

THE DEVELOPMENT OF AN INTERPRETIVE EXPERIENCE TO FOSTER POSITIVE TOURIST ENCOUNTERS AND MANAGE TURTLE TOURISM IN NORTHWEST WESTERN AUSTRALIA: IMPLICATIONS FOR FURTHER RESEARCH

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In understanding the importance of interpretation in guiding sustainable turtle tourism, this article reports on the effect of an interpretation program, the Jurabi Turtle Experience (JTE), on the behavior of turtle-watching tourists at the Jurabi Coastal Park, on the Northwest Cape of Western Australia. Ninety-seven turtle-watching tourists in the Jurabi Coastal Park, including people who attended the JTE and others who did not, were sampled during the peak turtle nesting season (December–January) using participant observation and a questionnaire. People participating in the JTE showed increased compliance with a behavioral code of conduct for turtle watching and higher satisfaction with the experience compared with people who did not participate. These increases strengthen the case for continuing the JTE and possibly requiring all Jurabi Coastal Park visitors to participate in a JTE-like experience.

Key words: Turtle watching; Wildlife tourism; Interpretation

Introduction

Marine turtles worldwide are vulnerable to extinction (International Union for Conservation of Nature [IUCN], 2010) and marine turtle tourism has been presented as an alternative to consumptive use of marine turtles (Waayers, Newsome, & Lee, 2006; Wilson & Tisdell, 2001). Tourism based on viewing nesting marine turtles can contribute to marine turtle conservation by raising revenue to

fund turtle conservation projects, and by encouraging tourists to have a conservation ethic and contribute financially to turtle conservation (Landry & Taggart, 2010; Tisdell & Wilson, 2001, 2002, 2005a, 2005b; Tisdell, Nantha, & Wilson, 2007, Wilson & Tisdell, 2001). Tourism based on viewing nesting marine turtles occurs both formally (guided) and informally (free independent travelers) at many locations throughout the world, including Costa Rica, Malaysia, South Africa, Brazil, America,

and Australia (Johnson, Bjorndal, & Bolten, 1996; Newsome, Dowling, & Moore, 2005; Troeng & Drews, 2004; Waayers et al., 2006).

The Northwest Cape of Western Australia is an important rookery area for nesting populations of green turtles (*Chelonia mydas*), with smaller numbers of loggerhead (*Caretta caretta*) and hawksbill (*Eretmochelys imbricata*) turtles also recorded (Prince, 1990). The Jurabi Coastal Park is one of 10 key attractions for the Shire of Exmouth on the Northwest Cape (Shire of Exmouth, 2005). The viewing of the nocturnal nesting activity of marine turtles is a small part of, but growing, nature-based tourism industry that is largely based on whaleshark tourism and coral reef viewing based at Coral Bay and Exmouth (Shire of Exmouth & Department of Conservation and Land Management, 2004; Waayers et al., 2006). Current annual tourist numbers to the Shire are approximately 84,000 (Tourism Western Australia, 2013). In the case of turtle tourism, and in order to reduce disturbance by tourists, a voluntary code of conduct (see Table 1) is in place that is designed to inform visitors about how to behave when watching turtles laying their eggs at night (Department of Environment and Conservation,

n.d.). Despite this code of conduct, noncompliance with the code has been reported (Osborne, 1995; Waayers et al., 2006).

In relation to reducing disturbance, the role of visitor interpretation that is a more active and engaging educational approach is potentially a very important management approach in fostering visitor compliance with voluntary codes of conduct. Ham and Weiler (2002) and Black and Weiler (2005) assert that guided touring is a powerful interpretation technique, and Weiler and Davis (1993) reported that it is the role of the tour leader to modify and correct visitor behavior to ensure that it is environmentally responsible. According to Black and Weiler, (2005) tour guiding is likely to be most effective when group sizes are small and while under the supervision of certified guides. For example, intervention from a scuba-diving tour leader, while underwater, has been shown to reduce incidents of scuba diver damage to a coral reef (Barker & Roberts, 2004). Such approaches, particularly when delivered via tour guiding and/or patronage of a visitor center at the same time, can act to encourage environmentally responsible behavior that also enhances the visitor experience (e.g., Hughes & Morrison-Saunders, 2005;

Table 1

Department of Environment and Conservation Code of Conduct for Viewing Nesting Marine Turtles

Code of Conduct	Behavioral Guideline
1. Walk along the beach at the high tide mark (near the water) looking for tracks in the wet sand or turtles. Do not approach or shine lights on turtles leaving the water or moving up the beach. If a turtle is encountered, calmly stop where you are, sit down, and wait for her to start digging.	a) Walk along the beach at high tide mark looking for tracks
2. Avoid excess noise and sudden movement at all times.	b) Do not approach turtles leaving the water or moving up the beach
3. Always position yourself behind the turtle and stay low (sit, crouch, or lie on the sand). If you are getting covered in sand as she digs you are too close.	c) Do not shine lights on turtles leaving the water or moving up the beach
4. When approaching a nesting turtle crawl up behind her on your stomach ("commando crawl").	d) If a turtle is encountered, stop where you are and sit down
5. Be patient. She may abandon the nest and dig another one for a variety of reasons including hitting an obstacle or the sand being too dry.	e) Avoid excessive noise at all times
6. Wait until she is laying before moving closer. She will be quite still when laying her eggs—if sand is spraying or she is using her flippers, she is not laying.	f) Avoid sudden movement at all times
7. Give her enough space to camouflage the nest.	g) Stay low
8. Let her return to the ocean without interruption or getting between her and the ocean.	h) If you are getting covered in sand as she digs you are too close
9. Depart all beaches by 11 pm.	i) When approaching a nesting turtle crawl up behind her on your stomach
	j) Be patient
	k) Wait until she is laying before moving closer
	l) Give her enough space to camouflage the nest
	m) Let her return to the ocean without interruption
	n) Do not get between the turtle and the ocean when she is returning to the ocean
	o) Depart all beaches by 11 pm

Source: Adapted from Ningaloo Turtle Program (n.d.).

Newsome, Moore, & Dowling, 2013; Orams & Hill, 1998; Tilden, 1957).

In recognition of the important role of interpretation in reducing visitor disturbance and negative impacts on turtles, the Jurabi Turtle Centre (JTC) was designed and implemented at the Jurabi Coastal Park turtle nesting area (Shire of Exmouth & Department of Conservation and Land Management, 2004). Accordingly, the Jurabi Turtle Experience (JTE) was further developed as a more active educational and management strategy to reduce disturbance to nesting marine turtles and provide an enjoyable wildlife tourism experience at the JTC. The JTE comprises two additional participatory components: (1) attendance at a presentation that delivers information on turtle ecology, nesting behavior, and conservation status; and (2) tourist participation in a guided tour to view nesting turtles. Initially, the JTE was aimed to be voluntary for people visiting the beach to view turtle nesting activities at night. However, following implementation of the JTE on a voluntary

basis, Jurabi Coastal Park management undertook a systematic assessment of the activity and effectiveness of the center as a visitor management strategy and fostering positive tourist experiences.

The aim of this article is therefore to report on this research and to gain insight into whether participation in the complete interpretive package of the JTE:

1. Increases compliance with the voluntary code of conduct and fosters appropriate visitor behavior in the presence of nesting turtles.
2. Improves the satisfaction levels of turtle watching tourists.

