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The value of conserving whales: the impacts of cetacean-related tourism on the economy of rural West Scotland

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ABSTRACT

1. During the tourist season of 2000, interview surveys were conducted with those involved in whale-watching in West Scotland. The groups included in the study were boat operators (32), visitor-centre managers (8), tourists on whale-watching trips (324), general tourists to West Scotland (673) and local residents (189). The latter two groups were interviewed for comparison of responses of those engaged in whale-watching against the views of the local community and tourists in general. From the data provided by these interviews, estimates for the economic value of this specialist sector of the Scottish tourism industry were calculated.

2. Extrapolating from the surveys, in the year 2000, an estimated total of approximately 242 000 tourists were involved in cetacean-related tourism activities in West Scotland.

3. In 2000, 59 full-time and one part-time jobs were estimated to be created as the direct result of cetacean-related tourism, with 38% of these positions being seasonal.

4. Cetacean-related tourism was estimated to account for 2.5% of the total income from tourism in the region. In remote coastal areas, cetacean-related tourism may account for as much as 12% of the area's total tourism income.

5. The direct economic income (i.e. expenditure on excursion tickets) from cetacean tourism activities was estimated to be £1.77 million per annum.

6. A 23% of surveyed whale watchers visited West Scotland specifically to go on whale-watching trips. The associated expenditure (accommodation, travel, food, etc.) from tourists being brought to rural West Scotland solely due to the presence of whales represented £5.1 million in additional tourism income for the region.

7. In addition to the above tourists, 16% of surveyed whale watchers stayed in West Scotland an extra night as a result of going on a whale-watching trip; thus generating a further £0.9 million of additional associated expenditure (extra accommodation, food, etc.).

8. The total gross income generated (directly and indirectly) by cetacean-related tourism in rural West Scotland was estimated at £7.8 million.

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9. In comparison with established whale-watching industries (in countries such as the USA, Canada and New Zealand) the total expenditure by tourists on whale watching in West Scotland is low. However, cetacean tourism in West Scotland is still a relatively young industry and still developing.

10. The value of the non-consumptive utilization of cetaceans (i.e. whale-watching) to rural, coastal communities in West Scotland was three times greater than the value of the consumptive utilization of cetaceans (i.e. commercial whaling) for rural, coastal communities in Norway.

11. This study demonstrates that live cetaceans in Scotland can provide notable financial benefits and, therefore, their conservation has an economic value.

KEY WORDS: whale-watching; cetaceans; tourism; coastal communities; economics; conservation value; Scotland

INTRODUCTION

The waters around West Scotland have the greatest abundance and diversity of cetaceans in the UK: to date, 24 species of cetacean have been reported in this region, with the most commonly sighted species being harbour porpoises, minke and killer whales and bottlenose, common, white-beaked and Risso's dolphins (Evans *et al*., 1993; Boran *et al*., 2000; Shrimpton and Parsons, 2000).

Cetaceans have traditionally been part of Scottish marine heritage and utilised economically: at one stage there were five commercial whaling stations operating in Scotland, four in Shetland and one on Harris (in the Outer Hebrides). The Harris station was the last whaling station in Scotland and only ceased operating in 1952 (McCarthy, 1998). However, all cetaceans are now protected in UK waters from capture, killing, injury and deliberate harassment or degradation of their habitats under the European Habitats Directive and the UK Wildlife and Countryside Act (Shrimpton and Parsons, 2000). Now, instead of consumptive uses of cetaceans in Scotland, they are increasingly becoming a tourist attraction and there is a growing number of commercial tourism enterprises that draw on this element of the country's marine resources (Thompson, 1994).

Whale-watching can be defined as 'any commercial enterprise which provides for the public to see cetaceans in their natural habitat' (International Whaling Commission, 1994). It is important to note that although the generic term 'whale-watching' is used, the term also encompasses the watching of other cetacean species such as dolphins and porpoises.

The first British commercial whale-watching operation began in Scotland in 1989 on the island of Mull. By 1994, there were seven full-time whale- and dolphin-watching operators established in the UK with an additional 14 companies engaged in whale-watching on a part-time basis (Hoyt, 1994). By 1998, this had risen to an estimated 40–44 operators in the UK (Hoyt, 2001).

In 1991, only 400 tourists were involved in whale-watching in the UK, with a total expenditure of £192 000 (a figure which includes expenditure by the tourists on food and accommodation); this figure rose to 15 000 people generating an expenditure of £6.5 million in 1994, of which £850 000 was direct expenditure on whale-watching fares alone (Hoyt, 1995; Arnold, 1997). By 1998, an estimated 121 125 people went whale-watching in the UK, generating £1 142 000 through direct expenditure, with an estimated total expenditure of £5 million (Hoyt, 2001). This latter increase was mainly due to a substantial number of new lower-cost trips concentrating on small cetacean-watching in more easily accessible areas such as the Moray Firth.[1]

One of the most studied areas with regards to whale-watching in Scotland is the above-mentioned Moray Firth on the east coast of Scotland, where whale-watching operations are based upon sightings of a resident

[1] It should be noted that, although numbers of tourists increased substantially, the associated costs (travel & accommodation) accrued per visitor was on average lower, due to easier access and cheaper tour costs.

bottlenose dolphin population. Tourism research in the Moray Firth revealed that 28% of visitors stated that the presence of dolphins had been the sole reason for their visit to the region; 14% said that the dolphins had been a factor when choosing the area as a holiday destination and, perhaps more significantly, 16% of those visiting the area said that the presence of the dolphins had resulted in them staying an extra night (Arnold, 1997). This equated to an additional £720 000 being input into the local economy (Arnold, 1997). Hoyt (2001) estimated that, in total, land and boat-based whale and dolphin-watching in the Moray Firth attracted 73 000 tourists and generated £477 000 as direct expenditure and £2.34 million in total expenditure in 1998.

In contrast, this study seeks to determine the importance of whale- and dolphin-related tourism on the west coast of Scotland, in particular its economic impact on rural coastal areas. The study concentrates on the financial benefits that live cetaceans can bring to an area. This value will be subsequently compared to the financial impact of the consumptive utilization of these animals (i.e. commercial whaling) in geographically similar, rural coastal areas of Norway.

