Regional Economic Dependence on Iconic Wildlife Tourism:

Case studies of Monkey Mia and Hervey Bay

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Abstract

Iconic wildlife tourism - that which focuses on the viewing and visiting of a single, well known species of wildlife - is a rapidly growing sector of the tourism industry. This paper reports on research undertaken as part of a multidisciplinary investigation which sought to collect information for use in recreation planning, management and product development of iconic wildlife tourism. Although the larger study considered a broad range of issues, this paper confines itself to reporting on the economic component of the study - the primary aim of which was to investigate the strength of the financial dependency of the communities of Monkey Mia, Western Australia, and Hervey Bay, Queensland, on the presence of the wildlife icons.

The estimates indicate that the dolphin experience is directly 'responsible' for between 5% and 11% of Gascoyne's total regional income and that whale watching appears to be directly 'responsible' for between 2% and 4% of Hervey Bay's total

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Introduction

Although wildlife tourism - the viewing and visiting of wild animals for recreational purposes or as a tourist attraction - is a relatively recent phenomenon, it is growing rapidly (Hoyt, 2001; Mvulva, 2001; Orams, 1996; Roe, Leader Williams & Dalal Clayton, 1997; Wilson & Tisdell, 2001). Iconic wildlife tourism - that which focuses on the viewing and visiting of a single, well known species of wildlife - is but one example of wildlife tourism. In Australia, there are many iconic wildlife tourism destinations, e.g. the Northern Territory and crocodiles (Ryan, 1998; Tremblay, 2002); Phillip Island, Victoria, and fairy penguins (Head, 2000; Phillip Island Nature Park, 2005); Fraser Island, Queensland, and dingoes (Lawrance & Higginbottom, 2002); Monkey Mia, Western Australia, and dolphins (CALM, 1993), and Hervey Bay and whales (Corkeron, 1995). Like other wildlife tourism destinations, these iconic wildlife destinations are also seeing rapid growth. Whale watching, for example, is estimated to contribute close to $AUS300 million to the economy, attracting close to 1.5 million participants. This represents a 15% per annum increase in a 5-year period (Hoyt, 2001).

For communities looking to diversify and grow, the industry thus stands as an attractive one to nurture and develop. But some regional economies are heavily dependent upon tourism for income, the downside of this being that the entire community can be at the mercy of the boom-bust cycles often evident in the industry (Australian Bureau of Statistics (ABS), 2004d). Further, the economic security of regional communities that are reliant upon iconic wildlife may be even more tenuous. Not only are livelihoods at the mercy of sometimes whimsical tourists, but they are also dependent upon the presence and on-going 'quality' of the wildlife icon which serves to attract its visitors. If the wildlife icon disappears, fewer tourists may be drawn to the region, and local incomes may suffer.

The flip side to this, of course, is that the health and security of the wildlife icon in such places is often at the mercy of its regional visitors and some forms of tourism debase the natural environment (Wanhill, 1997). This creates a strong, mutual interdependency between the wildlife icon and the regional community: even those who place no value whatsoever on nature, for nature's sake, cannot but acknowledge that its presence may be important to regional economies. Research that contributes to our understanding of that interdependency may thus have much to offer - irrespective of whether one is interested in the wildlife icon for its own sake, or as a financial asset.

The research reported on here was undertaken as part of a larger project (funded by the Sustainable Tourism Cooperative Research Centre, Australia) into the attitudes and perceptions of visitors toward icon wildlife species and human interactions with these species at Monkey Mia, Western Australia, and Hervey Bay, Queensland (Smith, Newsome, Lee, Stoeckl & Birtles, 2005) - see Figure 1.

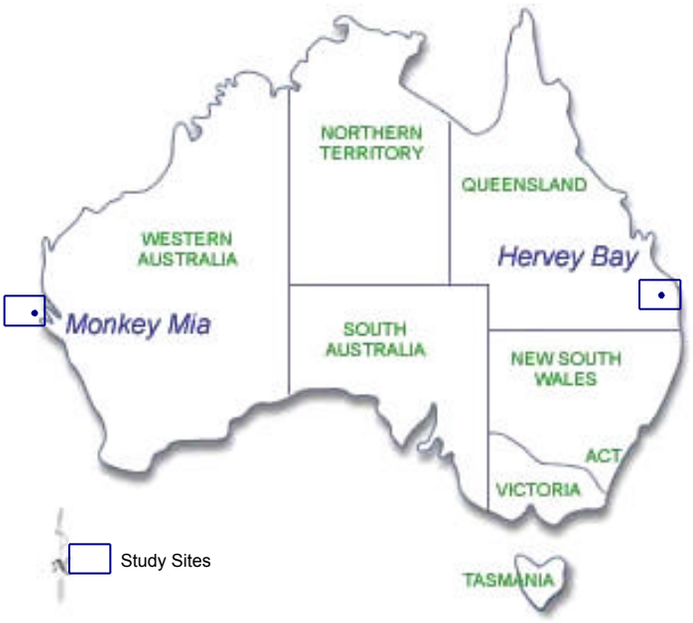

Figure 1: Location of study sites, Monkey Mia, Western Australia and Hervey Bay, Queensland

Source: (Smith *et al*., 2005)

The project sought to collect information that could be used in recreation planning and product development for the Shark Bay World Heritage and Great Barrier Reef Marine Park areas, the full details of which are reported in Smith *et al*. (2005). This paper confines itself to reporting on the economic component of that investigation, the primary aim of which was to determine how dependent the regional economies of Hervey Bay and Monkey Mia are on the presence of wildlife icons for their livelihood.

