, 2001).

Operators also make distinctions that other groups may not. They may define “chasing” as a form of harassment but not “following.” For example, on a trip with one

operator, 11 participants (including the first author) began “following” a mother and calf as they moved up the Homosassa River feeding. One participant stood up and declared that the group was not allowed to chase the manatee. At this, a teenage participant responded that the group was not “chasing,” but “following” them. The captain then mollified the group saying that this “following” behavior was okay because the manatees “do this everyday” and are used to people. After this, the entire group followed these manatees a few hundred feet up the river, touching them as they surfaced to breathe.

Detecting Manatee Responses to Human Interaction

As discussed in the literature review, the effects of human–wildlife interactions are often hard to disentangle from other variables that influence the survival of an individual or population, and the Crystal River manatees are no exception. Three agencies, the USFWS, the USGS Sirenia Project, and the Florida Fish and Wildlife Conservation Commission’s Florida Marine Research Institute, collect data on manatees. Interviews with manatee biologists within each agency revealed the uncertainty and complexity involved in connecting human behavior during manatee encounters to negative long-term effects for manatees.

U.S. Geological Survey’s Sirenia Project. This agency is responsible for informing management decisions made by the USFWS by collecting data on manatee biology and ecology. Cyrus Renhia has been a member of the project for over 20 years and has monitored the Crystal River manatee population for over 15 years. His concern regarding harassment would be significant if he observed negative impacts to manatees. For example, he would be concerned if he repeatedly saw a female who was not reproducing: “Is she aborting fetuses because of herbicides or is she not getting pregnant because too many people are patting her on the back?” However, he has yet to see any evidence in the Crystal River manatee population of negative long-term responses to encounters.

When looking for a cause–effect relationship between manatee encounters and negative impacts, Cy notes that there are variables that affect an individual manatee’s response to interactions. For example, he divides manatees into two general classes or dispositions: the “Type A personality” are those manatees with “puppy dog mentalities” that actively engage in interactions, while the “Type B personality” are those that avoid people. These “personality” variables must be incorporated when discussing negative impacts because, “what might not necessarily impact a Type A manatee may be very detrimental to a Type B manatee.” Therefore, detecting the effects of harassment can be problematic because of the variation of responses by individual manatees.

On a larger scale, the population, Cy noted general differences between the Crystal River population and other manatee populations. He explains that the Crystal River population has a higher degree of “friendliness” than manatees elsewhere. This “friendliness” may vary depending on the setting. For example, radio tagging a manatee in Crystal River is relatively easy: “You can hold your breath and just take the tag and put it on [the manatee] in the water . . . and the animal won’t move.” This same individual, however, may be “difficult to approach” outside of Crystal River. This suggests that negative effects from encounters may be difficult to detect because manatee behavior within the Kings Bay setting may differ significantly from their behavior in other settings. Thus, manatees may be selectively habituated to human presence and interaction in Crystal River.

USFWS. As the primary agency involved in the manatee recovery decision-making process, the Service strives to make decisions based on sound biological information. In the case of manatee encounters and harassment there is no identifiable causal link between

encounters and negative impacts. One Service employee at the Crystal River National Wildlife Refuge explained the problem they have using current information to make decisions about harassment: “What we don’t seem to have, in my opinion, is sound biologically based information showing that mere touching or mere contact—if it’s not an aggressive sort of thing—would potentially cause that animal to swim away and possibly end up dying.” Another refuge employee said, “If touching manatees was found to cause negative impacts, sure, I would agree with stopping it. . . . I just don’t see it yet. . . . Somebody would have to prove that to me.”

Florida Marine Research Institute. The Florida Marine Research Institute (FMRI) is similar to the U.S. Geological Survey’s Sirenia Project in its role of informing management decisions; however, FMRI is responsible for manatee research at the state level. Some scientists at FMRI are concerned that encounters alter manatee behavior, creating the potential for long-term harm. The problem is, however, that detecting long-term responses to behavior can be difficult or impossible.

