

ECONOMICS, ECOLOGY AND THE ENVIRONMENT

Working Paper No. 172

**World Heritage Listing of Australian Natural
Sites: Effects on Tourism, Economic Value and
Conservation**

by

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October 2010



THE UNIVERSITY OF QUEENSLAND

ISSN 1327-8231
**WORKING PAPERS ON
ECONOMICS, ECOLOGY AND THE ENVIRONMENT**

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¹ This is a draft chapter for the book *The Economics of Nature Based Tourism and Conservation* by Clem Tisdell and Clevo Wilson to be published by Edward Elgar, in 2011. There is some overlap between this paper and No. 60 in this series. Feedback is welcome.

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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.

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World Heritage Listing of Australian Natural Sites: Effects on Tourism, Economic Value and Conservation

ABSTRACT

This article is primarily concerned with the economic consequences of World Heritage listing for the valuation of natural properties and the economic impacts of this listing. Australian data is used to throw light on this subject. Conceptual problems that arise in valuation are explored and several neglected limitations of the travel cost method for estimating the demand for visits to natural sites are mentioned. The importance of economic impact analysis in this context (especially its political ramifications) is given attention. The use of World Heritage listing for political purposes is discussed. It is argued that World Heritage listing favours the long-term conservation of natural properties.

Keywords

Conservation of natural areas; economic impact analysis; economic valuation; tourism; travel cost method; World Heritage listing.

JEL Classification

L83, Q26, Q57

World Heritage Listing of Australian Natural Sites: Effects on Tourism, Economic Value and Conservation

1. INTRODUCTION

The Convention concerning the Protection of World Cultural and Natural Heritage was adopted by the General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in November 1972. The impetus for developing this convention came from the United Nations Conference on the Human Environment held in Stockholm in 1972. The preamble to this convention points out that “parts of the cultural and natural heritage are of outstanding interest and therefore, need to be preserved as part of the world heritage of mankind as a whole”. This convention is designed to address this need.

Properties are only accepted for listing as World Heritage properties if they have “values that are outstanding and universal”. They must meet at least one of ten criteria (Anon, 2010a). The criteria for selection are that a property should satisfy one or more of the following requirements:

- (1) should “contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance”;
- (2) contain “outstanding examples representing major stages of the Earth’s history; including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features”;
- (3) possess “outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial fresh water, coastal and marine ecosystems and communities of plants and animals”; or

(4) have “the most important and significant natural habitats for on-site conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation”.

In 2009, 890 properties had World Heritage listing. Most of these were listed for cultural reasons. Only 176 had been listed solely for natural reasons. Australia is a party to the World Heritage Convention. Most of its listed properties have been listed for natural reasons and it has more properties listed in this category than any other country (see Anon, 2010b).

This article is primarily concerned with the impacts of the World Heritage listing of a natural property on tourist visits to the property and its valuation by tourists. However, this article also considers other issues as well such as the possible consequences for conservation of World Heritage listing. Furthermore, several important problems involved in measuring the economic value of a tourist site are examined. Australia is taken as a case study for this purpose.

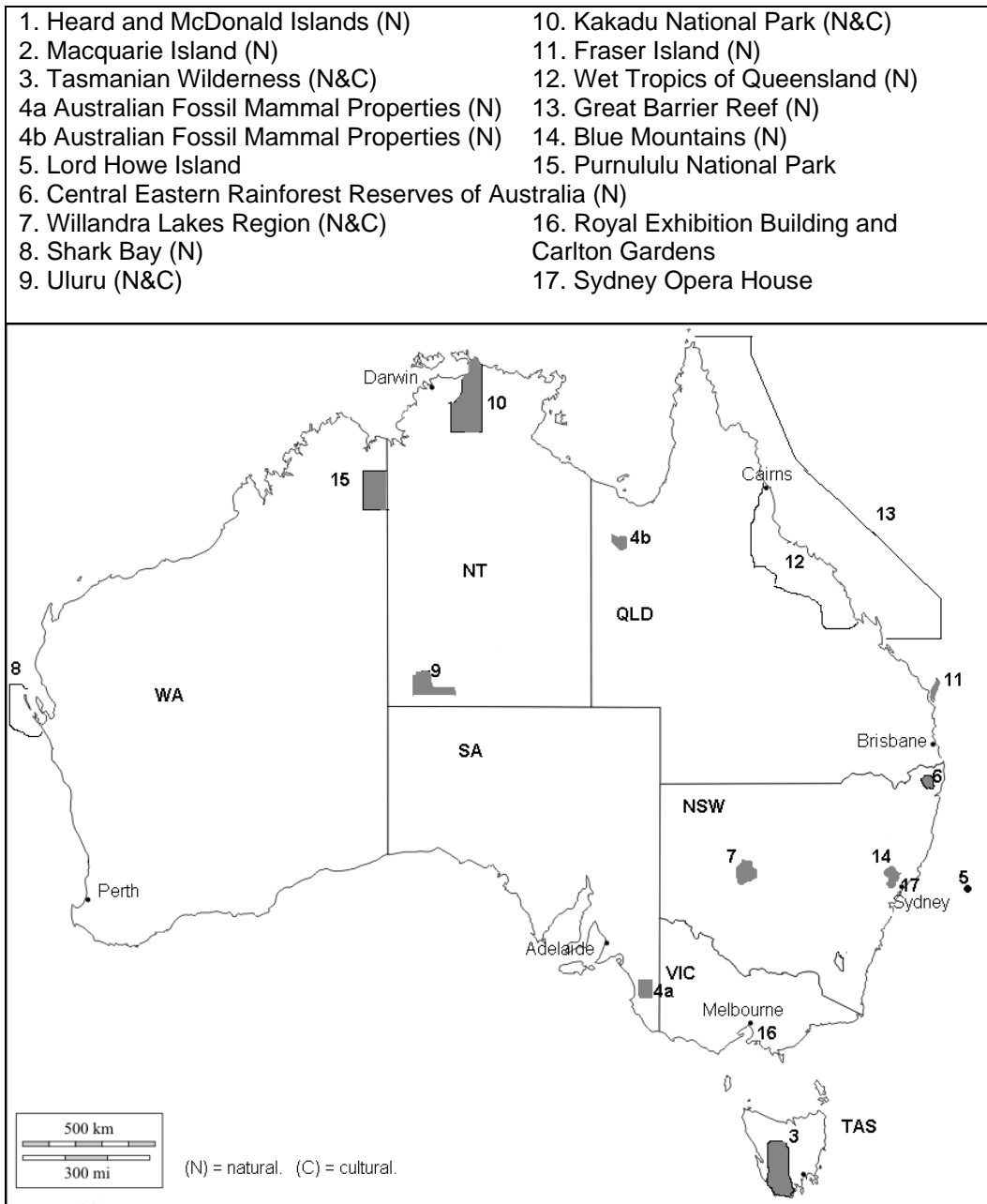
More specifically two main issues perceived as resulting from World Heritage listing are discussed, namely (1) whether it promotes increased tourism and (2) whether it raises the tourism economic value of natural sites by acting as a signalling device. With regard to issue (1), the likely impacts of World Heritage listing are examined conceptually and then available Bureau of Tourism Research (BTR) International Visitor time-series data are used to explore the consequences of this listing. Only data for international visitors are used because satisfactory time-series data for domestic visitors are not available. Issue (2) is examined by considering the applicability of utilitarian welfare economics. Particular problems raised by applying the travel cost method (TCM) in this context are highlighted. Alternative measures of economic value are also discussed, such as economic impact, and the relevance of the Total Economic Value (TEV) concept is considered. A discussion of conservation effects of World Heritage listing rounds off this article.

