



# Humpback Whales in Tonga: An Economic Resource for Tourism

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*The growth of whale-watching internationally has been spectacular. It now occurs in almost 100 countries and is estimated to be worth in excess of U.S.\$1 billion each year in revenue. Thus, whales have become valuable as a resource for tourism. The Vava'u island group in the northern part of the Kingdom of Tonga in the South Pacific is an area with a growing reputation as a whale-watching destination. However, the industry is relatively new there and the impacts of whale-based tourism in these islands is, as yet, unknown. In addition, there has been a recent consideration of a return to hunting whales in Tonga. As a result, concerns regarding the value of these animals for tourism and the potential impact of a return to hunting have arisen. Consequently, a study was designed to provide a preliminary assessment of the economic impacts of these animals for the island community. This study estimates that humpback whales may be worth in excess of U.S.\$700,000 annually as a tourism attraction and that there is significant potential for future growth. Furthermore, the study shows that current visitors are opposed to any resumption of whaling practices in the islands and that such a move would likely displace large numbers of tourists from Tonga. Thus, it is concluded that a resumption of whaling in Tonga would likely have a significant opportunity cost in terms of lost tourism revenues.*

**Keywords** economic impacts, Tonga, tourism, Vava'u, whale-watching

## Introduction

Whales have a history of interaction with humans that goes back far beyond Herman Melville's story of Moby Dick. They have been a source of fascination for peoples from coastal communities throughout the world over the ages. Their images are found in paintings, on coins, and in early writings from as long ago as the first century (Lockyer, 1990). Over the past three hundred years, human involvement with large cetaceans has primarily been a commercial one based upon their value as a source of products for human use (Samuels & Tyack, 2000). Without doubt, this period of "lethal use" of whales has had the most significant impact on their numbers. Almost every large whale species was hunted, resulting in a severe depletion in their numbers. Some species were reduced to the verge of extinction by the middle of the 20th century (Bowen & Siniff, 1999). As a result of these unsustainable hunting practices and, perhaps, as a result of a

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growing compassion and empathy for these animals, whales have become icons for the environmental movement. Currently, there are significant debates at cultural, economic, political, and scientific levels regarding the future management of whales (Aron, Burke, & Freeman, 1999; Moyle & Evans, 2001). These debates have, to a certain degree, become polarized. On one side are those who argue that whales should be protected from any consumptive (lethal) use, on the other are those who argue that whales should be hunted on a sustainable basis.

The international agency charged with management of large whales is the International Whaling Commission (IWC). Established in 1946 by the International Convention for the Regulation of Whaling, the IWC was charged with providing for the “conservation, development, and optimum utilization of whale resources” (Article V of the Convention). While the role of the IWC was clearly intended to be prowhaling, in more recent times it has become a “battleground” for prowhaling and antiwhaling factions—so much so that some commentators and government representatives are becoming extremely critical of the functioning of the IWC (for example, see Aron, Burke, & Freeman, 1999, and Palazzo, 1999). An additional issue has further complicated the controversy. In recent decades a further “value” for these animals has arisen: they have become popular as a tourism attraction. This growing industry is dependent on large numbers of whales easily accessible for observation and has placed an economic value on whales alive (Hoyt, 2000). This value has, in some instances, been utilized as an argument against the lethal use of whales as a consumable product (International Fund for Animal Welfare, 1998).

### ***The Growth of Whale-Watching***

The rapid worldwide growth of whale-watching as a tourism activity over the past decade has been widely reported in the literature. Whale-watching now takes place in every continent and from countries as diverse as Argentina, South Africa, Japan, Norway, New Zealand, and Tonga. Hoyt’s (2000) review of the industry worldwide illustrates its spectacular growth. He estimates that the worldwide economic impact derived from whale-watching activities in 1998 totaled more than U.S.\$1 billion. He also claims that in 1983 whale-watching occurred in only 12 countries, but by 1995 it had expanded to 295 communities and 65 countries and that by 1998 almost 100 countries or territories and nearly 500 communities were involved in whale-watching. As a consequence there appears to be widespread optimism about the future potential of this industry, and predictions are that whale-watching will continue this rapid growth rate (Hoyt, 2000).

### ***Research on Whale-Watching***

Internationally, research effort directed at understanding whale-watching has focused primarily on the behavior of the whales as a result of the close approach of boats and aircraft (Constantine, 1999). Related work has focused on the impact of noise on cetaceans (Reeves, 1992; Norris, 1994; Richardson et al., 1995). Despite the increasing amount of work directed at understanding the impacts of whale-watching on whales (examples include Hoyt, 1994; IFAW, Tethys Research Institute, & Europe Conservation, 1995; Richardson & Wursig, 1997), little effort has been directed at the impact of whale-watching on the watchers themselves. In addition, work assessing the impacts of the industry on host communities has been limited. This is surprising because it is obvious that whale-watching has become a significant industry worldwide with important social and economic impacts.

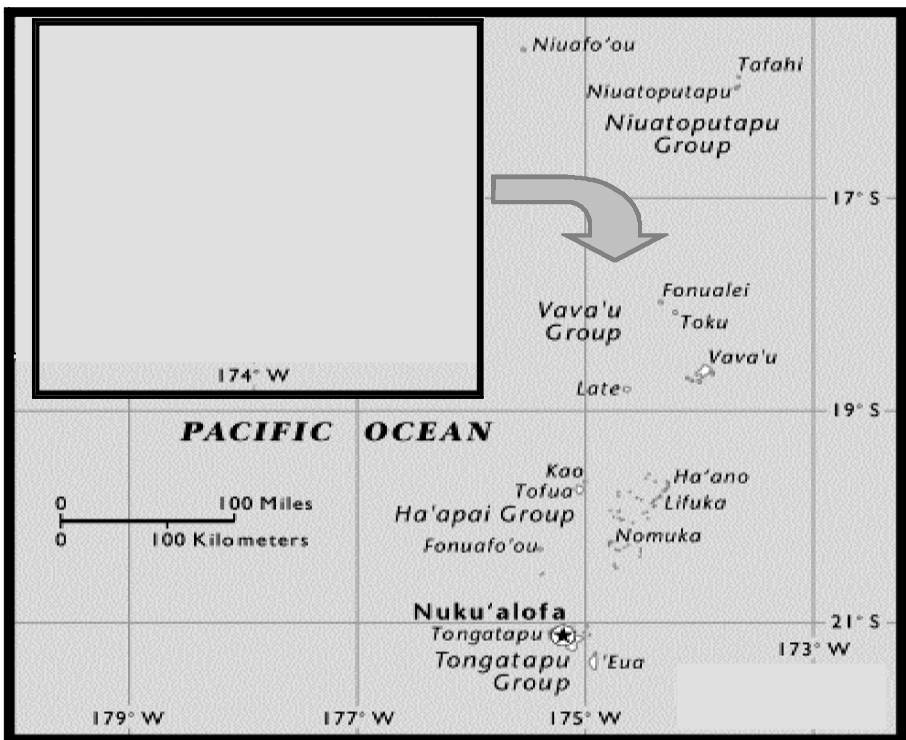
There have, however, been a number of studies that give estimates of the economic

