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A STUDY OF THE IMPACT OF ECOTOURISM ON ENVIRONMENTAL EDUCATION AND CONSERVATION: THE CASE OF TURTLE WATCHING AT AN AUSTRALIAN SITE

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Abstract

The importance of environmental education as a component of ecotourism is highlighted. The extent of environmental education and its impact on attitudes to conservation of sea turtles and actions by ecotourists to support such conservation as a result of their visits to Mon Repos Conservation Park (Queensland), an important marine turtle rookery, is examined. To do this, results from 519 usable survey forms completed by ecotourists are analysed. It is found that a considerable amount of environmental education is obtained by visitors and that this has positive and statistically significant impacts on their desire to protect sea turtles and their intended actions to do so. The importance of the interaction of tourists with wildlife as a contributor to their pro-conservation sentiments and actions is also discussed.

Key words: ecotourism, environmental education, sea turtles, sustainable tourism, wildlife conservation.

A STUDY OF THE IMPACT OF ECOTOURISM ON ENVIRONMENTAL EDUCATION AND CONSERVATION: THE CASE OF TURTLE WATCHING AT AN AUSTRALIAN SITE

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1. Introduction

As Wall (1997) points out, there have been many definitions of ecotourism. A common theme in most definitions is that ecotourism is responsible tourism in natural areas which conserve these (c.f. Blangy and Wood, 1993, p.32). But some writers add further requirements such as ecotourism should preserve local cultures and sustain the wellbeing of local peoples, or most importantly in this context, that it ought to provide tourists with environmental education. The latter requirement, for example, has been highlighted by Wight (1993) as a requirement for ecotourism.

The importance of this topic has recently been highlighted by Kimmel (1999). He maintains: "Ecotourism presents an important opportunity to advance the cause of environmental education. A greater sense of the educational role of ecotourism and more research on appropriate methods and materials are needed. There must be a clear statement of objectives, more appropriate interpretative material, and an emphasis on the professional preparation of tour guides" Kimmel (1999, p. 44). Also it would be useful, as is attempted in this article, to have measures of the knowledge imparted by environmental education at ecotourism sites and its impact on values of tourists and upon their future conservation behaviour.

The purpose of this article is to report on the environmental educational impacts of marine turtle-watching by tourists at Mon Repos beach in Queensland, Australia. This ecotourism activity is managed by the Queensland Parks and Wildlife Service (QPWS), at Mon Repos Conservation Park near Bundaberg in Queensland and conveys significant

educational content. There is an interpretative small museum display, lectures and a movie display in an outdoor amphitheatre prior to visitors' viewing nesting turtles or turtle hatchlings together with explanations by staff when turtles are nesting on the beach or hatchlings are emerging and making their way to the sea.

The turtle season at Mon Repos lasts from mid-November to the end of March. We conducted a survey of visitors during this period from 1999–2000 with the help of QPWS staff and volunteers. A total of 1,200 survey forms were distributed, 519 usable responses were received giving an effective response rate of just over 43%. In this article these responses are used to measure the effectiveness of environmental education generated by ecotourism at Mon Repos turtle rookery. Detailed information about the study area and the questionnaire can be found in Tisdell and Wilson (2000).

Before reporting the empirical results from the survey, it is convenient to outline possible purposes of environmental education, consider ways of quantifying its impacts and briefly outline some factors which might influence those impacts.

2. Goals of Environmental Education, Implications of Impacts and Significant Influences

Environmental education is likely to serve multiple goals. In relation to ecotourism, (1) it helps to satisfy the natural curiosity of individuals; (2) Enhances their environmental awareness and (3) may strengthen the pro-conservation values of visitors, thereby increasing the likelihood that they will take positive future action to protect nature.

Both increased environmental knowledge and strengthening of pro-conservation values can be expected to have a dual impact. Visitors are more likely to be careful of nature at the ecotourism site (Orams and Hill, 1998), and in the future are more likely to take tangible action to support nature conservation.

