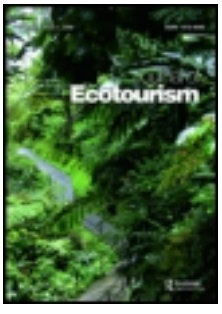

Journal of Ecotourism
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/reco20

For love or for money? Investigating the impact of an ecotourism programme on local residents' assigned values towards sea turtles

Fernanda de Vasconcellos Pegas [a], Alexandra Coghlan [b], Amanda Stronza [c] & Valéria Rocha [d]

[a] International Centre for Ecotourism Research, The Griffith School of Environment, Griffith University, Gold Coast Campus, Southport, QLD, 4222, Australia

[b] Department of Tourism, Leisure, Hotel and Sport Management, Griffith University, Gold Coast Campus, Southport, QLD, 4222, Australia

[c] Department of Recreation, Park and Tourism Sciences, Texas A&M University, College Station, TX, USA

[d] National Coordinator of the Environmental Education and Social Inclusion Program of the TAMAR Project, Projeto TAMAR, Praia do Forte, Brazil

Published online: 02 Sep 2013.

To cite this article: Journal of Ecotourism (2013): For love or for money? Investigating the impact of an ecotourism programme on local residents' assigned values towards sea turtles, Journal of Ecotourism

To link to this article: http://dx.doi.org/10.1080/14724049.2013.831099

Journal of Ecotourism, 2013
http://dx.doi.org/10.1080/14724049.2013.831099

Routledge
Taylor & Francis Group

For love or for money? Investigating the impact of an ecotourism programme on local residents' assigned values towards sea turtles

Fernanda de Vasconcellos Pegas[a*], Alexandra Coghlan[b], Amanda Stronza[c] and Valéria Rocha[d]

[a]*International Centre for Ecotourism Research, The Griffith School of Environment, Griffith University, Gold Coast Campus, Southport QLD 4222, Australia;* [b]*Department of Tourism, Leisure, Hotel and Sport Management, Griffith University, Gold Coast Campus, Southport, QLD 4222, Australia;* [c]*Department of Recreation, Park and Tourism Sciences, Texas A&M University, College Station, TX, USA;* [d]*National Coordinator of the Environmental Education and Social Inclusion Program of the TAMAR Project, Projeto TAMAR, Praia do Forte, Brazil*

(*Received 8 August 2011; final version received 29 July 2013*)

This study adopts an 'assigned values' conceptual model to explain the formation of values and behaviours related to sea turtles at an ecotourism project in Brazil. For over 25 years, the Brazilian Sea Turtle Conservation Programme (TAMAR) has used ecotourism to protect sea turtles in the fishing village of Praia do Forte. The village beaches are prime nesting sites for endangered marine turtles, traditionally harvested on a regular basis, despite federal bans. Seventy-seven residents, including 25 TAMAR workers, were interviewed. Results indicate an overall support for TAMAR, turtle conservation, and implementation of ecotourism initiatives. Both TAMAR workers and non-workers were equally likely to support turtle conservation for the economic role that turtles play in the local economy, with variations in perceptions about their intrinsic or ecological values. Changes in use and values are positive indicators that education and economic benefits from ecotourism can generate support for conservation. However, such outcomes are not necessarily a result of greater stewardship but rather of changes in the social, cultural, and economic dynamics of the village. A better understanding of the factors that drive people to support conservation initiatives, both in terms of values and behaviours, are essential if conservation efforts are to succeed.

Keywords: environmental behaviour; TAMAR; livelihoods; flagship; incentives

1. Introduction

For the past three decades, there has been an increasing push for conservation to provide economic benefits, e.g. using ecotourism, for local communities. Although based primarily upon economic incentives, conservation initiatives adopting this approach may also seek to change local residents' assigned values to the natural resource being protected. Since 1982, the Brazilian Sea Turtle Conservation Programme (TAMAR) has provided economic benefits, skill development, and educational activities as incentives for residents of coastal communities with a history of turtle harvesting to stop harvesting turtles and turtle eggs (Marcovaldi, Patiri, & Thomé, 2005). Ecotourism has become the foundation

*Corresponding author. Email: f.pegas@griffith.edu.au

of these initiatives. TAMAR, which stands for sea turtle (TARtaruga MARinha) in Portuguese, has its headquarters in the fishing village of Praia do Forte, Bahia.

Studies conducted over the past three decades show a decrease in turtle harvesting (Marcovaldi et al., 2007; Silva, Castilhos, Lopez, & Barata, 2007) and an increase in employment and educational opportunities to local communities (Marcovaldi et al., 2005; Pegas, Coghlan, & Rocha, 2012) since TAMAR was established. This study adopts the work of Seymour, Curtis, Pannell, Allan, and Roberts' (2010) as their framework for changing assigned values towards natural resources and considers TAMAR's role as an external factor in changing values from consumptive to non-consumptive uses of turtles. We also consider turtle conservation in relation to residents' associations with TAMAR, residents' perceived and real benefits from TAMAR, and residents' ties with local fishing conservation.

1.1 *Ecotourism as a tool for conservation*

Broadly, ecotourism is a form of nature-based tourism that provides direct benefits to nature conservation, the welfare of local residents, and includes some form of environmental education (Weaver & Lawton, 2007). For Honey (1999, p. 22), ecotourism not only includes an environmental component but also 'means education, for both tourists and residents of nearby communities'. It is not uncommon to view ecotourism as an incentive for local communities to 'buy into' conservation programmes. Ultimately, the goal is to change existing behaviour into activities that support conservation goals while also addressing local livelihoods. The incentive is often primarily economic in forms of jobs or income alternatives, and in some instances leads to changed values (Stronza & Gordillo, 2008). Changed values arguably lead to reduced consumption of natural resources and/or increased support for conservation.

1.2 *Benefits to local communities*

To highlight the focus on community well-being through ecotourism, community ecotourism is now recognised as a specific subtype of ecotourism (Buckley, 2010). Under this perspective, direct socioeconomic benefits to communities and greater participatory opportunities occur in parallel to the conservation agenda using participatory approaches to conservation where ecotourism is one of the tools.