impact of whales as a tourism attraction. These include Duffus (1988) and Duffus and Dearden (1990), who reported the results of studies on the economic impact of whale-watching on the Vancouver Island (British Columbia, Canada) community. They found that whale-watchers spent an average of CAN\$370–\$400 per trip and estimated that whale-watching contributed around CAN\$4 million into the Vancouver Island economy. Similarly, Forestell and Kaufman (1990) estimated in 1990 that in Hawaii whale-watching fares alone were worth in excess of U.S.\$3.9 million. Work conducted by Lincoln University in New Zealand has also identified the significant economic impacts of whales as a tourism attraction in the New Zealand town of Kaikoura (Horn, Simmons, & Fairweather, 1998).

Recently many of these estimates (including those provided from the study reported in this article) have come under criticism. Moyle and Evans (2001) argue that studies of the economic value of whale-watching have utilized flawed methods and, as a result, have seriously overestimated the economic value of these animals as a tourism attraction. It is clear, therefore, that the value of whales as a tourism resource has become an important and controversial issue in discussions regarding future utilization of these animals. This is certainly the case with regard to the Kingdom of Tonga in the South Pacific, where a push to resume whale hunting by the prowhaling organization the World Council of Whalers<sup>1</sup> has been argued against by those who consider the whales of greater value alive as a tourism attraction.

### *The Kingdom of Tonga and Whales*

The sheltered, warm waters of the Vava'u island group in the Kingdom of Tonga (Figure 1) have been an important breeding ground for humpback whales (*Megaptera novaeangliae*) for centuries. It seems likely that these islands are an important breeding area for the



**Figure 1.** The Vava'u Island group in the Kingdom of Tonga.

population of humpbacks that once migrated close to the shores of New Zealand (Baker et al., 1998). This group of humpbacks sustained a significant whaling industry in New Zealand, which between 1911 and 1963 killed over 3,600 humpbacks. Many thousands more were killed on the Antarctic feeding grounds, including 48,000 taken by the former Soviet Union in the 1950s and 1960s (Donoghue, 2000). By 1964 numbers of the New Zealand/Tonga humpbacks had been reduced from an estimated 10,000 to less than 250 whales (Donoghue, 2000). The “collapse” of this population reflected a worldwide decline in humpback numbers as a result of whaling activities. Despite dwindling numbers, whaling practices continued on a small scale in Tonga until 1978, when the King of Tonga imposed a prohibition on whaling. The protection provided by that decision probably saved humpbacks from extinction in Tongan waters. However, despite two decades of protection, the numbers of whales breeding in Tonga are still extremely low and concern remains over the survival of this group. In contrast, the humpbacks that migrate up the east and west coast of Australia are showing a steady recovery in numbers (Queensland Department of Environment and Heritage, 1993). Estimates of the Tongan humpback population, an unknown proportion of which visits Vava’u, are around 500, but could be as low as 300 or as high as 700 (Baker et al., 1998). The Tongan humpback population is therefore endangered and is a small fraction of the original numbers. Despite these low numbers, a small-scale whale-watching industry has developed in Vava’u. This industry has received considerable attention and appears to have significant potential given the worldwide growth of whale-watching.

## Study Objectives

It is clear that humpback whales are an important and growing tourism resource for Tonga, and particularly for Vava’u. They are heavily utilized in promotional material for the islands and the Tonga Visitors Bureau and local operators report a growing number of “whale-tourists” visiting the area. The tourism industry, while small, is important for Vava’u. The community in the Vava’u area is a small one, with only around 16,000 people. In addition, its economy is fragile; it has significantly less agricultural production and virtually none of the manufacturing, forestry, and service industries of the larger island of Tongatapu to the south. As a result, tourism is an economic activity that is extremely important in Vava’u. Furthermore, the potential for growth in tourism to the area has long been recognized (Tourism Council of the South Pacific, 1997). One of the greatest potential contributors to that growth is whale-watching. Whale-watching’s spectacular growth worldwide over the past decade reveals the high demand for the activity. The natural marine environment of Vava’u and the presence of humpbacks has resulted in the establishment of five whale-watching businesses in the area. There is, however, no specific information regarding the state of the whale-watching industry in Vava’u. This information would be useful in quantifying the economic influence of the whales as a tourism attraction and identifying future management strategies for the industry.

In addition, as a result of the relatively recent cessation of whaling in Tonga and with the encouragement of prowhaling organizations, consideration of a return to whaling activities is being given in the kingdom. Dramatic evidence of this occurred in July 1999 when, despite the royal decree protecting whales in Tongan waters, a female humpback whale was butchered near the capital Nuku’olofa and the meat distributed for local consumption. This death, processing, and consumption of the whale was coincident with a visit to Tonga by representatives of the World Council of Whalers. Thus, an important issue for Tonga is the potential future utilization of whales. Questions regarding the value of these whales alive as a tourism attraction have arisen and concerns exist about the potential impact on tourism that could result from a return to whaling in the kingdom.

As a consequence a study was developed to examine the impact of whale-watching on the Vava'u community. In particular, the economic influence of the whales as a tourism resource was explored and additional information on tourists' characteristics, behavior, and attitudes was obtained.<sup>2</sup> Specifically the following objectives formed the basis for this research:

1. to estimate the economic influence of the whale-watching industry to the Vava'u community;
2. to consider those influences in the context of the historical growth of tourism in Vava'u and whale-watching elsewhere;
3. to consider the future economic potential of the whales as a tourism attraction in the area;
4. to consider the potential impacts on tourism of a resumption of whaling in Tonga.

## **Background**

### ***Tourism in Tonga***

Tonga is a relatively small nation with a modest economy. GDP for Tonga was estimated at T\$231 million<sup>3</sup> in 1996/97 (Tourism Council of the South Pacific, 1997). The 1996 census in the kingdom reported a population of 97,446. The great majority of these people (68%) reside on the island of Tongatapu. The Vava'u island group has approximately 16% of the nation's people with a population of around 16,000. Tongan society is characterized by several important features. First, it is a constitutional monarchy; King Taufa'ahau Tupou IV is the current head of state in Tonga. He represents a long history of ruling monarchs who can be traced as far back as the tenth century. Political rule in Tonga is conducted through a Legislative Assembly which consists of nine democratically elected "people's representatives"; however, a majority is always held by royally appointed representatives and "nobles," members of the extended royal family. Second, Tonga is an intensely religious society. Christianity is enshrined in the laws and constitution of Tonga. The most obvious outward expression of this is the prohibition against commercial activities, work, and organized sport on Sundays. Third, the influence of the large number of Tongans who live outside Tonga (approximately 60,000) is important economically and socially. In particular, the sending home of income from family members working overseas—payments that are termed "remittances"—form an extremely important source of income for Tonga.