Allison, a manatee biologist with FMRI who championed an interagency roundtable and working group on marine mammal harassment,¹ and Alex, a coworker, have a narrow definition of harassment that focuses on the negative impacts that may occur as a consequence of encounters. For example, repeated disturbance by encounter participants can result in cumulative impacts that may be undetectable or untraceable by scientists. Alex also explained that people have no basis for judging whether an interaction disturbs a manatee unless the manatee is disturbed to such an extent as to depart, its only defense mechanism. They conclude that the negative impacts from manatee encounters can be insidious—undetectable, yet with significant potential for harm. Thus, even seemingly innocuous behavior such as touching a manatee could be considered harassment. For this reason, the official state position is that encounters, as they currently occur, are “not in the best interest” of the manatee (Behrendt, 2000.)

Enforcing Harassment

The fact that manatee responses to encounters with humans are hard to detect makes defining human behaviors as “harassment” problematic. Nonetheless, federal law enforcement officers are directed to enforce human–manatee interactions using the ESA definition. As discussed above, USFWS law enforcement officers consider harassment to be a “gray” regulation. In order to write up a harassment case the behavior observed would have to be “blatant” such as “riding” or “grabbing onto a manatee.” For other behaviors, such as following or pursuing, it would be “tough to prove that it’s actually harassing or harming the manatee . . . the way the definition’s written.” Thus, the onus is on law enforcement to provide clear and convincing evidence on regulations related to harassment, yet the evidence is often very difficult to collect and articulate.

Other variables also confound the ability to enforce harassment regulations. While the Service administers the Crystal River National Wildlife Refuge in Kings Bay, most manatee encounters occur off refuge property. Thus, the Service is unable to spatially or temporally control visitor use of the area with rules created under refuge authority; it is relegated to enforcing encounters based solely on the statutory definitions. Because use occurs unrestricted, there are high densities of participants in specific encounter areas (e.g., the Main Spring; Figure 2). Moreover, while use nears 100,000 participants per year, only two full-time law enforcement officers patrol the encounter areas.

The Service must also observe agency standards when citing violators, and this potentially inhibits enforcement efforts. For example, USFWS law enforcement officers must show that a participant “knowingly” committed a violation; that is, they must show

that a person “knew or should have known” that their behavior was illegal. One refuge officer perceives this standard as potentially constraining:

The Department of Justice ruled that all the Endangered Species Act cases must be articulated as “knowingly.” In other words, the defendant would have to knowingly violate one of these regulations, which makes it fairly tough for the officer. Well, when they witness that, when you are interviewing the subject that committed that violation, I mean, you have to articulate . . . that this person knowingly violated one of these regulations. So that’s what’s happening now. These cases involved with manatees are now “knowingly” violations and we’re having to deal with that issue as far as articulation of the facts.

This can be difficult in Crystal River where there is open access to the resource. Visitors can seek encounters with manatee using their own boats without ever having contact with the Service. Private operators who rent boats and provide guided tours are required by the terms of the Service’s special use permit to show a 10-minute *Manatee Manners* video educating visitors about regulations, including those on harassment, but operators do not always take their educational responsibility seriously (Sorce, 2001).

Consequently, officers tend to only write violations that they feel will “stick” in a court of law. These tend to be limited to the most egregious behaviors that satisfy the burden of creating the “likelihood of injury” and “significantly [disrupting] normal behavior” and thus readily qualify as harassment. For lesser cases, officers have taken an educational enforcement approach that promotes self-monitoring among operators and participants. A refuge manager discusses how this approach is operationalized in the field:

The approach that has been taken here has been to basically try to educate people about the protection that manatees have, to remind them of the penalties—you know, to give them the dos and don’ts and remind them of the penalties if they cross the line into a situation where there’s harm and harassment going on, and also the threat of possibly getting ticketed or something and the presence of the refuge and refuge staff and refuge law enforcement officers and all of that.