Methods

Study Site Description

The JTE takes place in the Jurabi Coastal Park, which is situated on the western side of the Northwest Cape of Western Australia, adjacent to Ningaloo Marine Park (Fig. 1). The West Australian

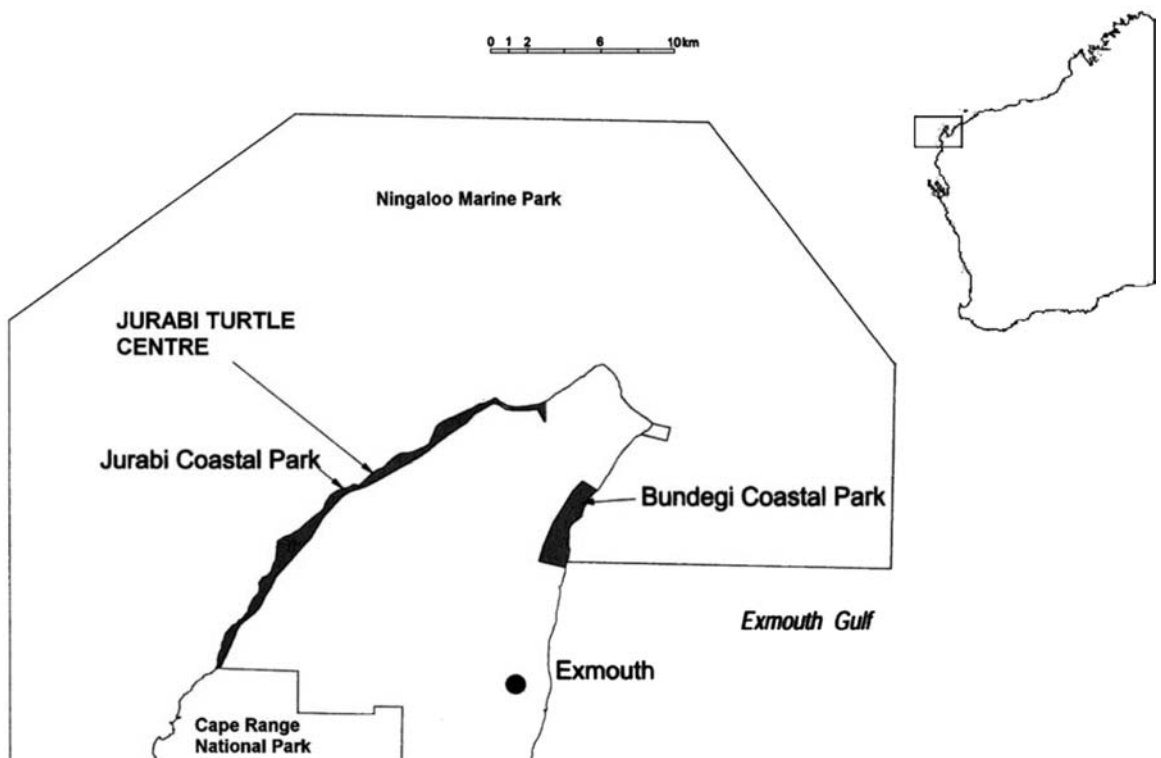


Figure 1. Location of the Jurabi Coastal Park. Adapted from Shire of Exmouth & Department of Conservation and Land Management (1999, p. 14).

Department of Environment and Conservation (DEC) and the Shire of Exmouth jointly manage the Jurabi Coastal Park for the purposes of recreation and coastal management (Shire of Exmouth & Department of Conservation and Land Management, 1999). The Jurabi Coastal Park is a 20-km drive from the town of Exmouth, but accommodation is available closer to the Park at the Lighthouse Caravan Park, Yardie Homestead, and in Cape Range National Park. The Park comprises an active dune system, vegetated with acacias, stunted eucalypts, small shrubs, and spinifex (Shire of Exmouth & CALM, 1999). Dominant genera of flora in the broader region of Ningaloo Marine Park comprise *Acacia*, *Eremophila*, *Cassia*, *Atriplex*, *Triodia*, and *Eucalyptus* (Marine Parks and Reserves Authority & Department of Conservation and Land Management, 2005).

There have been no detailed studies of the fauna of the Park; however, the area is considered important for breeding seabirds and contains significant turtle rookeries (Shire of Exmouth & CALM, 1999). The three species of marine turtle that nest in the region are the green, loggerhead, and hawksbill (Marine Parks and Reserves Authority & Department of Conservation and Land Management, 2005). There are numerous beach accesses in the Jurabi Coastal Park (several graded but many four-wheel drive-only tracks) where nesting marine turtles can be accessed and viewed.

Code of Conduct

Tourists interacting with nesting marine turtles in the Jurabi Coastal Park are expected to comply with the DEC voluntary code of conduct for viewing nesting marine turtles. The code of conduct (Table 1) outlines behavioral guidelines for interacting with nesting marine turtles, and is based upon regulations developed at Mon Repos, Australia while also incorporating local Exmouth knowledge (Roland Mau, personal communication.). The code of conduct consists of nine clauses, which can be divided into 16 behavioral guidelines (Table 1).

A modified version of the code is available to tourists via the Internet (Ningaloo Turtle Program, <http://www.ningalooturtles.org.au>) and in a pamphlet obtainable from the DEC office in Exmouth, Milyering Visitor Centre in Cape Range National

Park, and Exmouth Tourism Bureau (Shire of Exmouth & Department of Conservation and Land Management, 2004). There are two versions of the pamphlet—one that discourages the use of flash photography and one that makes no reference to the use of flash photography. As well as the official code of conduct, at each graded beach access there is a sign informing visitors of appropriate behavior during turtle watching (Fig. 2). High levels of noncompliance with the code of conduct have previously been observed (Osborne, 1995), and in an attempt to resolve this, the JTC was opened in 2004 to educate tourists about turtles in the region and promote turtle conservation.

The Jurabi Turtle Centre

The JTC (Fig. 3) is located in the north of the Jurabi Coastal Park, between the Hunter and Mauritius beach accesses (Fig. 1). The JTC contains various static interpretive displays that describe the life cycle, nesting process, and threats to marine turtles in Ningaloo Marine Park. Signs are positioned along the walkway to the JTC that inform visitors about appropriate tourist behavior when viewing nesting marine turtles. The information in these signs is similar to the sign located at nesting beaches (refer to Fig. 2).

The JTC is accessible at all times and entry is by donation. During the peak of the nesting season (December–January) tourists have the opportunity to participate in interpretive activities at the JTC, including presentations on turtle ecology, and commercial guided turtle-watching tours. The presentation is free of charge, but the guided tour costs approximately AU\$25. Everyone who participates in a tour is required to attend the presentation at the JTC. The three activities combined (i.e., visit to the JTC, interpretive presentation, and guided tour) comprise the Jurabi Turtle Experience (JTE).