Before continuing, it should be noted that the iconic experience for Monkey Mia and Hervey Bay involved not only the existence of the iconic species but also the opportunity to view and watch (respectively) the species in the natural environment. At these sites the opportunity to interact with the wildlife icon in formal tourism settings is limited to viewing at the Monkey Mia (with approximately only 1 in 100 visitors having the opportunity to feed the dolphin), or watching the whales from tour boats in Hervey Bay. From this point forward, the terms interact/interaction have therefore been used to refer to viewing, feeding and/or watching the icon species in managed tourism settings.

The paper is organised into six sections. The next section (2) provides background information on iconic wildlife tourism in Hervey Bay and Monkey Mia. Section 3 describes some methodological issues, noting the way in which data were collected and analysed in this project. Section 4 presents the results of the analysis, while section 5 briefly summarises key points and offers a few concluding remarks regarding the way in which this type of information can be used by different stakeholder groups.

Background

Monkey Mia is located on the eastern shore of the Peron Peninsula, 25km east of Denham and 856km (9-hour drive) north of the capital city of Perth, in the Shark Bay World Heritage Area, Western Australia (CALM, 1993). Being renowned for the bottlenose dolphins (*Tursiops truncates*) that have been entering the shallows of the bay since the 1960's to interact with people on the beach and also to take fish from humans (CALM, 1993), it stands as a multi-million

dollar example of iconic wildlife tourism.

In the mid 1970's the region saw approximately 10,000 visitors per annum, however roads into the area were sealed in the mid 1980's, after which there was a sharp increase in visitation. In 1987, Monkey Mia saw a reported 114,335 visitors, although numbers have somewhat steadied since then, levelling off at approximately 100,000 per annum (CALM, 1993). Compared to the number of tourists to major tourist destinations such as Tropical North Queensland (which saw more than 2.2 million visitors in the year ending June 2004 - See Tourism Queensland, 2004) these numbers seem small. Yet the local impact of tourism is high, primarily because visitor numbers are so large relative to the population base. In the 2001 census, the ABS, counted just 2,153 persons in Shark Bay (ABS, 2004a). In short, Shark Bay stands as an example of a region that is highly dependent upon icon tourism for its livelihood.

As regards Hervey Bay, it has a population of almost 50,000 and is located 295km north of Brisbane (a 3-hour drive). At the southern tip of Great Barrier Reef, Hervey Bay has 60km of water frontage and around 600 acres of reef just off shore from the Urangan Harbour (Queensland Government, 1994). Commercial whale watching began in Hervey Bay in 1987 when the initiative was taken by a charter fishing boat owner, who saw his passengers were far more interested in the whales they saw than in the fishing (Corkeron, 1995). Since that time, visitor numbers per annum have ranged from 11,000 to 83,121 (Queensland Government, n.d). Peak periods for whale watching in Hervey Bay were from 1995 to 1999. This time coincided with considerable media coverage and the presence of Mimi McPherson, sister of supermodel Elle McPherson, operating Mimi McPherson Whale Watch Expeditions, which added significant publicity to whale watching activities (Scott, 2003). Although the numbers have levelled off somewhat in more recent years, from 2000 to 2003, the mean visitor numbers per annum is 65,296 (Queensland Government, n.d).

Yet, while the humpback whale migration is an important focus for tourism in Hervey Bay, it remains only a small part of the total spectrum of opportunities. Most notable perhaps, is the nearby world heritage listed Fraser Island, the world's largest sand island, which is 126km long and extends north and south bridging the continental shelf (Tourism Queensland, 2003). The region also boasts safe, sandy swimming beaches and is regarded as a recreational fishing area of national significance (Queensland Government, 1994).

If one compares the icon tourist to local population ratio in Hervey Bay (65,000 : 50,000) with that of Monkey Mia (100,000 : 2,000), it would appear that wildlife tourism is of relatively less significance in Hervey Bay than in Monkey Mia. Just how significant that difference is, is the key point of this paper's investigation, and it is to that issue that the discussion now turns.

Methodology

Different types of tourism generate different regional benefits because (a) different types of visitors have different direct expenditures; and (b) different tourism enterprises have different economic relationships with local businesses, generating different indirect expenditures. Those interested in determining the economic benefit (or impact) of tourism therefore need two different types of information - about tourism expenditure, and about the strength of economic links between regional businesses.

As noted by Mules, Faulks, Stoeckl, & Cegielski (2003) most empirical studies that are interested in measuring the size of the regional benefits attributable to tourism have approached the problem by:

1. Conducting a comprehensive survey of visitors to estimate average expenditure;

2. Scaling average expenditure upwards to total visitor expenditure by using some estimates of total visitor numbers; and

3. Estimating the total economic impact by combining estimates of total visitor expenditure (direct expenditures) with multiplier estimates (which give indirect expenditures).