Although whale-watching in Western Scotland is a relatively small part of the tourism industry in Scotland as a whole, boat trips to see coastal scenery and marine wildlife are often an integral part of a visit to the Scottish coast. There are, at present, over 60 tour boats operating from the West Coast of Scotland (both from the mainland and the islands). The trips offered by these operators vary enormously in the size of their operation, the type and length of trip offered. Trips range from 2 h excursions to see seal colonies or to cross a loch mouth, to 10 day cruises to St Kilda and around the Hebridean Islands. These boat trips tend to be concentrated in key areas, notably northern Argyll, the Small Isles and the western Highlands. Of the 60 boat operators working on the West Coast (Masters *et al.*, 1998), 35 are in Argyll, with 18 of these operators based on Mull or the nearby mainland.

Defining whale-watching in Scotland

Although any sighting of cetaceans constitutes whale-watching by the definition above (International Whaling Commission, 1994), it was important to distinguish between the different levels at which this activity occurred. The variety of boat trips available to tourists on the West Coast of Scotland range from excursions where cetaceans are the major, or sole, purpose of the trip, to excursions where sightings of cetaceans occurred, but these sightings were additional or peripheral to the main purpose of the trip. Under the definition of whale-watching provided by the International Whaling Commission (1994) all of these types of excursions could be defined as whale-watching operations. However, when cetacean sightings were a peripheral or lesser component of a particular boat trip one can only attribute a small proportion of the tourists' actual expenditure on the boat trip to opportunities for observing cetaceans. Therefore, for the purpose of this project, the definition of whale-watching needed to be refined.

The study was primarily concerned with the economic value of whale-watching so only those marine tour operators who advertized the opportunity of sighting cetaceans were included in the sample. These operators were using cetaceans to gain a potential marketing and commercial advantage and, as a result, income. It was assumed that other trips did not attract 'whale-watchers' *per se* and, therefore, could not claim to be gaining a direct commercial benefit from cetaceans in the area. Cetacean sightings on such excursion boats were incidental to the trip rather than the purpose of it.

Marine wildlife tours that could be termed 'whale-watching' according to the above-mentioned International Whaling Commission (1994) definition were divided into four categories, according to how important cetaceans were as a marketing tool to attract tourists onto the tours. These categories are defined in Table 1. The locations of the tour operators that qualify for one of these categories are shown in Figure 1.

In addition to whale-watching tour operators, there are several visitor centres on the west coast of Scotland that feature cetaceans to varying degrees. These operations do not fit into the definition of

Table 1. Categories and definitions of whale-watching operations

Category	Definition
1	Marine wildlife tour operator who advertises 'whale-watching' trips (either day trips, charters or cruises). 100% of the operator's income is attributable to using whales and dolphins as a draw for tourists.
2a	Marine wildlife tour operator who draws substantially on cetaceans as a primary species in their marketing but does not specifically mention 'whale-watching'. For example, an operator who states that cetaceans are regularly seen, who uses a cetacean logo or has prominent photographs of cetaceans in their marketing materials. Two-thirds of the operator's income is attributable to using whales and dolphins and a draw for tourists.
2b	Marine wildlife tour operator who draws on cetaceans for marketing purposes to a lesser extent, for example, mentioning that cetaceans are occasionally sighted. One-third of the operator's income is attributable to whales and dolphins.
3	Marine wildlife tour operators who make a brief passing reference to cetaceans in their marketing materials. For example, a statement such as 'on our return journey we may be lucky enough to see a porpoise'. A 10% of the operator's income is attributable to whales and dolphins.

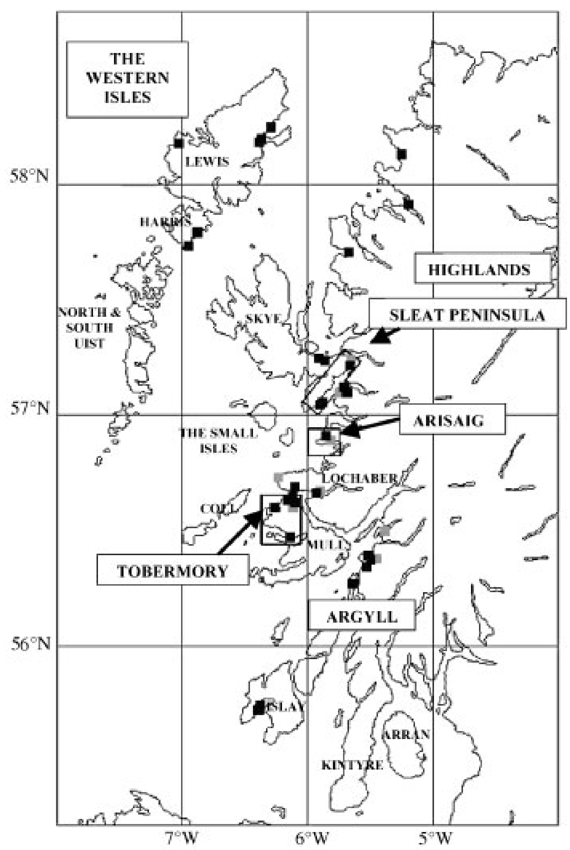

Figure 1. The distribution of whale-watching operators (black) and visitor centres featuring cetaceans (grey) on the West Coast of Scotland. The outline boxes show the locations of the three survey sites.

whale-watching as given above as they do not provide for the opportunity for 'the public to see cetaceans in their natural habitat' (International Whaling Commission, 1994). However, these commercial tourism operations do use cetaceans as a means to attract visitors and, therefore, derive a financial benefit from whales and dolphins inhabiting west Scottish waters. Like marine wildlife tour operators in West Scotland, visitor centres in the region also vary in the role cetaceans play in attracting visitors, from cetaceans being the main theme of the centre, to being one aspect of display materials. Categories and definitions for these visitor centres are summarized in Table 2, and the locations of visitor centres fitting these criteria are displayed in Figure 1. Although this current study primarily focuses on whale-watching operations, these visitor centres are included in the final estimations of the economic value of cetacean-related tourism to the rural communities of West Scotland.

MATERIALS AND METHODS

The study area

The area covered by this study includes the West Coast mainland of Scotland from the Kintyre Peninsula (Argyll) in the south to Cape Wrath (Highlands) in the north and also the offshore islands of the Inner Hebrides (Mull, Coll, Tiree, Islay, Jura, the Small Isles and Skye) and the Western Isles (Lewis, Harris, Benbecula, North/South Uist and Barra, (Figure 1).

Within this area, three regions were identified for detailed case studies: the Sleat Peninsula (Isle of Skye), Arisaig (Lochaber) and Tobermory (Isle of Mull). These locations were identified according to the following criteria:

(i) locales that were traditionally dependent on primary industries, such as fishing and agriculture;
(ii) rural coastal communities; and
(iii) bases for marine wildlife tour operators who operate whale-watching excursions.

