

# **ECONOMICS, ECOLOGY AND THE ENVIRONMENT**

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**Conservation and Economic Benefits of  
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**by**

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## **CONSERVATION AND ECONOMIC BENEFITS OF WILDLIFE-BASED MARINE TOURISM: SEA TURTLES AND WHALES AS CASE STUDIES**

### **Abstract**

Tourism development can have positive and/or negative impacts on wildlife. However, if tourism is developed in accordance with the basic tenets of wildlife tourism such an activity can be sustainable and can aid the conservation of species. Based on two case studies in Queensland, Australia, this article outlines the various economic and conservation benefits arising from wildlife-based tourism. Some of the benefits are direct, such as tangible economic benefits, others are less tangible, such as increased visitors' willingness to pay in principle for the conservation of species. Wildlife-based tourism is shown to foster political support for the conservation of species utilized for such tourism by various mechanisms. Non-consumptive uses of wildlife are not only sustainable, but may provide a viable alternative to consumptive uses.

**Keywords:** ecotourism, sea turtles, whales, economic and conservation benefits

# **CONSERVATION AND ECONOMIC BENEFITS OF WILDLIFE-BASED MARINE TOURISM: SEA TURTLES AND WHALES AS CASE STUDIES**

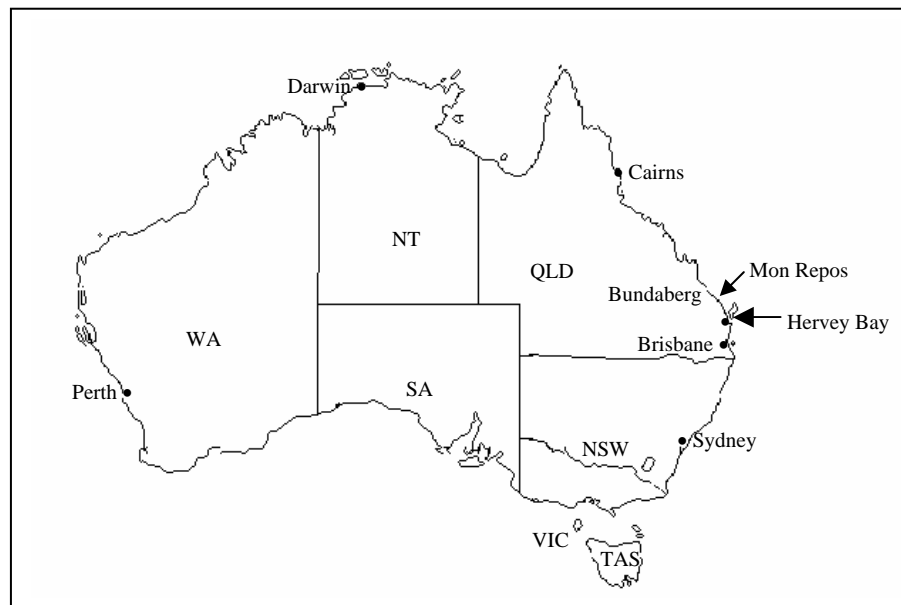
## **Introduction**

A common theme in most definitions of ecotourism is that ecotourism is responsible tourism in natural areas which could facilitate conservation objectives (Maharana et al. 2000). In this article, we demonstrate that nature-based tourism, such as sea turtle and whale watching, can have positive impacts on wildlife, if such tourism accords with the basic tenets of ecotourism. We show that such tourism is not only sustainable, but can aid in the conservation of species. Empirical results are based on two surveys of tourists visiting Mon Repos and Hervey Bay in south-eastern Queensland in order to watch sea turtles and whales respectively. The results demonstrate that there are considerable direct and indirect economic and conservation benefits arising from the above mentioned nature-based tourism activities. These benefits are all the more significant when highly migratory marine species are transboundary open access resources and are increasingly threatened. Such tourism, could complement and strengthen the use of economic instruments to conserve these species. Sea turtle and whale watching-based tourism highlight the opportunity costs of consumptive uses and incidental destruction of wildlife. These benefits also provide strong arguments for inter-governmental efforts to reduce the harvesting of these species and justify the establishment of marine parks and legal sanctions.