The Jurabi Turtle Experience

The JTE is designed to help manage tourist interactions with nesting marine turtles in the Jurabi Coastal Park and was developed using information from the Mon Repos turtle-watching facility, though there are differences in the nature and scale of the operations (Mau, 2003). Major differences in the Mon Repos

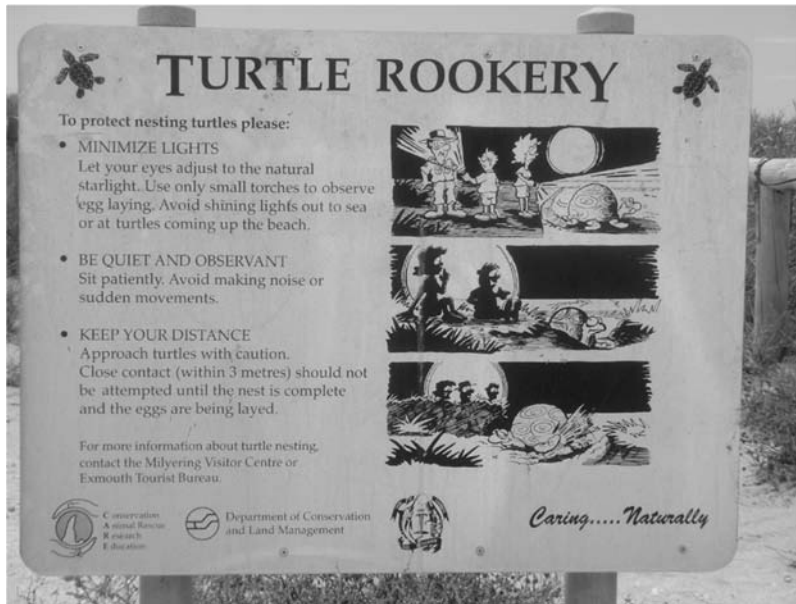


Figure 2. Sign installed at beach access areas in the Jurabi Coastal Park (photo by David Newsome).

operation include the species of turtle (mostly loggerhead turtles), tour group size (up to 70), and tours are conducted by park rangers (Mau, 2003). In addition, the interpretation center at Mon Repos is more commercialized than the JTC, with a gift shop, food van, and audiovisual interpretation (Mau, 2003).

The JTE begins with viewing of displays at the Center prior to a presentation, which is delivered by a DEC volunteer and commences at 8 pm. The



Figure 3. The Jurabi Turtle Centre, Exmouth (photo by David Newsome).

presentation includes information on marine turtle ecology and nesting behavior and threats to turtles. The code of conduct is presented as a maxim, “go slow, stay low, no glow and no flash photography.”

During the presentation other DEC volunteers—known as “scouts”—patrol the nesting beaches adjacent to the JTC. The scouts comprise a combination of Exmouth residents, university students, and international tourists. The main purpose of the scouts is to search for nesting turtles for the guided tour. The scouts may also approach and inform non-JTE tourists about following the code of conduct in order to minimize their disturbance to turtles. The scouts wear a uniform t-shirt that clearly identifies them as representatives of DEC, and remain in contact with volunteers at the JTC via radio. When the interpretive session concludes (approximately 8:20 pm) the scouts inform the tour guides, via radio, of turtle nesting activity. Tourists then have a further 5–15 minutes to view the JTC displays before the commencement of the tour.

Tour groups are set at a maximum of 15 people per group and tour participants are required to stay with their tour guides. The one exception is when the guide takes tourists two at a time to view egg chambering; once the turtle starts laying eggs the

entire group is then allowed to approach. Tour groups are required to follow the code of conduct and consequently must leave the beach by 11 pm.

Tourist Categories

The sampling frame for this study was tourists on the beach in the Jurabi Coastal Park with the purpose of interacting with nesting marine turtles; the sampling unit was individual tourists. Tourists in all categories were subject to the possibility of being approached by a scout during their interaction and such approaches were recorded. The following section describes the sampling strategy utilized to select the project participants.

Sampling Strategy

Tourists visiting beaches in the Jurabi Coastal Park to interact with nesting marine turtles were sampled from Monday to Saturday each week between early December and late January to coincide with the operation of the JTE. Based on their level of interpretation, we identified three groups: tourists who visited the JTC only (JTC), tourists who both attended the JTC and also joined a guided tour on the beach (JTE), and tourists who participated in neither of these activities (Table 2).

Tourists were not allocated randomly to the different groups, but chose experiences themselves. Therefore, tourists were sampled using the "first to pass" nonprobability sampling regime (Finn, Elliot-White, & Walton, 2000) with up to four individual tourists being sampled simultaneously. Data collection occurred at three beach accesses in the Jurabi Coastal Park with a rotation of one beach per night and during the last 2 weeks of sampling. Tourists agreeing to participate were observed while turtle

watching and were asked to complete a short questionnaire immediately afterwards. Observations were recorded relating to compliance with the codes of conduct such as proximity from turtle, use of lights, and flash photography. The questionnaire consisted of a mix of open-ended questions and others asking tourists to evaluate statements using a 5-point Likert scale. The key areas of the questionnaire included past experience, participation levels, knowledge of code of conduct, and satisfaction with the experience of turtle watching.

Data Collection and Analysis

Tourist Compliance With the Code of Conduct. Tourist compliance was scored as to whether or not tourists complied with 13 of the 16 behavioral guidelines in the code of conduct (refer to Table 1, items a–p). Very few tourists had an opportunity to demonstrate compliance/noncompliance with the remaining three behavioral guidelines (see Table 1, items i, k, and m).

Expectations and Satisfaction With the Turtle-Watching Experience. Tourist satisfaction with the turtle-watching experience was elicited through the questionnaire. As satisfaction is dependent on meeting or exceeding expectations (Akama & Kieti, 2003, O'Neill, Barnard, & Lee, 2004), the satisfaction questions were divided into two areas: (i) expectations, and (ii) self-reported satisfaction. With regard to expectations, a Likert scale was used to assess the importance to each respondent of seeing: Turtle crawl, Turtle dig, Turtle lay, Turtle cover, Turtle return, and Turtle hatch. Tourists evaluated their expectations on each criterion on a 5-point Likert scale, ranging from 1 (*extremely important*) to 5 (*not at all important*). A Likert scale ranging from 1 (*very satisfied*) to 5 (*very dissatisfied*) was also used to assess: Overall satisfaction, Satisfaction with number of turtles seen, Satisfaction with closeness to turtles, Satisfaction with guidelines, and Satisfaction with information provided.

Limitations of the Study

This research aimed to undertake a systematic, evaluation of the effectiveness of an interpretive experience (JTE) provided by the JTC. However,

Table 2
Categorization of Tourist Groups

Tourist Category	Level of Interpretation		
	Visited JTC	Attended Interpretive Session	Participated in Tour
No interpretation	No	No	No
JTC only	Yes	No	No
JTE participants	Yes	Yes	Yes

limitations of the study need to be noted. The sample size of 97 may be regarded as relatively small, in terms of statistical analyses but “the size of a sample is less important than whether or not it accurately represents the population” (Neuman, 1997, p. 262). Two issues arise as a result of sampling for this study. The first is that the population of turtle-watching tourists in the Jurabi Coastal Park has not been defined, and until it is defined it will not be possible to know whether any sample from this “population” is representative. We have aimed to reflect an issue rather than an extrapolative population response. The second issue relates to the sample size; however, the data from this research were not intended to be generalized beyond the sample. The purpose of this research was to determine if the interpretive experience of the total JTE aided in reducing non-compliance with the code of conduct and increased satisfaction with the turtle-watching experience. The findings of this study reflect that those with a higher level of interpretation experienced a higher level of satisfaction with their experience.