Table 2. Categories and definitions of visitor centres featuring cetaceans

Category	Definition
1	A visitor centre that has cetaceans as its primary theme, with virtually all its display space dedicated to cetaceans. If the visitor centre has a shop, the majority of the merchandise sold in this shop has a cetacean theme. A 100% of the centre's income is attributable to using whales and dolphins as a draw for tourists.
2a	A visitor centre that has the marine environment/natural history as its primary theme, with a significant proportion of its display space, entailing several exhibits, devoted to cetaceans. Cetaceans are given a prominent position in the centre's marketing materials and if the visitor centre has a shop, a sizeable proportion (50–75%) of the merchandise sold has a cetacean theme. Approximately two-thirds of the centre's total income can be attributable to using whales and dolphins as a draw for tourists.
2b	A visitor centre which may have a small display area or one exhibit dedicated to cetaceans. Cetaceans may be mentioned in marketing materials as a passing comment. If the visitor centre has a shop, some of the merchandise sold (20–40%) has a cetacean theme. Approximately one-third of the centre's total income can be attributable to using whales and dolphins as a draw for tourists.
3	A visitor centre which may mention cetaceans in a display about the marine environment/natural history. Marketing materials do not contain references to cetaceans. However, the centre has a shop which includes some cetacean related merchandise (10–20% of total merchandise). Only 10%, or less, of the centre's total income can be attributable to whales and dolphins.

The Sleat Peninsula (Isle of Skye)

The Isle of Skye receives 427 686 visitors a year who provide an estimated expenditure of £65.7 million during their stays (Woods-Ballard, 2000). Eighty-three per cent of these tourists stay at least one night. There are two main points of access to the island — the Skye road bridge from the Kyle of Lochalsh to Kyleakin, and the vehicular ferry from Mallaig (mainland) to Armadale.

On Skye and the mainland region of Lochalsh, there are over 15 boat operators, offering wildlife watching and/or scenic trips. Tours range from 1-h trips to see seal colonies to 10-day trips around the islands. These boat trips depart from a number of harbours on the island and in Lochalsh, but predominantly on the more populated, eastern side of Skye. Two survey locations were used on Skye: the two access points to the island, the coastal villages of Kyleakin and Armadale.

Two boat operators run trips from Kyleakin (one of which was eligible for inclusion in this report). Whales and dolphins are rarely seen in the area, although harbour porpoise sightings are quite frequent. The main tourist attraction in the village is the recently opened Bright Water Visitor Centre and the associated Eilean Ban Visitor Centre. These centres focus on the life and times of the naturalist Gavin Maxwell, the otters he wrote about and the marine environment in general. A further two boat operators run trips from Armadale pier, one of which contributed to the current study as a whale-watching operator.

Arisaig (Lochaber)

Lochaber is a large and diverse area covering over 2000 mile^2, and includes Ben Nevis (the UK's highest mountain) and the Ardnamurchan Peninsula (an isolated part of Britain which includes the most westerly point on the British mainland). The population density of the region is a mere 4.4 persons mile^{-2} (the second lowest in the UK). The region receives over half a million visitors each year, the majority of whom pass through the main town, Fort William (Hughes, 2000).

Arisaig is a small village with a population of only 353 (Hughes, 2000), lying between the towns of Fort William and Mallaig. Of those community members who are of working age, 8.1% are unemployed — this unemployment rate is approximately twice the Lochaber average for the year 2000 (Hughes, 2000).

In July 1999 the 'Land, Sea and Islands Centre' was opened in Arisaig. This visitor centre features several exhibits on the marine environment and information about cetaceans. There is one boat operator offering commercial trips to the Small Isles (Rum, Eigg and Muck) and is one of the main attractions for visitors to the area. The boat offers flexible tickets for passengers wanting to spend more time on the islands and also serves as a local ferry service for residents of the Small Isles.

Although the service does not specifically offer whale-watching trips, during the summer months cetaceans are seen almost on a daily basis, and the schedules are flexible to allow passengers to see the cetaceans as and when they are sighted. Cetaceans are also used substantially in the company's marketing and publicity materials, with several displays and photographs of cetaceans in the ticket office. This venture was considered to be a category 2a whale-watching operation.

The Isle of Mull (Argyll)

The Island of Mull has a population of approximately 2700 residents and is served by three ferries. These ferries carry over 250 000 visitors to the island each year (Touchstone *et al.*, 1999), the main one operating from Oban to Craignure. A high proportion of these visitors are day trippers who travel down to the southerly tip of the island and cross to Iona, an island of significant cultural and religious importance.

There are eight operators offering boat trips from Mull. These are all day trips and fall into three categories. There are those that offer sea angling, those that offer trips to the nearby islands of Staffa (Fingal's Cave) and the Treshnish Islands (seabird and seal colonies), and whale-watching boats. These categories are not exclusive and a number of operators offer different types of trips depending on the clients.

With a population of approximately 800, Tobermory is the largest village on Mull. The tourist industry is the largest employer in Tobermory and its Tourist Information Centre receives 55 000 enquiries annually — representing a conservative estimate of the number of visitors to the town as not every tourist visits the centre.

In 2000, three boat operators used Tobermory as a base. Two operators specialised in sea angling, but also ran wildlife trips featuring cetacean-watching; the third ran whale-watching trips exclusively and had been doing so for over 10 years. A land-based wildlife watching operation also took tourists to see wildlife by land rover and this company advertized the potential for watching harbour porpoises from land. The village also has a small, but busy (over 18 000 visitors per annum) visitor centre dedicated to cetaceans and the local marine environment.

Methodology

The study was designed to collect information from five key stakeholder groups in order to gain a complete summary of cetacean-related tourism in the region. These groups were:

(i) Whale-watching tour operators (as defined in Table 1).
(ii) Operators of visitor centres featuring cetaceans (as defined in Table 2).
(iii) Whale-watchers — who could provide information on why they chose a particular trip, the role whale-watching played in choosing Scotland as a holiday destination and information on their expenditure as a direct or indirect result of whale-watching.
(iv) General tourists — the baseline against which the whale-watchers could be compared.
(v) Local residents — to gain an idea of how important local people saw cetacean-related tourism and whale-watching as being to the local economy.

The methodology for each of the sample groups is given below. Identical methodologies were used at each of the study sites so that the data could be used to provide an overall picture as well as a comparison between the regions. The surveys were piloted during the month of June and appropriate adjustments were made.