Despite best intentions, the relationship between tourism development, conservation, and communities has been complex and often fraught with tension (Butcher, 2007) as well as shortcomings to communities, nature, or both (Buckley, 2010). Indeed, there has been a significant amount of research into community involvement in tourism and their perceptions of, and support for, ecotourism and conservation (Andereck, Valentine, Knopf, & Vogt, 2005; Stronza & Durham, 2008). Furthermore, research in this area has provided very mixed results, with some studies suggesting that local community members actually receive few direct benefits (Spiteri & Nepal, 2006), whilst residents employed in ecotourism ventures are more likely to have positive attitudes towards tourism and its impacts (Jurowski, Uysal, & Williams, 1997; Sirakaya, Teye, & Sonmez, 2002). Other studies imply that residents with a greater involvement in tourism are also more aware of its negative outcomes (McGehee & Andereck, 2004; Snepenger, O'Connell, & Snepenger, 2001).

On the positive side, benefits include direct and indirect employment, tourism development and promotion, maintenance of natural resources for controlling present or future use and improved social capital (Buckley, 2009; Pegas & Stronza, 2008). Another benefit from

ecotourism may be the provision of incidental environmental education opportunities for local residents simply through the increased focus on natural resource conservation (Wunder, 2000) or perhaps through direct exposure to the ecotourism venture's interpretation (Boyle, 2004; Fennell & Weaver, 2005). Meanwhile, Stem, Lassoie, Lee, and Deshler (2003) specifically indicate that the best examples of strong ecotourism ventures are those that maximise local benefits and include environmental and cultural education for tourists as well as for host communities. This may be particularly effective where residents work in the ecotourism ventures or where ecotourism-related interpretive signs are displayed throughout the community.

1.3 *Changing values*

The study of environmental values, and its links with pro-environmental behaviour, has received significant attention from a variety of disciplines using numerous conceptual frameworks and methodologies. For this study, we have adopted Seymour et al.'s (2010) framework as they are particularly interested in how *assigned* values towards natural resources can *change*. They suggest that assigned values are the relative valuation of a natural resource, and are influenced by the context in which the valuation occurred as well as the perceptions, preferences, and held values of the individual. Assigned values are therefore relative, while held values are absolute. Accordingly, assigned values may be more easily modified than held values and most likely respond more quickly to external factors such as the establishment of conservation initiatives via ecotourism's main economic development–conservation umbrella.

Figure 1 indicates some of the context-dependent factors that might influence assigned values according to Seymour et al.'s (2010) framework.

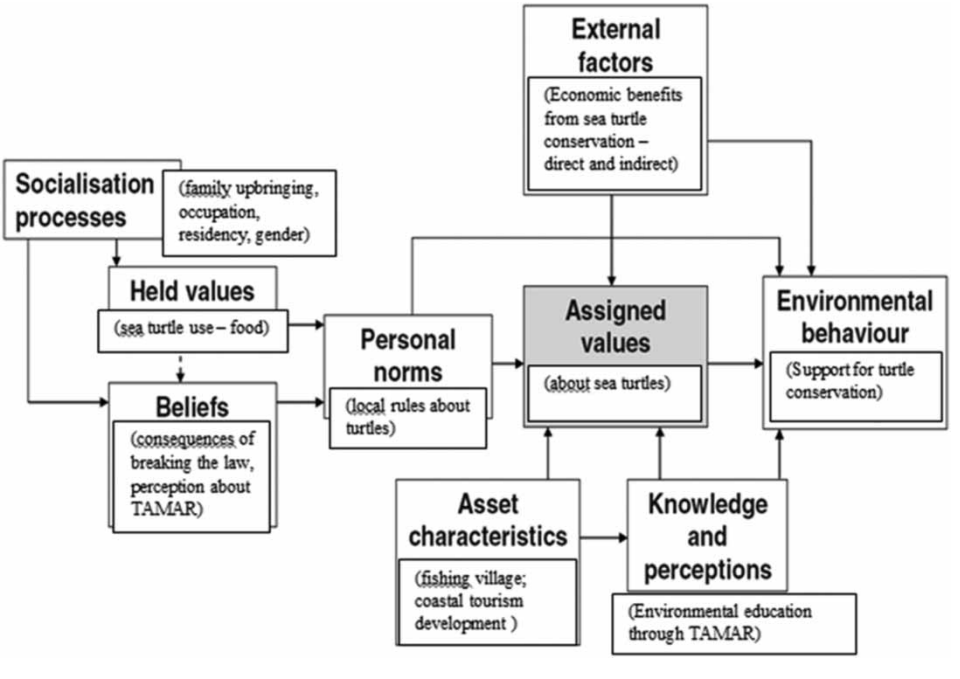

Figure 1. Seymour et al.'s (2010) framework on resource values, adapted to our case study.

Each factor in Figure 1 will influence residents' assigned values towards resources – in this case, sea turtles. Ecotourism, as the main conservation strategy, can be included in the external factors as it is usually designed to provide an incentive to conserve a natural resource via economic initiatives (Spiteri & Nepal, 2006). Knowledge, information, and perceptions arguably become important when the person can relate directly to that knowledge, particularly as it regards the benefits derived from the sustainable management of an asset. This knowledge becomes perhaps the most influential type of knowledge of behaviour. Finally, Seymour et al. (2010) provide indications that assigned values are influenced by various socialisation factors, such as family upbringing, membership in environmental groups, number of years of residency, and occupation. While there has been a research focus on understanding community assigned values for natural places in a natural resource management context (Kideghesho, 2008; Kuriyan, 2002; Stronza & Pegas, 2008), less is known about the factors that might influence assigned value expression and the predictive power of such values for understanding environmental behaviour (Seymour et al., 2010).

In this article, we explore the role of a conservation programme, TAMAR, in changing residents' assigned values towards sea turtles. We present TAMAR as an external factor that may be driving changes in values in a dynamic community, where the dominant economic activity has shifted from fishing to tourism through two main economic development catalysts: large-scale coastal tourism development (not a result of TAMAR) and community ecotourism approach via TAMAR (initiated and run by TAMAR). Despite their fundamental differences, these two economic development mechanisms have grown in parallel and benefited from each other.

1.4 *The research context: sea turtle protection in Brazil and Praia do Forte*

In Brazil, sea turtles have been protected by law since 1986 when the capture of turtles became a federal crime. Since then, laws have become more comprehensive. It is a federal crime to capture, kill, collect eggs, consume, and sell marine turtle products or by-products.