Further limitations relate to the sampling strategy. It is possible that by using the first-to-pass sampling strategy, the most interested, critical, and questioning tourists were sampled. It has been noted that tourists were aware that they were being observed. Although every effort was made not to interfere with the tourist experience, it is possible that tourist behavior or satisfaction was influenced by the act of being observed (i.e., the “Hawthorne effect”) (Babbie, 2002). The following results report on responses provided to individual questions within the survey; *n* varies according to responses to individual questions.

Results

Tourist Categories

A total of 97 people were observed and completed a questionnaire, of which there were 42 *JTE participants*, 29 tourists who visited the *JTC only*, and 25 that had *no interpretation*. Only two non-English-speaking people were observed, and both had the questionnaire translated by a companion. Approximately, a third of tourists with *no interpretation* and 10% of tourists who visited the *JTC only* were approached by a turtle scout while on the nesting beach. Mann-Whitney *U* tests indicated that being approached by a scout did not significantly affect any

aspect of tourist noncompliance, knowledge, or satisfaction (0.05 significance); therefore, the data for those tourists that were approached by a scout have been included with the data for those not approached.

Tourist Demographics

JTE participants, tourists who visited the *JTC only*, and tourists with *no interpretation* had relatively even proportions of males and females and there was no significant gender difference between categories [$\chi^2(2) = 0.65, p > 0.2$]. Most respondents were younger than 45, with no significant difference between tourist categories [$\chi^2(2) = 1.43, p > 0.2$]. Place of residence is presented in Table 3; significantly more *JTE participants* were from overseas [$\chi^2(4) = 17.2, p < 0.05$] while the majority of *non-JTE participants* were from WA other than Exmouth.

It may be argued that a limitation to interpretation of the results of this research in that tourist chose their interpretation experience rather than being allocated randomly to it. Therefore, it is possible that tourists “preselected” themselves by volunteering for specific groups and that this preselection is responsible for the significant differences. It can be argued that self-selection is a natural activity not influenced by the research process. An exploration of demographics provides information to alleviate this problem. Two-way contingency tables to test for associations between group membership and the variables of “gender,” “age,” “place of residence,” and “previous experience with nesting turtles” were developed. They showed that tourists of both genders, all ages, and both experienced and inexperienced turtle watchers were distributed evenly across the three interpretive groups.

For most of those sampled, this was their first turtle-watching experience, with 83% of *JTE*

Table 3
Place of Residence for Respondents

Place of Residence	Percentage of Respondents in Each Category		
	JTE Participants (<i>n</i> = 42)	JTC Only (<i>n</i> = 26)	No Interpretation (<i>n</i> = 25)
Exmouth	0	15	8
WA other	23	58	44
Interstate	14	4	16
International	63	23	32

participants (35 of 42 respondents), 76% of tourists who visited the *JTC only* (22 of 29 respondents), and 96% of tourists with *no interpretation* (23 of 24 respondents) providing that response. Locations for previous turtle watching were varied and included Exmouth (Australia), Mon Repos (Australia), Heron Island (Australia), Zakynthos (Greece), Malaysia, Borneo, and Indonesia.

However, there was a disproportional representation of international tourists in the *JTE interpretative experience* group. Place of residence appeared to be a key factor in participation in interpretation. International visitors were more likely to engage in the complete *JTC* experience, whereas visitors from WA were proportionately more likely to visit the *JTC only*.

Tourist Compliance With the Code of Conduct

Levels of noncompliance for each guideline in the code of conduct are displayed in Table 4. Breaches

occurred for all but two guidelines: “do not shine lights on turtles leaving the water or moving up the beach” and “do not get between the turtle and the ocean when she is returning to the ocean.” The range of code of conduct guidelines breached was lower for *JTE participants* (8 behavioral guidelines) than tourists who visited the *JTC only* (10 behavioral guidelines) and tourists with *no interpretation* (9 behavioral guidelines). Similarly, the mean number of guidelines breached was slightly lower for *JTE participants* (2.0 ± 1.1) than for tourists who visited the *JTC only* (2.9 ± 2.4) and tourists with *no interpretation* (3.0 ± 2.3). Due to the small size of resultant samples, tests were not undertaken for statistically significant differences.

Many guidelines in the code of conduct apply to particular turtle nesting behaviors. Because many *non-JTE participants* did not see a turtle, or witness all of the nesting behaviors, much of the non-compliance data is based on small sample sizes. All *JTE participants* did see a turtle and the sample sizes

Table 4
Noncompliance With the Code of Conduct

Guideline in Code of Conduct	JTE Participants		JTC Only		No Interpretation	
	No. of People to Which Guideline Applies	% of People Who Breached Guideline	No. of People to Which Guideline Applies	% of People Who Breached Guideline	No. of People to Which Guideline Applies	% of People Who Breached Guideline
Walk along the beach at high tide mark looking for tracks	42	29	26	89	25	84
Do not approach turtles leaving the water or moving up the beach	27	0	3	33	9	56
Do not shine lights on turtles leaving the water or moving up the beach	27	0	3	0	9	0
If a turtle is encountered, stop where you are and sit down	42	2.4	16	63	14	79
Avoid excess noise at all times	42	2.4	29	0	25	0
Avoid sudden movement at all times	42	0	29	21	25	4
Position yourself behind the turtle	42	12	16	69	14	100
If you are getting covered in sand as she digs you are too close	30	23	7	86	8	75
When approaching a nesting turtle crawl up behind her on your stomach	42	67	16	50	14	64
Wait until she is laying before moving closer	42	48	12	33	12	50
Let her return to the ocean without interruption	23	0	9	22	3	0
Do not get between the turtle and the ocean when she is returning to the ocean	23	0	9	0	3	0
Depart all beaches by 11 pm	42	17	29	38	25	12

The number of people to which the actions apply varies within each tourist category, as certain actions relate to particular turtle behaviors and/or tourist activities.

for this tourist category were large enough to enable comparisons of noncompliance for each guideline.

The guidelines most commonly breached by *JTE participants* were “when approaching a nesting turtle crawl up behind her on your stomach” and “wait until she is laying before moving closer.” Every breach of these guidelines by *JTE participants* occurred when the guide took tourists two at a time to view a turtle digging an egg chamber; often the *JTE participants* crawled on their hands and knees instead of on their stomach (as required by the code of conduct) and would stop at the edge of the body pit (0.5–1 m from the turtle) to watch the turtle dig its egg chamber.

Tourist Satisfaction With the Turtle-Watching Experience

Expectations of and Satisfaction With Turtle Watching. All *JTE participants* (41 respondents), 21 tourists who visited the *JTC only* (72%), and 17 tourists with *no interpretation* (71%) expected to see a turtle. The number of turtles sighted ranged from 1 to 8 for *JTE participants*, 0 to 3 for tourists who visited the *JTC only*, and 0 to 2 for tourists

with *no interpretation* (Fig. 4). Significantly more *JTE participants* saw a turtle [$\chi^2(2) = 23.4, p < 0.05$] and the mean number of turtles seen was higher for *JTE participants* (3.45 ± 2.38) than tourists who visited the *JTC only* (0.79 ± 0.90), and tourists with *no interpretation* (1.00 ± 0.93).

Table 5 highlights the importance of turtle behaviors to the viewing experience. The turtle behaviors that were most important for *JTE participants* to witness were “dig body pit/egg chamber” and “lay eggs”; the least important behavior for this group was “cover/camouflage nest.” The most important behavior for tourists who visited the *JTC only* was “lay eggs” and the least important behavior was “emerge from ocean.” For tourists with *no interpretation*, the most important behavior to witness was “dig body pit/egg chamber” and the least important behaviors were “return to ocean” and “hatching.”

