

ECONOMICS, ECOLOGY AND THE ENVIRONMENT

Working Paper No. 149

**Wildlife Conservation and the Value of
New Zealand's Otago Peninsula:
Economic Impacts and Other Considerations**

by

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June 2008



THE UNIVERSITY OF QUEENSLAND

ISSN 1327-8231
WORKING PAPERS ON

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* This is a revised and extended version of Working Paper No. 145 in this series. It is a draft contribution to the edited book entitled *Wildlife: Destruction, Conservation and Biodiversity* to be published by Nova Science Publishers, New York.

[†] School of Economics, The University of Queensland, Brisbane QLD 4072, Australia
Email: c.tisdell@economics.uq.edu.au

WORKING PAPERS IN THE SERIES, *Economics, Ecology and the Environment* are published by the School of Economics, University of Queensland, 4072, Australia, as follow up to the Australian Centre for International Agricultural Research Project 40 of which Professor Clem Tisdell was the Project Leader. Views expressed in these working papers are those of their authors and not necessarily of any of the organisations associated with the Project. They should not be reproduced in whole or in part without the written permission of the Project Leader. It is planned to publish contributions to this series over the next few years.

Research for ACIAR project 40, *Economic Impact and Rural Adjustments to Nature Conservation (Biodiversity) Programmes: A Case Study of Xishuangbanna Dai Autonomous Prefecture, Yunnan, China* was sponsored by the Australian Centre for International Agricultural Research (ACIAR), GPO Box 1571, Canberra, ACT, 2601, Australia.

The research for ACIAR project 40 has led in part, to the research being carried out in this current series.

For more information write to Emeritus Professor Clem Tisdell, School of Economics, University of Queensland, Brisbane 4072, Australia.

Wildlife Conservation and the Value of New Zealand's Otago Peninsula: Economic Impacts and Other Considerations

Abstract

Valuing objects is a distinctive human trait. It is necessary for rational behaviour. Factors that are likely to influence valuations, the difficulties of getting agreements about valuations and the limited perspective of economics as a basis for valuation are discussed generally in this article. Attributes of Otago Peninsula that seem to be valuable and worth conserving are listed and discussed, taking into account possible conflicts in getting maximum value from these attributes. Particular attention is given to the economic value of conserving wildlife species on the Otago Peninsula. As a result of the presence of these species and their use for tourism, expenditure of over \$100 million NZ is generated annually in the Dunedin regional economy (directly or indirectly) and that 800-1000 full-time equivalent jobs are created. The economic opportunity cost of this wildlife conservation on the Peninsula is low and that the economic benefits from this conservation are well in excess of the costs involved. When non-use economic values and the social values associated with Otago Peninsula are taken into account, this further adds to the value of conserving this wildlife. While there has been remarkable expansion in wildlife tourism on the Otago Peninsula and its economic impact in the Dunedin region in the last two decades, (especially in the viewing of Yellow-eyed Penguins), difficulties and constraints are emerging that are likely to hamper its future expansion. However, wildlife tourism on the Otago Peninsula will still have a huge economic impact on Dunedin's regional economy in the future. Consequently, even if assessed solely in terms of their economic value, the wildlife attractions of the Otago Peninsula are well worth conserving. Furthermore, the value of conserving biodiversity on the Peninsula exceeds its touristic and its economic value. Some conservation organizations (such as the Yellow-eyed Penguin Trust), even though not directly involved in tourism, add to its economic value as well as to its social value and promote the highly desired goal of conserving biodiversity.

Wildlife Conservation and the Value of New Zealand's Otago Peninsula: Economic Impacts and Other Considerations

1. Introduction and Background

The purpose of this article is to identify a number of factors that are important in determining the value of New Zealand's Otago Peninsula and to highlight the importance of wildlife conservation as a contributor to its economic value. Two species of wildlife, the Southern Royal Albatross (*Diomedea epomophora*) and the Yellow-eyed Penguin (*Megadytes antipodes*) add substantially to the economic value of the Otago Peninsula mainly by their significance as tourist attractions. However, other wildlife present on the peninsula also make a contribution to its overall economic value.

It should be noted that many of the issues raised in this exposition are not specific to the Otago Peninsula. They are relevant to many geographical areas that have attractive environmental features, particularly natural attractions, and competing uses.