TAMAR is Brazil's pre-eminent sea turtle conservation organisation whose mission is to protect sea turtles found in Brazil. TAMAR is a collaborative effort between the Brazilian Government's Institute of Renewable Resources, Chico Mendes Institute of Biodiversity, and Ministry of the Environment and a non-profit organisation, *Fundação Pró-TAMAR* (Foundation Pro-TAMAR). TAMAR operates in nine states, monitors 1100 km of coastline, promotes conservation via 23 research stations, employs approximately 1300 people, runs visitor centres and promotes ecotourism in 13 communities that have a strong tourism component (TAMAR, 2011). One of these communities is Praia do Forte, located on the *Costa dos Coqueiros* (Coconut Coast) region approximately 80 km north of Salvador, Bahia's state capital (Figure 2).

The settlement of Praia do Forte goes back to 1551, with Portuguese settlement and later with the establishment of a private cattle operation and coconut plantation in the region. The village was formed when families moved to the area to work on the plantation at the end of the nineteenth century. These residents form the native residents of Praia do Forte. The plantation was sold in 1972 with the new owner ceasing the plantation operation soon after, leading to massive outmigration of native families due to employment cuts, a ban on the traditional practice of raising livestock and access to traditional fishing grounds (Pegas & Stronza, 2010). As a result, local families relied more extensively on local resources, including turtles. Residents, as in other coastal communities, consumed turtles for food and to use as fish bait (Pegas, 2012). Such practices, in turn, are associated with

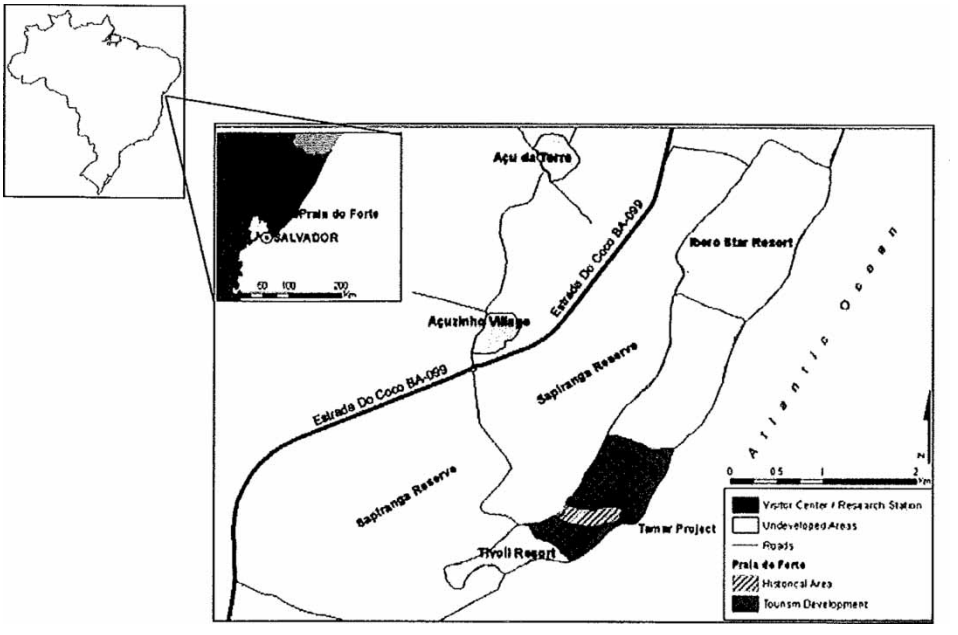

Figure 2. Map of Praia do Forte.

the substantial decline of sea turtle population numbers in the region and throughout Brazil (Marcovaldi et al., 2005).

The establishment of TAMAR in 1980 saw the founding of marine turtle conservation efforts in Brazil. In 1982, TAMAR opened a research station in Praia do Forte and initiated the implementation of economic incentives and environmental educational initiatives. At that time, the village was small, without electricity, and it was home to approximately 600 residents (Marcovaldi & Laurent, 1996). Tourism development was still in its infancy with few tourism-related establishments and limited infrastructure, providing few income opportunities for local families and fishing remained an important cultural component and economic driver of the local economy. In response to an increase of tourism interest over sea turtle conservation activities conducted by TAMAR, a visitor centre was built a few years later. Together, the visitor centre and research station provided a new form of income earning for the community.

Conservation efforts implemented by TAMAR have also anchored the flagship status of sea turtles in Brazil. Flagship species, according to Leader-Williams and Dublin (2000), have the ability to act as public relations and raise funds for conservation. Out of TAMAR's 11 visitor centres, Praia do Forte's is the most visited. In 2011, 368,000 people visited the Centre (Fundação Pró-TAMAR, 2011).

The *Costa dos Coqueiros* is now Brazil's fastest growing coastal tourism development region. In 2007, Praia do Forte was voted one of the top ten best beach destinations in Brazil (Veja, 2007). As a result of the booming development of secondary homes and hotel lodging options in the village, the population of about 2000 permanent residents rises to over 14,000 people during the peak summer season (Prefeitura Municipal da Mata de São João, 2004). A larger tourism industry means greater demand on local resources (e.g. water), greater potential for habitat loss, pollution, and tourist-sea turtle encounters during the nesting season. Overall, high-end tourism development continues with many secondary

luxury homes. Growing seasonal and permanent population as well as coastal development within and expanding outwards the village are associated with socioeconomic negative impacts, including increased cost of living, prostitution, drugs, and urban violence (Pegas, 2012; Pegas & Stronza, 2010). The tourism industry has, nonetheless, brought positive outcomes too, chiefly employment and income opportunities, better transportation services, and road access.

In addition to being a popular tourist destination, Praia do Forte is an important feeding and reproduction site for the endangered loggerhead (*Caretta caretta*), olive ridley (*Lepidochelys olivacea*), green turtles (*Chelonia mydas*), and the critically endangered hawksbill (*Eretmochelys imbricata*). In its early days, these harvesting practices posed the greatest threat to turtle survival in the area. Hence, raising awareness about the impacts of traditional hunting practices on turtle populations was vital if uses and values were to change from harvesting to the protection of the species. Engaging the community in turtle conservation, monitoring activities that violate protection laws, and generating economic benefits became TAMAR's key strategies to stop turtle poaching. Economic benefits included direct sources like income and job opportunities for both men and women in the village but also through indirect economic incentives, such as providing transportation and food items. In 2012, 143 residents of Praia do Forte and adjacent communities worked for TAMAR in various positions such as caretakers, drivers, sales representatives, and interpretation guides. Out of the 143 employees, 70 are women. Long-term assessment of local nesting activities shows a steady increase in the number of hatchlings released since 1982 indicating a decrease in egg poaching. Including all locations where TAMAR is active, over 15 million hatchlings have been released since 1980. A decrease in nest poaching and an increase in hatchling numbers are indicators that TAMAR's strategies are working.