A key problem here is that methods of estimating regional multipliers, empirically, are far from perfect. Until recently, many applied researchers used static input-output (IO) analysis to gauge the strength of economic ties between different industries in a particular area (e.g., Archer, 1985; Blaine, 1992; Wanhill, 1994). Nowadays, more sophisticated versions of IO models (e.g., dynamic IO tables and social accounting matrices) are available and advances in information technology have made computable general equilibrium (CGE) models a viable, theoretically preferable and increasingly popular method of examining these relationships (Dwyer, Forsyth & Spur, 2004).

Yet it is costly - in terms of both time and money - to collect enough data to create a transactions table (used in IO analysis) and it is difficult to develop good quality, regional CGE models (which also rely on IO tables for calibration). In some cases it is simply not cost-effective to develop complex models of small, rural areas. Consequently, researchers interested in the regional impact of changes in one sector of an

economy are frequently forced to use shortcuts and approximations, as per the discussion below.

In most cases, these shortcuts and approximations are grounded in much background research - both theoretical and empirical. Baaijens, Nijkamp & Van Montfort (1998), for example, use meta-analysis to consider factors influencing the magnitude of regional tourist income multipliers that have been estimated in a cross section of different research studies. A significant outcome of their investigation is that they are able to identify situations when researchers can 'transfer' estimates of multipliers from one region to another, similar, one thereby circumventing the need to generate region-specific estimates. Another solution (that results from quite a different approach) is given in Chang (2001), who estimates IO tables for 114 regions, using information from them to generate 'look-up tables' for regional tourism multipliers. Also, Harris, Harris and Liu (1998) demonstrate a process by which one can generate a 'hybrid' local IO table, using local survey data to tailor/alter larger-scale tables to regional conditions.

Another common short-cut is to only consider the direct impact of visitor expenditure. These estimates will generally understate the total economic benefit of an activity since it ignores the indirect expenditure that occurs as a consequence of the 'multiplier' process. In small regional economies, multipliers are generally relatively small (in the order of 1–1.25) (Johnson, 2001) so this short-cut can be viewed as either (a) generating estimates of the direct economic impact of tourism, or (b) generating estimates of the total economic impact which are biased downwards by up to 25%.

This is the type of information reported in Hoyt's (2001) study into the economic benefits of whale watching (although the terms 'direct' and 'indirect' are used differently in that study than they are here). If one were interested in determining the economic impact of whale watching tourists, then this could be considered a reasonable estimate. However, Hoyt's estimates do not give information about the dependence of regions on the icon.

This is because Hoyt's (2001) study uses information about the expenditure of all whale watching visitors and it is probable that at least some of the visitors that come to the regions he studied came for reasons other than the icon. Some visitors, for example, may have come to the region to visit friends or relatives. If they had not had the opportunity to view or watch the wildlife icon, they may simply have spent their time and money doing something else. So it is not correct to say that all visitor expenditure in those regions is attributable to or caused by the wildlife icons.

In other words, total visitor expenditure does not tell a full and accurate story about the importance of an icon to a regional economy; other information must be sought. In this study, the problem was therefore approached in steps. Firstly, questions were included within a visitor survey about (a) the respondents' total expenditure, and (b) the respondents' response to a hypothetical question about what they would have done if the opportunity to interact with the icon had not been there. Estimates of total expenditure were then correlated with the respondent's hypothetical responses to the 'no opportunity to interact' question, and that information was used to identify the proportion of total visitor expenditure that is attributable to the icon. Further details are given below.

Data collection

A sample of the population of visitors to Monkey Mia were surveyed onsite during the peak period (Western Australian July school holidays) for visitation. Visitors involved in the dolphin interaction at Monkey Mia at the time of survey were approached by the researcher once the interaction was complete and asked if they would fill out a questionnaire. The survey was completed independently by visitors whilst in the Reserve and collected onsite. The study population included people 18 years and over. Sampling was conducted over the course of six days (11th to 15th July 2004) between 8.00am and 1.00pm, including both weekdays and weekends.

For Hervey Bay, a sample of the population of visitors involved in whale watching during the peak period for visitation were surveyed onsite. A range of experiences were sampled which included large and small vessels, half and full day trips on four of the eleven vessels operating in the Bay. All visitors at the time of survey were approached by the researcher on the return journey back to the harbour while still on board a whale watching vessel and asked if they would fill out a questionnaire. The survey was completed independently by visitors whilst travelling and collected onboard. The study population included people 18 years and over. Sampling was conducted over the course of six days (23rd to 28th August 2004) including both weekdays and weekends.

Questionnaire design

As reported in Smith *et al.* (2005), the visitor survey was organised into five parts: Part I - most recent visit characteristics, Part II - purpose for visiting Monkey Mia/Hervey Bay, Part III - expenditure and Part IV - visitor characteristics. Most pertinent to this paper were the questions about local expenditure, and about the importance of the wildlife icon as a reason for visiting the region.