The Otago Peninsula is located on the South Island of New Zealand close to the centre of the city of Dunedin and although it is mainly rural, it falls within the boundaries of Dunedin City Council. It contains some villages, farms (which mostly graze cattle and sheep) and conservation areas. It is in fact almost an island being surrounded on one side by Otago Harbour and on the other side by the southern Pacific Ocean. It is located more than 45° south of the Equator and some of its wildlife species are frequently associated with the sub-Antarctic. Useful background on the geography of the Peninsula, the history of its human settlement and its biodiversity can be found in Kai Tiahu Ki Otago (2006). A generalised map of the Otago Peninsula is shown in Figure 1.

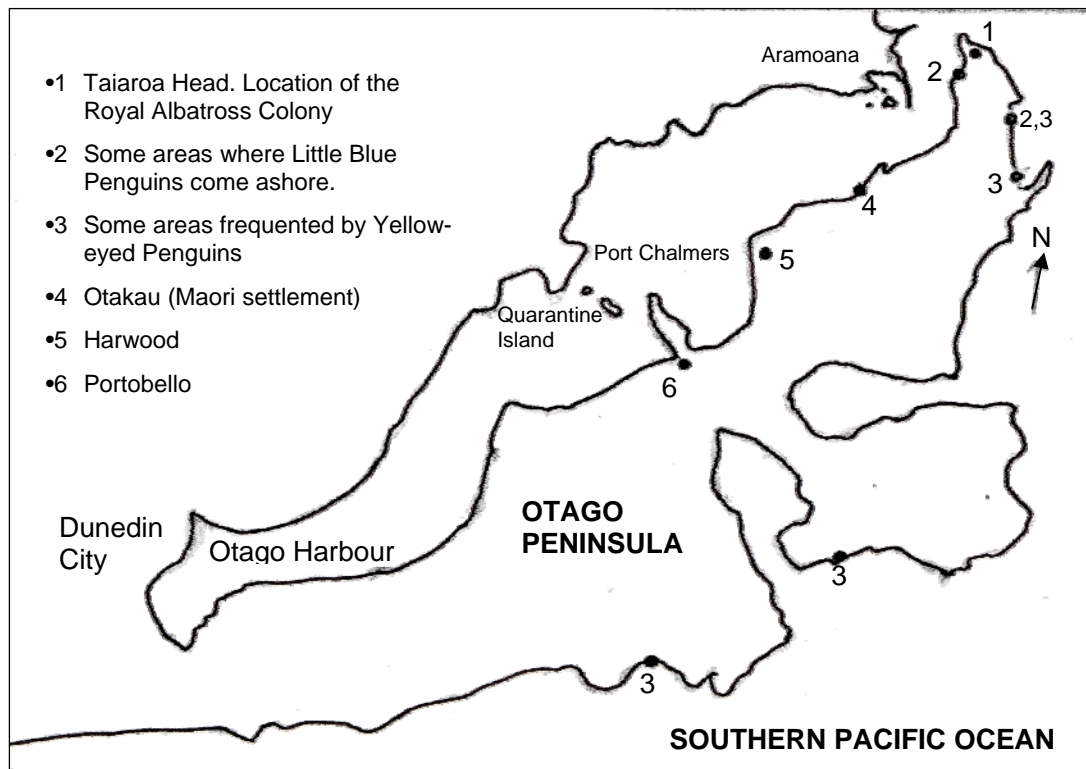


Figure 1: A generalised map of the Otago Peninsula showing some areas frequented by its wildlife attractions

2. The Process of Valuing Objects

The valuation of objects, including their economic valuation, is usually controversial and is probably imperfect. Nevertheless, valuing objects is a major preoccupation of human beings; one that seems to distinguish human beings from other species. Values provide a guide to individuals about how they should act, and are essential for engaging in rational behaviour.

In this article, I shall discuss the process of valuing objects (such as geographical features of the Otago Peninsula), outline the valuable attributes of the Otago Peninsula, provide information on the economic impacts (benefits) of wildlife conservation on the Peninsula, and discuss non-use economic values and social values which are not captured by economic impact analysis, and then conclude.