1.5 *Community involvement in turtle conservation*

TAMAR initiated education initiatives through the use of photographs and drawings of turtles with messages, such as 'do not kill' and 'conserve' along the nesting sites and within the research station and visitor centre and through the prominent use of the turtle logo around the village (Marcovaldi et al., 2005). Education initiatives have since diversified and expanded with audio-visual media (e.g. documentary about turtles at the visitor centre), interpretation information and guided visits at the visitor centre. TAMAR also hired some of the local fishermen, ongoing today, to help with conservation activities.

Hatchling release ceremonies occur during the nesting season and provide the community with a visual connection with turtle conservation. TAMAR provides an *ad hoc* environmental education programme targeting the local adult community, including workshops for the employees. The fishermen continue to be involved with conservation through activities like helping the staff of TAMAR locate nests, monitoring of illegal activities, and test different fishing techniques. Overall, education opportunities are available to the community at the visitor centre, during communal environmental programmes and events, and via initiatives at the local schools. In 2011, 448 youth from Praia do Forte and adjacent communities received support from TAMAR in a variety of environmental education activities. One of these initiatives is the Fin Larsen Kindergarten, which enrols 270 local children.

2. Research aims and methods

The aim of this study was to apply Seymour et al.'s (2010) framework for a case study, as presented in Figure 1, and, in particular, to explore whether TAMAR's community

involvement initiatives have provided residents with a different perspective about turtles. Detailed information about the ethnographic research methods are presented in Pegas and Stronza (2010). A mixed methods approach was adopted and data collection was divided into three phases (i) an exploratory study, including interviews with 35 residents, in May to September 2006; (ii) a main data collection phase, from September to December 2007, including interviews with 77 residents, and (iii) follow-up interviews between June and August 2008, to evaluate changes in perceptions and perspectives about sea turtle conservation, tourism development, and TAMAR.

In 2007, a snowball sampling approach (Bernard, 2000) was used to interview 77 residents. The snowball approach initiated from a baseline of key 'gatekeepers' in the community, which included six native fishermen and their families, chiefly their wives. This information was provided by the founders of TAMAR and TAMAR research staff in 2006 and formed the basis of the 2007 data collection. The lead author approached the 'gatekeepers' and asked whether they were willing to participate in this study. They were also asked the names of those in the community, representing both native and not native residents, who would be willing to participate in an interview for the study. Their feedback generated a list of residents who represented the main stakeholder groups in the village: native and non-native; fishermen and non-fishermen; TAMAR workers and workers in other areas, such as education, services (e.g. security guards and tourism retail), and hospitality; women and men.

Despite limitations of a snowball method, this approach also provides benefits (Bernard, 2000). In this study, these benefits included the opportunity for the first author to identify local gatekeepers in a safe matter. This was mainly because of safety concerns stemmed in part from the fact that the lead author was both an outsider and a woman whose work (e.g. asking questions) challenged local perceptions of gender roles and made people generally suspicious. Some fishermen were simply not comfortable talking to her nor did she feel comfortable talking to some of the fishermen and other community members. Some families interviewed in 2006 also advised her to avoid certain groups and residents for safety reasons particularly due to the nature of some questions (e.g. poaching).

Face-to-face semi-structured interviews were conducted to access respondents' values towards and knowledge about turtle conservation and general perspectives about TAMAR. Appendix 1 provides the list of questionnaire items and how these fit within our framework. Interviews were conducted, manually transcribed, translated, and coded by the lead author, a native Brazilian. Out of the 77 respondents (ages 19–68), 32 are native residents (i.e. descendants of the first families who inhabited the village), 34 are women, 25 worked for TAMAR, and 15 are fishermen. Interviews lasted approximately 90 minutes and took place at a location chosen by the interviewee (e.g. his/her house).

3. Results

3.1 *Held values, beliefs, and norms*

Variables used to identify held values were extracted from respondents' perceptions about turtles, turtle conservation, and TAMAR. Evaluation of existing 'norms' was based on the establishment of communal rules and enforced federally enacted turtle protection laws while the 'beliefs' factor was based on residents' perceptions about the impacts of turtle poaching and conservation in their livelihoods.

3.1.1 *Food values*

Seventy-two respondents (95%) said they value turtles differently from the way they did in the past and prior to TAMAR's arrival in the village. These changes seem to be based on mixed factors. When asked to elaborate their answers, responses included comments that indicate a change in value from sources of food to the must be protected context. When asked about the traditional uses and their reasons for such practice, a pattern was clear among the long-term residents. Based on their statements, consumption was extensive and driven by two main reasons: to complement the household diet and for opportunistic reasons. Still, the 22 long-term residents said that despite the abundance of sea turtles, fish was the most popular protein choice. Occasional turtle consumption was an informal ritual amongst the fishermen during social gatherings on the beach. Long-term residents also stated that turtle harvesting increased during the nesting season due to the abundance of turtles and during the winter season due to fish shortages. Food shortage was associated with economic hardship conditions experienced by these families.

3.1.2 *Beliefs*

Sixty (78%) respondents said turtle numbers are higher than before TAMAR arrived in the village. This increase is associated with a decrease in local poaching. Five respondents specifically said that harvesting will not and should not take place because, unlike decades ago, there are alternatives and affordable sources of food available to the community. When asked about his perspective on sea turtles and changes in value over time, a fisherman said: 'For certain it has changed, but not only because of tourism but because people here have become aware that there are other alternatives in getting a living without killing the turtles, like protecting them'. Such perceptions were also shared among the younger generation. A fisherman's daughter said the intensity of turtle harvesting will not return to the historical levels: 'Because the situation today is different. In the past, when there were less financial resources so people were forced to kill them, but now is different'.

When asked whether turtles are valued differently, 95% of respondents ($n = 72$) associated changes in value with the tourism popularity of turtles. 'The identity of Praia do Forte is connected with preservation, especially with the turtles', said a young local woman. An older local woman believes that the community: 'Values them more now because turtles are the main source of money-making for the majority of people in the village'. A young non-native man is certain that values changed: 'Because the biggest tourist attraction here are the turtles. . .beside the turtles the village does not have anything that the tourist would like to come and see'. Comments indicating concern over the ecological status of turtles included statements such as these: 'Turtles should be protected because their numbers are low', 'They can go extinct if we don't protect them', and 'They are in low numbers'.