## **Background to Sea Turtle and Whale-Based Tourism**

There are interesting similarities and differences between sea turtle and whale watching-based tourism activities. In the last few decades, these two resources have been used for non-consumptive purposes, marking a significant shift away from consumptive uses. Many countries, which hitherto used these resources for consumption, are now turning to non-consumptive uses in the form of nature-based tourism. For example, in the case of whales, both developed and developing countries are currently promoting whale

watching-based tourism (Hoyt 2001). Sea turtle viewing is also encouraged in countries such as Australia, South Africa, USA, and Israel. Even developing countries have realized the potential for non-consumptive purposes. For example, Costa Rica, Sri Lanka, Indonesia and Malaysia encourage some form of sea turtle-based tourism which includes sea turtle hatcheries. Although many countries now engage in ecotourism based on these two resources, Australia has not only taken a leading role, but is also one of the countries that is best known for promoting them as tourism resources. Since whale watching began at Hervey Bay in 1987, it has increased rapidly during the last one and a half decades. Similarly, sea turtle viewing has been in existence at Mon Repos since the 1960s, with commercial viewing being introduced in 1994. Although whale and sea turtle watching are practiced in other parts of Australia, Hervey Bay for whales and Mon Repos for sea turtles are the most popular. These two sites as shown in Figure 1 are located in south-east Queensland, approximately 150 km apart.



**Figure 1: Map of Australia Showing General Location of Mon Repos and Hervey Bay**

These two activities contrast in the nature of viewing. While sea turtle viewing is land based, whale watching mostly involves watching whales at sea. Sea turtle viewing is a night time activity while whale watching is a day time activity. The season for sea turtle

viewing for Mon Repos is from late November to March, while for whales it is from late June to October. Both these activities are associated with the breeding of the species. Whale watching is based on the annual migration of the Humpback whale from the cold waters of Antarctica to the warm waters of north Queensland for mating and calving. On the other hand, sea turtle viewing is when female sea turtles come ashore to lay their eggs and when hatchlings emerge from their nests.

While whale watching operators are private based [but regulated by the Queensland National Parks and Wildlife Service (QNPWS)], sea turtle viewing is wholly a QNPWS based activity. Although for whale watching there are restrictions imposed in the form of distance vessels should maintain from a whale/pod, there are no restrictions placed on the number of visitors who could watch whales. On the other hand, apart from the restrictions imposed on visitors during viewing sea turtles, restrictions are also imposed on the number of visitors permitted to view a single sea turtle at a given time. This number is limited to 70 individuals. Whale watching at Hervey Bay is a large-scale activity. Sightings during the season are almost guaranteed with an encounter ratio of 0.74 for 2000<sup>1</sup> (QNPWS 2001). As shown in Table 1, Humpback whale numbers are recovering from the world-wide ban in commercial whaling that continued to decimate the stocks until the 1960s. On the other hand, sea turtle-based tourism is a much smaller activity involving approximately 190 female sea turtles on average for the last four seasons (Table 1).

**Table 1: Nesting Sea Turtles at Mon Repos and Humpback Whales at Hervey Bay for Four Seasons**

Season	Sea Turtles				Humpback Whales	
	Loggerhead	Green	Flatback	Total	Season	Pods
1996/7	198	2	4	204	1997	4,862
1997/8	119	1	8	128	1998	6,347
1998/9	262	2	7	269	1999	5,611
1999/2000	152	3	4	159	2000	5,037

Source: Queensland Parks and Wildlife Service, 2000 and 2001 (unpublished data).

<sup>1</sup> The encounter ratio for 1998 & 1999 was 0.84 (QNPWS 2001).