How, why and to what extent individuals come to value objects is a little explored but a fascinating subject. It is not usually a matter examined by economists because they normally take people's wants and values as given. This seems to be the source of the jibe that "economists know the price of everything and the value of nothing". While that is an unfair assessment, it is true that economic values give a limited perspective on the value of objects. They are not a complete measure of value because they only measure what can be assessed in terms of money. For example, the economic value of an object is often assessed in terms of the maximum amount of money that people are willing to pay for it or the maximum amount they would pay if it is an object requiring conservation to ensure that it is conserved. Economic value is not a measure of the 'ultimate' value of an object even though it is often an important factor to take into account in deciding on the ultimate value of an object. Thus, the role of economic valuation should be seen in this perspective. The importance of doing this was already stressed by Arthur Pigou (1932) (the founder of welfare economics and social cost-benefit analysis) early in the last century. He stressed that economics could not be the ultimate arbiter of what is valuable.

Valuation of objects is complicated by the fact that many values are culturally determined and alter historically as societies change and as ethical standards develop. For example, as John Passmore (1974) has pointed out, in Western countries, social attitudes towards nature and animals have altered substantially in recent times. There is, for instance, greater recognition of the rights of other species to exist and greater objection to cruelty to animals now than in the past. Conserving other species has become a valued objective in itself and those who contribute to saving other species obtain moral satisfaction from doing it when the socially accepted 'correctness' of such behaviour increases. These trends have undoubtedly added to the perceived value of nature conservation, including nature conservation on the Otago Peninsula.

To some extent what is valued by individuals depends on their experiences and perceptions. These are partly shaped by the society in which they live and by the

educational processes that have helped to shape their values and their perceptions of the world. Just as it is sometimes said that ‘beauty is in the eye of the beholder’, up to a point what is valued and by how much is determined by personal factors. Therefore, it is little wonder that there is so much controversy about what should be valued and by how much.

Given the personal aspect of valuing objects, it is not surprising that individuals’ valuations of objects have been a subject of psychological research. Individuals’ capacities to value items are restricted by their limited ability to obtain information, retain it and process it, that is by what has been described as their bounded rationality (Simon 1957, Tisdell, 1996). Personal valuations may be altered by the type of information provided to individuals (Tisdell, 2007b) and by advertising and promotion. The psychology of valuation deserves more study (Tisdell et al., 2008).

Economists are aware that the amount of money one pays for a commodity or object is frequently not a complete measure of its economic benefit. The economic value of an object is often greater than the amount paid for it. There are even some commodities for which nothing is paid but which nevertheless, have economic value. For example, individual New Zealanders may pay nothing for the continuing existence of the kiwi (the national bird emblem of New Zealand) but many would be willing to pay to ensure its continuing existence and would give this a high priority. However, as I mentioned before, economic value is just one dimension of value and considerable room exists for controversy about what should be valued and by how much.

The values expressed by individuals are often culturally or institutionally influenced. Many Australians, for example, may consider the kiwi to be a scruffy, insignificant animal of little value but not New Zealanders. These views would, however, be most likely reversed when it comes to valuing the conservation of the flightless emu, the bird symbol on the Australian coat-of-arms. The choice of these birds as avian emblems of New Zealand and Australia respectively help shape these valuations.

Similarly, Americans are likely to be willing to pay a considerable sum to keep the bald eagle (*Haliaeetus leucocephalus*), a symbol of the United States, in existence, but as individuals they need pay nothing for this.

Despite differences of opinions about values, in most societies a degree of consensus emerges about what should be valued. Without some agreement on values and social goals, social action would be paralysed. Economic considerations are almost invariably factors that are taken into account in setting social goals, including those relating to the state of the environment.

3. The Valuable Attributes of Otago Peninsula Worth Conserving

What is valuable or should be valued on the Otago Peninsula? Not being a local and not having had an opportunity to survey locals for their views, my list of what might be regarded as valuable on the Peninsula is likely to be incomplete. A useful overview of features of the Otago Peninsula which are believed to be valuable is contained in Kai Tahu ki Otago Ltd. (2006). An important aspect of this Peninsula, is that it includes many diverse features or attributes in a relatively small area. The following are some of the attributes that I consider to be of value and which are worth conserving. These are not necessarily in order of importance.

- (1) European heritage sites. Some are on private land, such as battery placements built for defence during World War II. Scope exists to develop these further as tourist attractions.
- (2) Maori heritage. This has been little developed for tourism purposes.
- (3) Impressive landscapes and seascapes with panoramic views.
- (4) Relatively rare and unique wildlife species which are comparatively easy to see. The rarity of the species from a global perspective and their vulnerable conservation status adds to the value of these species, such as the Royal Albatross and the Yellow-eyed Penguin.