Residents were also asked whether the community would resume eating turtles again. Twenty-seven respondents (35%) provided statements that suggest that turtle harvesting will no longer be part of local livelihoods in part due to an understanding about turtle conservation. Examples of these statements include: 'No, because the people here were already aware and conscious about the conservation', and 'No, because TAMAR has worked a long time here to get people aware about turtle conservation'.

3.1.3 *Norms*

While the turtle–tourism relationship seems to be a strong factor in respondents' reasons to support turtle conservation, existing norms and institutions also play a role in village-based

protection of the species. Sixty-eight (88%) respondents said the community has rules regarding sea turtles. This includes all the 15 fishermen, 23 (92%) of the TAMAR workers, 28 (87%) of the native residents, and 31 (92%) of the respondents whose families are traditional local fishing families.

Not all community members shared these norms; the daughter of one fisherman warns that: 'A group of people in the village would eat them again'. Thirteen respondents said they knew of a case of turtle harvesting between 2006 and 2007 though it was unclear whether these accounts overlap. They were also unable to provide the actual numbers. When asked to elaborate on 'who' might harvest sea turtles, respondents indicated seasonal non-local construction workers and non-local fishermen as those in the community who remain harvesting turtles. Seasonal workers are amongst some of the new arrival residents in the village. 'TAMAR has been here for a long time, so people respect that. The problem is the new people. They don't know the laws and they don't have the same ties that we have with TAMAR', said a fisherman. A non-local man who sells souvenirs in the village presented an even gloomier perspective: 'Certainly, without doubt, there will be people selling the shells. It is for subsistence, for survival. They say that the meat is really good. So, there will be consumption for their meals and to supply a demand for the meat'.

3.2 *Knowledge and perceptions*

'Knowledge' and 'perceptions' factors were based on the understanding of existing turtle laws, threats and conservation initiatives.

3.2.1 *Knowledge of sea turtle protection laws*

Long-term residents stated they were unaware that turtle harvesting was illegal until the staff of TAMAR provided such information. Based on the results of this study, the knowledge context of local residents about sea turtle conservation, particularly existing sea turtle protection laws, is very distinct from decades ago. Fifty-five respondents (71%) knew of the existence of laws and 69 (90%) supported the use of these laws to protect turtles. Most respondents, 88% ($n = 22$) of TAMAR workers and 73% ($n = 38$) of non-TAMAR workers, were able to list the main regulations in place to protect the species.

3.2.2 *Knowledge about existing threats to turtle survival*

When asked about the current threats faced by sea turtles, 53 respondents (69%) said threats to the turtles persist. For instance, one fisherman who worked for TAMAR explained that although egg harvesting has ceased, 'There are some people in the village who still kill turtles'. As noted above, his perception about on-going harvesting was also shared by 12 other respondents.

Most respondents were also able to explain the impact of certain fishing practices on sea turtles (e.g. drowning in longline fisheries), about the allowed fishing techniques (e.g. illegal to use nets along the reef), and about the main contemporary threats to sea turtles and their nests (e.g. coastal development). It appears, therefore, that there was a general understanding of the implications of harvesting turtles and the likelihood of turtle hunting increasing should TAMAR cease to operate in the village.

3.3 *Asset characteristics*

When asked to explain why turtle-related values are now different from the past, 59 respondents (76%) said the economic benefits (e.g. employment at TAMAR, tourism growth) rather than environmental values were the main reasons turtles are now worth more alive than dead. These responses were made regardless of employment affiliation with TAMAR. Statements demonstrating an appreciation of the local economic benefits offered through ecotourism at TAMAR were frequent among respondents. One statement provided by a native resident captures the overall changes in local values and uses of turtles from the historical to contemporary practices:

> People value sea turtles much more now than in the past. In the past, about 10 to 15 years ago, people here used to eat them. If TAMAR was not here the people here would continue eating sea turtles and they would all have been gone by now.

In fact, 94% ($n = 72$) of respondents said they value turtles differently because of their economic role in the local economy. Within this group, 19 TAMAR workers and 40 non-TAMAR workers gave responses that indicated economic benefits of ecotourism as the main reasons they support turtle conservation. Examples of such responses include: 'In the past, people here used them to eat, so they saw them as a source of food and nothing more. Now, tourists come here to see TAMAR' and 'TAMAR brings tourism and we need tourism'.

3.4 *External factors*

The research revealed an association between support for turtle conservation and perceived promises of benefits TAMAR can bring to the community and associated punishments from turtle poaching.

3.4.1 *Economic conditions*

Seventy-four respondents (96%) said TAMAR provides the community with jobs, income, and education opportunities. Direct economic benefits are associated with employment at TAMAR with 28 households receiving an income from TAMAR. Indirect benefits are associated with the economic impact of TAMAR's visitor centre and overall promotion of turtles as the village's iconic species, as the turtle logo has been adopted by the local hotel industry retail and general stores, etc. Forty-four (57%) households have at least one of their sources of income associated with tourism-related jobs. When asked: 'In your opinion, what is the role of TAMAR in the local economy?', almost all respondents ($n = 74$), said TAMAR has an important role in the local economy particularly because of its turtle tourism component. When asked 'What would happen if TAMAR were to close the visitor centre?', respondents perceived that such action would substantially impact the local tourism industry. As an example of such a statement: 'If a person comes to Praia do Forte and does not see a turtle, this person has not come to Praia do Forte. Turtles are Praia do Forte. TAMAR is the postcard for the community'. Furthermore, 70 respondents (92%) said they wanted their children to work for TAMAR. This includes 47 of the 52 non-TAMAR workers.

Sixty-five per cent ($n = 35$) of TAMAR workers and 68% ($n = 36$) of non-TAMAR workers felt that the presence of TAMAR's founders, who live in the village since 1982, is an effective deterrent to harvesting. Still, 11 (14%) respondents said that some people

in the village will resume eating turtle meat because, in part, of the dramatic increase in the cost of living. In fact, for 16 (21%) respondents, high cost of living is one of the main negative effects caused by rapid tourism development in the village.