2. AUSTRALIA'S WORLD HERITAGE PROPERTIES

Australia's first World Heritage properties (the Great Barrier Reef, Kakadu (first stage) and Willandra Lakes) were declared in 1981 and more recently the Greater Blue Mountains (west of Sydney) was declared in November 2000 (Environment Australia, 2000a). Australia has the highest number of World Heritage listed natural properties in the world, which indicates the richness of this country's natural and geological assets. Some World Heritage properties in Australia comprise both public and private property, many cover a vast area, and some are compact while others are composed of many fragments. For example, the length of the Great Barrier Reef property is approximately 2,000 kilometres. The Central Eastern Rainforest Reserves of Australia (CERRA) property is spread over a wide area covering two states and is the most disjoint of Australia's World Heritage properties, comprising 44 distinct reserves ranging from 11 ha up to 122,110 ha in size (Pugh, 2001, p.1). The Wet Tropics World Heritage Area consists of 19 national parks, 31 state forests, five timber reserves and one aboriginal and islander reserve, extending from sites near Cooktown to some south to Townsville, a distance of approximately 450 km. The Tasmanian Wilderness property is made up of a collection of national parks and nature reserves and covers approximately 20% of Tasmania. The Australian Fossil Mammal sites (Naracoorte in South Australia and Riversleigh in Northwest Queensland), though small, have portions in two states. Furthermore, Australian World Heritage properties vary in terms of their degree of remoteness and their accessibility from Australia's capital cities. For example, the Greater Blue Mountains World Heritage site is easy to access from Sydney, while Heard/McDonald and Macquarie Islands in the sub-Antarctic zone are distant from the Australian mainland and difficult to access. Nevertheless, Macquarie Islands do receive some tourists on their way to Antarctica (see Kriwoken and Holmes, 2007; and Chapter 5 in Tisdell and Wilson, forthcoming).

The locations of Australia's World Heritage properties are shown in Figure 1, and the year of their listing is reported in Table 1. Most of the properties have relied heavily on natural criteria for their listings, although Aboriginal heritage is significant for four of these properties (for example, Uluru and the Queensland Wet Tropics). In 2004, the

Royal Exhibition Building and the Carlton Gardens in Melbourne were World Heritage listed as a single property purely on cultural criteria and this was followed by the Sydney Opera House in 2007. Queensland has the largest number of natural World Heritage properties in Australia (five), two of which are shared with other states (New South Wales and South Australia).



Source: Adapted from Environment Australia (2000b), and updated

Note: Properties 1 and 2 are not shown because they are located far south of the Australian mainland. Heard and McDonald Islands are located 1500 km north of Antarctica and Macquarie Island is located 1500 km south-east of Australia. These islands highlight the remoteness of some of Australia's World Heritage properties.

Figure 1 The location of Australia's World Heritage listed properties (2009)

Table 1 Australia's World Heritage listed properties in 2009 and the initial year of listing

Name of property	Status	Year of initial listing and extension
1. Great Barrier Reef	(N)	1981
2. Kakadu National Park	(N and C)	1981 (stage 1) 1987 (stage 2) 1992 (stage 3)
3. Willandra Lakes Region	(N and C)	1981
4. Tasmanian Wilderness	(N and C)	1982 1989 (extended)
5. Lord Howe Island Group	(N)	1982
6. Central Eastern Rainforest Reserves (Australia)	(N)	1986
7. Uluru - Kata Tjuta National Park	(N and C)	1987
8. Wet Tropics of Queensland	(N)	1988
9. Shark Bay, Western Australia	(N)	1991
10. Fraser Island	(N)	1992
11. Australian Fossil Mammal Properties (Riversleigh and Naracoorte)	(N)	1994
12. Heard and McDonald Islands	(N)	1997
13. Macquarie Island	(N)	1997
14. Blue Mountains	(N)	2000
15. Purnululu National Park	(N)	2003
16. Royal Exhibition Building and Carlton Gardens	(C)	2004
17. Sydney Opera House	(C)	2007

Source: Adapted from Environment Australia (2000b) and Anon (2010)

It should be noted that the tourism potential of a property is not mentioned as a consideration in its eligibility for World Heritage listing. For example, given the criteria for listing of a natural property, some properties may have significant tourism potential and others possess very little such potential. Therefore, the tourism potential of a property is incidental to its listing. Properties to be listed must be nominated by state parties to the Convention. The possibility that a listing could increase the number of tourism visits and demand may sometimes influence governments in proposing a nomination. For developing countries, the possibility of access to the World Heritage Fund to assist with conservation of listed properties could be a factor in government decisions to propose properties for listing.

Although the tourist value of a property is not a stated criterion for its inclusion in the World Heritage List, it is clear that many listed properties are valuable assets for tourism and that their listing is frequently used to promote them as tourist attractions. An example of the latter is a recent travel guide to France which emphasizes that France has numerous World Heritage properties (mostly cultural) with considerable tourist appeal (Williams et al., 2009, p.28).

3. VARIATIONS IN VISITOR NUMBERS AS A RESULT OF WORLD HERITAGE LISTING

Some possible impacts of World Heritage listing of trends in the number of visits to a property is illustrated in Figure 2(a) and in Figure 2(b). In Figure 2(a), it is assumed that a property is inscribed on the World Heritage list at time t_r . The number of visitors to the property follows the time-path ABC in the absence of listing but diverges along path BD when listing occurs. Other things unchanged, the difference between curves BD and BC provides an indication of the increasing demand for tourism to this protected area due to its World Heritage listing. As time passes and with sustained and increased marketing of World Heritage properties, visitor numbers can be expected to increase. Furthermore, it is also possible that after World Heritage listing visitor numbers could show an instantaneous increase as shown in Figure 2(b). However, this trend is less likely than the former because it takes time for visitors to acquire information, plan visits and save for such visits which can be expensive. If an instantaneous increase were to be recorded, it is more likely to come from domestic rather than foreign visitors.

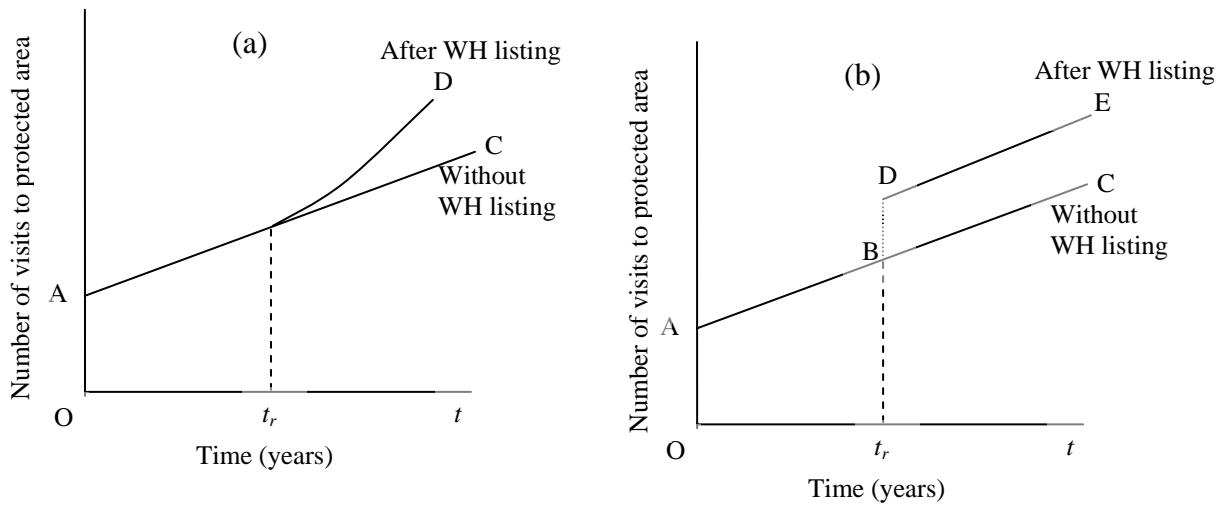


Figure 2 Hypothetical time-paths for visits to a protected area with and without World Heritage (WH) listing