Discussion and Conclusions

Formal measures created to protect wildlife from the negative effects of human–wildlife interactions can be difficult to implement when applied to a particular species in a complex physical and sociopolitical setting. For a number of reasons, protecting manatees from harassment is difficult to operationalize. First, the nature of the interaction adds complexity. The generally gregarious nature of the manatee affects enforcement efforts, which rely on an ambiguous definition of harassment to interpret how humans can behave around manatees. Second, interactions occur in a common resource, Kings Bay, inhibiting the USFWS’s efforts to control use spatially and temporally. Finally, there is a lack of objective scientific information to guide decision making on human–manatee interactions. The definition of what exactly constitutes harassment is ambiguous as outlined by federal and state regulations. Thus, stakeholders who have different goals interpret the harassment definition based on their own objectives.

Stankey (1991) suggested two key reasons that managers are often faced with difficult decisions in conservation–tourism debates like that surrounding the harassment of manatees. First, there are often gaps between the value systems of groups involved. Institutional mandates related to balancing preservation of the species while allowing some public access (i.e., enjoyment) often sets up a paradox fueling arguments on both sides of the issue. In the Crystal River situation, biologically based and animal welfare-

related values linked to potential declines in the health and well being of the manatee due to encounters are in conflict with the economic values that support encounters. Second, the rational-comprehensive planning model often used by resource managers is misleading. It holds a promise of developing and implementing alternative plans and policies based on comprehensive information about the species and the stakeholders' values and on adequate time and money. The "rational-comprehensive" promise is rarely fulfilled due to incomplete information and limited resources (Stankey, 1991).

Because of the high complexity surrounding human-manatee interactions, problem definitions in this case are in the "eye of the beholder," and the search for resolution is based on how each group defines the problem (Allen & Gould, 1986). Allen and Gould described resource management problems like this as "wicked" because complex and incomplete information precludes human ability to say with any certainty that one decision is right while another is wrong. In Crystal River, the issue of *harassment is not a technical one but largely an issue of social value.*

Solutions will not be easy to develop; however, there are some key issues to address in the process. The first appears to be scale. The definitions of harassment in the ESA and the MMPA were both written to include a myriad of species and thus were written broadly in an attempt to be inclusive and interpretive in nature. Manatees are not directly addressed based on their biology, particular behaviors, or potential tolerance levels in regard to humans. The FMSA, on the other hand, specifically addresses feeding as a form of harassment but otherwise relies heavily on the same broad language that the federal mandates provide. While feeding does occur in Crystal River, to the best of our knowledge, no tourism operators are presently provisioning manatees on-site to facilitate encounters. This is because manatees closely approach and interact with humans without this stimulus.

It is likely that the situation in Crystal River and throughout Florida would be much better served by working out details related to what harassment means to manatees in particular, as separate and distinct from dolphins, whales, mountain lions, and other mammals, marine or terrestrial. Given the existing situation a more concrete definition of harassment must be developed to enable the detection of negative impacts and enhance enforcement efforts.

The data presented here suggest that federal/state agency, advocacy, and tourism stakeholder groups all feel that there are acceptable and unacceptable encounters with manatees. Even the most preservation-oriented of these groups, the SMC, recognized that some planned encounters between humans and manatees may be reasonable. All agreed with harassment defined as direct harm to the manatee. Participants in this study recognized that harassment, like that conveyed in the MMPA's "Level B" definition, is much more open to interpretation. As a number of biologists revealed, it is very difficult to ascertain when an encounter will "significantly disrupt" behaviors related to migration, breeding, nursing, or sheltering. Good data simply do not exist and it is likely that it will be years before reliable data-based inferences can be made about human-manatee encounters due to the complexity of the situation. In the meantime, common ground should be used to develop a definition of manatee harassment that is agreeable given existing knowledge and political circumstances. Interviews with SMC personnel revealed a two-dimensional view of harassment (see Figure 3) that provides a good conceptual basis and possible starting point for discussions about what human actions constitute harassment.