Tour operator survey

After defining the study's parameters for the term 'whale-watching' (Tables 1 and 2), a list of tourism businesses involved with cetaceans was compiled. In total 32 boat-based operations and eight visitor centres were identified on the West Coast of Scotland which made reference to cetaceans in their marketing (Table 3). Of these, 30 boat-based and all of the visitor centre operators were available for interview, which were conducted either in person or by telephone. Copies of publicity and marketing materials were requested from the businesses (if not already received) as well as information about websites and other marketing media.

Whale-watcher survey

Having identified those West Scottish boat operators who use cetaceans in their marketing, specific boat operators in categories 1 and 2a were approached to assist with the distribution of the whale-watcher questionnaires. Only day-excursion boat operators were approached to take part in the whale-watcher survey as it was felt that their passengers were likely to contribute more to the local economy, in terms of spending on accommodation and provisions (i.e. associated or indirect expenditure), than cruise passengers. Operators who run cruise trips tend to take small groups (usually no more than 12) on an all-inclusive basis who pay in advance for the trip (i.e. all expenditure is direct with little or no indirect/associated expenditure). Although passengers on these trips were not included in the survey an estimation of the amount of direct revenue accruing to the boat operator was calculated from tour operator interviews.

Table 3. A breakdown of the number, types and categories (Tables 1 and 2) of tourism businesses examined in the current study

Category	Day trips	Cruises	Visitor Centre	Total
1	6	3	2	11
2a	11	2	0	13
2b	4	1	2	7
3	5	0	4	9
			TOTAL	40

For this study, five representative whale-watching operations were chosen and these companies distributed questionnaires onboard their vessels (two in category 1 and three in category 2a). Before the commencement of the survey, researchers met with these operators to discuss the background to the study and its aims and objectives. Questionnaires were left with the operators to distribute. The questionnaires were designed to be completed by the passengers individually, but with only one representative completing a questionnaire when tourists were taking a trip as a family group. Theoretically completion was dependent on the willingness of the skipper/crew to distribute them at an appropriate time during the trip; however, the operators were generally enthusiastic to distribute the questionnaires as they mentioned that it provided passengers with ‘something to do’ on the journey back to harbour. To ensure that questionnaires were distributed to the entire compliment of passengers on every trip, the operators were closely monitored by researchers and completed questionnaires were collated by researchers on the return of the vessels. This ensured a high questionnaire completion rate (>90%). The study period was from 14th June to 31st July (6 weeks), covering the main tourist season and a total of 324 questionnaires were collected during this period (146 from category 1 trips and 178 from category 2a trips).

Tourist survey

Researchers were located at each of the study sites (Tobermory (Isle of Mull), Arisaig (Lochaber) and Sleat Peninsula (Isle of Skye)) to conduct surveys of general tourists to the area. Data were collected between 1st and 31st July 2000 and interviews were undertaken every day of the week between 10 a.m. and 5 p.m. Owing to the small size of each village, only one interview point was necessary for each site. Interview points were carefully chosen as a place where visitors would pass and might have time to participate in the study. The tourist questionnaires were completed by an interviewer on a face-to-face basis. Respondents were selected on a ‘next person to pass the interviewer after completion of the previous interview’ basis to ensure an unbiased sample of visitors. Interviews were restricted to one representative from each family/group. A total of 673 general tourist interviews were conducted—a total sample size which gives a 95% confidence limit for a population size of 300 000 or greater (Scottish Tourist Board, 1993).

Local resident survey

Local resident information was collected simultaneously with the tourist survey, using the same methods as described above for general tourists, albeit with a different questionnaire. A total of 189 local resident questionnaires were collected.

RESULTS

What is the importance of whale-watching to the rural West Scotland economy?

Opinion of the whale-watching industry

Boat operators were asked whether they thought that whale-watching was important to the local economy; almost half (47.1%) of the operators did consider whale-watching to be important.

Table 4. Local opinion on why tourists come to the area

Reason for visiting area	%
Scenery	85.3
Wildlife	21.2
To see friends/relatives	13.2
Coast and facilities (e.g. boat trips)	10.1
Good accommodation	3.7
Nearby attractions	1.1
Accessible/convenient	1.1
Other[a]	28.6
	$N = 189$

[a] 'Other' opinions on why tourists came to the area included visiting the area for peace and quiet and 'to get away from it all' (11.6%), the general character of the area (2%), nice beaches (1.5%), a lack of pollution (1.5%), safety and a lack of crime (1%), camping facilities (1%) and history/culture (1%).

Local opinion

Local residents were asked questions designed to give an overview of their opinions on the importance of the local tourism industry, in particular whale-watching and cetacean tourism. Of the local residents who were interviewed, 47% were involved in the tourism industry to some extent (accommodation, gift shop assistant, restaurant/bar work, etc). Eighty-two per cent of local residents wanted to see more visitors in the area.

Local residents were asked why they thought tourists came to the area (Table 4). Eighty-five per cent thought that visitors came for the scenery. Only one in five of local respondents thought that wildlife was a major tourist draw. One in ten local respondents identified marine facilities (primarily boat trips) as a reason why visitors came to the area. It should be noted that the question asked why visitors come to that particular area, not to Scotland or the region in general.

The extent to which tourism expenditure is dependent on whale-watching

Of the general tourist sample surveyed, 44% stated that they had been previously aware of whale-watching trips in West Scotland, and 13.1% of the general tourist sample said that the presence of such trips had influenced their decision to visit the region. Tourists were also asked whether they had been on a whale-watching trip during their stay: 18.6% of respondents had been on a boat trip of some kind during their stay; 6.5% had been whale-watching (category 1 or 2a trips) and 12.1% had been on other non-whale-watching trips (including category 2b and 3 trips). A further 22.8% of respondents commented that although they had not been on a trip yet, they might (12%), or were intending to go (10.8%), on a whale-watching trip during their time in the area. However, 53.9% of the general tourists had not gone on, nor intended to go on, a whale-watching trip.

Potentially, the percentage of the general tourist sample who might go whale-watching is 17.3% (i.e. the sum of the percentage of people who had been whale-watching and the percentage of those intending to go), although this potential figure could be as high as 29.3% (since 12% of responding tourists said that they might be interested in going whale-watching during their stay) if all the tourists who expressed an interest actually went on a trip.