Time-series data for the volume of tourist visits are now used to examine the consequence of listing for the number of visitors. For this purpose, available data (compiled by the BTR 1991-1999) for World Heritage properties and non-World Heritage properties are compared to consider tourism trends during a nine-year period. International visitor data are used for this purpose. Although it is important to examine domestic visitor data as well, such data are not available as time-series. Furthermore, international visitor numbers shown in Table 2 are incomplete, but they are the only data available. Time-series for numbers of international visitors are available for well-established World Heritage properties such as Kakadu, Uluru, Fraser Island and Shark Bay from 1991 to 1999. Time-series data for this period are also available for the Wet Tropics (Kuranda only) and Tasmanian Wilderness (Cradle Mountain NP and Huon Valley only) but are incomplete. This is because these World Heritage properties are made up of a collection of national parks and reserves and data for all components are difficult to obtain. There are numerous problems in gathering data in such situations. Other World Heritage properties in Australia for which data are not available are, however, small properties and in most cases, are located in remote and inaccessible places.

The availability of time-series for visitor numbers for non-World Heritage natural sites is also limited. Some data for particular sites (such as the Rocks in Sydney) are available but are not for many natural sites. In general, analysis of changes in trends in visitor numbers as a result of World Heritage listing of properties is hampered by gaps in the available statistics.

Even when statistics for visitor numbers are available, they can be problematic. For instance, double counting of people who visit more than one national park, or site in the same World Heritage listed area can occur. For example, CERRA is made up of 50 separate reserves ((Pugh, 2001, p.2). If tourists visit more than one reserve or national park, they could be counted more than once, thereby inflating overall visitor figures for a property (e.g. CERRA visitor figures). The same problem could arise elsewhere, for example, the Wet Tropics, Greater Blue Mountains, Tasmanian Wilderness and Great Barrier Reef.

Table 2 reports visitation numbers for some World Heritage and non-World Heritage properties and their percentage increase between 1991 and 1999¹. As the data reveal, World Heritage listed properties experienced increases in international visitor numbers, but their percentage increases between 1991 and 1999 are mostly not as large as the percentage increases recorded by most of the non-World Heritage properties mentioned in Table 2. Even well-known World Heritage properties (such as Kakadu and Uluru national parks) do no better in the rate of increase in their number of visitors than most non-World Heritage properties listed in Table 2. Monkey Mia/Shark Bay is an exception.

Table 2 *Numbers (in thousands) of international visitors to specified World Heritage properties and non-World Heritage properties in Australia, 1991 and 1999, and their percentage change.*

World Heritage listed properties	1991	1999	Change%
Fraser Island/Hervey Bay (Qld)*	75.03	158.72	111.53
Wet Tropics (Kuranda, Cairns)+ (Qld)	214.3	396.8	85.09
Kakadu NP (NT)	74.63	136.04	82.2
Uluru (NT)	47.30	268.42	82.22
Monkey Mia/Shark Bay (WA)	23.17	59.82	158.15
Cradle Mountain National Park (Tas)	17.98	43.16	140.04
Huon Valley (Tas)+	17.31	18.63	7.64
Total	569.72	1081.59	89.84
Non-World Heritage listed properties			
Litchfield NP (NT)	25.53	62.50	144.82
Katherine/Katherine Gorge (NT)	54.99	95.60	73.84
Kings Canyon/Watarrka NP (NT)	31.42	136.04	332.94
The Pinnacles/Nambung NP (WA)	46.35	125.09	169.88
Kangaroo Island (SA)	25.25	63.82	152.69
Grampians NP (Vic)	35.34	89.07	152.00
Great Ocean Road, Twelve Apostles (Vic)	98.96	345.15	248.76
Phillip Island, Penguin Parade (Vic)	219.13	322.88	47.34
Total	536.97	1240.15	130.95

* Listed in 1992. *Source:* BTR Annual Reports, 1991 and 1999.

+ No international visitor data are available for properties such as the Wet Tropics and Tasmanian Wilderness. Hence, visitor numbers to nearby sites such as Kuranda are used as a proxy.

Note that, with two exceptions, the World Heritage properties in Table 2 were listed before 1991. Therefore, by 1999, adequate time had elapsed for potential visitors to become aware of the World Heritage listing of these properties. However, some visitors to World Heritage properties are unlikely to be influenced by the World Heritage ‘signalling’. Many tourists collect little information about sites that they might visit prior to visiting them (see Chapters 7 and 8 in Tisdell and Wilson, forthcoming). Some visitors only learn after visiting a site that the property is World Heritage listed. Furthermore, some visitors’ itineraries are decided by their travel agents as a part of tour packages. Therefore, the number of visitors attracted to World Heritage properties due to their listing can be expected to be only a fraction of their total number of visitors.

This aspect needs to be investigated by field surveys. A ‘natural’ increase in tourism numbers in the absence of listing (as reflected, for instance, in variations in visitor numbers to non-World Heritage sites) should also be taken into account. This underlines the point that the number of visitors to a natural site depends on multiple factors, one of which could be whether it is World Heritage listed or not.

Yearly BTR international tourist visitation data reveals strong growth in the number of international visitors to non-World Heritage properties (Table 2). For example, in 1999, more than 300,000 foreigners visited each of Phillip Island/Penguin Parade and the Great Ocean Road/Twelve Apostles. Among the World Heritage properties, Uluru, Kakadu and Fraser Island National Parks have relatively high international visitor numbers, though well below 300,000 in each case. Kings Canyon/Watarrka NP has visitation figures similar to Kakadu NP. The visitation rate for the Pinnacles/Nambung NP in 1999 is close to that of Kakadu NP and the percentage increase in visitor numbers between 1991 and 1999 for Pinnacles/Nambung NP is greater than for Uluru, Kakadu, and Fraser Island. BTR visitor numbers available for the Grampians NP, Flinders Ranges NP, West MacDonal Ranges NP and Rottnest Island public reserve from 1996 to 1999 (Table 3). These also show strong yearly visitor growth rates for non-World Heritage sites. From Table 2, it can be seen that in the early 1990s most selected World Heritage properties had higher yearly international visitor numbers than non-World Heritage sites. However, by the late 1990s visitation rates to the selected non-World Heritage sites had grown rapidly equalling or exceeding those at the World Heritage sites listed.