In addition to remittances, agricultural produce such as pineapples, papayas, kava, taro, bananas, yams, coconuts, and, especially of late, pumpkins and squash, are an important source of food for locals and of income from crops that are exported. Fishing and forestry also contribute to the economy. It is, however, tourism that is often referred to as the "economic star on the horizon" for Tonga (Keller & Swaney, 1997).

Currently it is estimated that tourism brings in around T\$12.3 million (U.S.\$8.61 million) (1997/98) in foreign exchange earnings. Total international visitor arrivals for 1998 were 29,281 (Tonga Visitors Bureau, unpublished data). The great majority of visitors to Tonga come by aircraft (80%) and land at Fua'amotu International Airport on Tongatapu; however, cruise ship passengers (10%) and cruising yachts (10%) also contribute significantly to visitor arrivals. It is important to note that over half of the aircraft arrivals are made up of expatriate Tongans returning to the islands to visit friends and relatives. Only 45% of visitors who arrive by air classify themselves as on holiday, and it is thought that a number of these may also be overseas-based Tongans visiting "home" (Tourism Council of the South Pacific, 1997). Thus, the actual number of vacationing tourists visiting Tonga is actually quite small, probably around 16,000 in 1998.

Tourism has, however, been identified as an important potential growth area for Tonga: "Government policy is to further support and promote tourism as a major earner

of foreign exchange and to play an expanded role in sustainable economic development" (Tourism Council of the South Pacific, 1997).

The Tonga Visitors Bureau and the Tongan Government have made significant investments in recent years to support the development of tourism in the kingdom through promotional campaigns and infrastructure improvements, such as the establishment of Royal Tongan Airlines, the extension of airport runways, and the upgrading of airport facilities.

### *Estimating Tourism Numbers for Vava'u*

The Vava'u island group consists of around 50 small islands surrounding Vava'u island, the largest of the group. It is located in the northern part of the Kingdom of Tonga lying 160 miles north of Tongatapu (Figure 1). The main town in Vava'u is Neiafu, located on the shores of the Port of Refuge harbor; many islands in the group are uninhabited, but a large number of small villages on both Vava'u and other islands exist.

Vava'u has, for many decades, been an important stopover for cruising yachts making their way through the South Pacific, particularly those coming and going from the Panama Canal to New Zealand and Australia via the South Pacific islands. More recently, Vava'u has also become well known as a specific tourist destination for visitors who travel via aircraft. As is often the case with small, less developed regions, regular and reliable data on tourism numbers are not available for Vava'u. However, in 1997 the Tongan Visitors Bureau (unpublished data) did record that Vava'u received 7,266 air arrivals, 345 cruise ship passengers, and 844 yacht-based visitors. Using these data as a basis (and assuming they are reasonably accurate) and in order to estimate the number of "vacationers" (as opposed to visiting friends and relatives) an assumption regarding the proportion of total visitors who are "vacationers" needs to be made. The Tourism Council of the South Pacific (1997) estimated that 45% of visitors arriving in Tongatapu were "vacationers." It is reasonable to assume that the proportion of "vacationers" would be greater for Vava'u because it is more well known as a "tourist destination" and its local population is small (therefore, fewer tourists visiting friends and relatives and less business travel). Thus an estimate of 60% of visitors who traveled by aircraft as "vacationers" has been made for the purposes of this study. Consequently, a total of 4,460 aircraft-based "vacationers" are estimated for Vava'u in 1997. Conversely, the numbers of yacht-based visitors reported for Vava'u by the Tongan Visitors Bureau in 1997 is likely to be an underestimate because the official figures report only those yachts that actually check in with customs in Vava'u. Many yachts, particularly those travelling north from New Zealand and Australia, check in at Nuku'alofa, to the south, and possibly a small number may check in at the Ha'apai island group. It also seems likely that some yachts that spend only a few days in the Vava'u area may not bother to check in with customs at all. Thus, it is assumed that the figures for yacht-based visitors to Vava'u underestimate actual visitation by around 25%. Consequently, the estimate of yacht-based visitors to the area in 1997 is adjusted upward to 1,055. It is assumed that all cruise ship passengers visiting Vava'u are "vacationers." The total number of vacationers to Vava'u in 1997 is therefore estimated to be around 5,860 (Table 1).

An important issue with regard to tourism in Vava'u (and Tonga as a whole) is that the visitation is highly seasonal. In Vava'u, the June to October period is the peak. Almost all yacht-based visitors are confined to this period (Figure 2). Vacationers who come via aircraft are more evenly distributed throughout the year; however, peaks also occur in the June to October period (Figure 3).

The trend illustrated in Figure 3 is consistent with the impressions of tourist busi-

**Table 1**  
Estimated numbers of vacationers to Vava'u in 1997

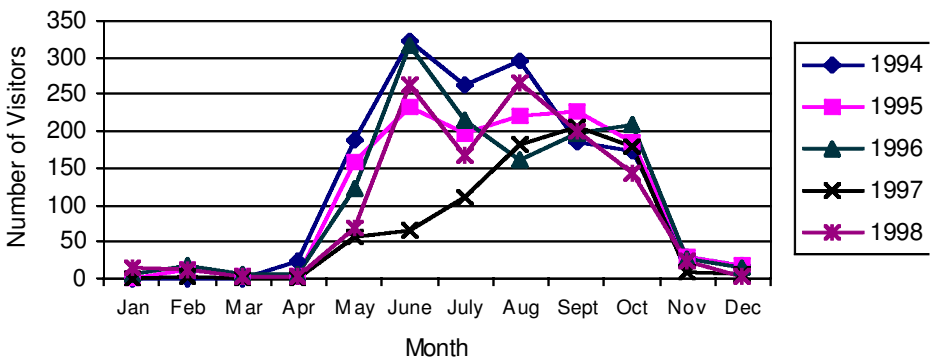
	Actual 1997 (TVB figures)	Adjustment	Estimated number of vacationers
Visitors via aircraft	7,266	60% holiday 40% VFR, business, and other reasons	4,460 (75%)
Visitors via yacht	844	+25% who cleared customs elsewhere	1,055 (20%)
Visitors via cruise ship	345	—	345 (5%)
Total	8,455		5,860

Source: Tonga Visitors Bureau, unpublished data.