Whereas Table 5 highlights the importance of viewing turtle behavior, Figure 5 displays the actual behaviors experienced by the tourists. Significantly more *JTE participants* witnessed a turtle “lay eggs,” “dig body pit/egg chamber,” and “cover/camouflage their nest,” and significantly fewer tourists who visited the *JTC only* saw turtles “emerge from

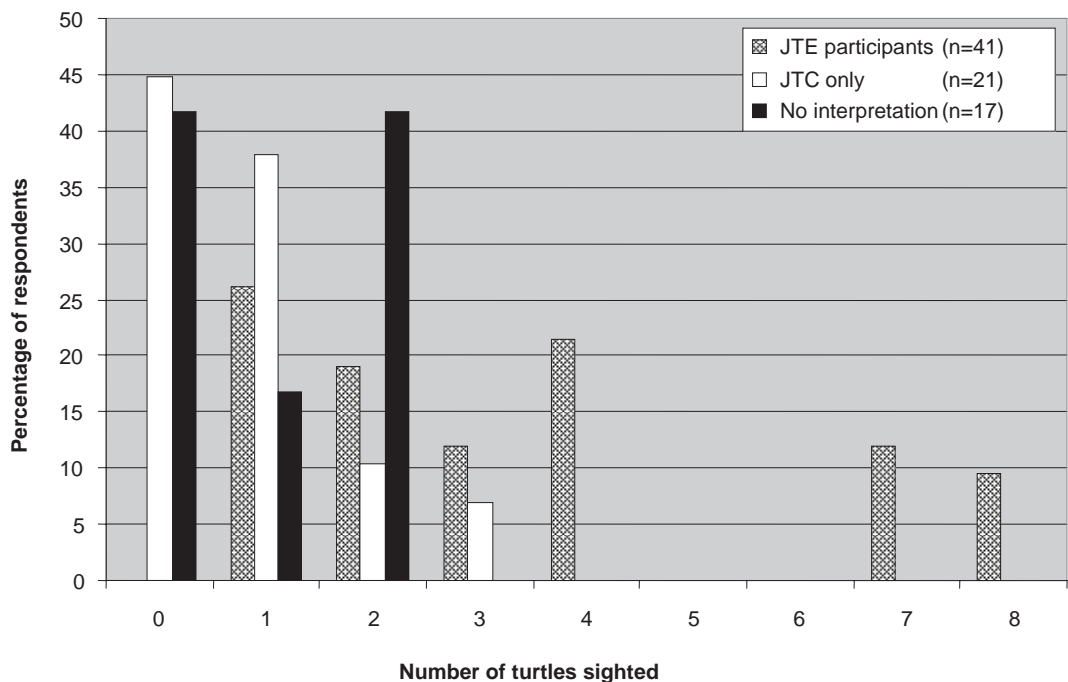


Figure 4. Level of interpretation and turtle sightings.

Table 5
Mean Importance of Witnessing Each Turtle Nesting Behavior

Turtle Behavior	JTE Participants		JTC Only		No Interpretation	
	No. of Respondents	Mean	No. of Respondents	Mean	No. of Respondents	Mean
Emerge from ocean	41	2.46	27	2.74	21	2.57
Crawl up beach	40	2.45	26	2.45	21	2.57
Dig body pit/egg chamber	40	2.33	26	2.46	21	2.14
Lay eggs	40	2.33	25	2.44	23	2.57
Cover/camouflage nest	40	2.78	23	2.61	23	2.61
Return to ocean	41	2.51	25	2.48	21	3.10
Hatching	38	2.53	23	2.70	25	3.10

Scale: 1 = *extremely important* to 5 = *not at all important*. The number of respondents varies within tourist categories as some tourists did not respond to all the questions.

ocean,” “crawl up beach,” and “return to ocean” ($p < 0.05$). None of the respondents witnessed “hatching.” Each of the remaining turtle nesting behaviors, except “crawl up beach” and “return to ocean,” were observed by a higher percentage of *JTE participants*. Each turtle nesting behavior, except “return to ocean,” was witnessed by a higher percentage of tourists with *no interpretation* than tourists who visited the *JTC only*.

Self-Reported Satisfaction With the Turtle-Watching Experience

More *JTE participants* (90% of 41 respondents) than tourists who visited the *JTC only* (70% of 26 respondents) and tourists with *no interpretation* (58% of 24 respondents) were satisfied with their overall turtle-watching experience (Fig. 6). *JTE participants* had the highest mean satisfaction

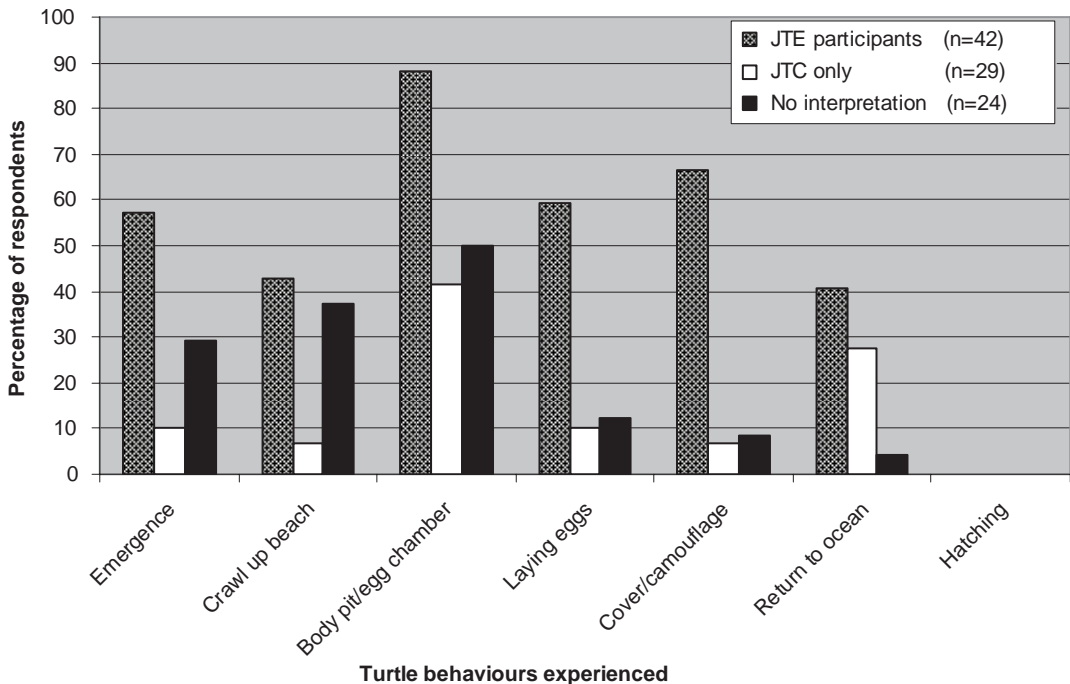


Figure 5. Turtle nesting behaviours experienced by tourists.