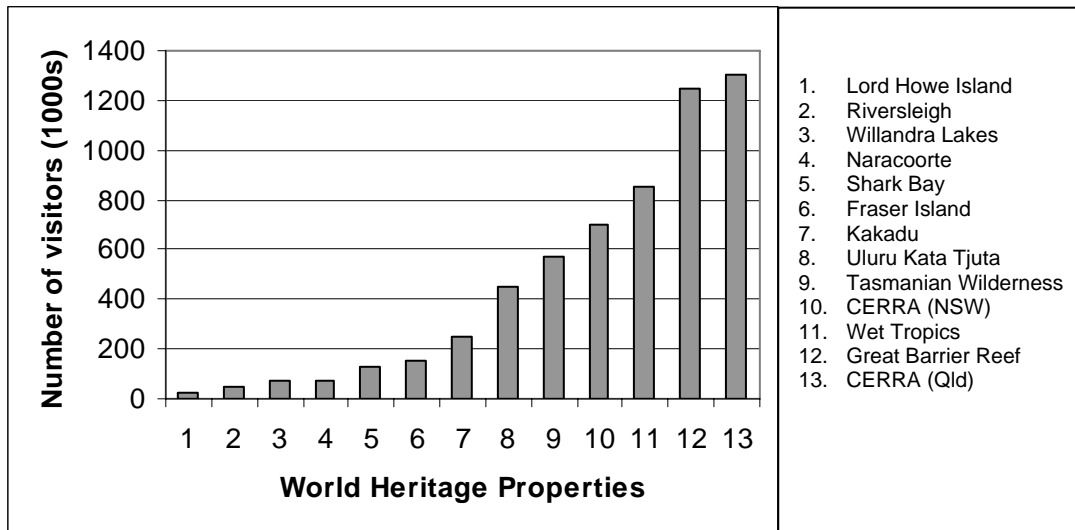
Table 3: Additional data on numbers (in thousands) of international visitors to World Heritage properties and non-World Heritage properties in Australia, 1996 and 1999, and their percentage changes

World Heritage listed property	1996	1999	Change (%)
Naracoorte Caves	11.87	12.76	7.51
Non-World Heritage listed properties			
Blue Mountains (NSW)*	831.90	811.02	-2.51
Rottneest Island (WA)	78.78	135.97	72.59
Flinders Ranges, Wilpena, Pound, Arkaroola (SA)	26.71	41.48	55.29
West MacDonalld Ranges (NT)	NA	51.47	-
Grampians NP (VIC)	NA	89.07	-

* Blue Mountains was declared a World Heritage property only at the end of 2000.

Source: BTR Annual Reports, 1996 and 1999.

Observe that properties close to major cities such as Fraser Island NP (approximately 350 km north of Brisbane) and the Pinnacles/Nambung NP (approximately 175 km north of Perth) have experienced high growth rates. Available BTR data (Table 3) reveal that the Greater Blue Mountains area, which is approximately 100 kilometres west of Sydney, attracted large numbers of visitors during and before 1999, that is prior to its World Heritage listing. The number of visitors to it is well in excess of that to any other of the properties listed in Tables 2 and 3. The high numbers are explained to some extent by the fact that Sydney is a major port of entry and departure for tourists² and the Blue Mountains is in close proximity to it. These observations indicate that natural sites close to major cities are comparatively greater drawcards for international visitors than more distant natural sites. This is largely explained by the fact that major cities are significant ports of entry for overseas visitors and substantial increases in travel costs and time are needed to travel to sites distant from these centres.



Source: Adapted from Thorsell and Duffy (1997, p.7).

Figure 3: Annual number of visitors to Australia's World Heritage properties per year in the mid 1990s³

Data presented in *Australia's World Heritage* by Thorsell and Duffy (1997), reported in Figure 3, provide further support for this point. For example, the Willandra Lakes region has few visitors, whereas CERRA, particularly the Queensland section, which is close to Brisbane and the Gold Coast, has a relatively high number of visitors. Figure 3 indicates that visitation to many properties (for example, Willandra Lakes region which was declared a World Heritage site in 1981 and Lord Howe Island) remains quite low while numbers for some others are very high (for example, CERRA which was declared a World Heritage site in 1986). BTR data for Naracoorte (Table 3) also show that few foreigners visited this property in 1996 and in 1999. While the Great Barrier Reef and the Wet Tropics are distant from the state capitals of Australia, they are outstanding natural properties and Cairns is a port of entry to Australia.

4. LIKELY REASONS FOR SLUGGISH GROWTH IN VISITS TO WORLD HERITAGE LISTED AUSTRALIAN PROPERTIES

There are several possible reasons why World Heritage properties (specified) have had smaller percentage increases in tourist numbers than selected non-World Heritage properties based on the available secondary data (see Tables 2 and 3). Most of these reasons may only be verified by a survey of visitors to World Heritage properties and non-World Heritage properties. World Heritage listing of properties has probably added to their tourist visitation rates but not by as much as claimed by some Australian government departments. For instance, the World Heritage Unit, Department of the Environment, Sport and Territories (1995, p.56) (subsequently known as Australian Heritage Commission and located in the Department of Environment and Heritage) was of the view that World Heritage listing has 'resulted in greatly increased visitation from overseas and within Australia'. The following observations are relevant:

- (1) Many World Heritage listed properties were marketed as exceptional long before their acknowledgement as 'areas of outstanding value' through their World Heritage listing. In such cases, their World Heritage listing may only have resulted in a minimal impact on their visitor numbers.
- (2) It is possible that visitor numbers to some World Heritage sites grew rapidly soon after their World Heritage listing in the 1980s and began to stabilise in the 1990s. BTR data are not available for the 1980s to examine whether this was the case. Nonetheless, although Fraser Island and Shark Bay (declared as World Heritage properties in the early 1990s) experienced large increases in international visitor numbers up to 1999, many non-World Heritage properties also recorded large increases in visitor numbers during this period (Table 2). However, the Willandra Lakes region, declared a World Heritage property in 1981, still experiences low visitor numbers (Figure 3)⁴.
- (3) Although it is perceived that World Heritage listing of a property makes it an iconic attraction, there are other factors that influence visitors' decision-making. Distances to properties, costs involved in travel, family size, age of family and the season

(especially the hot and wet weather in the north of Australia) are likely to affect visitors' decision-making. As can be seen from the data, properties that are close to major cities usually have larger visitation numbers than those that are not. Even zoos and aquariums attract large numbers of visitor because they are either located in or close to cities. Such visits are mainly family outings with children involved. Furthermore, properties close to special attractions such as whale watching at Hervey Bay, the rainforest Skyrail or the Scenic Railway at Kuranda and the Gold Coast beaches increase respectively demand to visit Fraser Island, some Wet Tropics national parks and reserves (e.g. Barron Falls) and CERRA (Queensland component). For example, Lamington NP which is part of CERRA and is approximately 125 km south of Brisbane is a popular tourist destination that would attract foreign (and also Australian) tourists, with or without World Heritage listing. At Kuranda, the special tourist attractions which are not World Heritage related (for example, the Kuranda Scenic Railway and the butterfly farm catering to family groups with easy access) bring visitors to the area and it is unlikely that the majority of visitors were influenced to visit by the World Heritage 'signalling' effect. However, this has not been empirically determined.

- (4) Similarly, World Heritage properties that are located close to (or in) the ocean where there are attractive marine areas and beaches such as the Great Barrier Reef, Fraser Island, Monkey Mia/Shark Bay and some World Heritage listed national parks and reserves in the Wet Tropics have relatively larger tourist visitation numbers (see Table 2). Non-World Heritage properties, too, benefit from these special features. This is another aspect that is yet to be empirically examined.
- (5) The purpose of travel by tourists (for example, whether it is for holiday, business or visiting friends and relatives) needs also to be taken into account. Mere World Heritage listing does not guarantee increased visitation rates. However, one of the purposes for a visit to a natural site might be to see a place people have heard much about, such as a World Heritage listed site.
- (6) Properties are declared as World Heritage properties for their 'outstanding universal natural or cultural values'. However, often these values interest mostly 'specialist' tourists rather than 'generalists'. Specialist tourists are fewer in

numbers than generalists. An example can be cited. The Greater Blue Mountains World Heritage area boasts of giving refuge to 114 endemic plant species found nowhere else on Earth (Environment Australia, 2000c). This was one of the main reasons for its declaration as a World Heritage property. Obviously, the majority of the 900,000 international visitors in 1999 to the Greater Blue Mountains did not visit to see the rare plants. In this case, the rare plants would have interested mainly the specialists rather than the generalists. Furthermore, the publicity arising from World Heritage listing is more likely to inform generalists than specialists⁵.