When attempting to generate estimates of total visitor expenditure, many visitor surveys ask respondents to indicate how much they have spent on different items while on holidays. Breen, Bull & Walo (2001) suggest that some respondents may have difficulty recalling exact expenditure with the result that responses to expenditure questions in surveys are not always very accurate. Further, while it may be relatively easy to answer a question about one's age, it can be quite taxing for respondents to work out how much they and their family have spent on take-away food for the last four days, for example. In an attempt to overcome that problem and reduce respondent 'stress' visitors were asked to indicate the approximate amount that they and their personal travel group had spent per day on different categories of goods. This was done by asking them to tick an appropriate expenditure category, as per the example in Table 1.

When estimating expenditure, the mid-point of each expenditure category (e.g., $35 for the range $21-$50; $75 for the range $51-100, etc.) was used, although the lowest amount (e.g., $150) for the top category was used. If respondents had ticked at least one box in the table but left other rows blank, then it was noted that they had spent $0 on that item.

In an attempt to gauge how much of that visitor expenditure is attributable to or caused by the wildlife icons, respondents were asked to answer the following question(s):

If Whale-Watching at Hervey Bay did not exist would you have still taken this trip to the Hervey Bay Region? (please mark one box only)

If dolphin viewing at Monkey Mia did not exist would you have still taken this trip to the Shark Bay Region?

a. Yes, we would have spent the same amount of time/number of days in Hervey Bay/Shark Bay	☐
b. Yes, but we would have spent less time/fewer days in Hervey Bay/Shark Bay	☐
c. No, we would have travelled elsewhere	☐
d. No, we would not have taken this trip	☐
e. Don't know	☐

Data analysis

Arguably, visitors selecting option *a* (from the question above) would have come to the region with, or without, the icon, and may have spent the same amount of money (albeit on different things). Their expenditure was not counted on the grounds that it was not *caused* by the icon. Similarly, visitors who selected options *c and d* would not have travelled to the region at all if the icon had not been there, therefore all of their expenditure was counted {calling it EXP_{C+D}}. And visitors selecting option *b*, would not have stayed in the region for quite so long if they had not been able to view or watch the wildlife icon, meaning that some, but not all, of their expenditure is attributable to the icon {called it EXP_B}.

Following this line of reasoning, it is possible to conclude that the total amount of visitor expenditure that is attributable to, or *caused* by the icon is likely to be greater than EXP_{C+D} and less than $EXP_{C+D} + EXP_B$. An annual estimate of visitor expenditure that is attributable to the icon was therefore calculated in several steps. First, it was assumed that the sample of visitors was representative of the total population of visitors and the proportion of total regional icon visitor expenditure that was directly attributable to the whale/dolphin was calculated, as between:

Table 1: Amount Spent ($AUS per day) While Respondents Were at Wildlife Icon.

Item - Cost PER DAY	**$<20**	**$21-50**	**$51-100**	**$101-150**	**$>150**
Drinks or food from a takeaway	☐	☐	☐	☐	☐
Meal in a café or 'family' restaurant	☐	☐	☐	☐	☐
Groceries	☐	☐	☐	☐	☐
Other supplies (e.g. film, maps, camping equipment, etc).	☐	☐	☐	☐	☐
Drinks at a bar, hotel or nightclub	☐	☐	☐	☐	☐
Tickets to local attractions/tours	☐	☐	☐	☐	☐
Souvenirs	☐	☐	☐	☐	☐
Other (please specify)	☐	☐	☐	☐	☐

Item	**$<50**	**$51-100**	**$101-150**	**$151-200**	**>$200**
Accommodation		☐	☐	☐	☐
Hire cars	☐	☐	☐	☐	☐
Fuel	☐	☐	☐	☐	☐

$$P_{C+D} = EXP_{C+D} / \text{Expenditure by all visitors}$$

and

$$P_{B+C+D} = EXP_{B+C+D} / \text{Expenditure by all visitors}$$

Then the total annual expenditure of all icon visitors was estimated, as:

$$E_{Icon} = \frac{\text{Total respondent expenditure}}{\text{Number of respondents}} \times \text{Estimated number of icon visitors}$$

And finally the range of regional annual expenditure of icon visitors that is directly attributable to the wildlife icon was calculated, as between

$$(E_{Icon} \times P_{C+D}) \quad \text{and} \quad (E_{Icon} = P_{B+C+D})$$

Before continuing, it should be noted that the figures derived should be considered as an estimate. The data obtained for the purposes of this project were collected over a single survey period. Consequently, reported expenditures and responses to the hypothetical question regarding 'action' if the opportunity to interact had not existed at the survey site (derived from the sample of visitors) may not provide a true representation of responses across the entire visitor population. Also, respondents may not have reported their expenditure correctly in the survey, or may have provided misleading information about what they would, or would not, do regarding time spent in the region if the icon had not been there. Nonetheless, the methodology is robust, and the estimates that are derived from it are 'plausible' when compared to other, similar studies - as discussed in the following section.

Results

Estimate of regional expenditure

Average total expenditure per group per day is higher in Hervey Bay ($AUS306) than in Monkey Mia ($AUS233) and this difference is statistically significant. With average group sizes in Hervey Bay and Monkey Mia of 2.95 and 3.64, respectively, average daily expenditure per person is close to $AUS103 in Hervey Bay and $AUS64 in Monkey Mia.