- (5) A high degree of natural biodiversity within a small geographical area. This biodiversity is being sustained and increased by programmes of Yellow-eyed Penguin Trust. Apart from conserving the Yellow-eyed Penguin, it is restoring natural vegetation in areas under its control with the help of volunteers. Some other NGOs (such as STOP, the Save the Otago Peninsula organization), as well as some private landholders, are doing likewise.
- (6) Much of the land on the Peninsula is used for livestock (sheep and cattle) and therefore, has some economic value for grazing, even though it is not rich agricultural land. In some portions also plantation forestry involving the planting of conifers has developed. Up to a point, these land uses may add to the scenic value of the Peninsula. They are a part of the scenic mosaic. Europeans have accepted the view that some types of agriculture enhance the scenic qualities (or values) of some landscapes and provide subsidies to agriculture as part of the EU's Common Agricultural Policy (CAP) to conserve these landscapes (Tisdell and Hartley, 2008, Ch. 4).

Another use of the land on the Peninsula is for residential purposes. Residential clusters have developed on the Peninsula and presumably pressures exist to allow further residential development in the area given the scenic views available and the demand for rural or semi-rural living within relatively easy reach of the centre of Dunedin. However, significant residential development of the area is likely to destroy the Peninsula's current attractive environment and endanger other valuable environmental qualities of the Peninsula. Often residential developments are up to a point self-destructive; they destroy the environment that originally attracted settlers to the area.

Negative environmental impacts of residential development usually include (1) destruction of landscape values; (2) loss of natural habitat and species dependent on such habitat; (3) development of infrastructure such as roads, which often result in further destruction of natural habitat (roadside areas often contain important remnant vegetation, as is evident on the Otago Peninsula) and roads may result in

road-kills of wanted wildlife; (4) various weeds may spread from domestic gardens and (5) domestic animals, such as cats, may pose serious risks to nearby wildlife. It is also important to note that development of infrastructure to serve tourism demands, such as the widening of roads, can have adverse environmental impacts on landscape values and on biodiversity.

The above raises a number of questions: To what extent are these conservation possibilities and uses in conflict with one another? To what extent are they compatible? What is the comparative value of each use? What is the most valuable or best combination of land use on the Peninsula? These are all questions that could be discussed if there happened to be enough time to do so. For example, measures to develop ecotourism (and other forms of tourism) can conflict with the conservation of Maori heritage on the Peninsula (Higham, 2001) and agricultural activities can conflict with nature conservation. When such conflicts exist, the big issue is how to get the right balance between nature conservation and land use. This is an important question for land-use planners. The best economic balance (or set of balances) can in principle be determined. To do so, however, will not necessarily settle social conflict because, for one thing, economic values are not ultimate values.

It is likely that conserving a mosaic or mixture of land uses on the Peninsula has the most value. While nature conservation and restoration on the Peninsula have a high economic value, restoring the whole Peninsula to the 'natural' state that existed prior to European settlement (even if possible) is unlikely to be the most highly valued option. For example, in many cases, open agricultural land adds to scenic values and there is some evidence that most individuals like mosaic patterns of land use. This is not to say that further restoration of natural vegetation on the Peninsula will not add to its value. It will do so by adding to biodiversity, reducing soil erosion and providing other ecosystem services. Often the areas targeted for such restoration have limited alternative uses, for example, for agriculture.

4. The Contribution of Wildlife Conservation to the Economic Value of the Otago Peninsula – Economic Impact Analysis

The presence of wildlife, particularly of two species (the Royal Albatross and the Yellow-eyed Penguin), on the Peninsula, add greatly to its economic value and generate much needed income and employment for Dunedin's regional economy. In the year ended September 2006, from the data which I collected from wildlife establishments on the Peninsula, over a quarter of a million visits were made to wildlife attractions on the Peninsula. The annual turnover of the establishments directly utilizing wildlife as attractions was estimated to be of the order of NZ\$6.5 million. [Note that all dollar values reported in this article are for New Zealand dollars]. Four of the enterprises involved had an annual turnover in excess of one million dollars. The equivalent if 70 full-time persons were employed directly in the industry at wildlife viewing sites.