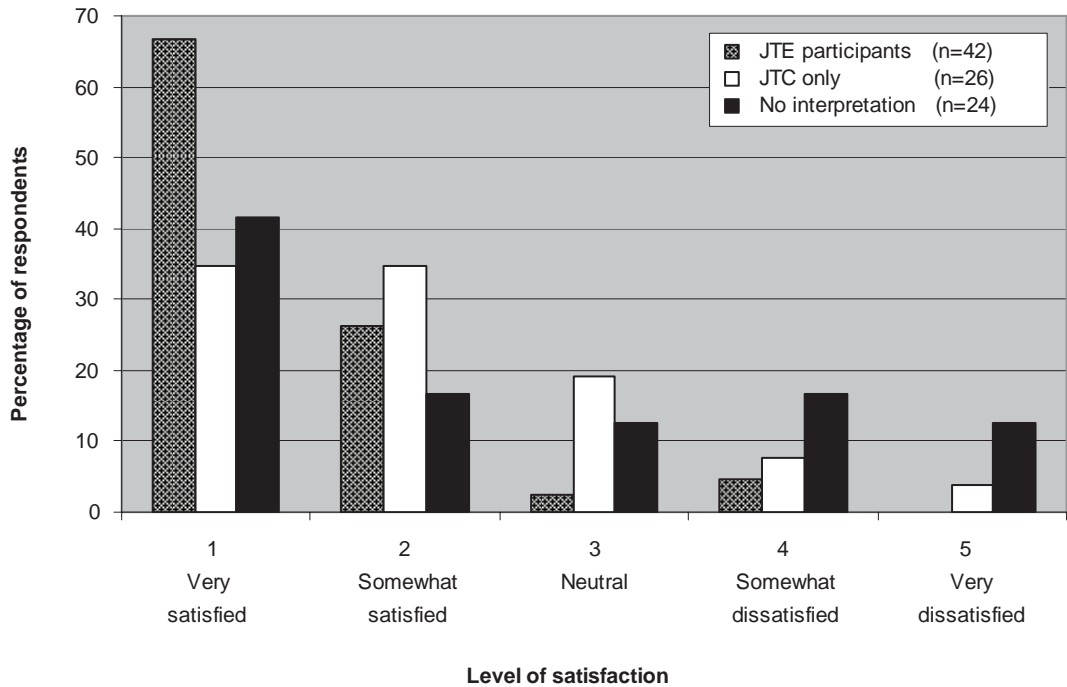


Figure 6. Overall satisfaction with the turtle-watching experience.

with their overall experience (1.46 ± 0.78), with only one respondent being neutral and two being somewhat dissatisfied, than tourists who visited the *JTC only* (2.12 ± 1.11) and tourists with *no interpretation* (2.42 ± 1.50). This supports the argument that the JTE experience acts to increase satisfaction with the overall experience.

In order to gain a deeper understanding of tourist satisfaction, a further series of questions asked tourists to rate their satisfaction with various components of their overall experience. Table 6 shows

that *JTE participants* had a higher mean satisfaction than the other two tourist categories for the number of turtles they saw, how close they got to a turtle, the guidelines for viewing turtles, and the amount of information they received about turtles. Tourists who visited the *JTC only* had higher mean satisfaction than tourists with *no interpretation* for the number of turtles they saw and their proximity to a turtle.

A further two questions asked tourists what they “liked most” and what they “liked least” about their

Table 6
Mean Satisfaction With Aspects of the Turtle-Watching Experience

Aspect of Turtle-Watching Experience	JTE Participants		JTC Only		No Interpretation	
	No. of Respondents	Mean	No. of Respondents	Mean	No. of Respondents	Mean
The number of turtles observed	42	1.48	23	2.70	24	2.83
Guidelines for viewing turtles	42	1.40	22	2.26	21	2.05
Proximity to a turtle	42	1.29	22	2.23	21	2.52
Amount of information received about turtles	42	1.29	22	2.32	22	2.32

Scale: 1 = *very satisfied* to 5 = *very dissatisfied*. The number of respondents varies within tourist categories as some tourists did not respond to all of the questions.

turtle watching experience. The most liked aspects of the turtle-watching experience, for *JTE participants* (41 respondents), were “being close to a turtle” (34%), “seeing a turtle” (15%), and “seeing a turtle lay its eggs” (12%). Tourists who visited the *JTC only* (23 respondents) most commonly responded “the surroundings” (e.g., stars/sky) (30%), “seeing a turtle” (22%), and “the whole experience” (13%); the most common responses for tourists with *no interpretation* (22 respondents) were also “seeing a turtle” (36%), “the surroundings” (23%), and “the whole experience” (14%).

For *JTE participants* (34 respondents) the least liked aspects of the turtle-watching experience were “too many people” (27%), “crawling on ground/walking in sand” (21%), and “too dark/couldn’t see” (15%), whereas tourists who visited the *JTC only* (18 respondents) and tourists with *no interpretation* (19 respondents) commonly responded with “did not see a turtle” (44% and 42%, respectively), “too dark/couldn’t see” (11% and 26%), and “cold/windy” (11% each). Over 90% of respondents in all categories indicated that they would recommend turtle-watching in Exmouth to friends, family or colleagues.

Discussion

Sample Characteristics

Visitor demographics for the Northwest Cape vary throughout the year (Wood, 2003) and reliable demographic information for visitors during the turtle-nesting (off-peak tourism) season is not readily available. The current study had a slightly higher proportion of international visitors and fewer Exmouth residents than a similar study conducted by Osborne (1995), supporting Wood’s (2003) findings of an overall growth in international tourism to Exmouth. The Osborne (1995) study reported higher levels of previous turtle-watching experience than found in the sample for this current research, which may be accounted for by the higher numbers of Exmouth residents in the Osborne (1995) sample.

Tourist Compliance With the Code of Conduct

It is encouraging that no respondent breached the guidelines “do not shine lights on turtles leaving the water or moving up the beach” and “do not get

between the turtle and the ocean when she is returning to the ocean.” Breaching of these two guidelines has been shown to be a major source of disturbance to nesting marine turtles (Johnson et al., 1996; Waayers et al., 2006). However, no breach of these guidelines was noted during this study period.

Orams and Hill (1998) found that tourists exposed to an interpretive program at a wild dolphin feed had reduced incidents of inappropriate behaviors during their interaction. Similarly, Medio, Ormond, and Pearson (1997) and Townsend (2003) found that an environmental briefing before scuba diving reduced incidents of tourists making contact with the reef. Furthermore, Tubb (2003) concluded that interpretation can significantly aid in fostering sustainable practices in tourism situations, and Madin and Fenton (2004) found that interpretation can change visitor understanding of targeted topics and issues. Such studies support the findings presented here that situations of increased interpretation led to a reduction in noncompliance in wildlife tourism situations.

Although *JTE participants* had the lowest levels of noncompliance with the code of conduct, each tourist averaged two breaches of the guidelines. The most commonly breached guidelines by *JTE participants* were “when approaching a nesting turtle crawl up behind her on your stomach” and “wait until she is laying before moving closer.” Not crawling on your stomach can cause disturbance to nesting turtles because marine turtles will move away from a high silhouette on the beach (Bartol & Musick, 2003). Being too close (<2 m) to a turtle before she is laying can also have an impact on the turtle as close proximity of tourists can cause the walls of the body pit to collapse, filling the egg chamber with sand. The turtle would then have to dig this extra sand out of the egg chamber before commencing to lay.

It is of concern that it was through following the lead of a tour guide that the aforementioned breaches of the code of conduct occurred as reported in this study. *JTE guides* are in a position to ensure that tour participants do not breach the code of conduct. As stated previously, one way to achieve this is to ensure guides are adequately trained in managing tour groups (e.g., Black & Weiler, 2005; Weiler & Ham, 2001b).