Figure 2 shows the average expenditure per group per day on each expenditure category at both sites. In both regions, most money is spent on accommodation. Tickets and fuel are the next largest categories. For most items, expenditure is higher in Hervey Bay than in Monkey Mia the exception being expenditure on fuel (although this difference is not statistically significant). The largest and most significant difference is for tickets - for local attractions and tours. In Hervey Bay, the average amount spent is $AUS66, compared to $AUS25 in Monkey Mia. This almost certainly reflects the fact that Hervey Bay respondents have gone on relatively costly whale watching tours (compared to Monkey Mia respondents, who can observe dolphins by paying an entry fee into Monkey Mia Reserve).

At $AUS66, average expenditure per group per night on accommodation in Hervey Bay is higher than in Monkey Mia ($AUS53). This undoubtedly reflects the different types of accommodation used by visitors at the different sites. A larger proportion of Monkey Mia respondents reported using cheaper types of accommodation such as caravan parks (46%) than did Hervey Bay respondents (28%).

Expenditure on hire cars was also greater in Hervey Bay than in Monkey Mia. The issue here is that it was expected that this amount would be zero in Monkey Mia because there are no car rental businesses in that region. Visitors must pay for the cars elsewhere (e.g., Perth) and drive them to the region. It was therefore thought prudent to compare these estimates with estimates from other, similar studies, to see if there were any differences of concern.

In their study of visitor expenditure in Seoul, Korea, Suh & Gartner (2004), found that average total expenditures per person were in the order of $US150 to $US200 per day. This is considerably higher than the daily expenditure estimates (of $AUS64 and $AUS103) reported in this current study, particularly when one takes the currency conversion into account. But Suh & Gartner's research was conducted in a large city where one would expect much higher expenditure. That the daily expenditure estimates in Suh & Gartner's study are greater than those reported in this current study is, therefore, encouraging.

Closer to home, Breen *et al.* (2001), report a mean total expenditure of $AUS60 amongst students participating in the 1995 Schweppes Northern Conference Games in Lismore, Australia. Like the case-study areas reported in this current study, Lismore is a regional town, so one might expect the expenditure patterns in their study to more closely align with the findings in this current study. But their sample was largely comprised of university students, a group that is likely to have a lower average income than our respondents. That the daily expenditure estimates in Breen *et al.*'s (2001) study are less than reported in this current study is also encouraging.

As reported in Greiner, Mayocchi, Larson, Stoeckl and Schweigert (2004) the Bureau of Tourism

Research (1999) estimates average per-night expenditure of overnight holiday/leisure visitors in Queensland at $AUS136.48. This estimate was derived from a sample that would include a high proportion of larger-town visitors (e.g., to Brisbane and the Gold Coast), so again, it would be expected that they would be higher than estimates from this current study (as is the case). The OESR (2002) estimates that average expenditure per visitor night in Hervey Bay during 1999 was $AUS69 for interstate visitors and $AUS72 for intrastate and international visitors. The estimates from this current study are higher than these by approximately $AUS30, although fewer than 10% of all visitors to the Fraser Coast South Burnett region are estimated to have gone on a relatively expensive whale watching tour (Tourism Queensland, 2003). Consequently, one would expect this study's whale watching only sample to have higher average expen-ditures than the OESR sample. Again, the estimates reported in this current study seem plausible when compared to these.

The 'plausibility' of the Hervey Bay expenditure estimate is confirmed by other studies of whale watching visitors. If one divides total estimated expenditure of whale watching visitors from Hoyt (2001), by total estimated whale watchers in Australia, one arrives at an average of $AUS104 per person; his figures for Queensland boat-based whale watchers are $AUS148; and $AUS45 for land-based whale watchers in Western Australia. The IFAW (2004) estimates visitor expenditure in Hervey Bay and other southern parts of Queensland at $AUS131.

In short, the expenditure estimates of $AUS103 per person per day in Hervey Bay relate well to other estimates of visitor expenditure. At $AUS64, the per-person estimates of expenditure in the Monkey Mia area may, however, be a little high; perhaps because respondents were attributing expenditure made in other nearby areas to the Shark Bay region as when, for example, they noted that money had been spent on car hire. For the rest of this section we will, therefore, look at the wider Gascoyne region, rather than just the Shark Bay/Monkey Mia area.

Current estimates, place the number of icon visitors to Monkey Mia and Hervey Bay each year at approximately 101,000 and 65,000 persons, respectively. If their expenditure patterns are similar to those included in the survey (i.e. at approximately $AUS205 per person per visit at Shark Bay (with average length of stay of 3.2 days) and $AUS472 per person per visit in Hervey Bay (where the average length of stay is 4.6 days), then the total regional expenditure of visitors that come to view or watch the wildlife icons in these areas are close to $AUS21m (101,000 x $AUS205) and $31m (65,000 x $AUS472), respectively.

To put these figures in context, the ABS (2004a, 2004b) estimates that total income in the statistical division of Gascoyne (containing Shark Bay) was approximately $AUS108m in 2000-01; in the statistical division of Hervey Bay, regional income was close to $AUS296m for the same period. These figures indicate that expenditure from icon tourists, account for almost 19% of regional income in Gascoyne and almost 10% in Hervey Bay. ABS estimates of total regional income in the statistical local area of Shark Bay are $AUS9.9m - less than our estimates of total regional expenditure of icon tourists.