Kimmel, (1999 p. 40) points out that "Ecotourism has the potential to enhance environmental learning" and suggests that, "increased emphasis on environmental learning as a part of ecotourism could help prevent or reduce its negative impacts". There is considerable empirical evidence that increased environmental knowledge is positively associated with more favourable environmental attitudes (Bradley, et al., 1999). While it is quite possible that knowledge changes environmental attitudes it may also be that pro-conservation attitudes encourage individuals to seek and retain greater environmental knowledge and reinforces pre-existing attitudes (c.f. Bogner, 1998). In quantifying the impacts of educational programmes associated with ecotourism it would be useful to have empirical measures of tourists of

(1) the amount of environmental knowledge gained,
(2) the extent to which pro-conservation values have been increased or reinforced; and
(3) the extent to which tourists will alter their actions to support nature conservation in the future.

The latter can include direct personal actions, eg. in the case of marine turtles not disposing of plastics in the sea, or indirect actions, e.g. contributing financially towards programmes for the conservation of turtles or lobbying politicians to take actions to conserve marine turtles more effectively.

A number of these effects were measured on the basis of our survey of ecotourists involved in turtle-watching at Mon Repos. Let us consider the results.

3. Measures of The Impact of Environmental Education Generated by Ecotourism at Mon Repos Turtle Rookery

Of the surveyed respondents, 99% (514) thought that their ecotourism experience at Mon Repos were informative and educational with only five respondents stating that their experience had no educational relevance for them. The percentage of respondents shown in brackets indicated the following to be educational: The visitor centre displays (93%),

amphitheatre (76%), information provided on the current threats (78%), the need to protect sea turtles (82%) and their life cycles (85%) were all considered educational. The interpretative program conducted by the rangers and volunteers also contributed in a major way to the understanding of the egg laying process (87%) and hatchling behaviour (90%) by the visitors. It is interesting to note that many visitors either learnt about the threats to sea turtles and biology of sea turtles for the first time or provided additional information because of the experience at Mon Repos (Table 1).

Table 1 Visitor Awareness of Threats to Sea Turtles and their Biology Following a Visit to Mon Repos

	Number of Respondents	**Percentage**
For the first time	163	31
Additional information	282	54
Knew most of it before	71	14
No response/Not sure	03	01
Total	519	100

The sea turtle viewing program educated and provided more information about threats to sea turtles such as sea turtles being harvested for consumption (56%), collecting of eggs for consumption (52%), threats from prawn trawlers (64%), entanglement in crab pots (55%), boats strikes (60%), fox/wild pig predation (59%), natural predators [e.g. goannas (45%)], natural diseases (37%) and pollution of waterways (53%).

Apart from educating the visitors on the threats facing sea turtles, the experience at Mon Repos influenced respondents to be more careful in disposing of plastics (62%), fishing gear (47%), switching off lights near beaches (68%), refraining from buying/consuming tortoiseshell products, eggs, meat, soups while overseas (73%) and using beaches used by sea turtles for nesting (75%).

Sea turtle viewing also convinced the visitors about the urgency of protecting/taking action to conserve sea turtles in Australia and elsewhere. A large majority of the respondents (87%) were convinced of the need to take action to conserve sea turtles.

Only 5% said they were not convinced about taking action to conserve sea turtles after their experience at Mon Repos. The rest were not sure (5%) or said the question was not applicable (3%).

Both the desire of tourists to conserve sea turtles increased following their visit and it was found that individuals would be more willing to take direct personal actions to protect marine turtles. Data collected from the survey revealed that the majority of respondents (98%) were convinced that more action should be taken to minimize threats to sea turtles. It was revealed that the desire to protect sea turtles increased after visiting Mon Repos. The reasons cited included: sea turtles are unique (90%), because they are ancient (66%), recreational value (32%) and they can generate income (23%). It was also found that after the visitors experience at Mon Repos, they were likely to report the sighting of sick turtles (66%), injured sea turtles (66%), poaching or mistreatment of sea turtles (88%).
In addition, it was found that the ecotourists visit to Mon Repos strengthened their willingness to contribute financially for the conservation of marine turtles. A considerable percentage of responding visitors (40%) said that their visit to Mon Repos will influence them to contribute more money for sea turtle conservation than before. Another 27% said they would contribute the same amount as prior to their visit to Mon Repos, whereas only 1% said they would contribute less. However, 32% did not answer this question.