- (7) Uluru (which attracts large numbers of visitors) is a unique geological phenomenon. There are no close 'substitute' properties. Because it is remote, tour operators combine visits to nearby properties (mainly natural sites) and hence, value is added to the visits of tourists to Uluru. This complementarity may explain why unlisted national parks in close proximity to well-known World Heritage properties have also recorded increases in visitor numbers (see Table 2).
- (8) Some World Heritage properties have limitations placed on visitor numbers (for example, Lord Howe Island) and some properties are too remote (for example, Heard and McDonald Islands) for the average visitor, who is a non-specialist visitor to travel to those sites. In such instances, World Heritage listing does not increase tourist numbers significantly.

5. SUBSTITUTION AND COMPLEMENTARY EFFECTS OF LISTING

The above analysis considers only the effect of World Heritage listing on the number of visits to the listed property itself. There may, however, be positive or negative effects on the numbers of visitors to other natural sites. It is conceivable that observed increases in demand to visit a property because of its World Heritage listing may be at the expense of visits to other protected areas, that is, a substitution effect may be present. One would have to consider the size of this effect to ascertain how net visitation rates to protected areas as a whole alter as a result of World Heritage listing of a property. Furthermore, the geographical pattern of the substitution may vary and only some protected areas may lose visitors to World Heritage areas⁶. On the other hand, complementarity (as

mentioned above) is also possible. The World Heritage listing of a protected area may not only increase demand to visit this protected area but also increase demand to visit other areas. Furthermore, foreign visitors may exhibit a different demand response rate for World Heritage listing in comparison to Australians.

From the data available, it is difficult to measure substitution or complementary effects resulting from World Heritage listing. The limited data indicate that the demand for visits to non-World Heritage natural properties in Australia remains high despite the existence of 15 natural World Heritage properties. It is possible that there is some substitution effect but it could be small. The substitution effects may be confined to areas close to cities while World Heritage properties in remote Australia probably complement non- World Heritage properties in their region. Unfortunately, however, we lack empirical evidence about these effects.

Complementary benefits from listing may accrue to some national parks that are located close to World Heritage properties. This is especially so for non-World Heritage properties in remote and interior locations. For example, Litchfield National Park in close proximity to Kakadu, and national parks near Uluru may receive complementary visits because of their proximity. Without the presence of close-by World Heritage listed properties marketed internationally, these unlisted properties may not have as many tourist visits as currently experienced. Data need to be collected to show whether visitors also cover lesser-known parks during journeys to popular national parks such as Kakadu and Uluru. In fact, many tourist operators offer tour packages to World Heritage areas that also cover neighbouring national parks and reserves. Examples include Kakadu and Uluru national parks. It appears that Kakadu NP complements Litchfield NP located approximately 125 km to its west and also visits to Katherine Gorge. Kings Canyon/Watarrka NP probably has an increase in visitation rates by being located relatively close to Uluru and Alice Springs. Non- World Heritage properties may also complement other national parks and reserves, but such an examination is beyond the scope of this study. Most likely (although the necessary data for comparison purposes are unavailable) visits to the Great Barrier Reef (World Heritage listed property) raise demand for some World Heritage listed national parks and reserves(e.g. Daintree NP, Barron Falls and surrounding areas) in the Wet Tropics World Heritage

area and vice versa. These two World Heritage areas run parallel for hundreds of kilometres and in some instances, the distance between them is only a few kilometres.

6. MEASURING THE ECONOMIC VALUE OF WORLD HERITAGE LISTING OF A NATURAL AREA: MEASURES FROM TRADITIONAL WELFARE ECONOMICS

As mentioned above, World Heritage listing of a natural area acts as a signalling device and may stimulate tourist visits, even though, ostensibly, the tourism potential of a property is an incidental consideration in its listing. Indeed, some listed properties such as Willandra Lakes and Heard and McDonald Islands may have little tourist potential. Nevertheless, many government bodies (e.g. Environment Australia), politicians and tourist operators claim and believe that World Heritage listing acts as a stimulus to raise the number of visits to most properties when they are listed. Where this is so, the demand curve for visits to the natural areas is shifted upward. Using standard economic theory, this movement might provide one basis for measuring the increase in the apparent touristic economic value of a natural area as a consequence of its listing as a World Heritage property.

A relevant valuation theory in this case is utilitarian-based welfare economics, such as that developed by Marshall (1890) and Pigou (1932). This theory uses monetary values for consumers' surplus plus producers' surplus to measure economic welfare. Increases in the sum of these values indicate a rise in economic welfare. While this approach is subject to several theoretical limitations, it has nevertheless been widely applied to the economic valuations of outdoor recreational sites and national parks and to social choices about land use. For instance, the theory implies that taking into account only the economic value of visits to a natural area⁷, it is socially optimal to protect the area if the total economic surplus generated as a result of visits exceeds the maximum economic surplus from its best alternative economic use. Even if entry to the protected area is free and no income is generated by these visits, its conservation and use by tourists or recreationalists could constitute its best economic use.

Using Figure 4, consider how this standard type of theory might be applied to assessing the increase in social welfare (economic value) generated by World Heritage listing of a natural area. In Figure 4, D_1D_1 represents the demand curve for visits to a natural area in the absence of World Heritage listing and D_2D_2 is assumed to be the demand curve after such listing, other things held constant. The difference between these two curves reflects the stimulus to the demand for visits provided by World Heritage listing. However, there are also likely to be some costs in managing a natural area to cater for visitors. For illustrative purposes, the marginal costs of catering for visitors is shown by line AC in Figure 4.

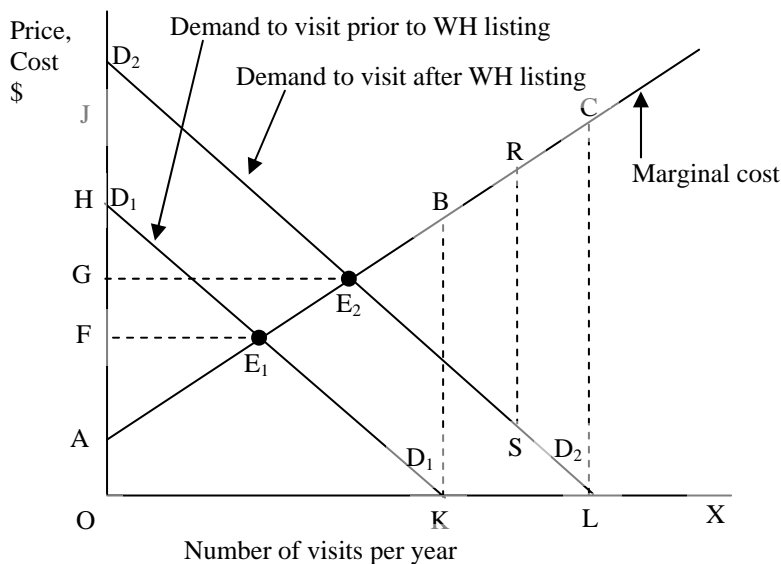


Figure 4 Diagram to illustrate the extra economic value generated by World Heritage listing of a natural area.

The impact on economic welfare (economic value) of World Heritage listing depends on policies for the pricing of entry to the natural area. If marginal cost pricing prevails and the situation shown in Figure 4 applies, the price of entry to the natural area rises from OF before listing to OG after listing. Consequently, the increase in total economic surplus (rise in consumers' surplus plus producers' surplus) due to listing is equivalent to the area of trapezium HE_1E_2J .