JTE guides are encouraged to complete an accredited “Turtle Tour Guide Training Course,” but a lack of trained guides during the nesting season

meant that tours were occasionally conducted by unqualified guides. Jacobson and Robles (1992) found that (certified) nesting turtle tour guides in Costa Rica struggled to control tour groups with more than 11 people; therefore, reducing the size of JTE tour groups from the current maximum of 15 participants to a maximum of 11 participants may also assist with managing tourist behavior.

Tourist Knowledge of the Code of Conduct

Although recall of the code of conduct increased with the level of interpretation, recall was low for all three tourist categories. However, closer analysis of the additional 24 guidelines recalled, which were not specifically mentioned in the code of conduct, revealed that tourists had an awareness of themes in the code of conduct. Considering that most tourists (90 of 96 respondents) breached at least one guideline in the code of conduct, it appears that this general awareness of the code of conduct is not enough to ensure compliance.

Further, the code of conduct behaviors recalled (both correct and where respondents added additional information that was not in the code of conduct) appear to have been influenced by where tourists actually heard about the code of conduct. Furthermore, the majority of *JTE participants* heard about the code of conduct in the presentation at the JTC, which incorporates a maxim of “go slow, stay low, no glow and no flash photography.” The main responses for this tourist category (“sudden movements,” “flash photography,” “not staying low,” and “torches/lights”) reflected this maxim.

Tourists who visited the *JTC only* most commonly learned of the code of conduct from the JTC displays, where the main behavioral information is in signs positioned along the walkway to the Jurabi Turtle Centre. The most common responses of behaviors discouraged in the code of conduct for this tourist category (“noise,” “torches/lights,” “flash photography,” and “bright lights”) are all, apart from “flash photography,” mentioned in the JTC signs. Other common responses for tourists who visited the *JTC only* (“not staying behind the turtles,” “touching turtles,” and “sudden movements”) are mentioned in the JTC signs.

As with the tourists surveyed by Osborne (1995), tourists with *no interpretation* mostly learned of

the code of conduct from a beach sign or pamphlet. The code of conduct is presented in the pamphlet, though some versions include the additional recommendation of not using flash photography. The information in the beach sign is similar to the information in the JTC signs.

The most common behaviors recalled as being discouraged in the code of conduct by tourists with *no interpretation* (“torches/lights,” “noise,” “being too close,” “approaching a turtle,” and “sudden movements”) are all mentioned in the beach sign. As “being in front of a turtle,” “touching turtles,” and “not staying low” are mentioned in the signs positioned along the walkway to the JTC, but not the general beach sign, it is not surprising that fewer tourists with *no interpretation* than tourists who visited the *JTC only* recalled these as behaviors discouraged in the code of conduct. Those tourists with *no interpretation* that recalled “being in front of a turtle” and “sudden movements” had been approached by a scout.

For guideline messages to be received they need to be easy to understand, presented clearly, and widely distributed (Moscardo, Woods, & Pearce, 1997; Moscardo, Woods, & Saltzer, 2004; Sirakaya & Uysal, 1997). The large variety of responses to “list the behaviors discouraged in the code of conduct,” and the fact that these responses reflected where respondents learned of the code of conduct, suggests that there should be standardized guidelines of appropriate behavior for interacting with nesting marine turtles in the Jurabi Coastal Park, and that all information sources should present these standardized guidelines. A national code of conduct for beach-based interactions with turtles has previously been drafted (Birtles et al., 2005). Though not compulsory, adoption of a national code of conduct by management agencies would achieve consistency in the information available to tourists interacting with nesting marine turtles.

Tourist Satisfaction With the Turtle-Watching Experience

Expectations for Turtle-Watching and Actual Experiences. Satisfaction is dependent on meeting or exceeding expectations (Akama & Kieti, 2003; O’Neill et al., 2004). Therefore, if tourist *expectations* for the turtle-watching experience were met or

exceeded by their *actual experiences*, it is likely that the tourists were satisfied. Following this reasoning, it is a logical progression that *JTE participants* had higher self-reported satisfaction than *non-JTE participants*. All *JTE participants* expected to, and did, see a turtle, whereas more *non-JTE participants* expected to see a turtle than actually did. Similarly, the proportion of *JTE participants* who witnessed the turtle behaviors rated as being the most important behaviors to witness (by *JTE participants*) was higher than the proportion of tourists *non-JTE participants* who witnessed the turtle behaviors rated as being the most important behaviors to witness by their respective tourist categories. The proportion of tourists with *no interpretation* who did not see a turtle (42%) was considerably higher than for tourist groups sampled by Osborne (1995) (25%); this may be a result of the different sampling strategies or variations in weather conditions or nesting intensity. Although no respondents saw turtles hatching, this behavior had a relatively low importance for all three tourist categories.

Self-Reported Satisfaction With the Turtle-Watching Experience. Satisfaction with the overall turtle-watching experience was high for all three tourist categories, despite the fact that a large number of *non-JTE participants* did not see a turtle (Fig. 4). This result supports the findings of Orams (2000) in that a high proportion of tourists who experienced low-visibility whale watches (i.e., no/few whales and little whale surface activity) were still satisfied with their experience. Given that *JTE participants* saw significantly more turtles than *non-JTE participants*, they had the highest satisfaction with the number of turtles sighted, and with how close they got to a turtle. Conversely, tourists who visited the *JTC only* had higher satisfaction with the number of turtles sighted and how close they got to a turtle, but saw fewer turtles than tourists with *no interpretation*. It is possible that tourists with *no interpretation*, who received less information about turtles than tourists who visited the *JTC only*, had unrealistic expectations about how many turtles they would see and how close they would get to a turtle. This has implications for tourist satisfaction.

Overall satisfaction was highest for *JTE participants*, followed by tourists who visited the *JTC*

only, supporting the literature that interpretation leads to increased tourist satisfaction (Hughes, Newsome, & Macbeth, 2005; Lück, 2003; Moscardo et al., 2004; Muloin, 1998; O'Neill et al., 2004). *JTE participants* also had the highest satisfaction for the four aspects of the turtle-watching experience: i) the number of turtles sighted, ii) how close they got to a turtle, iii) the guidelines for viewing the turtles, and iv) the information they received about turtles.

As tourists are more likely to accept restrictions on their experience if they understand the reasons for those restrictions (Frost & McCool, 1988; Kuo, 2002; Swearingen & Johnson, 1995), it appears natural that *JTE participants*, who had the highest level of interpretation, had the highest satisfaction with the guidelines for viewing nesting turtles (i.e., the code of conduct). This result supports the findings of Mayes, Dyer, and Richins (2004) that tourists who were exposed to a structured interpretive program as part of a wild dolphin feed were more satisfied with the rules they had to follow than tourists that were exposed to limited interpretation. In contrast, tourists who visited the *JTC only* had lower satisfaction with the behavioral guidelines than tourists with *no interpretation*. It may be that because tourists with *no interpretation* had little knowledge of the code of conduct they were less aware of potential restrictions on their interaction (e.g., not to move closer to a turtle until she is laying).