Proportion of whale-watchers who came to the area specifically to go on a whale-watching trip

The tourists that were surveyed on whale-watching trips were asked whether they had come to the area specifically to go whale-watching: 22.5% said that they had, indicating that whales were the primary draw for bringing them on holiday to the region. Out of the 22.5% of the whale-watchers surveyed who had come to West Scotland specifically because of whale-watching, 15% had also stayed at least an extra night in the area in order to go on a whale-watching trip (i.e. 3.5% of the total number of whale-watchers).

Of the remaining 77% of whale-watchers who had not come to the area specifically to go whale-watching, a further 44 individuals (12.7% of the total number of whale-watchers) stated that they had stayed at least one extra night in order to take a whale-watching boat trip. Therefore, in total, 16.1% of whale-watchers had stayed an extra night as a *direct* result of whale-watching in the area. The number of extra nights typically ranged from 1 to 3, with a mean value of 1.6. However, one person stayed five additional nights as a result of whale-watching opportunities in the region.

The daily spend of whale-watchers

Whale-watchers were asked to provide details of their daily holiday expenditure. In order to gather comparable data, respondents were asked to state the amount of money that they spent personally on the day that the questionnaire was completed. Despite explicit instructions, respondents frequently gave their party's budget as a whole or their overall budgets for the week. These incorrect responses were discarded.

On average, the daily spend by passengers taking whale-watching trips was £85.25 (Table 5), of which the cost of the excursion was the main expense of the day. Accommodation accounted for almost one quarter of their daily expenditure, and one-fifth of the day's expenditure was on food and drink. Without the cost of the excursion, the average expenditure per day was £59.25.

The value of whale-related tourism in West Scotland

In order to determine the value of whale-related tourism to the local economy, a series of estimates were calculated. The first was to estimate the expenditure by visitors on whale-watching tours to the survey regions alone.

The value of whale-watching to the local economy

(i) *Direct annual expenditure in the survey regions*: The five main tour operators in the three survey areas were asked for their annual passenger numbers. Where information was not available the number was estimated based on a series of assumptions.[2] The direct annual expenditure of tourists on whale-watching trips was estimated from these data.

The estimated total number of passengers taken on whale-watching trips by the five whale-watching tour operators in the three survey sites was 15 650 per year. The direct expenditure of these tourists on whale-watching tours was calculated to be £230 080 per annum. The whale-watching operators were asked to indicate how much of their gross income went to finance the running costs of their whale-watching vessels.

[2](a) Accurate information was given by the operators on number of passengers taken per trip, operation season and number of trips taken per week.

(b) Owing to the nature of the climate in the region, boat trips were unable to sail on 20% of planned trips in the tourist season. The weather and sea conditions in the summer of 2000 were particularly good, resulting in fewer cancelled trips than in other years. Fluctuations such as these influences both the prosperity of the boat operators over the season, and also the contribution that whale-watching provides to the local economy.

(c) On average, boats operated at two-thirds capacity.

(d) Only one boat operator continued running all year; however, it was considered that the proportion of visitors on winter trips was negligible and, therefore, boats were considered to operate only during the main tourism season (April–October).

(e) For those operators offering child and adult prices, 80% of passengers were taken to be adult passengers and the remaining 20% were assumed to be children.

Table 5. The average daily expenditure for passengers on whale-watching trips

	Food/drink	Accommodation	Travel	Souvenirs	Other	Excursions	Total spend / day (£)[a]
Mean	17.53	20.48	9.12	8.32	3.80	26.00	£59.25
Std.Dev.	18.84	23.98	17.09	21.15	15.91	14.29	
N	227	181	177	178	156	212	

[a] NB This total does not include the tourists' expenditure on the whale-watching trip itself.

Table 6. A summary of estimated tourist numbers at each of the three survey sites

Region	Nearest Tourist Information Centre	Visitor Numbers (1999)
Skye (Kyleakin)	Kyle of Lochalsh (via Skye bridge)/Broadford (Skye)	(46 145 + 35 144) mean = 40 645
Skye (Armadale)	Mallaig (by ferry)/Broadford (Skye)	(62 414 + 35 144) mean = 48 779
Arisaig	Mallaig	62 414
Mull (Tobermory)	Tobermory	153 339
	Total	305 177

When these running costs were subtracted the net value of whale-watching for the operators was estimated at £109 548 per annum.

The total annual tourist expenditure in the three survey sites is an estimated £1 869 000 (Argyll and Islands Enterprise, Lochaber Limited and Skye and Lochalsh Enterprise, pers. comm.). Whale-watching, therefore, may bring in up to 12.3% of the tourist expenditure in the three survey sites. A significant part of the tourism economy in these rural areas.

(ii) *Economic value of whale-watching as a unique draw to the survey sites*: There were no accurate figures available for the total number of visitors to each of the survey sites. Figures were available for the number of people visiting the region through the local enterprise companies (LECs) but there was no indication of the proportion of these visitors who visited the villages used in the current study.

Data were available for the number of visitors using local Tourist Information Centres (TICs) and were used as a conservative indication of the volume of local visitors (Table 6). The only survey site with its own TIC was Tobermory (Mull); for the other sites the TIC nearest the site was used or, where there were two TICs equidistant from the town, a mean value was calculated. It should be noted that these figures are conservative estimates as a large number of visitors to the sites do not visit Tourist Information Centres during their stay. Also, rural TICs are not open all year (they are from closed November to March/April), but as the period that TICs are open coincides with the whale-watching season, TIC visitor numbers can be considered to represent the pool of tourists that are potentially available to take part in cetacean-related tourism activities.

Using the TIC visitor numbers, the estimated number of tourists going whale-watching at the three study sites (15 650) would represent 5.1% of the 305 000 visitors to the three sites each year. This figure is comparable to data previously described, i.e. 6.5% of visitors to the survey sites stated that they had been on a whale-watching trip.

Using the data presented above, of the 305 000 visitors to the three survey sites each tourism season, an estimated minimum of 19 825 (6.5%) will go whale-watching during their stay. Of these 19 825 predicted whale-watchers, 22.5% (4460 people) would have come to the area specifically to go whale-watching and 16% (3172) would have stayed at least one extra night as a result of going on a whale-watching trip. If each person stayed an average of 1.6 extra nights in the area, this would give an estimated total of 5075 extra person nights spent in the area by tourists as a direct result of whale-watching activities.

The average daily expenditure of whale-watchers was calculated to be £59.25 per day (not including the cost of the whale-watching trip). Therefore, the amount of additional (indirect) expenditure, contributable to whale-watching, in the local tourism industry was estimated to total £300 694 for the three survey sites (Tobermory, Arisaig and the Sleat Peninsula).