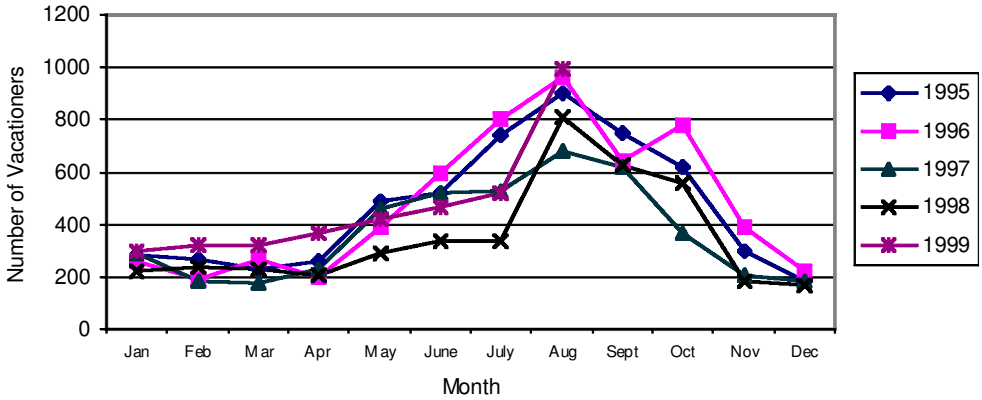
ness operators in the Vava'u area who stated that tourism numbers had been slowly declining in the area since 1995, but that the first half of 1999 had shown a marked “up-swing” in visitor numbers.

### *The Tourism Industry in Vava'u*

There are currently 53 officially licensed tourism operators in the Vava'u area (Table 2). A number of these operators offer more than one service (for example, accommodations, restaurant, and bar). In addition, there are many operators who could only be classified as part-time. In fact, around half of the operators with licenses maintain extremely small operations which run on an “on demand” basis. Thus, the Vava'u tourism infrastructure is modest. Other operations significantly supported by tourism are Royal Tongan Airlines, which maintains an office in Neiafu and at the airport, and local taxi drivers, all of whom utilize their own vehicles on an “on-demand” basis. Approximately 50 vehicles are registered as being able to be used as taxis in Vava'u. Additionally, the Tonga Visitors Bureau maintains an office in Neiafu.



**Figure 2.** Number of yacht-borne visitors by month.



**Figure 3.** Estimated number of vacationers to Vava'u arriving by aircraft.

## Study Methods

### *Estimating the Economic Influence of Whale-watching*

The prime objective of this study is to “estimate the economic influence of the whale-watching industry to the Vava'u community.” Consequently, this study differs from an assessment of the “economic value” of whale-watching. This is an important distinction because a calculation of economic value would include a consideration of costs and would also include an estimate of consumer and producer surplus and the “non-use” value of the resource. The whales that visit Tongan waters have, therefore, value independent of and in addition to the income they generate as a tourism resource (or as a source of food). This study, however, *does not* measure those values; it simply provides an assessment of the amount of additional expenditure that the whale-watching industry brings into the Vava'u community and considers the additional “downstream” impacts of that expenditure. Alternatively, this study can be said to estimate the expenditure that could be lost if whale-watching no longer occurred in the area.

**Table 2**  
Licensed tourism operations in Vava'u in 1999

Type of operation	Number
Resort/hotel	8
Guest house/motel/lodge	12
Restaurant/bar/cafe	8
Craft/souvenir	6
Charter yacht	5
Charter fishing	5
Other charter boat	1
Whale-watch	5
SCUBA diving	2
Tours	3
Kayak	1
Feast/cultural performance	3

Source: Tonga Visitors Bureau, unpublished data.



Economists recognize that the economic impacts of a particular industry extend beyond the expenditures of customers on products and services produced by that industry (Leeworthy & Vanasse, 1999). The initial spending of tourists (in this case) supports businesses. The businesses “re-spend” money on employees, goods and services, and so on: the costs of production for the business (some is retained as profit and investment). Employees and other businesses also “re-spend” this additional money. This “ripple effect” is termed the “multiplier.” The calculation of multipliers for specific resources and in specific communities has been somewhat controversial because it is not an exact calculation (Hvenegaard, 1997). Some economists consider its use in measuring true economic value inappropriate (Moyle & Evans, 2001); the use of “multipliers” is, however, widespread and well established in assessing the economic influence of tourism (for example, see Lundberg, Stavenga, & Krishnamoorthy, 1995). A consideration of the “multiplier effect” provides an indication of the economic influence of a particular industry, and as a result, a rough estimation of the “downstream” effects of expenditure by whale-watchers is included in this study.

The total economic impact of additional expenditure in a community can be viewed as the sum of the direct, indirect, and induced effects. Direct effects are the initial spending of tourists on the goods and services associated with whale-watching (in this case). The indirect effects are the expenditure of whale-watching businesses on goods and services they need to operate. The induced effects are related to the businesses and employees that receive additional income as a result of the direct and indirect expenditure. The total economic impact of a particular industry can therefore be calculated as the sum of the direct, indirect, and induced expenditure on that industry (Leeworthy & Vanasse, 1999).

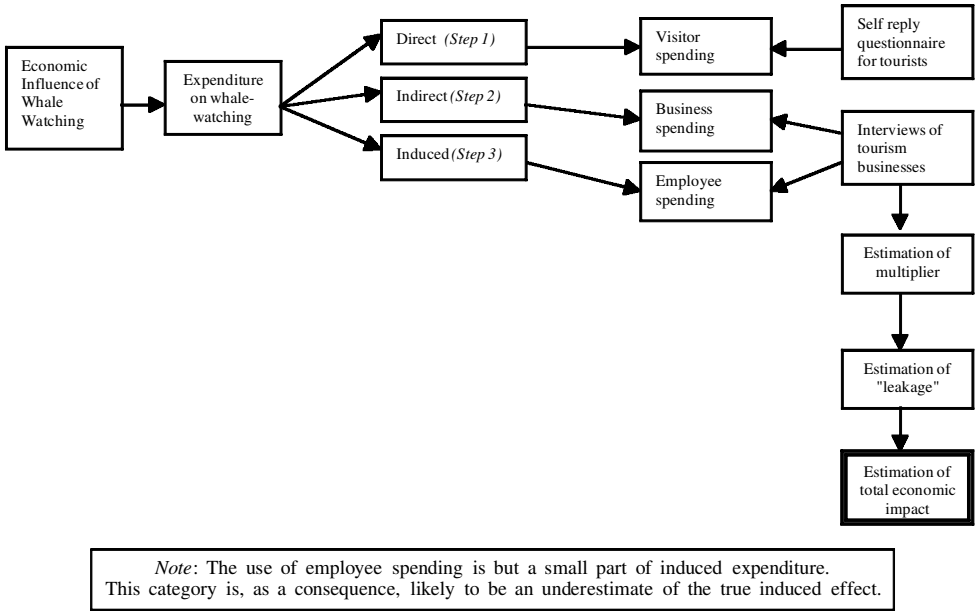
An important issue in calculating the sum of this expenditure is whether that expenditure actually occurs in the local community or whether it is spent elsewhere. This expenditure is commonly termed “leakage,” and it can be significant for small isolated communities such as Vava’u where many of the goods and services needed to operate a business (indirect expenditure) are purchased outside of the area. Examples might include fuel, food items, equipment, legal and accounting services, and so on. Thus, in estimating the economic impact of an industry in a particular area, only that additional expenditure actually made in that area should be included.