3.4.2 *Legal punishments of turtle poaching*

Sixty respondents (78%) are aware of the main laws that protect turtles. Native residents were more likely to know these laws than non-native residents (Fisher's exact *t*-test: *p* value .021). This analysis was not statistically different when testing the 'fishermen' and 'TAMAR worker' variables. When asked 'What happens if someone breaks these laws', 39 (56%) respondents said imprisonment, 17 (24%) said legal punishment but did not specify the type, seven (10%) were unaware of any type of legal punishment, and three (4%) were unable to explain existing laws. This indicates that the majority of respondents have some understanding of the implications associated with turtle harvesting. The active monitoring by TAMAR, rather than associating penalties, was cited by 28 (36%) respondents as an important reason why poaching is now rare. As demonstrated by the statement of a native older woman, knowledge not always precludes some in the community to harvest turtles: 'Nobody is crazy to pick up one [turtle]. People are afraid of getting caught but not too long ago there were many people still eating turtle meat and eggs. Now, only a few eat'. Overall, 69 (97%) respondents stated their approval over turtle protection laws.

3.5 ***Socialisation***

Variables used to identify the 'Socialisation' category were family upbringing (e.g. fishing family), occupation (e.g. TAMAR worker), residency period (e.g. native resident), and age. Cross-tabulation analysis of 'Socialisation' variables showed a positive perspective about TAMAR and conservation initiatives but without statistical differences between variables.

3.5.1 *Perception about TAMAR*

Sixty-five (84%) of respondents said TAMAR helps the local fishermen, 70 (92%) said they want their children to work for TAMAR when adults, and 74 (96%) said TAMAR provides jobs, income, and educational opportunities to the community.

3.5.2 *Knowledge, rules, and laws*

Fifty-three (72%) respondents said the presence of TAMAR founders in the village influence the way the community perceives TAMAR and turtle conservation. This sample includes 12 fishermen, 20 TAMAR workers, and 26 native residents. Sixty-eight (88%) respondents said the community has rules regarding turtles and 45 (59%) said the community contacts the researchers of TAMAR if a turtle is harmed, needs help, or if an illegal activity is taking place. The following statement provided by a native resident is a good representative of such attitudes: 'Nowadays people are more aware about conservation and call TAMAR if they see something happening to the turtles'. This practice was supported by feedback provided by TAMAR and observation during fieldwork. Furthermore, even for those who like turtle meat, the responses were almost all the same: 'Take to the Project'. Here, one respondent provides a clear view of the strong

foundation of these rules: 'If we find them, we have to take them to the Project. If there is a nesting activity taking place, we have to take them or inform the Project. But, the meat is delicious'.

4. Discussion

Our findings suggest that economic benefits (external factor) are important but they are not the only factors that contributed to behaviour and value change. Employment and family ties with TAMAR, occupation, length of residence, knowledge, and existing communal norms all contributed to changing traditional held values about sea turtles (i.e. source of food) into new assigned values (i.e. conservation of the species). It must be noted, however, that the context of TAMAR is somewhat rare in the conservation NGO/programme – community scenario. First, few programmes have been in place for a sufficient period of time to influence successive generations. TAMAR has operated in the village since 1982 and a whole generation has grown up with the presence of TAMAR in the village. Second, species harvesting was done for food rather than for medicinal or religious purposes. Third, turtle tourism grew in parallel with, and is a substantial attraction to, the local mass coastal tourism industry. Fourth, the socioeconomic condition of the village in the early 1980s provided an opportunity but also a need to generate direct benefits to the community in order to gain and sustain support. Finally, the case of TAMAR indicates the need of conservation programmes to diversify and adapt accordingly to the local expectations and limitations.

Our study demonstrates an overall support for turtle conservation across the main stakeholders: fishermen and their families, new residents, and TAMAR workers. The majority of respondents said they support turtle conservation because it contributes to the local tourism economy. This is a key shift in value where turtles are now more valuable alive than dead. This finding sustains the claim that ecotourism can create an incentive for locals to change the way they use and value wildlife (Stronza & Durham, 2008). Whilst economics may be the bottom line for these families, support was also associated with the presence of the founders of TAMAR in the village, their personal ties with the programme, and because of greater environmental awareness about the cause. Long-term ties with founders are linked with a sense of trust, which in turn influences perceptions about conservation initiatives. As a result, high levels of trust can act as catalysts of attitude change towards environmental policies and conservation initiatives (Jones, Panagiotidou, Spilanis, Evangelinos, & Dimitrakopoulos, 2011).

Overall, these factors demonstrate the presence of biological, economic, and intrinsic values as factors that influence their *assigned* values about sea turtles. The importance of economic benefits over ecological merit also contradicts our assumption that TAMAR workers are more likely to have greater awareness about the need to protect turtles than non-TAMAR workers. On the contrary, both groups provided similar answers regarding their reason to protect and support conservation efforts. Both groups also had similar levels of understanding regarding turtle laws. TAMAR workers did, however, have a greater and perhaps more sophisticated understanding of turtle threats. Employment at TAMAR as well as indirect economic benefits associated with turtle conservation, contributed to positive environmental behaviour.

The important role of turtle conservation in the village's economy is another example of the value of assessing the socioeconomic aspects of biodiversity conservation, particularly in common pool resources like fisheries. For Scholz et al. (2004), 'agencies who ignore the

concerns of affected user groups about the actual and perceived costs and benefits of management measures run the risk of deepening the schism between fishery managers and fishing communities' (p. 336).

The analysis of the socioeconomic implications of marine conservation strategies such as the ones implemented by TAMAR at the community level has provided a better understanding of the extent to which sea turtle ecotourism has been influencing the local economic context. Measurable economic indicators, as stated by Scholz et al. (2004), are often not available at the local level despite their role as ecotourism's success indicators (Buckley, 2003; Stronza & Pegas, 2008).

Whilst tourism was at its infancy in 1982, this industry is now the main income and a catalyst of both positive and negative socioeconomic and environmental at the local and regional scales. Some of the direct environmental impacts of tourism consist of habitat loss and degradation. As noted in this study, tourism has become one of the supporting avenues to raise awareness among residents and tourists as well as to provide a source of income. Since the nesting season overlaps with peak tourism visitation, educating visitors is as important as educating the community. Greater awareness about existing environmental protection laws, sea turtle conservation practices, and marine conservation problems not only help reduce tourists' impacts on sea turtles (Jones et al., 2011; Pegas & Stronza, 2010), but also influence overall attitude about biodiversity more broadly (Müller & Job, 2009).