The value of cetacean-related tourism to the economy of rural West Scotland (extrapolated)

(i) *The direct annual expenditure on cetacean-related tourism for West Scotland*: Along the length of Western Scotland, over 30 operators were identified as being involved in whale-watching to some extent, as well as eight visitor centres that feature cetaceans. From information given by the operators and their marketing materials and extrapolating from the data collected in the surveys described above, an estimate of the number of tourists involved in cetacean-related tourism in Western Scotland, and their economic contributions, could be calculated. The number of passengers on whale-watching trips (both cruises and day trips) and visitors to centres featuring cetaceans are summarized in Table 7.

The passenger total was multiplied by the cost of the trips (using the same assumptions for calculating the direct income in the survey regions, as described previously). The cost for a whale-watching day trip ranged from £5.50 for an hour cruise to just under £60 for an all-day whale-watch, with the average hourly fare for a whale-watching trip being £6.10. Most whale-watching trips cost between £10 and £25. The category of whale-watching operation was used to calculate how much of this income was directly attributable to cetaceans (i.e. 100% of category 1 income could be attributable to cetaceans, but only 10% of the income of category 3 operations; Tables 1 and 2). A similar calculation was conducted for visitor centres multiplying ticket price by the number of adult and child visitors, then adjusting the total value by the category of visitor centre and the proportion of the income that could be attributable to cetaceans being used as a tourist attraction. The resulting estimate for the direct expenditure on whale-related tourism is shown in Table 7. In order to respect the confidential nature of the economic information provided by individual operators, particularly as some operators can easily be identified by their nature, location and size, only the summated final figures calculated are presented in Table 7.

From this extrapolation, it was estimated that cetacean-related tourism directly contributes £1.77 million per annum to the economy of rural West Scotland through the sale of tickets and fares to whale-watching trips and cetacean-themed visitor centres.

(ii) *The associated expenditure as the result of cetacean-related tourism in rural West Scotland*: Visitors who take whale-watching day trips spend an estimated £23.5 million in total, over the course of their holiday (assuming an average length of stay of 6.4 nights and average spend of £59.25 per day, not including the cost of trips, visits to attractions or other excursions). This estimate does not include the cost of their travel to the region and, therefore, is a conservative figure. The associated spend of passengers on-board, multi-day, wildlife-watching cruise trips is negligible as most of the trips are all-inclusive (full board).

However, it should be noted that whale-watching alone is not responsible for this amount of expenditure. As previously discussed, for the majority of whale-watchers a trip brings additional value to a holiday and

Table 7. A summary of the estimated number of visitors to centres featuring cetaceans and passengers on whale-watching trips in Western Scotland, with an estimate of the resulting direct expenditure

	Visitor Centres featuring cetaceans	Whale-watching cruises	Whale-watching day trips
No. of customers	179 500	522	61 930
No. of businesses	7	6	26
Direct expenditure	£235 510	£730 500	£801 961

Table 8. A summary of the estimated economic impact of cetacean-related tourism on the economy of rural West Scotland

Economic activity	Expenditure (£)
Direct expenditure on whale-watching trips and visits to cetacean-themed visitor centres	1 767 971
Additional (indirect) income resulting from extra nights stayed as the result of whale-watching trips	939 468
Additional (indirect) income from cetaceans drawing tourists to the region	5 085 723
Total economic impact of whale-related tourism in West Scotland	7 793 162

Table 9. Employment provided by cetacean-tourism operations in West Scotland

Region	No. of operators involved in study	Whale-watching tour employees (all categories) All year	Seasonal	Total	Visitor Centres Total
Argyll and Islands	8	18	11	29	18
Lochaber	5	6	7	13	19
Skye and Lochalsh	5	5	10	15	2
Ross and Cromarty	3	4	3	7	—
Western Isles	6	8	4	12	—
Total	27	41	35	76	39

is not the main reason for coming to the area. However, 16% of whale-watchers stayed an average of 1.6 extra nights as a result of going on whale-watching trips staying a total of 15 856 extra nights and with a resulting £939 468 of extra expenditure coming into the economy of the area, directly attributed to the presence of cetaceans and whale-watching operations.

In addition, the surveys conducted in this study suggest that 22.5% of whale-watchers came on holiday to rural West Scotland specifically, and primarily, to go whale-watching. As these tourists are being brought into the region as the direct result of the presence of cetaceans, the money these tourists spent whilst on holiday can be classed as additional income to the economy of the region which is the result of cetacean-related tourism. Summating the average expenditure this sub-section of whale-watching tourists spends during the duration of their holiday (using the assumptions stated above) this equated to an estimated £5.08 million of additional tourist expenditure.[3]

Table 8 summarizes the total estimated economic value of cetacean-related tourism in rural West Scotland during the year 2000: £7.8 million. The total expenditure by tourists in rural West Scotland is estimated at £426 million (Argyll and Islands Enterprise, Lochaber Limited, Ross and Cromarty Enterprise, Skye and Lochalsh Enterprise and Western Isles Enterprise, pers. comm.). Therefore, at present, visitors who choose cetacean-related tourism activities as part of their holiday contribute 1.8% of the total tourism income of the region.

(iii) *Employment provided by whale-watching in West Scotland*: A total of 115 jobs were involved in all tourism operations featuring cetaceans (Table 9). Seventy-six jobs were involved with boat-based operations as skipper, crew or booking staff. Forty-six per cent of these jobs were seasonal. However, for some of these operations, cetaceans were not the main focus of the operation and, therefore, only a

[3] This was calculated from the proportion of whale-watching tourists visiting the area specifically because of the presence of whales (22.5%), multiplied by the average daily expenditure (£59.25), multiplied by the average visit length (6.4 days). It should be noted that this figure does not include tourist expenditure trips or visits to non whale-related tourism operations. Moreover, the proportion of tourists (who were drawn to the area due to the presence of whales) spending extra nights as the result of their trip, and their daily expenditure during these extra nights, was excluded from this total as this expenditure has already been calculated above.