Due to the low numbers of sea turtles involved, there is no guarantee that sea turtles will be encountered. Although sea turtles have been listed as being endangered by CITES and protected by individual countries, illegal consumption of turtle meat and eggs is widespread in almost all developing countries where this resource is available. Apart from this, the threats to sea turtles appear to be much larger than to whales. Therefore, while whales are showing an increase, sea turtles are recording a decrease. There are many consequences resulting from this. If sea turtle numbers continue to decline, then present nature-based tourism would not be sustainable as shown in Tisdell and Wilson (forthcoming). However, at present, both these nature-based tourism activities are not only popular, but also provide economic and conservation benefits for the protection of sea turtles and whales.

### **The Survey Methodology**

In order to measure the benefits of these two forms of tourism, two studies were conducted during 1999 and 2000 in Mon Repos and Hervey Bay respectively. Two detailed questionnaires were developed to gather the necessary information and questions involved in both surveys were in many respects similar, relating to economic, conservation and educational aspects. Both surveys obtained information on the visitors' current visit to watch these two species and socio-economic data.

Random sampling techniques were used to obtain the data. The sea turtle survey was conducted from December 1999 to the end of March 2000 by volunteers and rangers of QNPWS attached to Mon Repos and the whale study was conducted from July 2000 to October 2000. Approximately, 15 questionnaires a day were randomly distributed to visitors at the entrance and/or while awaiting their turn to watch sea turtles and while returning after watching whales on the vessels. For the Mon Repos survey 1,200 questionnaires were distributed by the rangers and/or volunteers and 1,550 were distributed by the vessel operators for the whale watching survey. The response rates were 43% and 45% for sea turtles and whales respectively. These response rates are not unusual for a study of this nature. Prior to the two surveys, pilot studies were conducted.



This enabled us to re-focus some of the questions and remove questions that proved difficult to administer. The surveys revealed that there were visitors from 23 countries, although the majority, as expected were from Australia. The number of visitors from Europe and America was significant at both sites. There were a few visitors from South Africa and Israel and the number of visitors from Asia was negligible.

### **Economic Benefits Resulting from Sea Turtle and Whale Watching-Based Tourism**

Sea turtles and whale watching-based tourism, although seasonal in nature, make a significant contribution to the local economy of the region(s). The surveys estimated the economic impact of visitor spending to the region(s) and whether or not visitors would have visited the Bundaberg and Hervey Bay regions if not for the presence of sea turtles and whales respectively. Interestingly, 40% of respondents said that they would not have visited Bundaberg if not for the presence of sea turtles. Similarly, 42% said they would not have visited if whale watching did not exist in Hervey Bay. The proportion of tourists who would not have visited Bundaberg and Hervey Bay if not for the presence of sea turtles and whales is shown in Table 2.

**Table 2: Surveyed Visitors to Mon Repos and Hervey Bay who Came to the Bundaberg and Hervey Bay due to the Presence of Sea Turtles and Whales**

Category	Number of Respondents		Percentage	
	Sea Turtles	Whales	Sea Turtles	Whales
Number of respondents whose visit did not depend on the presence of sea turtles & whales in the Bundaberg and & Hervey Bay region(s)	280	380	54	54
Number of respondents whose visit depended on the presence of sea turtles & whales in the Bundaberg & Hervey Bay region(s)	208	296	40	42
Locals	25	26	05	04
No Response	06	-	01	-
Total	519	702	100	100

Furthermore, of the surveyed visitors to Mon Repos, 19% of those who said that they would have come to Mon Repos even in the absence of sea turtles said that they would have reduced their stay within a 60 km radius of Bundaberg if there had been no sea turtles in the area. The number of reduced days in the Bundaberg area was 1.34 days on

average for this group. Of those visitors who said they would have visited Hervey Bay even if whales did not occur in the bay, 22% said that they would have reduced their stay if whales did not occur at Hervey Bay. The number of reduced days was 1.58 days per average person.