Considering that *JTE participants* were the only tourist category to be exposed to the interpretation of marine turtle ecology, the fact that they had the highest satisfaction with the amount of information received about turtles supports the view that interpretation increases satisfaction. Although tourists who visited the *JTC only* would have been exposed to more information about turtles than tourists with *no interpretation*, the two tourist categories had equal satisfaction with this aspect of their experience. It may be that the two tourist categories represent different market segments and that tourists who do not visit the *JTC* may be less focused on learning through interpretation. Although Lück (2003) found that tourists on swim-with-dolphins tours in New Zealand desired to be educated, Weiler and Ham (2001b) note that not all ecotourists share the

same motivations and expectations, and different market segments exist.

Given that this study reflects that a proportion of turtle-watching tourists who did not seek interpretation, turtle tourism managers may consider implementing “hard” management strategies such as fines for noncompliance and beach access restrictions. Nevertheless, sanctions and deterrent measures (such as fines) have, in the past, been shown to be ineffective in reducing noncompliance with voluntary guidelines (e.g., Sirakaya & Uysal, 1997). However, beach access restrictions appear to be effective at both Mon Repos and Tortuguero (Costa Rica), where beach access at night is restricted to turtle tour participants (Jacobson & Robles, 1992; Mau, 2003). Jacobson and Robles (1992) believe few people would attempt to access Tortuguero beaches without permission from Park staff. In the past, beach access restrictions have been considered unfeasible in the Jurabi Coastal Park, as these beaches are used at night by Exmouth residents for activities such as recreational fishing (Roland Mau, personal communication). In light of this research, beach access restrictions combined with interpretative turtle tours should be reconsidered. How such a proposal can be adopted by local residents represents a valuable opportunity for further research.

Many respondents from all three tourist categories stated that the most liked aspect of their experience was the surroundings (e.g., stars, sky), supporting the comment of Moscardo and Saltzer (2004) that natural settings often contribute to overall satisfaction in wildlife tourism. Most tourists who visited the *JTC only* and tourists with *no interpretation* expected to see a turtle, yet a large proportion of respondents in these tourist categories did not see a turtle, which was the least satisfying aspect of their turtle-watching experience. The fact that all *JTE participants* saw a turtle therefore represents an important opportunity commercially and far more sustainable turtle-watching opportunity in the Jurabi Coastal Park and associated tourism industry.

The least satisfying aspect of the turtle-watching experience for *JTE participants* was that there were too many people on the beach (27%). A further five *JTE participants* mentioned they would prefer smaller tour groups (currently a maximum of 15

participants per tour), and another three commented that the beach should be closed to non-tour groups, thus a combined total of 40% of *JTE participants* felt there were too many people on the beach. Similarly, 52% of 320 turtle-watching tourists sampled at Mon Repos (where only tour groups are allowed on the beach) during the 2004–2005 turtle nesting season stated there were too many people in their tour group (Curnock, Birtles, Gatley, & Valentine, 2005). The average tour group size at Mon Repos was 50 people, while *JTE* tour groups only occasionally exceeded 15 participants. Jacobson and Robles (1992) found that turtle tour groups at Tortuguero with over 20 participants received complaints about tour group size whereas groups of 10 or less did not.

JTE participants had the highest satisfaction with all aspects of the turtle-watching experience, and also had the highest number of respondents who indicated they would recommend turtle watching in Exmouth. Three of the four *JTE participants* who said they would not recommend turtle watching stated it was because they were concerned about disturbance to the turtles. Clearly some *JTE participants* felt their interaction had an impact on the turtles. Whereas it may represent a conservation ethic fostered through exposure to high-quality interpretation, it may also be an outcome of self-selection of the sample in that those who seek an interpretive experience already have a conservation ethic, with this also representing an opportunity for further research (Weiler & Ham, 2001a). As stated previously, small group size positively influences visitor satisfaction because tour guides can exercise more control over tour participant behavior. Once tour group size has been reduced to a maximum of 10 participants, tourist satisfaction with the number of people on the beach should be reassessed; if there are still complaints regarding too many people on the beach then *JTE participants* could be given the option of purchasing private, customized turtle-watching tours. Offering customized tours is supported by Beeton (2004), who states that wildlife tourism is generally moving away from “standardized” products to provide “customized” experiences, in recognition that tourism must cater for a diverse range and the needs and wants of tourists that have now emerged.

Further Research

Further research opportunities on the role of interpretation in managing turtle-watching tourism have been identified from this study.

1. Turtle watching at Northwest Cape requires the development of a baseline data set to provide the total numbers and demographics of turtle-watching tourists in each tourist category.
2. This study strongly indicates that those engaging in interpretive experiences have lower levels of noncompliance. Therefore, research investigating whether those seeking interpretation are “naturally” less likely to breach or whether the “lesson learned” through interpretation would provide interesting insight.
3. A question remains as to whether the general awareness of themes (e.g., avoiding disturbance to turtles, using a suitable approach distance, and demonstrating patience during the egg laying process) in the code of conduct as opposed to recall of specific guidelines in the code of conduct (do not shine light on turtle, crawl up to turtle on your stomach, be patient) demonstrated by all three tourist categories is adequate to prevent tourist disturbance to the turtles. Specifically, it would be valuable to evaluate the effectiveness of “recall of codes” against “awareness of themes” as measures that reflect decreases in noncompliance.
4. Linking with motivational research of wildlife tourists could provide a means of exploring why the sample of tourists who received *no interpretation* were more highly satisfied with the information they received about turtles, than those who visited the JTC but did not avail themselves of the total JTE interpretation experience. This may be a simple matter of expectations and satisfaction, with those not seeking interpretation having lower expectations.
5. Given the finding that voluntary compliance with the code of conduct is limited, in part, due to some tourist market segments being unwilling to seek activities for interpretation, it is suggested that some other forms of compliance regulation be enforced to ensure long-term turtle populations in this region. This study has highlighted that the implementation of beach access restrictions in the Jurabi Coastal Park should be

considered. As beach access restrictions are a contentious issue (Mau, 2003), how the public might accept beach access restrictions represents another key area for further research.

6. Research that provides evidence that those who follow the codes of conduct achieve higher levels of satisfaction (see Waayers et al., 2006) would also be useful to turtle managers and eco-tourism companies.

Although the suggestions listed above focus specifically on the study site and turtles, they are proposed as being applicable to many wildlife tourism settings throughout Australia and in wider, global, wildlife settings.

Conclusions

This research provides a “snapshot” of tourism based on viewing nesting marine turtles in the Jurabi Coastal Park during the summer nesting season and the results can be utilized as a basis to inform future management of tourism based on viewing nesting marine turtles in the Jurabi Coastal Park and in similar turtle-watching situations worldwide. The following management recommendations are important as they would act to increase both compliance with codes of conduct and visitor satisfaction while protecting the turtles on which the tourism experience depends.

Code of Conduct

- Standardization of the code of conduct will facilitate minimal impact from tourism.
- Tourists with the full interpretive experience (i.e., the *JTE participants*) had lower levels of non-compliance with the code of conduct, leading to reduced turtle disturbance.

Satisfaction

- All *JTE participants* saw a turtle, whereas more than 40% of independent tourists did not.
- *JTE participants* were more satisfied with all aspects of their turtle-watching experience.

This research shows that appropriate interpretation, as delivered through the JTE, fosters compliance with a turtle tourism code of conduct. In addition

to this, certified (trained and knowledgeable) tour guiding associated with such interpretive facilities is likely to be a very effective mechanism in achieving this goal.

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