5. Conclusion

In this article, we have evaluated TAMAR's efforts to protect sea turtles in one fishing community for over 30 years. We focused our assessment on the factors that have influenced how local residents use and value sea turtles over time. We found conservation in this case emerged as a result of successful synergies and relationships between the external actor, TAMAR, and the community. We found most respondents did not mention ecological or environmental reasons for turtle conservation. Instead, social, cultural, and economic factors, and the specific relationship and history between TAMAR and the village, influenced how, when, or why people cared about or engaged in conservation. This suggests local context matters for determining effective conservation strategies. As such, conservation initiatives must make the effort to understand not only what drives people to change their values and uses of nature into support for conservation efforts but what maintains such support. From a species conservation perspective, failure to appreciate traditional levels of use and value, particularly where traditional practices pose the greatest threat (or advantage) to species survival, can lead to the extirpation of the species in the region altogether. Such failure might cause the failure of an ecotourism venture particularly if dealing with flagship species.

Acknowledgements

We are grateful to the families of Praia do Forte for their generosity and for sharing their life stories about their beautiful community. The lead author is thankful for the support and assistance provided by TAMAR and its staff throughout the study. We thank the reviewers for their help in improving the quality of our article. This study was partially funded by the NSF Cultural Anthropology Programme (# 0724347; PI: Amanda Stronza), PADI Foundation, Viillo and Gene Phillips Scholarships, and funding from the Graduate Student Research Grant and The Centre for Socioeconomic Research and Education at Texas A&M University.

References

Andereck, K., Valentine, K., Knopf, R., & Vogt, C. (2005). Residents' perceptions of community tourism impacts. *Annals of Tourism Research*, *32*(4), 1056–1076.

Bernard, R. (2000). *Social research methods: Qualitative and quantitative approaches*. London: Sage.

Boyle, S. (2004). Opening minds: Interpretation and conservation. *Museum International*, *56*, 85–93.

Buckley, R. (2003). *Case studies in ecotourism*. Wallingford: CABI International.

Buckley, R. (2009). *Ecotourism: Principles and practices*. Wallingford, CT: CABI International.

Buckley, R. (2010). *Conservation tourism*. Wallingford: CABI International.

Butcher, J. (2007). *Ecotourism, NGOs and development: A critical analysis*. London: Routledge.

Fennell, D., & Weaver, D. (2005). The ecotourism concept and tourism-conservation symbiosis. *Journal of Sustainable Tourism*, *13*(4), 373–390.

Fundação Pró-TAMAR. (2011). *Fundação Centro Brasileiro de Protecao e Pesquisa das Tartarugas Marinhas – Pró TAMAR* (Relatório de Atividades 2011). Bahia, Brazil: Fundação Pró-TAMAR; Praia do Forte.

Honey, M. (1999). *Ecotourism and sustainable development: Who owns paradise?* Washington, DC: Island Press.

Jones, N., Panagiotidou, K., Spilanis, I., Evangelinos, K., & Dimitrakopoulos, P. (2011). Visitors' perceptions on the management of an important nesting site for loggerhead sea turtle (*Caretta caretta L.*): The case of Rethymno coastal area in Greece. *Ocean & Coastal Management*, *54*, 577–584.

Jurowski, C., Uysal, M., & Williams, D. (1997). A theoretical analysis of host community resident reactions to tourism. *Journal of Travel Research*, *36*, 3–11.

Kideghesho, J. (2008). Co-existence between the traditional societies and wildlife in western Serengeti, Tanzania: Its relevancy in contemporary wildlife conservation efforts. *Biodiversity Conservation*, *17*, 1861–1881.

Kuriyan, R. (2002). Linking local perceptions of elephants and conservation: Samburu pastoralists in Northern Kenya. *Society & Natural Resources: An International Journal*, *15*(10), 949–957.

Leader-Williams, N., & Dublin, H. (2000). Charismatic megafauna as 'flagship species'. In A. Entwistle & N. Dunstone (Eds.), *Priorities for the conservation of mammalian diversity: Has the panda had its day?* (pp. 53–81). Cambridge: Cambridge University Press.

Marcovaldi, M., & Laurent, A. (1996). A six season study of marine turtle nesting at Praia do Forte, Bahia, Brazil, with implications for conservation and management. *Chelonian Conservation & Biology*, *2*(1), 55–59.

Marcovaldi, M., Lopez, G., Soares, L., Santos, A., Bellini, C., & Barata, P. (2007). Fifteen years of hawksbill sea turtle (*Eretmochelys imbricata*) nesting in Northern Brazil. *Chelonian Conservation and Biology*, *6*(2), 223–238.

Marcovaldi, M., Patiri, V., & Thomé, J. (2005). Projeto TAMAR: Twenty-five years protecting sea turtles through a community-based conservation programme. *MAST*, *3*(2), 39–62.

McGehee, N., & Andereck, K. (2004). Factors predicting rural residents' support of tourism. *Journal of Travel Research*, *43*, 131–140.

Müller, M., & Job, H. (2009). Managing natural disturbance in protected areas: Tourists' attitude towards the bark beetle in a German national park. *Biological Conservation*, *142*, 375–383.

Pegas, F. (2012). Carrot-and-stick approaches to biodiversity conservation: The case of sea turtles in Brazil. *Applied Biodiversity Science Perspective Series*, *2*(3), 1–9.

Pegas, F., Coghlan, A., & Rocha, V. (2012). An exploration of a mini-guide program: Training local children in sea turtle conservation and ecotourism in Brazil. *Journal of Ecotourism*, *11*(1), 48–55.

Pegas, F., & Stronza, A. (2008). The ecotourism equation: Do benefits for people equal benefits for conservation? In A. Stronza & W. Durham (Eds.), *Ecotourism and conservation in the Americas: Putting good intentions to work* (pp. 163–176). Wallingford: CABI International.

Pegas, F., & Stronza, A. (2010). Ecotourism and sea turtle harvesting in a fishing village of Bahia, Brazil. *Conservation and Society*, *8*(1), 15–25.

Prefeitura Municipal da Mata de São João. (2004). *Adequação do Plano Diretor Urbano de Mata de São João ao Estatuto da Cidade* (Internal Report). Mata de São João: Prefeitura Municipal de Mata de São João.

Scholz, A., Bonzon, K., Fujita, R., Benjamin, N., Woodling, N., Black, P., & Steinback, C. (2004). Participatory socioeconomic analysis: Drawing on fishermen's knowledge for marine protected area planning in California. *Marine Policy*, *28*, 335–349.