The economic impact on Dunedin's regional economy of wildlife tourism on the Peninsula in terms of its generation of income and employment was much greater than that at wildlife sites because of multiplier or flow-on economic effects. Furthermore, the presence of wildlife on the Peninsula brought visitors to the Dunedin region who would not have come in the absence of the special wildlife species on the Peninsula and induced some visitors (who would have come to Dunedin anyway) to stay longer. As a result, there was extra local expenditure on accommodation, food, drink, entertainment and travel and so on. My conservative estimates (Tisdell, 2007a) suggest that this would have directly contributed an extra \$60 million in expenditure to the local economy, and with multiplier effects (which result from further spending on the local commodities by recipients of this money) the net economic contribution can be predicted to be well in excess of \$100 million. Furthermore, the total employment generated locally as a result of the wildlife species on the Peninsula will be well in excess of the 70 full-time equivalent persons directly employed by wildlife enterprises on the Peninsula. The exact figures are not available but the total local employment generated is bound to run

into the hundreds. I have estimated (Tisdell, 2007a) that it results in the equivalent of 800-1000 extra full-time equivalent jobs in the Dunedin region.

An interesting feature of the use of wildlife on the Otago Peninsula for tourism is that the amount of land (space) that has to be forgone to preserve the terrestrial habitat of the current focal species (which are mainly marine-based) is very little. These wildlife species generate a very high economic impact on the local economy and the economic benefit per hectare of land set aside for them is huge. The agricultural returns forgone from conserving those wildlife species are minimal. In the case of sheep, some landowners who combine sheep farming with the use of Yellow-eyed Penguins as tourist attractions claim that the presence of the two species is compatible. The fact that two graziers on the Peninsula willingly combine sheep grazing with the conservation and commercial viewing of wildlife (including the Yellow-eyed Penguins) indicates that they are not sacrificing income to engage in wildlife tourism. The economic opportunity cost to landowners of engaging in wildlife tourism on the Peninsula appears to be relatively low.

The site of the Royal Albatross Colony at Taiaroa Heads on the Peninsula occupies only 8 hectares. The recent annual turnover of the Royal Albatross Centre was around \$1.6 million. Therefore, its average turnover per hectare is \$200,000 annually. When the direct and indirect economic impact of the existence of the Royal Albatross Colony on Dunedin's regional economy is taken into account, this might amount to one-third to a half the regional economic impact of wildlife on the Peninsula as a result of the local tourism generated. This would result in an average economic impact of \$4-6 million annually per hectare. Although similar figures are not available for the Yellow-eyed Penguin, their economic impact in relation to the land area they use is undoubtedly very high.

The economic impact of individual members of the key tourist species on the Peninsula is also very high. For example, there are about 30 breeding pairs of albatross at the Royal Albatross Colony. Therefore, the average annual turnover per

pair of the Royal Albatross Centre is about \$50,000 and the economic impact on Dunedin's regional economy is \$1-2 million annually. Each pair of Yellow-eyed Penguins on the Peninsula would also have a very high impact. There are estimated to be about 200-250 Yellow-eyed Penguins nest on Otago Peninsula (see Figure 2). This suggests that the average economic impact of each pair of these Yellow-eyed Penguins on the Dunedin regional economy is about a quarter of a million dollars annually assuming that about \$60 million annually is the economic impact locally from the presence of these penguins. This assumption is reasonable because visits to sites on the Peninsula that have the Yellow-eyed Penguin as an attraction now generate about twice the revenue obtained by the Royal Albatross Centre (Tisdell, 2007a). It is now the premier wildlife attraction in economic terms (Figures 3 and 4). However, only a small proportion of Yellow-eyed Penguins on the Peninsula is available for viewing by tourists. The economic impact of those utilized for viewing is clearly much higher on average than a quarter of a million dollars



Figure 2: A Yellow-eyed Penguin with its juvenile at its nest on the Otago Peninsula
[Photograph kindly supplied by the Yellow-eyed Penguin Trust, Dunedin, New Zealand].



Figure 3: A close-up view of the head of a Yellow-eyed Penguin.
[Photograph kindly supplied by the Yellow-eyed Penguin Trust, Dunedin, New Zealand].



Figure 4: Yellow-eyed Penguins engaged in preening on the Otago Peninsula. This species is now the premier tourist attraction on the Otago Peninsula.

[Photograph kindly supplied by the Yellow-eyed Penguin Trust, Dunedin, New Zealand].