Given the large numbers of visitors coming to watch sea turtles and whales, the economic benefits are significant. During the 1999/2000 sea turtles season, 23,500 visitors came to Mon Repos. The number of visitors to Hervey Bay to watch whales was 62,670<sup>2</sup> in 2000. In order to determine the economic benefits to the region from these two species, a question was devised in each of the questionnaires aimed at estimating the expenditures of sea turtle and whale watchers in the Bundaberg and Hervey Bay areas respectively within a 60 km radius. Table 3 shows the average daily expenditures of surveyed visitors.

**Table 3: Average Daily Expenditures of Surveyed Sea Turtle and Whale Watchers**

<b>Region(s)</b>	<b>Aus \$</b>
Bundaberg	24.88
Mon Repos	10.57
Bundaberg and Mon Repos	35.45
Hervey Bay	125.97

Note: The expenditures incurred by sea turtle viewers in Bundaberg and Mon Repos were estimated separately. This was because visitors incur expenditures (e.g. entrance fees and purchasing souvenirs) inside the Mon Repos Conservation park as well. The expenditure at Hervey Bay is higher because the whale watching fee on average is Aus \$70 per adult.

As shown, the average expenditure per respondent on accommodation, food, travel, souvenirs purchased, recreational activities in the region (Bundaberg and Mon Repos) within a 60 km radius was Aus \$35.45. Assuming that this is the average expenditure of the 23,500 sea turtle viewers, the total direct expenditure in the region from sea turtle viewing is approximately Aus \$833,075. Since the average number of days spent by these visitors is 3.21 days, the amount of expenditure in the region for the sea turtle season was approximately Aus \$2.68 million for the 1999/2000 season. If only the expenditures at Bundaberg is taken into account, the total tourist expenditure in the region associated

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<sup>2</sup> The number of whale watching visitors to Hervey Bay in 1998 and 1999 was 82,511 and 77,859 respectively (QNPWS 2001).

with those who watched sea turtles at Mon Repos is about Aus \$1.9 million. In the case of whales, assuming that the average expenditure of 62,670 whale watchers in the Hervey Bay region for 2000 was Aus \$125.97, then the total direct expenditure is approximately Aus \$7,894,539. Since the average number of days spent by whale watchers is 3.76 days, the expenditure in the region during the season is approximately Aus \$30 million. These estimates, if anything, are on the conservative side. With the multiplier effects, the benefits to the region(s) are even larger. The importance of sea turtle and whale watching is even greater to the region(s) considering the fact that a large number of visitors would not have come or reduced the number of days spent in the region(s) if these two species did not occur. The loss of income to the regions in such an event is large. Therefore, considering the short seasons and the scarcity of the wildlife that is being viewed, the income generated from these wildlife-based tourism activities is significant. In fact these activities (excluding other tourism activities), are among the most important in the region(s), especially Bundaberg, apart from other activities such as sugarcane farming, beef production and dairy farming.

### **Conservation Values**

Wildlife-based tourism activities also promote conservation values. First hand encounters with sea turtle adults and hatchlings and whales seem to create human empathy for them and make individuals more willing to support their protection. Both surveys provide evidence to this effect. Data collected from the sea turtle survey revealed that the majority of respondents (98%) were convinced that more action should be taken to minimize threats. It was revealed that the desire to protect sea turtles increased after visiting Mon Repos. 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%). Similarly in the whale-watching study, 78% of the respondents were of the view that the whale-watching experience at Hervey Bay convinced them that there should be a complete worldwide ban on whaling. Only 1% said that the whale watching experience did not convince them that there should be a worldwide ban. Furthermore, 80% said that after their whale watching experience, they

were convinced that more action should be taken to protect whales in Australia. In addition, 73% said that their whale watching experience made them more likely to report the stranding of whales, injured whales and mistreatment of whales. Only 3% said that the experience did not convince them. Furthermore, another major conservation benefit from these two ecotourism activities is that a considerable number of visitors were willing to pay for sea turtle conservation in Australia. In order to determine the visitors' willingness to pay for sea turtle and whale conservation in Australia, we employed the widely used contingent valuation method. These questions were made optional for foreign visitors.