Tourism Queensland (2004) estimates that the direct and indirect contribution that Tourism expenditure makes is approximately 6.6% and 14.4%, respectively, of Queenland's and Tropical North Queensland's regional income (product). When compared to these figures, it is evident that the expenditure of icon tourists in Gascoyne and Hervey Bay is not insignificant; these visitors make an important financial contribution to those regions.

As noted earlier however, this is

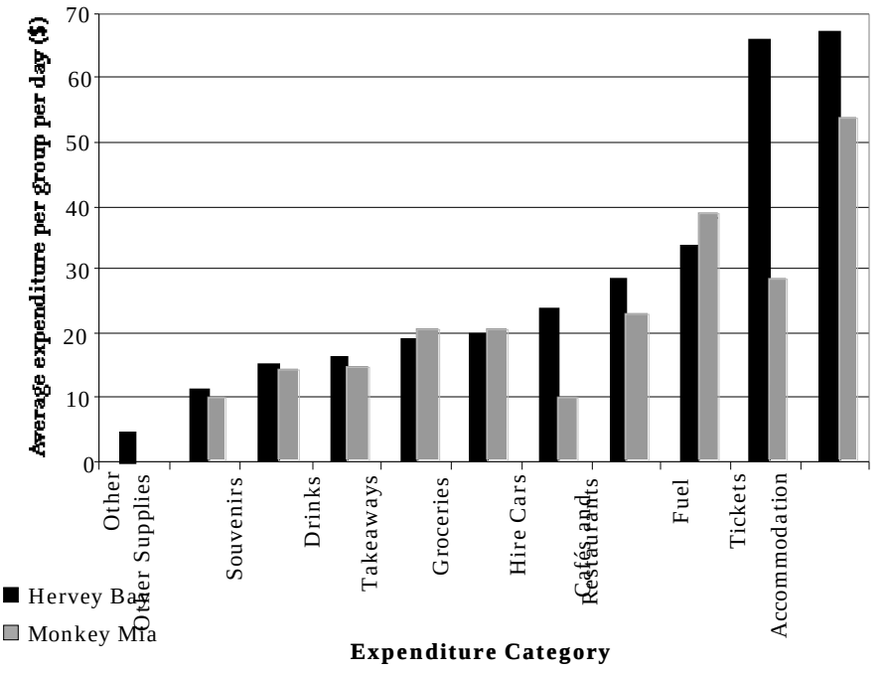

Figure 2: Average expenditure ($AUS) per group per day by category of expenditure

an estimate of how much icon tourists spend - it does not tell a full and accurate story about the importance of the icon to the regional economy. To do that, one needs to work out how much of that expenditure is directly attributable or caused by the icon.

The proportion of regional expenditure attributable to the wildlife icon

Close to 65% of HB respondents claimed that they would have spent less time in the region (23%) or travelled elsewhere (41%) if Whale-watching at Hervey Bay did not exist (Fig. 3). These figures were somewhat lower for Monkey Mia visitors: approximately 54% claimed that they would have spent less time in the region (24%) or travelled elsewhere (30%) if dolphin viewing at Monkey Mia did not exist.

This information was used to divide expenditure information from respondents as shown in Tables 2 and 3 (the first relating to Monkey Mia and the second relating to Hervey Bay).

As argued earlier, when trying to work out how much expenditure is directly attributable to the icon (i) the tourism expenditure listed in the middle column should be ignored; (ii) all of the expenditure listed in the column labelled *d* should be included; and (iii) only some of the expenditure listed in the column labelled *b* should be counted.

So these figures indicate that in Monkey Mia between $AUS54,000 and $AUS113,000 of the reported $AUS266,000 of regional expenditure of respondents is directly attributable to the wildlife icon, i.e. between 20% and 42% of icon expenditure. If the stated actions of survey respondents accurately reflects what would happen to all of the (approximately) 101,000 regional icon visitors if dolphin viewing did not exist, then it is possible to surmise that regional expenditure that is attributable to the wildlife icon is greater than $AUS4.2m (20% of the total $AUS21m spent regionally), and less than $AUS8.8m (42% of $AUS21m).

In Hervey Bay between $AUS90,000 and $AUS200,000 of the reported $AUS544,000 of regional expenditure of respondents is attributable to the wildlife icon, i.e. between 21% and 37% of icon expenditure. If the stated actions of survey respondents accurately reflect what would happen to all of the (approximately) 65,000 regional icon visitors if whale-watching did not exist, then it is possible to surmise that regional expenditure that is attributable to the wildlife icon is greater than $AUS6.5m (21% of the total $AUS31m spent regionally), and less than $AUS11.5m (37% of $AUS31m).

When compared to expenditure estimates from other, similar studies (Table 4), these estimates look plausible: our estimates should be lower than the other estimates since they refer to a smaller region, and are only accounting for expenditure directly attributable to the icon (rather than expenditure associated with the icon).