### **Research Instruments**

In order to facilitate an estimation of the economic influence of whale-watching in Vava’u, a number of research instruments were needed. Each of these instruments provided information that permitted an estimation of the direct, indirect, and induced expenditure made in the local community. This is reflected in Figure 4.

Two main primary data-gathering instruments were utilized in this study. In addition, secondary data from the Tonga Visitors’ Bureau were used to check the validity of the sample and to extrapolate results from the sample. The instruments designed to collect primary data were:

1. *Questionnaire*: A sample of all vacationing tourists to Vava’u was given a self-reply questionnaire written in English. Responding to these questionnaires was voluntary. Questionnaires used a combination of closed and open-ended questions to elicit responses on matters of expenditure, motivation, satisfaction, and sociodemographic information.
2. *Interview*: Business operators where whales form an important attraction for clients were surveyed. A structured interview was undertaken with each of the five permitted whale-watch operators. This interview ascertained information regarding business finances, including annual turnover, wages, and expenditure. Information on employee numbers, years of operation, growth rates, and attitudes were also obtained. Additionally, interviews with



**Figure 4.** Components of the economic influence of whale-watching and measurement instruments used in this study.

the seven major tourism operators in the area were conducted. This was undertaken to obtain representation in the sample from businesses whose clients may have been, in part, participants in whale-watching.

### **Sample Structure and Representation**

The time available for fieldwork in Vava'u was limited for this study: fieldwork was conducted over eight consecutive days in August and September 1999. However, every effort was made to ensure that the sample was representative. Self-reply questionnaires were administered to visitors waiting to board aircraft at Lupepau'u Airport. All aircraft-based visitors exit Vava'u via this airport. Additionally, in order to access yacht-based visitors, questionnaires were also administered to tourists at three waterfront restaurants/cafes (Ana's, The Mermaid, and The Bounty Bar) that are popular with "yachties." Finally, approaches were made to yachts moored/anchored at four popular anchorages close to Neiafu. In each situation every tourist available was asked to participate in the study. A total of 51 questionnaires were completed by yacht-based visitors and 85 by aircraft-based vacationers, resulting in a total sample of 136 questionnaires. Five tourists declined to participate in the study, two as a result of language (they did not speak English) and three because of time constraints (tourists in a hurry and late for the plane). This refusal/noncompletion rate is small and not likely to affect the validity of the sample.

Because of the short time frame and small sample size it is important to consider whether the sample is representative of the population of "vacationers" visiting Vava'u. Because specific data on the composition of the tourist population visiting Vava'u are not available, it is difficult to conduct tests regarding the validity of the sample. However, information is available for Tonga as a whole. A comparison of the country of origin for vacationers to Tonga and in the sample was made. The distribution of the sample for Vava'u approximates the distribution for Tonga as a whole, and differences observed could be explained by differences between Vava'u and other Tongan destina-

tions. The comparison provided evidence that suggests the sample obtained in Vava'u is representative of the population of vacationers that visit Vava'u.<sup>4</sup>

An additional issue relevant to an analysis of the sample is the composition relative to access mode. An overview of the proportion of vacationers who arrive in Vava'u via aircraft and via yacht for the months of July through October showed that the sample closely matched this proportion. This provided further evidence that the sample provided a valid representation of the population of vacationers visiting the area during the whale-watching season.<sup>5</sup>

Two cruise ships visited Vava'u in 1998, with a total of 473 visitors. No cruise ships were visiting Vava'u during the fieldwork for this study and therefore this group is not represented in the sample. Despite this omission, it seems reasonable to accept the assumptions regarding the representation of the sample. While the sample is relatively small ( $n = 136$ , representing 5.3% of the 2,575 vacation visitors who visited Vava'u during the whale-watching season) and the study was conducted over a short time frame, an analysis of the sample with the limited data available on tourists to Tonga and Vava'u shows that the sample is not dissimilar from the population targeted for this study.

### ***Confidentiality and Ethical Issues***

Because this study solicited financial information that could be of a sensitive commercial nature to businesses and individuals, it is not possible to report information on individuals' specific businesses. Thus, aggregated results are all that are presented in this article. In addition, some of the specific data utilized to estimate expenditure (such as business annual turnover, wages, and spending in the community) are not presented here. The business community in Vava'u is small, and as a consequence, it is relatively easy to identify data from individual businesses even if it is presented in categories. Therefore, only overall, aggregated data are presented here to protect the confidentiality of the businesses interviewed.

## **Results and Discussion**

### ***Estimate of Expenditures***

**Note:** *All financial data are reported in Tongan dollars, equivalent to U.S. 70¢ at the time of this study.*

The model presented earlier in Figure 2 was used as the basis for estimating the economic influence of whale-watching in Vava'u. The self-reply questionnaire distributed to yacht-based visitors and aircraft-borne vacationers solicited information on respondents' expenditure on whale-watching and on other aspects of the stay in Vava'u. These data were utilized to calculate an average expenditure per person per day for whale-watching across variables such as the whale-watch fare and the amount spent on food, film for cameras, specific whale-related souvenirs associated with the trip, and "other" items such as sea-sickness medication and sunscreen. These data were then discounted on the basis of an estimate of the expenditure for each item that actually remained in the local Vava'u area (thus "leakage" was compensated for). Aircraft-borne vacationers and yacht-based visitors were calculated separately, and a summary is presented in Table 3. Calculations are based on a conservative estimate of 1,500 aircraft-borne vacationers to Vava'u during the whale-watching season (July–October), 60% of whom (900) went commercial whale-watching. In addition, 4% of 800 yacht-based visitors (32) are estimated to have participated in a commercial whale-watch. A conservative estimate is also made regarding the expenditure of those who went whale-watching from private and

**Table 3**

Estimates of direct expenditure on whale-watching by visitors to Vava'u  
(all figures in Tongan dollars and average per person unless otherwise specified)

	Whale-watch fare	Food	Film	Souvenirs	Other
Commercial whale-watching by air vacationers	\$50,000	\$7,000	\$4,000	\$6,000	\$2,000
Commercial whale-watching by yacht visitors	\$2,000	n.e.s.	n.e.s.	n.e.s.	n.e.s.
Whale-watching onboard private yachts	n.e.s.	n.e.s.	n.e.s.	\$1,000	\$4,000
Whale-watching onboard charter yachts	n.e.s.	n.e.s.	n.e.s.	\$1,000	n.e.s.
Season total	\$52,000	\$7,000	\$4,000	\$8,000	\$6,000
Total direct expenditure on whale-watching per season: \$77,000–\$115,000.					

n.e.s. = not economically significant (< \$1,000).