4. Binomial logit and Tobit Analyses of Impacts of Educational Content of The Mon Repos Ecotourism Experience Values and on Conservation Actions of Tourists

Respondents were asked whether their visit to Mon Repos had increased their desire to protect sea turtles and a number of possible desired characteristics were mentioned. Question 7.2 was designed as follows:

Did your visit increase your desire to protect sea turtles for their:

Uniqueness ☐
Because they are ancient ☐
Recreational value ☐
Can generate income ☐
All of the above ☐
Other (specify) ……

Binomial analysis is used to analyse the results of the survey. As can be seen from Table 2, those visitors to Mon Repos who said that their visit was educational and those who were able to observe sea turtles (adults or hatchlings) were more likely to have increased their desire to protect sea turtles. Statistically these interrelationships are highly significant.

Table 2 Increased Desire to Protect Sea Turtles for their Uniqueness, Because they are Ancient, have Recreational Values and the Potential to Generate Income

	Marginal Effects	**SE**	**T Ratio**
Constant	0.035	0.079	0.451
Mon Repos visit was educational	0.061	0.025	2.357****
Seeing sea turtles/hatchlings	0.086	0.030	2.836****
Age	-0.003	0.011	-0.272
Income	-0.009	0.019	-0.488

The asterisks **** and * indicate 1, 2.5, 5 and 10% level of significance respectively for a one tailed test. Usable observations: 323. The Data Used Have Been Transformed into Square Roots.

Respondents were asked: "From your experience at Mon Repos are you likely to report the sighting of a sick turtle?". Members of the public are urged in Queensland to report such sightings to QPWS. Binomial logit analyses were applied to the following independent variables:

1. Whether or not they saw turtles (adults or hatchlings) at Mon Repos.
2. Whether or not they claim to have obtained additional information about threats/biology of sea turtles
3. The respondent's age
4. The respondent's nationality (whether Australian or not)
5. Level of income of the respondent
6. Whether or not the respondent reported that his/her visit to Mon Repos was educational

Table 3 The Reporting of Sightings of Sick Turtles as a Result of Respondents' Experience

	Marginal Effects	**SE**	**T Ratio**
Constant	-0.099	0.117	-0.841
Seeing sea turtles/hatchlings	0.091	0.051	1.786**
Obtained additional information on threats/biology of sea turtles	0.050	0.031	1.634
Age	0.014	0.018	0.765
Nationality	0.086	0.035	2.413****
Income	-0.024	0.027	-0.884
Mon Repos visit was educational	0.071	0.042	1.678**

The asterisks **** and * indicate 1, 2.5, 5 and 10% level of significance respectively for a one tailed test. Usable observations: 323. The Data Used Have Been Transformed into Square Roots.

As can be seen from Table 3, the most significant variables statistically are whether the respondent is an Australian or not, and whether the visitor reported that Mon Repos was educational. Those who found Mon Repos to be educational were more likely to report sea turtles as were Australians. The latter is probably not surprising since most visitors after the Australians were Europeans or from North America. Overseas visitors may not

like to report to a foreign government body and marine turtles do not nest in most of Europe.

Whether or not marine turtles (adults or hatchlings) were seen at Mon Repos, and whether or not respondents said they attained additional information on threats/biology of sea turtles were statistically of moderate significance and in both cases increased the likelihood of such turtles being reported. Age and income were not significant variables in influencing the intended reporting the sightings of sick sea turtles.

Willingness to pay to support the conservation of sea turtles may also be related to the educational experience of ecotourists visiting Mon Repos. We used Tobit analysis to investigate this possibility. The questions about willingness to pay was prefaced by the following remark:

"Conserving sea turtles costs money. In order to meet the costs of conservation money will have to be raised by the government. These questions are being asked to determine how much individuals are willing to pay for sea turtle conservation and not to raise money for Mon Repos. (Please bear in mind that this is only one of many educational issues which may cost you money and that this may have to come from your/family budget)".

Contingent valuation questions were used to elicit willingness to pay bids. Except for one question, the rest were based on the dichotomous choice model. That is, Yes/No responses were elicited from several questions in relation to their willingness to pay to protect sea turtles that come to nest in Australia as indicated above. The final contingent valuation question was an open ended one where the respondents were asked the maximum amount per week they were willing to pay to protect sea turtles that come to nest in Australia for the next ten years. The contingent valuation questions were made optional for overseas visitors. Prior to the contingent valuation questions, respondents were given a brief introduction about the costs involved with the conservation of sea turtles. The respondents were also reminded that paying for sea turtle conservation is one

of many environmental issues which may cost money to the respondent and that this may have to come from the family budget.