The economic benefits forgone (these are opportunity cost and should be compared with the economic benefits gained) of conserving wildlife vary with the wildlife species involved. On the Peninsula, the main species used for tourism are those that find their food in marine areas but come ashore to rest and reproduce. Seals and sea lions use mainly shoreline areas for this latter purpose whereas Yellow-eyed Penguins and Little Blue Penguins (*Eudyptula minor*) venture further afield but do not go far from the shore, and the Royal Albatross uses a small area of a headland for this purpose. Overall the terrestrial area used by these wildlife species is quite small, the species do not compete with livestock for food or predate on them, and most of the areas used by them do not seem to be of high value for livestock grazing. Hence, the economic benefits forgone by graziers in conserving these species seems to be low. Some, however, such as seals and sea lions could have adverse impact on human fishing activities (see Wright, 1998) and in some cases mariculture. It has also been suggested that they could create water pollution problems which could adversely affect sales of littlenecked clams from Papanui Inlet (personal

communication on August 16, 2007, from Lala Frazer based on advice from Roger Belton of Southern Clams).

Furthermore, the return of Hooker's Sea Lion (*Phocarctos hookeri*) to the Otago Peninsula (Wright, 1988) has created a new challenge for the conservation of the Yellow-eyed Penguin because some of these sea lions predate on Yellow-eyed Penguins. Therefore, their presence is not welcomed by all of those who are trying to conserve the Yellow-eyed Penguin on the Otago Peninsula.

One of the reasons why the presence of wildlife on the Otago Peninsula has a high economic impact on the local economy is that most accessible sites for viewing the main species used for wildlife tourism can only be reached by way of privately owned land or land under the control of a Trust. This means that in most cases, landholders have the right of exclusion of visitors and can charge a fee for access. This results in a larger appropriation of outside money for the local economy than if there were open access to the viewing of the focal wildlife species. It may also result in their more effective protection and conservation than otherwise would occur with open-access because landholders are able to profit or obtain income from wildlife tourists. This provides them with an economic incentive to conserve those species which provide them with income. In fact, in one area on the Otago Peninsula where there is public access for viewing the Yellow-eyed Penguin, significant conservation problems have emerged because unsupervised visitors have been disturbing Yellow-eyed Penguins at their nesting sites and the number nesting at this site (Sandfly Bay, the most southerly site on the Peninsula for Yellow-eyed Penguins indicated in Figure 1) have declined. Significant adverse visitor impacts on these penguins have reduced their numbers in this area and could see them eventually disappear there (Fouts, 2008). It has been suggested that public volunteers be recruited to control visitors at Sandfly Bay as has been done at Pilots Beach, a public beach just inside the entrance to Otago Harbour, where Little Blue Penguins come ashore (Fouts and Harwood, 2008).

The above observations imply that economically important wildlife species on the Otago Peninsula have a higher chance of surviving and adding sustainably to the economic value of the Otago Peninsula if they are in areas under the control of New Zealand Trusts (which are in effect, government empowered NGOs) or the species are on land areas under private control. Areas in which there is public access (open access) jeopardize the long-run survival of those species when visitor numbers increase because visitors interact negatively with these species (Tisdell, 2001, Ch.2) unless visitors are subject to community control, for example, by volunteers in conjunction with the New Zealand Department of Conservation as at Pilots Beach. Also, as mentioned above, open-access wildlife tourism is likely to have a smaller economic impact on local communities than in cases where access-fees are charged for wildlife viewing.

Another feature that adds to the economic impact of wildlife on the Otago Peninsula is that this wildlife is not located far from a major city, Dunedin. This means that it is relatively accessible and the cost of travelling to it once in Dunedin is low. The comparative location of the Otago Peninsula adds to its economic value for tourism and other purposes.

Several examples exist of commercial wildlife tourism being combined with livestock grazing on the Peninsula. Nevertheless, views differ about how desirable this combination is because there is usually some loss in natural biodiversity as a result of grazing by livestock. In this regard, the efforts of the Yellow-eyed Penguin Trust are important because it is not only trying to conserve the Yellow-eyed Penguin but to restore the natural habitats associated with it. Consequently, its activities add value by enriching natural biodiversity and its revegetation programme in many areas reduces soil erosion. It makes an important contribution to the land use mosaic on the Otago Peninsula, and generates environmental value beyond its contribution to conserving the Yellow-eyed Penguin. Its strategies also help to reduce the risk that the Yellow-eyed Penguin will disappear from the Otago Peninsula prematurely.