On the other hand, if entry to the natural area is free, and if the non-listed demand situation prevails, a deadweight social loss equivalent to the area of triangle E_1KB prevails. The consequence of listing, however, is to increase the area of this deadweight loss to an amount equal to the area of triangle E_2LC . This difference is equivalent to the area of trapezium $SRLC$, where SR is constructed to equal BK in length and therefore, the area of triangle E_2SR equals that for triangle E_1BK . Hence, total social deadweight loss rises by an amount equivalent to the area of trapezium $KLCB$. Note that the area of this trapezium can exceed that of trapezium HE_1E_2J . It is more likely to do so the steeper is the marginal costs curve. When this occurs it implies that the extra social cost of visits exceeds the extra social benefits, and economic value is reduced by World Heritage listing. This would, however, not be so if the marginal cost of catering for visits is zero, and it is less likely to be so the closer such costs are to zero. If entry is free, the economic surplus from World Heritage listing is $HKLJ$ if the marginal cost of catering for greater visitor numbers is zero.

Note that this analysis does not take account of any environmental damages, resulting in spillover or external costs, caused by visitors. For example, increased tourist visits as a result of World Heritage listing could degrade the environment of a protected area and reduce its Total Economic Value (cf. Wen and Tisdell, 2001, Ch. 7). However, the source of the previously mentioned increase in the costs of misallocating resources following World Heritage listing basically arises from the failure to adopt marginal cost pricing rather than from environmental effects.

Failure to adopt marginal cost pricing could give rise to a major national economic burden from World Heritage listed areas, especially if the majority of visitors are foreigners. Foreign visitors will appropriate consumer surplus and possibly contribute little via taxation for funding the cost of visitor management of the natural area. For example, foreign visitors pay no income tax. However, the type of analysis presented in Figure 4 does not distinguish between demand from foreign visitors and from domestic visitors. Such a distinction is necessary if national economic benefits are to be distinguished from global economic benefits (cf. Clarke and Ng, 1993; Dwyer and Forsyth, 1993). Most standard economic analysis of this subject focuses on global economic benefits.

Although the above application of neoclassical economic theory is a means to assess the economic value added by the World Heritage listing of a natural site seems to be straightforward, it is problematic for several reasons. This is because neoclassical economics assumes that consumers (travellers in this case) are very well informed; in fact, possess all the knowledge required for perfect decision-making and are not impeded in this by the costs of decision-making itself. Hence, given these assumptions, the World Heritage listing of a site should not alter the demand for visits to this site. In reality, these conditions are not satisfied and the World Heritage listing of a site can push the demand curve for visits to the site upwards for reasons extraneous to neoclassical economic theory and have economic benefits not captured by neoclassical evaluation.

The following factors (extraneous to neoclassical theory) may shift the demand curve to visit a site upwards as a result of its World Heritage listing:

- (1) The listing may make potential visitors aware (or increase their awareness) of the favourable attributes of a site and thereby, increase their interest in visiting it.
- (2) For some individuals, the World Heritage listing may act as an inexpensive sorting mechanism like a star-rating system. Consequently, they may display a preference for visiting listed rather than non-listed properties, or increase their propensity to visit listed sites.
- (3) Listing of a site may magnify social influences on demand for visits. For example, it may appear to be socially more prestigious to visit a listed site rather than an unlisted one. A type of 'warm glow' effect can be generated by visits to a listed site and by subsequent sharing of the highlights of the journey with friends and contacts. Listing of a site bestows social recognition on it.

Neoclassical economics is an inadequate tool for assessing the welfare consequences of these effects. Nonetheless, listing of properties is likely to have positive economic consequences for tourists if the World Heritage selection system does help tourist to make more informed choices at lower costs than otherwise. On the other hand, the

social consequences of listing are very difficult to assess from a purely economic point of view.

It must, however, be realized that many tourists visit World Heritage sites without knowing in advance that they have been listed. Only during their visit, or subsequently, do they learn that they have been listed. This sometimes adds to their perceived value of the site in retrospect. This is a retrospective psychological phenomenon. Amongst other things, it tends to confirm to visitors that they have made 'good choices'. Many such psychological effects cannot be easily assessed in economic terms. The above limitations all arise in applying the travel cost method to evaluating sites because it is based on neoclassical economic theory.

Consider the argument (in a different way) that neoclassical economic theory is not satisfactory for analysing changes in economic welfare or valuing a property resulting from its World Heritage listing. This is because neoclassical economics assumes perfect knowledge on the part of consumers; that is, in this case, tourists or visitors to a property. But if perfect knowledge existed, why would the demand for visiting a property shift upwards after its World Heritage listing? It is usually believed that demand to visit a listed property rises after its listing because prospective visitors become more aware of (knowledgeable about) its attributes. This could not happen if prospective visitors to a property had perfect knowledge, as assumed in neoclassical economic theory. Another reason for an elevation in demand to visit a property after its World Heritage listing could be the social (Veblen-like) effect of the listing on demand. Unfortunately, neoclassical economics is unable to value social effects. Because neoclassical economics does not take into account the bounded rationality of economic actors, its application to tourism economics seems to be subject to significant limitations. These limitations are compounded because insufficient attention is given to observed types of behaviours and their diversity. However, these are now getting greater attention in behavioural and psychological economics (see Chapters 7 and 8 in Tisdell and Wilson, forthcoming)

7. CONCEPTUAL PROBLEMS OF MEASUREMENT AND THE TRAVEL COST METHOD

Anticipated demand for experiential commodities

A major challenge is to estimate the demand curves for visits to a natural area empirically. The travel cost method (TCM) is widely used for this purpose even though many limitations of it have been noted in the literature. Some of these limitations are particularly relevant to valuation for World Heritage listed properties. The TCM method of estimating demand is a revealed preference method (see, for example, Asafu-Adjaye, 2000, p. 105) and, it assumes that travellers are fully informed. Their decisions to visit a site are based on their anticipated utility from visiting it and this is supposed to be a perfect measure of their utility subsequently realized by visiting the site.

It, therefore, seems more appropriate to describe TCM as an *anticipated* preference method rather than a revealed preference method. Now, anticipated and realized utility may only closely coincide when an outdoor recreational facility is already well known to travellers, as would most likely to be so in the original cases considered by Clawson and Knetsch (1996). It is less likely to be satisfied for first-time visitors to a natural area or to an outdoor attraction than for frequent visitors to this attraction. This is likely for visits to remote national parks or heritage areas (such as Kakadu or Uluru) where many visitors are first-time visitors.

In neoclassical welfare economics, anticipated and actual satisfaction derived by the consumer of a commodity do not differ because the consumer is assumed to be fully informed. Demand before consumption is assumed to be just the same as demand with hindsight and so no disappointment and no unexpected bonus of utility occurs ex post. This may be a reasonable assumption as far as run-of-the-mill commodities are concerned, but is unlikely to be the case as far as experiential commodities are concerned. These are commodities that cannot be sampled beforehand and about which considerable residual uncertainty exists prior to their purchase and consumption. Many holiday journeys, especially to new natural areas for the visitor, fall into this category. Empirical support for the importance of this phenomenon is provided in Chapters 7 and

8 of Tisdell and Wilson (forthcoming). The degree of uncertainty prior to the travel event for overseas tourists may be greater than for domestic tourists, and is greater for visits to some types of tourist attractions than to others⁸. Naturally this uncertainty will be less for visitors making repeat visits to sites than for first-time visitors. However, the majority of overseas visitors to most World Heritage listed sites are likely to visit these only once (e.g. see Font, 2000). Furthermore, most domestic visitors only visit some remote natural areas once in their lifetime. In such cases, considerable scope exists for demand curves for visits based on the anticipations of visitors (their ex ante demand curves) to differ substantially from the demand curves that would (or do) prevail with hindsight (that is, the ex post demand curves of visitors)⁹.