Table 10. The number of people employed by cetacean-tourism companies according to category (actual number and number adjusted according to category of activity)

Category	No. of operators involved in study		Whale-watching tour employees			Visitor Centres
			All year	Seasonal	Total	Total
1	9	*Actual*	13	10	23	6
2a	5	*Actual*	14	17	31	—
		Adjusted	*9.3*	*11.3*	*20.7*	—
2b	5	*Actual*	8	3	11	7
		Adjusted	*2.7*	*1*	*3.7*	*2.3*
3	3	*Actual*	6	5	11	26
		Adjusted	*0.6*	*0.5*	*1.1*	*2.6*
Total	27	*Actual*	41	35	76	39
		Adjusted	*25.6*	*22.8*	*48.4*	*10.9*

proportion of each employees job could be attributable to the cetacean derived visitors and income. The number of employees must, therefore, be adjusted according to the category of visitor centre, or whale-watching tour provided. These figures are summarized in Table 10. Fifty-nine full-time and one part-time tourism-related job positions were estimated to be created as the result of cetaceans, with 38% of these positions being seasonal.

The potential for growth of cetacean-related tourism in West Scotland

In order to gauge the potential development of cetacean-related tourism in West Scotland, tour operators were asked which sectors of Scottish tourism they saw as having the greatest potential for growth. Seventy-four per cent of the operators saw whale-watching as an area for potential growth. Almost all of the interviewed operators (92%) considered that ecotourism in general was a growth sector.

Tour operators were also asked to comment on the current state of tourism and whale-watching in the West of Scotland. Several themes recurred, including:

(i) Contrary to the results of the present study, it was widely believed by tour operators that (in the year 2000) few visitors came to the area specifically for whale- and dolphin-watching. It was believed that most visitors discovered whale-watching trips when they arrived in the area.
(ii) There was general agreement that the presence of whales and dolphins in Scottish waters could be used as a marketing tool to bring tourists to Scotland. However, it was stressed that any developments of this nature should be conducted with sustainability in mind, within the current tourism framework at a local level and ensuring minimum impact on the cetaceans.
(iii) Many operators agreed that, whereas whale and dolphin sightings added tremendous value to their passengers' enjoyment, the unpredictability of their distribution and the local weather conditions led to a reluctance to promote cetacean-watching too heavily. Their primary concern was raising expectations that may lead to visitor dissatisfaction. Advertising a more general wildlife trip with the possibility of seeing cetaceans was generally agreed to be a better and less risky approach.
(iv) There is great variation in whale-watching boat trips on the West Coast of Scotland in terms of the type of trips and also the demand. Some operators are currently working to capacity and would not want to encourage additional passengers. Others would welcome a new angle on their existing operation to encourage more people to take trips.
(v) There is significant variation in the cetacean species sighted along the West Coast. Minke whales, for example, are regularly seen by operators around Mull and Ardnamurchan but are rarely seen by

operators north of Skye where harbour porpoises, Risso's dolphins and white-beaked dolphins are more commonly seen. Whale-watching operations in these different areas offered a different product — in terms of cetaceans sighted — and were not deemed to be in direct competition with each other.

(vi) All those interviewed agreed that land-based cetacean-watching in Western Scotland could be developed further.

There is clearly a potential for growth in cetacean-related tourism. From a conservation perspective, cetacean-related tourism can also raise an awareness of, and educate the public, about these species. Although whale- and dolphin-watching itself is a niche market, it is a high value one, and whales and dolphins provide a very strong draw for tourists (e.g. 1995–1996 73% of tourists visiting the Moray Firth had come to the area to see the resident bottlenose dolphin population; Arnold, 1997).

However, tour operators concerns about the short whale-watching season and the effects that adverse weather may have on sightings will affect the development of this facet of wildlife tourism. Also, the set-up costs are high for whale-watching boats (e.g. high insurance, running costs, expensive health and safety equipment, etc).

DISCUSSION

Tourism and Scotland

Tourism is a key part of Scotland's economy, and Scotland's largest industry. In 1999, tourism expenditure injected £2.47b annually (5%) into the Scottish economy (Scottish Executive, 2000). The tourism industry is worth more to the Scottish economy than both the oil/gas and whisky industries and produces four times more revenue than the agriculture and fishing industries (Oban Times, 2001). Tourism currently employs 8% of the Scottish workforce (Scottish Executive, 2000).

The West Coast of Scotland encompasses some of the most sparsely populated parts of the European Union, and the majority is classed by the European Union as a 'Less-Favoured Area.' Owing to the outstanding natural beauty of the area and its extensive cultural heritage, tourism is an important industry. For example, in 1995, 42% of jobs in the Highlands and Islands region were tourism-related (Independent Northern Consultants, 1995). In such a sparsely populated area, the natural environment plays a key role in the experience of visitors to the area, in terms of both the scenery and the wildlife. Research, both independent and officially commissioned, repeatedly points towards the importance of these as a key motivating factor for visitors (System Three, 1991, Cobham Resource Consultants, 1996; Scottish Tourist Board, 1999; Warburton, 1999; System Three, 2000). In particular, the importance of Scotland's wildlife to the rural tourism industry should not be underestimated. In 1997, there were over 1973 jobs involved with wildlife tourism in Scotland, either directly or in businesses that offered wildlife viewing as part of their activities (A&M, 1998). By 2001, this employment had increased to 2960 jobs (A&M, 2002). The part that Scotland's marine wildlife plays in the country's tourism industry has also been acknowledged in recent years. In 1996, this sector of the market was estimated to be worth over £9.3 million to rural Scotland and supported over 400 jobs (Masters *et al*., 1998). Indirect revenue resulting from marine wildlife tourism was estimated in 1998 to be £57 million and to provide employment for as many as 2670 people (Masters *et al*., 1998). Moreover, marine wildlife tourism has continued to expand with a 62% increase in the number of tourists taking wildlife-watching boat trips reported between 1997 and 2001 (A&M, 2002).

Particular species, through appropriate management and marketing, can actually attract visitors to an area, thereby increasing local tourist expenditure and raising the overall awareness of the species (Table 11). This can result in species becoming valued beyond their intrinsic value. Four of the top six species/species groups being promoted by those involved in wildlife tourism are marine species (cetaceans, seals, seabirds

Table 11. Examples of increased tourism-related income as the result of key wildlife species acting as a draw to tourists

Species/location	Economic impact	Reference
Red Kites/mid Wales	Attract annual expenditure of £2.9 million to the economy of rural mid-Wales.	RSPB, unpublished in Rayment, 1995
Ospreys/Scotland	Attract 50 000 people who spend £1.7 million, creating 69 jobs.	RSPB, unpublished in Rayment, 1995
Birds/Shetland Islands	Birdlife is a main attraction in Shetland generating £1 m to economy and creating 40 jobs.	RSPB, unpublished in Rayment, 1995
Wildlife/Orkney	Wildlife-watching visitors spend £1.7 million.	Hooper, 1991 cited in Rayment, 1995
Bottlenose dolphins/ Moray Firth	A 28% of visitors stated that the presence of dolphins had been sole reason for visit. Generated £720 000 for the local economy.	Arnold, 1997
Birds/Islay & Jura	Estimated expenditure £3.1 million, of which £342 000 (11%) was by wildlife enthusiasts, £986 000 (32%) by visitors with active wildlife interest. 124 FTE jobs relating to expenditure by holidaymakers.	Mackay Consultants, 1989
Marine wildlife/ Mull	Marine wildlife tourism alone generates £650 000 direct spend and 22 jobs.	Warburton, 1999
Cetaceans/West Scotland	Whale-watching and visitor centres featuring cetaceans generated £1.8 million; cetaceans brought £7.6 million as the result of tourists attracted to the region; and whale-watching generated £1.4 million as the result of extra nights spent in the region.	This study

and otters). Of these species, cetaceans were ranked as the most influential draw for tourists (McCarthy, 1998).