There has been remarkable expansion in the economic importance of wildlife tourism on the Peninsula in the last two decades. For example, in 1987 there appear to have been no more than 14,000-15,000 persons engaging in wildlife tourism on the Peninsula (Tisdell, 1988). By 2006, this number had swelled to an estimated 200,000. It had increased by more than 13 times the 1987 figure and its local economic impact in all probability increased by much more than this. The fastest growth was in visitor participation in viewing Yellow-eyed Penguins. Whereas this was minimal in 1987 (and was dwarfed by the viewing of the albatross), viewing Yellow-eyed Penguins was the major tourist wildlife activity on the Peninsula in 2006. More visitors to the Otago Peninsula participated in the viewing of Yellow-eyed Penguins in 2006 than participated in gazing at the Royal Albatross (Tisdell, 2007a). However, the rapid and significant growth in wildlife tourism on the Peninsula is creating some capacity problems and difficulties for the wildlife tourism (Tisdell, 2007a). For example, during peak tourist periods many visitors to the Royal Albatross Colony do not get a chance to view albatross from its hide because it is not large enough to cope with the demand.

There are of course other wildlife on the Peninsula that are a part of the wildlife tourism mix and which use the foreshores. These include Hooker's Sea Lion, New Zealand Fur Seals (*Arctocophalus forsteri*), Little Blue Penguins and others (Kai Tahu ki Otago, p.49) even though they are not the main wildlife tourist attractions at present.

5. Non-use Economic Values and Social Values Associated with the Otago Peninsula add to the Value of Conserving its Wildlife

The economic benefits and the value of the Otago Peninsula are, of course, not just confined to the Dunedin region. It is drawcard for visitors to New Zealand and to the South Island. Available data indicate that the majority of persons viewing wildlife on the Otago Peninsula are from overseas. Such visitors have a positive economic impact on the whole of New Zealand's economy. Thus, the presence of

the Otago Peninsula with its particular attractions has a positive economic impact in New Zealand generally.

Tourism provides an economic incentive for conserving wildlife on the Otago Peninsula but it is not the only (economic) reason for conserving wildlife there. Efforts by bodies such as the Yellow-eyed Penguin Trust help satisfy public demands for conserving wildlife and biodiversity and provide a safety back-up to the local wildlife tourism industry. In addition, expenditure by such bodies adds to local employment and incomes. These are all extra economic benefits. Furthermore, there are social benefits to the local community via voluntary contributions to such conservation efforts. The results should also add to community pride in these conservation achievements.

Economists recognize that even when individuals do not use a facility or commodity, they may still place an economic value on it. These values are referred to as non-use economic values (Tisdell, 2005, pp.110-113). Some individuals who do not visit Otago Peninsula may value its continuing existence and will want to conserve its existing attributes, such as its wildlife. They might, in principle, be willing to pay for this conservation even though they have little intention of visiting it. This is described as *existence value*. Or some may wish to pay for its conservation because they want to keep open the opportunity of visiting it in the future. This is called *option value*. Furthermore, some non-users may want to conserve the Peninsula for the benefit of future generations and be prepared to pay to do so. This is called *bequest value*. In addition, it is possible that those who actually visited the Peninsula would be willing to contribute more than they paid for the visit (or even more than the maximum they would have been willing to pay for the visit) to ensure the future existence of the Peninsula in a desired state, retain the option of visiting it again, or to ensure that it is conserved in a desired state for the benefit of future generations. These non-use values are difficult to estimate but can still be very important. There are, however, no reliable estimates of the existence, option and bequest values for the attractions of the Otago Peninsula.

As mentioned above, economics is unable to capture or measure all values. This is true for example, of social or sociological values. Conservation activities on the Otago Peninsula have provided a basis for significant social cooperation involving non-government organizations, trusts and government bodies. This has social value because it helps to empower local communities, promotes social cohesion, provides individuals with a sense of belonging, and enhances their social purpose. Social benefits of this type have been well documented by Dianne Buchan (2007).