This could have serious implications for calculation of the value of recreational services offered by a property and for the estimation of consumer surplus obtained by individuals visiting a property. Presumably, ex post demand curves, since they are based on greater knowledge, come closest to satisfying the conditions assumed in neoclassical welfare economics. Nonetheless, they will only coincide with the ex ante demand curves, as identified by TCM, in special circumstances. If the ex ante demand curves are to the right of those ex post, the economic value of a natural area used for visits will be overestimated by TCM-based demand curves. On the other hand, if the ex ante demand curves are lower than those ex post, then the opposite will prevail. Note that this is not just a conceptual and practical problem for measuring the economic value of World Heritage listed sites, but applies also to other tourist sites and attractions.

Despite its limitations, the TCM is the most widely used technique for estimating the recreational and tourism value of an outdoor area (Bateman et al., 1996), and has been used in Australia to determine the recreational value of many protected areas. None of these studies take account of the experiential good problem discussed above, even when their attention is focused on domestic tourists only. These include studies by Knapman and Stanley, (1993) (Kakadu), Stoeckl, (1995) (Hinchinbrook Island), Beal, (1995a) (Carnarvon Gorge), Beal, (Beal, 1995b) (Girraween) and Bennett, (1996) (Dorrigo and Gibraltar Range). TCM studies to estimate demands of foreign visitors (as well as in some cases domestic visitors) for natural protected areas have been carried out by Maille and Mendelsohn, (1993), Navrud and Mungatana, (1994), Menkaus and Lober,

(1996), Font, (2000), Carr and Mendelsohn, (2001) (Great Barrier Reef), Ward, (2001). These do not take account of the experiential issue and the importance of bounded rationality in decision-making by tourists.

Multi-purpose trips of international visitors

Further limitations of TCM arise when a journey is for multiple purposes rather than for a single purpose. This is likely to be a particular problem in the case of international visitors mostly due to spatial limitations as discussed by Smith and Kopp (1980). Furthermore, visits by international tourists usually have multiple objectives. Application of TCM in such circumstances is liable to overestimate the value of any particular site visited during the journey if the cost of the whole journey is taken as an indicator of the willingness of the visitor to pay to visit the individual site. This involves a misuse of the technique. Ward (2000) has suggested that if a property is not the principal destination of visitors, the local point of origin for a visit might be used to calculate travel distance rather than the home point of origin of the visitor. This method might, however, create a bias in the opposite direction.

Impact of size and configuration of World Heritage listed properties on demand estimation using TCM

In Australia, the scattered and disjointed nature of some World Heritage listed properties, and the vastness of many, limit the practical application of TCM for estimating the demand for visits. TCM treats the tourist attraction as a point rather than a large area. Many of Australia's World Heritage listed properties comprise a collection of national parks and reserves spread over a large and geographically diffuse area. For example, CERRA is large and is spread across two states, namely Queensland and New South Wales. The Australian Fossil Mammal property is also located in two states (Queensland and South Australia) but is small.

Even though many World Heritage properties do not extend beyond one state, they often still cover vast areas such as the Great Barrier Reef World Heritage Area, the Greater Blue Mountains and Tasmanian Wilderness and may be disjoint. For example,

the Tasmanian Wilderness, Wet Tropics and CERRA are made up of many national parks and reserves. The following problems can arise in applying TCM in such circumstances:

- (1) because there are many entry points to several World Heritage properties, it is difficult to sample visitors to these representatively;
- (2) different parts of a large or scattered property may have substantially different values, and this will be concealed by aggregation; and
- (3) valuation cannot be based on a single entry point to the property, and much travel may take place within the property itself, as (for example) in the case of the Great Barrier Reef World Heritage area and Kakadu¹⁰. This can lead to serious under valuation if only expenditure to reach the borders of the property are taken into account.

The first two problems can also occur for other valuation or demand estimation techniques, such as contingent valuation methods, but problem (3) seems to be specific to TCM.

The application of TCM in such cases is being stretched beyond the limits for which it was originally designed. It is ludicrous to apply TCM to try to estimate the demand for visiting a very large World Heritage property such as the GBR, Kakadu or the Tasmanian Wilderness because it cannot be treated as a single site. This, however, raises the question of how large a property must be before it can no longer be treated as a single site for the purpose of applying TCM. It may also be necessary to determine what other characteristics should be considered in this regard. Although Ward and Beal (2000) do not specifically address this issue in their book, the limitations of single site analysis as a method of estimating recreational and tourist demand for large national parks is apparent from their book. The problem is magnified for many World Heritage properties in Australia. For these properties, multiple-site demand systems may be more relevant (cf. Ward and Beal, 2000, pp. 135-138). Moreover, these issues do not appear to have been previously raised in studies which have used TCM to assess the recreational

value of relatively large national parks, such as Kakadu (Knapman and Stanley, 1993) and Carnarvon Gorge (Beal, 1995a) in Australia.

Other limitations of TCM

Some of the other commonly cited problems of the TCM are also relevant to valuation of World Heritage properties. These include: problems arising in measuring the economic value of time; deciding how to apportion the travelling costs of a party across individual members of that party; non-paying visitors and statistical problems involved in estimation¹¹ (Hanley, 1989; Hanley and Spash, 1993, p.86; Turner et al., 1994).

8. ECONOMIC IMPACT AS AN ALTERNATIVE MEASURE OF ECONOMIC VALUE

Discussions of the economic impact of an event normally focus on its influence on incomes or on employment (via income and employment multipliers) rather than on economic welfare as measured in neoclassical welfare economics and considered above (e.g. see Archer, 1989; Fletcher, 1989; Johnson and Moore, 1993; West, 1993). Changes in the latter may not be in the same direction as the variations in the former. For example, World Heritage listing of a property may have a highly favourable impact on local income and employment but economic welfare, as measured in terms of neoclassical economics, may fall. The favourable economic impacts locally could be brought about, for instance, by the government subsidies for the management and promotion of a site that is World Heritage listed. However, there can be occasions when increased economic welfare and favourable economic impacts locally go hand in hand. Politically, economic impacts probably have greater influence on social decision-making than changes in economic welfare estimated by using methods developed in neoclassical economics.

If fees are charged for visits to World Heritage properties and if the listing of a property shifts the demand curve for visiting it upwards, the revenue generated by the property can be expected to increase. For example, given the scenario illustrated by Figure 4, if entry fees are constant, revenue will rise as a result of World Heritage listing. It will

also do so if marginal cost pricing is adopted in which case the price of entry rises from OF to OG given the situation illustrated in Figure 4. Consequently, the country in which the World Heritage property is located will obtain increased income and employment as a result of listing.

The extent to which local and regional incomes and employment rise will depend on the share of this revenue which is distributed to the management of the World Heritage property and also on the levels of expenditure in the local area or region by visitors to the property. Increased local expenditure can be generated (1) by individuals visiting an area who would not have visited it in the absence of a World Heritage listed property and (2) by individuals who would have visited an area staying longer as a result of a World Heritage listing in the area.

The support of the local population for conserving sites in their area is likely to be positively influenced by the amount of economic benefits (especially increased incomes and employment) that they expect to gain from it. When World Heritage listing of a site is proposed, local political representatives are keen to emphasise these likely benefits, particularly if government is by regional representation. Politicians are more likely to be interested in these economic impacts than in economic welfare benefits of conservation which might be considerable but which bring little local, regional or national benefit. Balmford and Whitten (2008) have pointed out that while conservation projects in some less developed countries may generate considerable global economic benefit, they often are a disbenefit to the less developed countries concerned or to the region in which the conservation is proposed. Therefore, a distributional problem is involved and the amount of income and employment generated locally by tourism based on a conserved area sometimes falls short of the economic opportunities forgone locally by conserving the area. That is, however, not to say that this is always the case.