Because decisions regarding human-manatee interactions have consequences for many other stakeholders (as well as the manatee) and because decisions are largely an issue of social value, they must involve stakeholders in the decision-making process. Natural resource-based recreation planners have been considering the use/protection paradox for over 50 years, trying to define the amount of use beyond which irreparable

damage occurs to a resource (Hammit & Cole, 1998). Within the last few decades, planning processes have been developed that specifically address the complexity of managing recreational use while protecting the resource by shifting the focus from an issue of carrying capacity to one of desired conditions.

Management frameworks like the U.S. Forest Service's Limits of Acceptable Change (LAC; Stankey et al., 1985) have been designed specifically to help diverse interests work toward solutions that are mutually acceptable (even if they are later shown to be less than scientifically valid). The LAC, or some adaptation thereof, may be an appropriate tool for reaching decisions on human-manatee interactions because the process is issue driven, salient concerns are initially defined, and management objectives are developed based on this. In Crystal River, concerns are primarily related to manatee harassment. Moreover, the LAC is proactive, focusing on future conditions rather than reacting to current problems. Australia's Great Barrier Reef Marine Park Authority has successfully applied the LAC to develop stakeholder consensus in a port dredging project. Stakeholders determined limits of acceptable change related to the health of resident corals and agreed upon managerial actions to be taken if the specified changes occurred (Oliver, 1995). In his critique of the process Oliver noted that the procedures "are highly relevant to the decisions facing wildlife managers, who may be asked to decide what level of exploitation of wildlife is considered to be ecologically acceptable" (p. 136).

A key to consensus-based planning processes, such as the LAC, is to identify specific indicators of a condition and agree on when those indicators represent unacceptable levels (in this case indicating harassment). This can be attempted at the scale of the interaction by examining relatively easily measured indicators related to distance from a manatee, number of people or boats in proximity to a manatee, and in-water pursuing behaviors. Or it can be examined at the population scale by looking at indicators such as survival rates or manatee distribution in the bay as related to warm-water springs and human use. Such indicators may serve as variables that tourism operators and managers could agree on as acceptable given current knowledge of manatee biology.

A first step to arriving at a consensus on harassment is to create a set of "best practices" for tour operators. Manatee interaction guidelines published by the USFWS already provide guidance on human behavior with manatees, but other best practice guidelines may help to allay concerns of stakeholders concerned with encounters. For example, operators may agree to self-imposed limits, such as limiting the number of operators at Three Sisters Spring to three at a time. Operator rules of a similar nature have been implemented in Western Australia, where tour operators who provide swim-with-whale-shark opportunities "wait in line" to provide the experience for their customers (Davis, 1998). Currently, operators in Crystal River are not well organized and show a low level of concern for increased competition for the common resource. A well-organized association of users can be instrumental in helping to establish and enforce "best practices" in human-manatee encounters that reflect the goals of the managing agency.

Achieving an appropriate balance between the use and protection of a resource like the endangered manatee in Crystal River is often difficult for managers. The statement by a USFWS officer that the concept of harassment is "a real gray one" summarizes the core issue when it comes to achieving this balance. The specific meanings of manatee harassment must be articulated in a manner that provides clear consensus-based indicators of when harassment is occurring. At the same time, stakeholders must agree on what acceptable encounter practices are given current use patterns. The baseline definition for harassment in existing policy is vague and applies to many animals. The situational context for each species should be carefully examined to develop knowledge specific to biophysical and sociopolitical variables related to human interactions with wildlife. This higher level of specificity is needed to aid managers and stakeholder groups

in the development of policy that is less vague and more enforceable. In Crystal River, Florida, manatee tour operators, wildlife advocates/and managing agencies will all be better served by coming together to develop a more specific definition of harassment as it relates to the manatee.

Note

1. Groups involved included: SMC, National Marine Fisheries Service, Mote Marine Laboratory, The Sirenia Project, USFWS Endangered Species Division, Crystal River National Wildlife Refuge, and the Florida Fish and Wildlife Conservation Commission.

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