*Assumptions:* 50% of those who stated that they intended to go whale-watching actually do. Those who stated they went whale-watching only went whale-watching once during their stay in Vava'u.

*Notes:* Results reported in this table are data taken from the visitor questionnaire. The estimate provided above is a minimum figure. Respondents tended to underestimate their spending while in Vava'u. In addition, whale-watch operators report greater numbers of clients spending a minimum of \$90,000 on whale-watch fares per season. As a result, a range is reported for the total direct expenditure calculation. Final total is rounded to the nearest thousand.

charter yachts: only expenditure on specific whale-related souvenirs and fuel (private yachts only) are included in the calculation (including the discount for “leakage” of that expenditure).

The results of this calculation estimate that direct expenditure on whale-watching each season in Vava'u totals around T\$77,000, \$52,000 of which is receipts from whale-watch fares. However, it seems likely that respondents may have underreported their expenditure on whale-watching. It is common for tourists to be inaccurate when asked to recall activities such as expenditure that may have occurred many days earlier (Ryan, 1995). Interviews with the five whale-watch operators provided estimates of expenditure on whale-watch fares alone of a minimum of T\$90,000 per season. Consequently, a range from \$77,000 (tourists' own estimates) to \$115,000 (operators' estimates) is adopted as a reasonable estimate of the direct expenditure of yacht-based visitors and aircraft-borne vacationers to Vava'u each whale-watching season.

Table 4 provides an important indication of the economic impact of whale-watching in Vava'u. Calculations are based on those “whale tourists” who specifically visit Vava'u to watch the whales. This provides important information for estimating the economic influence of whale-watching in Vava'u because it is that expenditure which would be lost if whale-watching did not occur in the area (or if “whale tourists” chose not to visit Vava'u). Those aircraft-borne vacationers (22%) and yacht-based visitors (8%) who indicated that whales were “extremely important” in their choosing to visit Vava'u were deemed to represent this group of “whale tourists.”<sup>6</sup> The expenditure of these “whale tourists” while in Vava'u (Table 4) together with their actual expenditure on whale-watching (Table 3) constitutes the category of “direct expenditure.” This figure is T\$664,000–T\$702,000 per season and constitutes Step 1 of the calculation of the economic impacts of whale-watching outlined in Figure 2.

**Table 4**  
 Estimates of other expenditure by whale tourists visiting Vava'u  
 (all figures in Tongan dollars = U.S.70¢)

	Accommodation	Food	Transport	Souvenirs	Other
Air vacationers expenditure per season	\$360,000	\$120,000	\$10,000	\$10,000	\$20,000
Yacht visitors expenditure per season	\$7,260	\$37,290	\$1,320	\$11,220	\$9,900
Season total	\$367,260	\$157,290	\$11,320	\$21,220	\$29,900
Total indirect expenditure in Vava'u by whale tourists per season: \$587,000					

*Note.* Final total rounded to nearest thousand.

It can be argued that the expenditure of “whale tourists” on their travel to and from Vava'u (airfares, etc.) could also be included as part of this calculation. However, it has been decided to exclude it, as the great majority of this money is spent outside Vava'u. It could also be argued that this figure is an underestimate of the potential opportunity cost of whale-watching activities in Vava'u (the amount of revenue that would be lost if whale-watching did not occur in the area). It is likely that a portion of other tourists visiting Vava'u in addition to those who visited there specifically for the whales would also be lost to the area without whale-watching as an attraction for the area.

Step 2 of the calculation of the economic impact of whale-watching (Figure 2) requires an estimation of the expenditure of whale-watching businesses. Interviews were conducted with each of the five permitted whale-watch operators in Vava'u and general estimates (specific information was not requested for ethical reasons) were obtained. As a result of these interviews an overall business expenditure estimate of T\$56,000 was calculated. However, an important issue with regard to economic impacts on a local community is the amount of this expenditure that is made outside the area. This “economic leakage” was estimated by asking interviewees to estimate the percentage of each expenditure item made in the local community. As a result, an overall estimate of T\$47,000 business spending in the local community was calculated (Table 5).

Step 3 in calculating the economic impact of whale-watching is to estimate the expenditure “induced” in the local community due to the wages paid to employees and other expenditure of whale-watch businesses in the local area. This estimate was arrived at as a result of the whale-watch business interviews. An overall estimate of the expenditure for each business and an estimate of the proportion of expenditure that remained in the local community was obtained (i.e., a discount for estimated “leakage” was applied). This totaled around \$47,000 per season (Table 5). The total of each of these estimates—the direct expenditure on whale-watching (Table 3), the other expenditure of “whale tourists” (Table 4), the expenditure of whale-watch businesses (Table 5) and the expenditure of their employees that remains in the local community—is the estimate of the total economic influence of whale-watching in Vava'u (Table 6). Rounded to the nearest thousand, this is T\$733,000–T\$771,000 per season.

Whales are, therefore, worth around T\$750,000 (U.S.\$525,000) in expenditure to the Vava'u community each year. This economic influence is significant for a small economy. The annual foreign exchange earnings of Vava'u from tourism were estimated

**Table 5**

Estimates of expenditure in Vava'u by whale-watch businesses  
(all figures in Tongan dollars and average per week unless otherwise specified)

	Wages	Fuel	Boat maintenance	Supplies	Other
Estimated totals for all permitted whale-watch operators	\$2,800	\$500	\$100	\$50	\$50
% spent in Vava'u	98%	10%	90%	50%	30%
Multiplied by % spent in Vava'u and by 16-week whale-watch season	\$43,904	\$800	\$1440	\$400	\$240
= Subtotal for season					
Total seasonal expenditure in Vava'u by whale-watch operators = \$47,000					

*Note:* Totals are rounded estimates to protect confidentiality of operators. Estimates are on conservative side and take into account weather-related cancellations. "Supplies" category includes safety equipment, ice, administration equipment (paper, printer ink, etc.). 100% of fuel is purchased locally; however, this fuel is imported so the net benefit is estimated at 10%. "Other" category includes marketing costs, postage, mooring fees.

to be T\$2.5 million (U.S.\$1.75 million) in 1997. While this figure is likely to be an underestimate, it does place the economic importance of whale-watching in Vava'u in context.