Conclusion

Economists have long acknowledged that the value of an environmental area is almost always greater than the value (if any) attributed to it in the market place, and a large body of literature focuses on ways of trying to identify and measure different aspects of those many and varied benefits (e.g., the value of ecosystem services, existence values, option values, etc.). This research reports on just one aspect of the 'value' attributable to wildlife icons; the financial contribution which the wildlife icon visitors make to regional communities.

Although the total visitor expenditure that is attributable to wildlife icons is approximately equal in both regions, the Gascoyne economy is smaller than that of Hervey Bay, so this expenditure is relatively more important. In Hervey Bay, whale watching appears to be 'directly responsible' for between 2% and 4% of total regional income (i.e. between $AUS6.4m and $AUS11.4m of $AUS296m). In Gascoyne, the estimates from this study indicate that the dolphin experience is directly

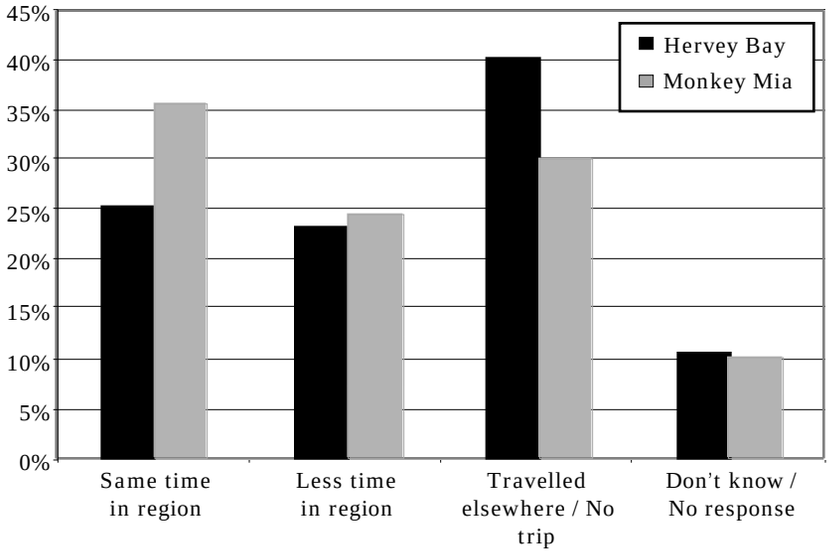

Figure 3: Respondents' reaction if the whales/dolphins no longer came to the region

Table 2: Regional Expenditure in Monkey Mia by Stated Action if Dolphin Viewing Did Not Exist.

Average expenditure ($AUS per group per day)	Respondents segmented according to stated action if dolphin viewing did not exist: Don't know/ No response	Less time in region (b)	Same time in region	Travelled elsewhere/ No trip (d)	All Respondents
Other	0.30	0.71	0.26	0.54	0.46
Other Supplies	14.39	9.70	10.68	7.67	9.90
Souvenirs	10.30	12.62	14.66	16.19	14.18
Drinks	12.58	16.61	14.57	14.06	14.73
Takeaways	16.36	23.63	17.69	22.13	20.39
Groceries	13.18	19.52	23.76	19.65	20.42
Cafés and Restaurants	16.52	23.45	23.38	24.60	23.09
Fuel	23.48	41.96	38.03	40.10	38.21
Tickets	33.64	31.85	32.09	19.70	28.45
Accommodation	36.36	47.92	57.05	59.16	53.36
Average expenditure in region per group per day *(a)*	184.70	237.80	242.22	233.96	232.96
Average number of days in region *(b)*	2.76	2.86	4.46	2.15	3.21
Average expenditure in region per group per trip *(c = a x b)*	$509.32	$679.42	$1,080.07	$502.33	$747.37
Number of respondents in category *(d)*	36	87	126	107	356
Total regional expenditure by respondent category per trip *(e = d x c)*	$18,335.37	$59,109.69	$136,089.18	$53,748.96	$266,063.56
Proportion of total respondent expenditure (%)	6.89	22.22	51.15	20.20	100.00

Table 3: Regional Expenditure in Hervey Bay by Stated Action if Whale-Watching Did Not Exist.

Average expenditure ($AUS per group per day)	Respondents segmented according to stated action if dolphin viewing did not exist: Don't know/ No response	Less time in region (b)	Same time in region	Travelled elsewhere/ No trip (d)	All Respondents
Other	0.77	9.84	4.07	2.95	4.80
Other Supplies	10.77	9.84	12.20	11.62	11.32
Souvenirs	10.77	17.81	13.93	15.09	15.20
Drinks	16.15	15.47	20.87	14.66	16.65
Takeaways	13.08	21.56	18.60	18.80	19.13
Groceries	16.15	22.34	23.73	17.09	20.15
Cafés and Restaurants	26.92	24.30	28.87	31.03	28.62
Fuel	36.54	37.50	35.67	29.70	33.55
Tickets	56.92	93.13	69.60	49.79	65.97
Accommodation	36.54	77.73	64.00	65.60	66.64
Average expenditure in region per group per day *(a)*	$241.92	$364.69	$306.20	$280.26	$305.72
Average number of days in region *(b)*	2.54	4.17	9.97	1.91	4.59
Average expenditure in region per group per trip *(c = a x b)*	$551.50	$1462.34	$3669.93	$687.14	$1677.31
Number of respondents in category *(d)*	35	76	82	131	324
Total regional expenditure by respondent category per trip *(e = d x c)*	$19, 303	$111,138	$300,934	$90,015	$543,449
Proportion of total respondent expenditure (%)	3.6	20.5	55.4	16.6	100.0

Table 4: Estimates of Expenditure Associated With Whale Watching for Different Regions in Different Years.