However, the importance of wildlife to the tourism industry is not always recognized. As this survey showed only one in five of interviewed local residents thought that wildlife of any description was a major tourist draw, with even fewer (one in ten) remarking on marine tours. It was clear from this current survey, that in the eyes of local residents, wildlife is not an important means of attracting visitors to their locality, despite wildlife having been identified as a major draw for tourists in a number of research studies (Arnold, 1997; Warburton, 1999; System Three, 2000; A&M 2002). However, in a study conducted a year after this current study, interviewing residents of the Isle of Mull, it was noted that marine and terrestrial wildlife were cited as the second and third most popular draws, respectively, for tourists to the island (Pettigrew, 2001). This suggests that an awareness of wildlife and cetaceans as a draw for tourists is increasing amongst the general populace.

The economic impact of whale-watching in Scotland

Hoyt (2001) estimated that in 1998 land- and boat-based whale- and dolphin-watching in the Moray Firth generated £477 000 as direct expenditure and £2.34 million as total expenditure. Hoyt (2001) also estimated that on the northern islands of Shetland, land-based whale-watching generated £109 000 as indirect spend. This study has estimated that, in 2000, whale-watching in West Scotland generated £1.77 million as direct expenditure. When combined with the direct expenditure generated by the above-mentioned Moray Firth dolphin-watching operations, a conservative estimate of how much money cetaceans bring directly into the Scottish economy could be generated: a total of £2.24 million per annum (equivalent to US$3.42 million).

Table 12. A comparison of direct whale-watching expenditure in West Scotland to other whale-watching regions (except for West Scotland, all data are from Hoyt, 2001)

Location	Direct expenditure
UK	
West Scotland	US$ 2.7 million
Moray Firth	US$ 0.787 million
England and Wales	US$ 0.262 million
USA	
New England	US$ 30.6 million
Alaska	US$ 89.1 million
Hawaii	US$ 16.26 million
Canada	
British Columbia	US$ 9.102 million
Quebec	US$ 10.151 million
Newfoundland	US$ 3.159 million
Australia	
Queensland	US$ 4.2 million
New South Wales	US$ 3.56 million
Victoria	US$ 0.709 million
New Zealand	US$ 7.503 million
Azores	US$ 0.58 million
Iceland	US$ 2.958 million
Norway	US$ 1.632 million
South Africa	US$ 0.311 million
Canary Islands	US$ 17.77 million

The direct whale-watching expenditure in Scotland is a fraction of the direct expenditure in regions which have long established and highly publicised whale-watching industries such as New England (US$ 30.6 million p.a.), Hawaii (US$ 16.26 million), British Columbia (US$ 9.1 million) or New Zealand (US$7.5 million) (Table 12). However, despite still being a developing and relatively unpublicized sector of the tourism industry, Scotland still attracts a market equivalent to several well publicized international whale-watching destinations such as the Azores, Iceland and parts of Australia (Table 12).

The estimate of the gross indirect income generated by West Scotland whale-watching operations in this current study amounted to £6.02 million per annum (the associated spend from extra nights spent as the result of whale-watching trips plus the associated spend from tourists coming to Scotland specifically to go whale-watching). When the West Scotland figures are added to the indirect revenue generated by cetacean-watching in the Moray Firth and Shetland (£2.34 million and £109 000, respectively; Hoyt, 2001), the total amount of indirect expenditure resulting from cetacean tourism in Scotland could be as high as £8.47 million per annum.

From the above, the estimated total income from Scottish cetacean-related tourism (direct plus indirect expenditure) would be a total of £10.7 million. To put this amount into context, it has been estimated that commercial hunting of whales in Japan (when one excludes a £6.3 million subsidizing grant given to the whaling industry) generates a total income of approximately £21.7 million per annum (Economist, 2000). The income generated annually by whale tourism in Scotland brings in 50% of the Japanese commercial whaling revenue. Moreover, Toolis (2001) cites the Norwegian commercial whaling catch having a value of £4 million per annum which, if this value is correct, equates to only 37% of the value provided by live cetaceans in Scotland. Even within Norway, Hoyt (2001) estimated that the total expenditure generated by the Norwegian whale-watching industry to be approximately £8 million in 1998, i.e. double the value of hunting whales.

The value of live cetaceans in Scotland is notable and should, therefore, be viewed as a resource that should be conserved and promoted. Whale-watching is one of the fastest expanding sectors of the global tourism industry and actions to promote the abundance, health and diversity of cetacean stocks in Scotland will, therefore, aid the Scottish cetacean-tourism industry. There is a considerable potential for growth in the whale-watching industry in Scotland, particularly on the West Coast. If this potential were realized, the economic contribution of cetacean tourism to the Scottish economy could increase substantially.

However, in relation to the overall tourist revenue of Scotland of £2.5 billion (Scottish Tourist Board, 2000), cetacean-related tourism currently plays a relatively tiny role (0.4%) but in the peripheral coastal areas where these businesses are located, the impact is much more significant with up to 12% of the local tourism revenue in such areas attributable to cetacean-related tourism. The success of one or two small businesses can significantly lift a rural coastal economy and can help to diversify the economy away from reliance on single or declining industries (such as agriculture, forestry and fishing).

It should be noted that a rapid increase in whale-watching tours without appropriate planning, quality control and management, could cause negative impacts for cetaceans (ranging from changes in behaviour and habitat use to injury or mortality as the result of boat collisions) and for the industry (a rapid number of new businesses forming with inappropriate training, knowledge of the animals and ultimately a poor quality tourism product). Although growth in cetacean tourism is warranted, it must be done in a sustainable and appropriately managed fashion.

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