Willingness to pay to conserve sea turtles in dollars per week is taken as the dependent variable in this Tobit regression analysis. As indicated in Table 4, the independent variables considered are, (1) The highest level of the respondent's educational qualifications; (2) The respondent's level of income; (3) Whether or not the respondent saw marine turtles (adults or hatchlings); (4) Whether or not a respondent made a donation at Mon Repos; (5) Whether or not the visitor's Mon Repos visit was said to be educational, and (6) Whether or not the respondent obtained additional information on threats to/biology of sea turtles.

Table 4 Regression Results of the Contingent Valuation Willingness to Pay Bids to Protect Sea Turtles that Come to Nest in Australia

Independent Variable	**Coefficient**	**Standard Error**	**T Ratio**
Constant	-0.821	0.425	-1.930**
Respondents' educational qualifications	0.332	0.135	2.445****
Respondents' income	0.192	0.096	2.007***
Seeing sea turtles/hatchlings	0.321	0.225	1.424*
Made donations at Mon Repos for sea turtle conservation	0.251	0.111	2.251****
Mon Repos visit was educational	0.398	0.166	2.396****
Obtained additional information on threats/biology of sea turtles	0.143	0.105	1.358*

The asterisks **** and * indicate 1, 2.5, 5 and 10% level of significance respectively for a one tailed test. Usable observations: 323. The Data Used Have Been Transformed into Square Roots.

As can be seen from Table 4, both whether or not the Mon Repos visit was reported to be educational and the Mon Repos visit was reported to be educational and the highest level of the respondent's educational qualifications were statistically significant as influences on the willingness to pay for the conservation of sea turtles. They influenced it positively. Whether or not a donation was made at Mon Repos conservation park was of similar importance. The positive relationship and extremely high degree of statistical significance of this variable tends to support the veracity of the willingness to pay (WTP) answers in the sample. Income was also of a high degree of statistical significance and

WTP increased with income but not as strongly as with higher educational qualifications or according to whether Mon Repos was rated as being educational.
Whether or not marine turtles were seen by a visitor had a relatively high positive marginal impact on WTP, but the statistical significance of this was relatively low. Whether or not respondents said they obtained additional information on threats/biology of sea turtles had a small positive impact on WTP, but once again the statistical significance of the relationship was relatively low.

5. Discussion of the Results and the Conclusions

It is clear that environmental education is a major component of the experience of tourists at Mon Repos Turtle Rookery. In the majority of cases this educational experience reinforces conservation values and pro-conservation action of visitors. Whether or not respondents indicated that their Mon Repos visit was educational is highly significant in this regard. These results thus are in accordance with the findings of Bradley et al., (1999) in a different context. Furthermore, in this case ecotourism has been shown to be highly educational and it realizes the potential suggested by Kimmel 1999.

It should also be noted that the influence of the variable whether or not marine turtles (adults or hatchlings) were seen was significant. Such sightings were found to be moderately significant statistical influences on the likelihood of reporting sick turtles and has the highest marginal effect of the variables considered in Table 3. This suggests that sightings may promote empathy for these creatures (see Table 4). Similarly in relation to WTP, sightings have a high marginal effect but the statistical significance of this positive relationship is low.

The relevant literature suggests that "natural" contact with nature may reinforce environmental education and increase empathy for the conservation of species in the wild. Miles (1986/87), extolled wilderness as a learning place and Bogner (1998), reviews briefly relevant literature in this regard. In the case of marine turtles at Mon Repos, ecotourists who saw these animals do interact with them to a considerable extent

in their natural settings. For instance, at the appropriate time visitors may touch the caripace of a nesting turtle when given permission by the guides to do so. In relation to the study of the elephant exhibit at Atlanta zoo Swanagen (2000) found that active experiences with the passive experience of watching elephants and reading accompanying graphics seem to be more powerful in building pro-conservation attitudes. The results from the present study provide at least further weak support for this view. Those who saw marine turtles and therefore interacted with them in their natural settings were more likely to report sick turtles and were willing on the whole to pay more to support the conservation of sea turtles.

Overall it seems that the ecotourism experiences at Mon Repos relying on the natural marine turtle rookery are highly effective in their environmental educational content and in building support for the conservation of turtles. However, this survey was undertaken immediately following the visitors' experience. To what extent these influences will be maintained in the long-term is unknown.

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