Seymour, E., Curtis, A., Pannell, D., Allan, C., & Roberts, A. (2010). Understanding the role of assigned values in natural resource management. *Australasian Journal of Environmental Management*, *17*, 142–153.

Silva, A., Castilhos, J., Lopez, G., & Barata, P. (2007). Nesting biology and conservation of the olive ridley sea turtles (*Lepidochelys olivacea*) in Brazil, 1991/1992 to 2002/2003. *Journal of Marine Biological Association*, *87*, 1047–1056.

Sirakaya, E., Teye, V., & Sonmez, S. (2002). Understanding residents' support for tourism development in the central region of Ghana. *Journal of Travel Research*, *41*, 57–67.

Snepenger, D., O'Connell, R., & Snepenger, M. (2001). The embrace-withdraw continuum scale: Operationalizing residents' responses toward tourism development. *Journal of Travel Research*, *40*, 151–155.

Spiteri, A., & Nepal, S. (2006). Incentive-based approaches to conservation in developing countries. *Environmental Management*, *37*, 1–14.

Stem, C. J., Lassoie, J. P., Lee, D. R., & Deshler, D. D. (2003). How 'eco' is ecotourism? A comparative case study of ecotourism in Costa Rica. *Journal of Sustainable Tourism*, *11*(4), 322–347.

Stronza, A., & Durham, W. (2008). *Ecotourism and conservation in the Americas*. Wallingford: CABI International.

Stronza, A., & Gordillo, J. (2008). Community views of ecotourism: Redefining benefits. *Annals of Tourism Research*, *35*(2), 444–468.

Stronza, A., & Pegas, F. (2008). Ecotourism and conservation: Two cases from Peru and Brazil. *Human Dimensions of Wildlife*, *13*, 263–279.

TAMAR. (2011). *Fundação Centro Brasileiro de Proteção e Pesquisa das Tartarugas Marinhas – PRÓ TAMAR* (Relatório de Atividades 2011). Bahia: Projeto TAMAR.

Veja. (2007). *Praia: O Melhor Destino*. Retrieved from http://veja.abril.com.br/especiais/brasil_2007/p_018.html.th

Weaver, D., & Lawton, L. (2007). Twenty years on: The state of contemporary ecotourism research. *Tourism Management*, *28*, 1168–1179.

Wunder, S. (2000). Ecotourism and economic incentives – an empirical approach. *Ecological Economics*, *32*(3), 465–479.

Appendix 1: Questionnaire items and how they relate to the assigned values framework

Questions	Category[1]	Factor[2]	Type[3]
Demographics			
1. Are you a fisherman?	S/K	FU/PE/EC	Y/N
2. Gender	S	FU	Male/Female
3. Age	S	FU	OE
4. Marital status	S	FU/PE	OE
5. Are you native of Praia do Forte?	S/K	FU/PE	Y/N
6. Number of years living in Praia do Forte	S	FU	OE
7. Reason for moving to Praia do Forte	S	FU	OE
8. Are you from a fishing family?	S/K	FU/PE	Y/N
9. Do you fish?	S/K/EF	FU/PE/EC	Y/N
Economic background			
1. Do you work for TAMAR?	S/K/HVBN/ EF	EC/PE/B	Y/N
2. What are the sources of income of your family?	EF	EC/PE	OE
3. Which of these sources is more important? Why?	EF	EC/PE	OE
4. Which one generates greater income?	EF	EC/PE	OE
5. Does your household have income from TAMAR?	EF	EC/PE	Y/N
6. Do you have income from fishing?	EF	EC/PE	Y/N
7. Do you have income from tourism (not related with ecotourism TAMAR)?	EF	EC/PE	Y/N
Education background			
1. Were you a mini-guide at TAMAR?	S/K/HVBN	HV/K	Y/N
2. Education level	S/HBBN	K	OE
Perception about TAMAR			
1. Does TAMAR helps the local fishermen? How?	S/B/P/EF	K/B/E	Y/N; OE
2. Would you like that your children work for TAMAR?[4]	P/EF	B	Y/N
3. Have you received any benefits from TAMAR?What?	EF	HV/EF	Y/N; OE
4. What do you think about TAMAR?	HVBN	HV/B/EF	OE
Knowledge about sea turtle conservation efforts and threats			
1. Are there any threats to sea turtles in the area? What?	P/HVBN	HV/P/K	Y/N; OE
2. Are there any laws that protect turtles? What?	P/HVBN/EF	HV/P/K	Y/N; OE
3. What happens if someone breaks these laws?	P/HVBN/EF	HV/P/K	OE
4. Has anyone broken these laws within the past year?	P/HVBN/EF	HV/P/K	Y/N
5. Do you think the number of turtles has changed since TAMAR arrived in the village?	P/HVBN/EF	HV/P/K	Y/N
Community behavior towards sea turtles: consumption and conservation			
1. Does the community have any rules about sea turtles? What?	P/HVBN/EF	HV/P/K	Y/N
2. What are the laws to protect sea turtles?[5]	P/HVBN/EF	HV/P/K	OE
3. What do you think about turtle conservation?	P/HVBN/EF	HV/P/K	OE
4. What do you think about sea turtle protection laws?	P/HVBN/EF	HV/P/K	OE

(*Continued*)

Appendix. Continued.

Questions	Category[1]	Factor[2]	Type[3]
5. How did the community use turtles before TAMAR?	P/HVBN	HV/P/K	OE
Do you value turtles differently now than from the past? Why?	P/HVBN	HV/P/K	OE
6. If TAMAR would to leave the village, will the community resume eating turtles? Why?	P/HVBN	HV/P/K	Y/N; OE

[1]Category: Socialization (S), Held Values, beliefs and norms (HVBN), Knowledge and perceptions (KP), External factors (EF).
[2]Factor: family upbringing (FU), Knowledge (K), Economic conditions (EC), Occupation (O), Residency period (RP), Gender (G), Age (A), Held values (HV), Beliefs (B), Norms (N), Education (E).
[3]Yes/No (Y/N); Open ended (OE).
[4]One of the respondents does not have children and did not want to have children.
[5]Coding of these answers led to the conclusion whether the respondent knew the main laws in place to protect sea turtles. As per baseline, knowledge included: no capture, consumption or cause harm to sea turtles, no collection or consumption of turtle eggs, no lights on the beach, and no net fishing on the reef.