This estimation of the economic influence of whale-watching in Vava'u only takes into account the first (expenditure of whale tourists) and second round (expenditure of whale-watch-businesses) and partial third round (expenditure of employees) of spending of whale-watching-related income. It does not incorporate the spending of other

**Table 6**

Calculation of economic benefit of whale-watching in Vava'u  
(all figures in Tongan dollars per season)

	Direct expenditure of visitors on whale-watching	Other expenditure of whale tourists	Whale-watch operators expenditure in Vava'u	Whale-watch business employees' expenditure in Vava'u (leakage estimate 50%)	Total
Estimated totals for all permitted whale-watch operators	\$77,000–115,000	\$587,000	\$47,000	\$22,000	\$733,000– \$771,000

*Note.* Totals are rounded to nearest thousand.

businesses supported by whale tourists (for example, accommodation providers, restaurants, transportation businesses, and their employees), nor does it account for the subsequent rounds of re-spending of whale-watch-related income. Thus, the true multiplier effect of whale tourists' expenditure is not calculated. Consequently, the calculation of whale-watching's economic influence of T\$750,000 (U.S.\$525,000) is an underestimate of the total economic impact of whale-watching in the Vava'u community. It is possible that the total economic impact of whale-watching in Vava'u could exceed T\$1,000,000 (U.S.\$700,000) each year.

### ***Other Impacts***

It is important to recognize that there are a number of other impacts which accrue to Vava'u and to Tonga as a result of the presence of whales and the existence of a whale-watching industry there. While these have not been included in the above estimation of economic impacts, these other impacts do have economic as well as other less tangible impacts for the area.

Vava'u is becoming a favorite location for professional wildlife photographers, particularly those specializing in whale photography. These photographers not only contribute to the local economy through the hire of boats and payment for accommodation, food, and supplies, but they also provide significant exposure for Vava'u as a tourism destination. Similarly, television and film crews frequent Vava'u, also attracted by the spectacular scenery, the clear water, and the ability to capture spectacular images of humpback whales and their calves. Film crews from Television New Zealand, TV3 (New Zealand), National Geographic (USA), The Discovery Channel (USA), the British Broadcasting Corporation, Japanese and French crews, and others have visited Vava'u in the past three years. Magazine articles on the Vava'u humpback whales have also appeared recently. *New Zealand Geographic*, *New Zealand Dive Log*, *Pacific Wave* (Air New Zealand's in-flight magazine), and *Lulu'tai* (Royal Tongan Airlines' in-flight magazine) have all contained feature articles in the past few years.

Advertising in the international community for a small nation such as Tonga is a challenge. It is extremely expensive and difficult to access potential markets for tourism to Tonga. The work of these photographers, the television documentaries, and magazine articles provide significant and free exposure for Vava'u and its attractions in a variety of important markets. It is the whales that are the attraction for this publicity, and therefore, they have significant economic value for Vava'u. For example, the 29-page article in *New Zealand Geographic* (No. 30, 1996) provided free exposure for Vava'u and Tonga. Purchasing the equivalent space for advertising in this publication would cost T\$150,000.

A further issue that should be considered is the contribution that the protection of whales in Tongan waters provides for the international image of Tonga. Tonga utilizes its image as a religious, peaceful, friendly kingdom as a means of promoting itself internationally. Tongans themselves draw much of their self-image and sense of pride in their country and their culture from these characteristics. It is also an image attractive to the dominant tourism markets for Tonga: Australia, New Zealand, Western Europe, and North America. Protection of whales and an enlightened approach to the promotion and management of a whale-watching industry is an important contribution to Tonga's international image in these markets.

### ***Attitudes Toward Whaling***

A series of attitudinal statements regarding whaling were presented to respondents in the questionnaire and their level of agreement/disagreement solicited. The results are heavily

skewed indicating a high level of consistency across respondents. Both yacht-based visitors (83%) and aircraft-borne vacationers (95%) are opposed or strongly opposed to the commercial hunting of whales. Respondents were also asked to consider whether the hunting of whales in Vava'u would influence their willingness to visit Vava'u. This also revealed a strong level of consistency across respondents with 65% of yacht-based visitors and 73% of aircraft-borne vacationers agreeing that they would be less likely to visit Vava'u if whales were hunted there.

These attitudinal tests show, not surprisingly, that the great majority of visitors to Vava'u are opposed to any consumptive use of whales. This is important because it reveals that any change in the protected status of whales and resumption of whaling practices, even on a small scale, might displace a large proportion of the current visitors to Vava'u (see Orams, 2001, for a more complete discussion of this aspect of the study).

## Conclusions

Tourism is an important industry for the Kingdom of Tonga. It has been clearly identified by the Tongan government, and by previous research, that tourism has significant potential in contributing to an improved future for the Tongan people. It is obvious that whale-watching is already an important industry for Vava'u. However, in the context of the global growth of the industry, Vava'u appears to be in its "infancy" as a whale-watching destination. It could experience significant growth over the coming decade. The demand for high-quality natural experiences, particularly those based on large "charismatic" animals like whales appears to be limitless (Shackley, 1996). Vava'u is well placed to cater to this demand. It is a location blessed by a tropical climate; it has clear, clean water; it already has an established market in areas where "ecotourism" experiences are popular (North America, Western Europe, Australia, and New Zealand); and it is fortunate to host one of the whale species most popular for tourism. The competitive advantage that the humpback whales give Vava'u is significant. Tonga's main competitors for tourism are other South Pacific islands, such as Fiji, Samoa, Rarotonga, and Norfolk. Each of these alternates possess similar qualities to Tonga: warm climates, high-quality marine environments and friendly Polynesian cultures. What Tonga has that they do not are sufficiently large numbers of humpback whales easily accessible for tourism. This is a major attraction for visitors to Vava'u and to Tonga. This competitive advantage is well recognized and utilized in promotional campaigns for Tonga: over 80% of all written publicity material on Tonga mentions whales. Studies conducted on the tourism industry in Tonga refer to the importance of whales as a tourism attraction for the area. For example, the Kingdom of Tonga Tourism Sector Review completed in 1995 by the Tourism Council of the South Pacific identifies whale-watching as an area with significant potential for Tonga. While this study estimates that whale-watching in Vava'u is currently worth around T\$1 million each year, it has the potential to be worth significantly more. Other small and remote locations have whale-watching industries estimated to be worth many millions annually (Hoyt, 2000). The economic contribution of the whale-watching industry to Vava'u and to Tonga could become even more important in the future.