For the sea turtle study, of the 519 usable forms utilized in the analysis, 374 respondents answered this question, of whom 285 were Australians and 89 were foreigners. Of the 702 respondents interviewed for the whale study, 451 Australians and 81 foreigners answered this question. Of the respondents who answered the valuation question, there were zero bids and protest bids. As suggested by Hanley and Spash (1993), protest bids were not included in the analysis. The WTP bids for the two studies are shown in Table 4.

**Table 4: Average Weekly Willingness to Pay to Protect Sea Turtles and Whales in Australia**

<b>WTP Bids Category</b>	<b>Sea Turtles</b>	<b>Whales</b>
	Aus \$	Aus \$
Australians and Foreigners Combined (with Zeros)	1.97	2.58
Australians and Foreigners Combined (without Zeros)	2.49	3.22
Australians (with Zeros)	2.15	2.41
Australians (without Zeros)	2.43	3.06
Foreigners (with Zeros)	2.53	3.41
Foreigners (without Zeros)	2.67	4.09

As can be seen, foreigners were willing to pay higher amounts for sea turtle and whale conservation in Australia. This may be due to the favourable exchange rate enjoyed by many foreign visitors to Australia, especially those from the U.K and North America. For example, in the case of whales, Australians (when zero bids were included) were willing to pay Aus \$2.41 a week, while foreigners (when zero bids were included) were willing to pay Aus \$3.41. It can be inferred from Table 4 that the visitors to Mon Repos

for the 1999/2000 season would be prepared to pay at least Aus \$250,000 per year to protect sea turtles in Australia. In the case of whales, the amount visitors to Hervey Bay were willing to pay was higher. When these figures are combined with the willingness to pay by turtle and whale watchers from previous years, plus the willingness of some non-visitors to pay, considerable collective economic value is placed on the conservation of these two species in Australia. This can also be expected to translate into political support for state programs for the conservation of these two species.

There are other potential benefits as well. Revenue generated from sea turtle viewing is indirectly invested in research at Mon Repos, patrolling nesting beaches (e.g. to prevent poaching, incidental destruction of eggs by beach users) and conducting programs for the eradication of predators such as foxes. Furthermore, sea turtle viewing activities at Mon Repos was successful in forestalling a proposed real estate development which would have had disastrous environmental consequences for the rookery. Furthermore, marine reserve parks have also been established to protect these species at Mon Repos and Hervey Bay. There is little doubt that the importance of ecotourism activities from these two species exerted pressure on the creation of these two marine parks. Much research is being conducted in these marine parks (and outside) on these two species, both by QNPWS and research scientists. Part of the research is being funded by money generated from whale watching ticket fees. An example is that of *The Oceania Project* whose research on whales and dolphins is partially supported by revenue generated from whale watching activities. Mon Repos also serves as an important center for training researchers, both in Australia and abroad, especially those from the Indo-Pacific area. Apart from the above mentioned benefits which are useful to create political support, the education imparted from these two activities could also aid in conservation. In the sea turtle and whale watching studies, 99% and 86% of the respective respondents said that the experiences were educational and informative. The survey also revealed that there are other potential benefits to be derived from these activities. For example, in the case of sea turtles, visitors indicated their willingness to subscribe to a newsletter with updates on the conservation work. Ecotourism of this nature also raises the possibility of introducing

a scheme whereby sea turtles and/or whales could be adopted by the public in return for a donation.

## **Conclusions**

The study showed that ecotourism of this nature provides economic benefits to the region(s) where such tourism takes place. As demonstrated, the income generated is significant. The economic benefits are not only useful for the further development of such nature-based activities but can develop political support for conservation. Such non-consumptive activities provide a viable alternative to consumptive uses and could strengthen economic instruments in conserving these migratory common-access species. However, it must be noted that the sustainability of such ecotourism depends on the extent to which these species' populations are maintained. If the populations decrease, then visitor numbers would also decline. These two studies demonstrate that ecotourism can provide effective educational and experiential outcomes thereby securing vital support for the conservation of wildlife.

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