General Region	Details if relevant)	Year	Estimated number of whale-watchers	Total Expenditure ($AUS million)	Source
Australia		1998	734,962	77	Hoyt (2001)
		2003	1,618,027	276	IFAW (2004, p. 13)
QLD		2003	229,168	96	IFAW (2004, p. 13)
	Boat-based	1998	148,280	22	Hoyt (2001, p. 129)
	Hervey Bay + South	2003	159,168	21	IFAW (2004, p. 17)
	Hervey Bay	2004	65,000	Between 6.4 & 11.4	*This study*
WA		2003	153,081	46	IFAW (2004, p. 13)
	Land based	1998	112,081	5	Hoyt (2001, p. 129)
	North	2003	106,364	37	IFAW (2004, p. 26)
	Monkey Mia	2004	110,000	Between 4.2 & 8.8	*This study*

'responsible' for between 5% and 11% of total regional income (i.e. between $AUS4.2m and $AUS8.8m of $AUS108m). The Shark Bay economy is a small subset of the Gascoyne one, so this region is likely to be even more dependent upon the icon for its livelihood than the broader Gascoyne region.

At this point it is worth repeating an important issue raised earlier - namely that the figures derived in this study should be considered as estimates only. The data obtained for the purposes of this project were collected over a single survey period. Consequently, reported expenditures and responses to the hypothetical question regarding 'action' if the opportunity to interact had not existed at the survey site (derived from the sample of visitors) may not provide a true representation of responses across the entire visitor population. Also, respondents may not have interpreted our questions as we had intended them. They may also have reported their expenditure incorrectly, or may have provided misleading information about what they would, or would not, do regarding time spent in the region if the icon had not been there.

Further research could undoubtedly improve upon the questionnaire design and/or the representativeness of the sample (e.g., to allow for seasonality), thereby refining the methodology. Further research could also broaden this research approach by considering the wider economic impact of an icon, a wider range of regions, a more diverse spectrum of 'attractions' at a region, a more diverse range of icons and/or several different levels of iconic interaction.

As regards the survey design, the expenditure question could have been improved with the inclusion of an explicit 'zero-expenditure option'. As noted earlier, if respondents had ticked at least one box in the expenditure table but left other rows blank, then their response was coded as if they had spent $0 on that item - but this may not be an accurate assumption. Also, the questions; "If dolphin viewing did not exist..." and "If whale watching at Hervey Bay did not exist..." were problematic, primarily because respondents may have interpreted them as; (a) the companies enabling viewing and watching no longer exist or (b) the dolphins and whales no longer exist or come to the setting. This study interprets responses as if they were (b) but subsequent studies might consider more carefully worded questions here. The wider study by Smith *et al.* (2005), for example, corrected this problem of interpretation in surveys of managers and operators where the 'absence' of the iconic species was defined more comprehensively, through a variety of scenarios that clearly reflected not only the absence of viewing opportunities but also the absence of the icon.

When considering this research in a broader context, it is worth noting that the Smith *et al.* (2005) research project considered a wider variety of the region's resources and attractions than those discussed here, so as to further explore the tourism destinations' dependence on the icons and the opportunities for diversification of product. Future research could also include the consequences for regions of utilising a wildlife brand and the effect of that branding on other aspects of the wider tourism system within the region, including the kinds of souvenirs purchased, the choice of accommodation related to the brand and the theming of ancillary tourism businesses such as restaurants.

Those issues aside, we believe that the methodology used here - i.e. that which considers the expenditure that is attributable to the iconic interaction - is robust, and the estimates that are derived from this study are 'plausible' when compared to other, similar studies. Importantly, they provide further

evidence that local natural resources - wildlife icons in this instance - can make an important financial contribution to regional communities. Since this represents only one part of the total 'value' of the icon, it provides a base minimum estimate of what the resource is worth to a local community. If other values were included (indirect benefits, financial, cultural, environmental or other), these estimates would necessarily be greater.

Information like this could, therefore, be useful to several different types of stakeholders. For example, those who are interested in using iconic tourism to help promote regional development, might benefit from information about the importance of the icon to an individual's decision to visit a region. This could be used when developing regional marketing material. Information about the financial contribution that such visitors make to the local community could also be useful - if only to identify a limt to the budget on a related marketing campaign (so as to avoid spending more on the campaign than the visitors are 'worth').

On a less mercenary note, this information could also prove useful to those interested in promoting sustainable wildlife tourism. As noted in the introduction, iconic wildlife tourism creates a complex interdependent relationship between wildlife icon, visitors, and the local community. If the icon is not managed and conserved, then it may disappear, and studies such as this are able to quantify the potential financial loss. This potential loss represents a bare minimum value of management/conservation; a value that could be used (possibly in conjunction with other information and 'values) when attempting to strike a balance between income derived from and expenditure applied in maintaining the iconic resource.

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