6. Concluding Observations

Valuing geographical assets, such as the Otago Peninsula with all of its associated attributes, is likely to result in a variety of estimates depending on one's point of view. There can be no doubt, however, that the Otago Peninsula is a very valuable asset from varied points of view. Its economic value for wildlife tourism alone is large. I have estimated that wildlife tourism on the Peninsula pumps more than \$100 million per year into Dunedin regional economy, ensures the employment of several hundred (800-1000) people locally and has some wider positive economic impacts on New Zealand's economy. Moreover, existence, option and bequest benefits from wildlife on the Peninsula further add to its economic value. In addition, community-led conservation initiatives on the Peninsula (often involving NGOs, trusts and the Department of Conservation) increase the social value of conservation on the Peninsula even though this cooperative aspect is not captured by economic measures of value. While the full economic potential of conservation on the Peninsula has not yet been realized, continuing growth in wildlife tourism on the Peninsula is facing some capacity constraints, environmental and economic challenges which are outlined in Tisdell (2007a). Nevertheless, even if the rate of growth in wildlife tourism on the Otago Peninsula slows, the value of this Peninsula for wildlife tourism and nature conservation will still remain huge. It is an asset well worth conserving.

In concluding, let me stress that wildlife need not be used commercially to be of economic value nor need it be a tourist attraction. The Yellow-eyed Penguin Trust does not utilize the Yellow-eyed Penguin for tourism. Yet the Trust's efforts to conserve the Yellow-eyed Penguin and restore its natural habitats and associated biodiversity on the Otago Peninsula (and elsewhere) have economic value, according to modern concepts of economic value. Apart from the Trust creating local employment and incomes by its expenditure, the Trust supplies conservation services that have non-use economic value. It caters for the demand of those who would like to see the continuing *existence* of the Yellow-eyed Penguin on the Otago Peninsula in a natural state, who want to retain the *option* of interacting with it in the future and who would wish to make it available to future generations as a *bequest* for them to enjoy. In addition, habitat restoration and predator control by the Trust provide general environmental services and side-benefits of economic value. Furthermore, the activities of the Yellow-eyed Penguin Trust and other conservation organizations focusing on the Otago Peninsula generate important social and sociological values (Buchan, 2007). These cannot be satisfactorily measured in terms of economics but nevertheless, add to the value of the Otago Peninsula.

Economics cannot be the final arbiter of what is valuable but it can be a very useful input into deciding what is valuable. Even if the economic benefits from conservation on the Otago Peninsula happened to be low, many might believe it to be important to conserve the current attractions of the Peninsula. The case for putting a high priority on conservation on the Otago Peninsula is strengthened by the fact that this also yields high economic benefits.

The survival of key wildlife species used on the Peninsula for tourism is by no means guaranteed. Continuing conservation effort is needed to safeguard the species there. The loss of the key species would be a major economic blow to Dunedin's regional economy, to its social activities, and result in a significant loss of biodiversity. At the present time, wildlife conservation effort is concentrated on

shorelines and nearby land areas on the Peninsula. However, the importance of offshore areas (as feeding grounds) for the key wildlife species also needs to be kept in mind.

The public needs to be kept aware of the importance of conserving wildlife on the Otago Peninsula and how it adds value to the Peninsula. The support given by Mainland (a New Zealand manufacturer of cheese and other dairy products) to the Yellow-eyed Penguin Trust has played a very positive role in that regard and the new initiative by Vodafone (a supplier of mobile telephone services) to provide support to the Yellow-eyed Penguin Trust will help further. The effort to keep the public informed needs to continue and to be adequately funded. Otherwise, the public is likely to lose sight of the value of conservation on the Peninsula and political support for wildlife conservation there may falter.

7. Acknowledgements

This is a revised paper prepared for a Public Lecture given on October 12, 2007 at the St. David Street Lecture Theatre, The University of Otago, Dunedin on the occasion of the Yellow-eyed Penguin Trust's 20th Anniversary Conference, "Almost an Island: Valuing Otago Peninsula". This lecture was sponsored by the Department of Tourism, School of Business, Otago University and The Yellow-Eyed Penguin Trust. I am grateful to the Yellow-eyed Penguin Trust and its donors for their support to me which has enabled me to complete the research for this paper. I thank all those in the Dunedin area who gave of their time to answer my questions and follow up my queries. In particular, I would like to thank David McFarlane for the assistance he has given to me with this project and Dr. Dorian Owen of the Department of Economics, Otago University, for assistance in gathering relevant secondary economic data for this project and his Department for providing me with facilities during my visit to Dunedin. Comments by David McFarlane and Hemanath Swarna Nantha on the original draft of this paper are appreciated. Margaret Suman's help in supplying photographs of the Yellow-eyed Penguins on

behalf of the Yellow-eyed Penguin Trust is gratefully acknowledged. The usual caveat applies.

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