It is important to recognize that while the demand for whale-watching opportunities is high internationally, that demand does not automatically translate into ever-increasing numbers of whale tourists to Vava'u. Tourism development is constrained by many other factors, particularly in remote locations such as Vava'u. Transportation, accommodation, and other elements of the tourism infrastructure in an area have a great influence on tourism numbers. Many tourism business operators in Vava'u consider these aspects to be the most important issues with regard to the future of tourism in the area. In



particular, difficulties with convenient and reliable airline connections was mentioned a number of times.

Experiences at other remote tourism destinations have shown that tourism destination choice is very fickle. Changes beyond the control of the tourism industry can have a major detrimental impact on tourism arrival numbers. For example, the political unrest in Fiji as a result of the military coup in 1987 devastated the tourism industry in the area virtually overnight (Waters, 1990). Tourists who travel large distances for holidays have a wide variety of alternate destinations and, as a result, they change their choice of holiday destination very quickly if there is any perceived risk or problem in the area, or even in neighboring areas. This is an important point, because it indicates that what happens elsewhere in Tonga, and indeed in other South Pacific Islands, will influence tourism arrivals in Vava'u.

Many respondents, both visitors and business operators, felt that the way in which whale-watching is managed in Vava'u in the future will be important. These views are backed up by experiences elsewhere. A major challenge for the future of whale-watching in Vava'u is to minimize the negative consequences of tourism development and the difficulties in hosting large numbers of tourists. Other locations have experienced conflict between operators, resentment in the local community of increasingly large numbers of visitors, inflationary pressure in the local economy, and a loss of local control over local resources. These problems seem unlikely to occur in the short term in Vava'u as a result of the isolation of the destination, the Tongan policies of no foreign ownership of land, and rules regarding Tongan involvement in tourism businesses. However, it is important that the Vava'u community and the Tongan government remain aware of the potential negative impacts of tourism development and that planning for future tourism development considers the potential costs as well as the potential benefits.

A further issue in managing the future of whale-watching in Vava'u is the active promotion of whale conservation and careful "use" of the whales. Forestell and Kaufman (1990, p. 401), for example, observe that controversy has resulted from the rapid growth of whale-watching in Hawaiian waters. They state that: "Concern has grown in every quarter that the cumulative effect of this activity may threaten the recovery and survival of this endangered species."

The humpbacks that visit Vava'u are an endangered remnant population that visit the area for mating, birthing, and raising young calves. As a result, the potential for harassment of these whales is high. This is complicated by the promoted practice of swimming with the whales in Vava'u, an opportunity that is highly valued by whale tourists to the area. There is widespread agreement in the scientific community that the potential for harassment of the whales, particularly if swimming with mother and calf pairs, is high. This issue of sensitivity to potential negative impacts is important because whale-watchers themselves consider it important. There would likely be a detrimental impact on the tourism industry if Vava'u were to develop a reputation as a destination where unethical whale-watching practices were commonplace. Furthermore, the presence of increasing numbers of humpback whales that are relaxed and healthy in Vava'u waters is a prerequisite for the future of the industry there. It is imperative that the careful approach currently being promoted in Vava'u (there is a code of practice for whale-watching operators) is further developed and adhered to by all involved in the industry.

Research elsewhere has shown that the kinds of tourists attracted to whale-watching are not only motivated to view the whales but are also extremely interested in learning about whales and the marine environment (Tilt, 1987; Forestell & Kaufman, 1990; Pearce & Wilson, 1995; Neil, Orams, & Baglioni, 1995; Orams, 2000). There is strong evidence that well-structured education programs add significant value to whale-watching experiences:

Consumers are attracted to those experiences which offer biological, cultural, and conservation interpretation components. Consumers generally seek to participate in more interactive experiences, and the addition of a hydrophone (underwater microphone) to the onboard equipment is often regarded with great interest. Sound systems, video displays, educational resource materials are all of use to the consumer. (International Fund for Animal Welfare, 1998)

It has also been pointed out that the selling of whale and marine “souvenirs”—photographs, artwork, clothing, video and audiotapes, and other such products—can also “add value” to the whale-watching product (International Fund for Animal Welfare, 1998).

The lessons from other whale-watching locations around the world are valuable for Vava'u. The findings of this study are consistent with those of other locations. Whale-watchers are typically well educated, are from upper socioeconomic groups, and are strongly conservation minded (Tilt, 1987; Forestell, 1990; Forestell & Kaufman, 1990; Pearce & Wilson, 1995; Neil, Orams, & Baglioni, 1995; Orams, 2000). These tourists spend more on their holidays than most and are sensitive to environmental and ethical issues. This study has shown that whale-watchers in Vava'u are similarly inclined. This has important implications for Vava'u as a tourism destination. The great majority of current vacationers to Vava'u are attracted by the pristine marine environment, the relatively undeveloped nature of the area, and the genuine natural experiences they can have there. Experiencing whales is an important component of those experiences for many. It is, therefore, important to recognize the environmentally sensitive paradigm of these visitors because it indicates that any change in the protective status of whales and resumption of whaling practices, even on a small scale, would likely displace a large proportion of the current visitors to Vava'u. Thus, there is a likely “opportunity cost” with regard to any lethal use of the whales in Vava'u. It appears unlikely that a whale-watching industry could coexist with a lethal use of whales in Tonga.

## Notes

1. The World Council of Whalers is a prowhaling international nongovernmental organization established in 1997 and based on Vancouver Island, British Columbia, Canada. For further information see [www.worldcouncilofwhalers.com](http://www.worldcouncilofwhalers.com).

2. Tourist characteristics, behavior, and attitudes are more comprehensively reported in Orams (2001).

3. One Tongan Paenga (dollar) was equivalent to around U.S.70¢ at the time this study was conducted.

4. A chi-square test showed no significant differences between the sample and the data for Tonga as a whole with regard to country of origin (aircraft-borne vacationers:  $\chi^2 = 4.45$ ,  $df = 3$ ,  $p = 0.217$ , yacht-based visitors:  $\chi^2 = 1.626$ ,  $df = 3$ ,  $p = 0.654$ ).

5. A chi-square test showed no significant differences between the sample and the data for Vava'u with regard to access mode:  $\chi^2 = 0.303$ ,  $df = 1$ ,  $p = 0.582$ , correction for continuity applied.

6. It is also important to note that an additional 21% of aircraft-borne vacationers and 29% of yacht-based visitors stated that whales were “important” in their choice to visit Vava'u. Thus, a proportion of these visitors may also be deemed “whale tourists”—unlikely to visit Vava'u if whale-watching did not occur there.

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