9. THE TOTAL ECONOMIC VALUE OF PROPERTIES

The tourist value of a property as measured by the neoclassical method of estimating and summing the consumers' surplus and producers' surplus provides an estimate of the direct use value of a property for tourist and recreational purposes. Often this is the only direct use value of a protected area, even though it does not represent the TEV of the area. The concept of TEV is more comprehensive and accounts for both the economic use and non-use values of a property. Nevertheless, TEV is utilitarian in nature and in many respects, can be regarded primarily as a more comprehensive restatement of the neoclassical theory of economic valuation (cf. Tisdell and Wen, 1997).

The tourism value of World Heritage properties is generally less than their TEV and in many cases is substantially less because tourism economic value relates only to direct economic value, whereas TEV consists of all use and non-use values. Use values consist of direct, indirect and option values while non-use values include bequest and existence values (Pearce, 1993). Direct use values can be consumptive, non-consumptive or both. An example of a non-consumptive direct use value of a property is sometimes tourism¹². Examples of a consumptive direct use value of a property are sustainable timber extraction (for example, from some private lands and timber reserves of World Heritage properties of the Wet Tropics), non-timber (forest products) extraction (for example, aboriginal use of plants and animals for food and medicinal purposes in the World Heritage listed Wet Tropics, Tasmanian Wilderness and Kakadu), and grazing (for example, Willandra Lakes region). Fishing, such as on the Great Barrier Reef, also falls into this category. Indirect use values of a property include nutrient cycling and watershed protection. An option value is a value that can be used in the future by an individual (categorized as a use value) or a value that can be used in the future by an individual's descendents (including existing children), which is then categorised under non-use value. Such values are known as bequest values. Existence values are non-use values. Apart from the failure of the analysis presented in Figure 4 to capture the indirect use values of a property, it fails to capture non-use or passive use values (Turner et al., 1994). These include option values, existence values and bequest values.

Little research has been conducted on the TEV of Australian World Heritage properties. Some early studies using the contingent valuation method were carried out for Fraser Island (Hundloe et al., 1990) and Coronation Hill of Kakadu Conservation Zone which is now part of World Heritage listed Kakadu NP (Imber et al., 1991). The latter study proved to be highly controversial.

It should also be pointed out that the distinction between indirect or non-consumptive values (such as recreation) and non-use values is not clear. This has led to the replacement of the term 'non-use values' with 'passive use values', which seems to distinguish better the difference between use and non-use values (Turner et al., 1994). It must be pointed out that the above discussion is mainly relevant to the valuation of natural assets. Modifications have to be made to the existing valuation techniques when valuing cultural assets. The valuation process becomes even more complicated when both natural and cultural assets are involved.

In our study, possible changes in TEV as a result of the World Heritage listing of a property are not analysed. Only the tourist and recreational component of TEV is considered. Further research is required to assess possible changes in the TEV of properties that are World Heritage listed. However, that listing makes it more likely that the non-use values of a property will be conserved¹³. In that sense, listing can add to the economic value of a property, and in fact, the prime reason for listing many properties seems to be to enhance their economic value in this respect.

10. WORLD HERITAGE LISTING AS A CONSERVATION STRATEGY: INSTITUTIONAL AND POLITICAL ASPECTS

For psychological, institutional and political reasons, World Heritage listing of natural or cultural sites plays a positive role in their conservation. The political role played by listing depends on the institutional framework for governance in a country, as is evident from Australian experience.

Heritage listing of property imparts an iconic quality to it and tends to raise the social valuation of it. Listing bestows international recognition on the value of a property and

this often generates national pride and a feeling of obligation to conserve the listed property.

Furthermore, listing may bring economic benefits to communities in which listed properties are located. Listing may result in increased tourist expenditure in these localities or additional local expenditure by governments to conserve these sites. If this happens, it will generate local political support for the conservation strategies involved. In addition, nature-based tourists will be supportive of the initiative if a natural site is conserved, and domestic tourists may vote accordingly. In addition, travel companies can form a strong political lobby. This is underlined by the political support given by railroad companies in the United States for the provision of national parks as tourist attractions in the western USA, mainly the Rocky Mountains. These companies were able to gain financially by transporting tourists to these parks.

Institutional and political factors also make World Heritage listing of properties a powerful force for their conservation. While institutional frameworks differ between nations, in most cases, the World Heritage listing of a property results in its conservation being institutionally locked-in to a high degree. World Heritage listing makes it politically difficult for a government (including a future government) to allow the undertaking of any project that would threaten the conservation of a listed property.

Depending on the rules for governance of a country, World Heritage listing of properties can be used effectively to ensure their conservation, as in Australia's case. Australia is a federation of its states. The Australian Constitution gives specific legal powers to the Australian Government and the residual powers are retained by the state governments. Under the Constitution, the Australian Government is responsible for external relations. This provision has given the Australian Government increasing control over environmental decisions within Australia because the number of international environmental agreements have magnified with the passage of time.

The World Heritage Convention (to which Australia is a signatory) involves the external relations power of the Australian Government. It was used by the Australian Government to stop the building of a dam by the Tasmanian Government on the

Franklin River on the basis that this would seriously detract from the value of the Tasmanian Wilderness Area which had been designated a World Heritage property in 1982.

The Australian Labor Party emerged victorious in the Federal elections of 1983 and Bob Hawke became Prime Minister. The Australian Government then used its external powers to override the jurisdiction of the Tasmanian Government and stopped its building of the dam on the Franklin River (Mulligan and Hill, 2001, p.256). Its right to do this was subsequently upheld by the High Court of Australia. In the Australian institutional setting, the World Heritage listing of the Tasmanian Wilderness area played a central role in ensuring its continuing conservation as a wilderness area.

11. CONCLUDING OBSERVATIONS

World Heritage listing of a property is considered to be prestigious and acts as a signalling device much as a brand name does. Only properties that are considered to be truly outstanding and of global significance in terms of their natural or cultural heritage, or both, are listed. This raised two questions which were examined in this article. These are: to what extent does listing raise visitor numbers to a listed property and to what extent does listing add to the perceived or actual economic value of a property? Trends in Australian visitor numbers did not reveal faster rates of growth of visits to listed natural sites compared to a set of unlisted sites. However, it is possible that in the absence of listing growth in visitor numbers to World Heritage sites would have been lower than otherwise. Data was not available to test the counterfactual. Direct surveys of visitors might be undertaken to determine how important World Heritage listing of a property is as an influence on their decisions to visit it. Furthermore, tourism potential is not the main criterion for listing properties and some listed properties continue to experience low visitor numbers despite World Heritage listing. In addition, different properties display different of tourist-demand responses to World Heritage listing. This article has speculated on some of the factors likely to influence the dynamics of response to listing. To some extent, socio-economic factors have an influence. The

absolute response is likely to be smaller for those properties that are costly and time-consuming to reach and for those that do not involve journeys with multiple attractions.

Although data on incomes and employment creation from World Heritage listing are not available, some of the issues involved in relation to the economic impact of World Heritage listing were discussed. In this connection, the concept of TEV has relevance to World Heritage listing, although difficulties arise from such valuation. An increase in demand for World Heritage properties results in a larger consumers' surplus. However, many laymen do not perceive consumers' surplus as economic value because it has no direct economic impact. From their point of view, the *perceived* economic value of an increase in tourism as a result of World Heritage listing is likely to depend on the economic impact of this increase in terms of employment and income generation. Although this study suggests that the effects of World Heritage listing are not as large as generally thought, further work is required in the form of case studies at selected World Heritage and non-World Heritage properties to identify the underlying factors that influence visits to natural sites. Only such a study could identify the real extent of the 'signalling' effect and provide a basis for estimating the local (and perhaps, the regional) economic impact of World Heritage listing.

Considerable care is needed before claiming that World Heritage listing of a natural area adds to economic value. Cases can occur where social economic welfare based on tourist demand is actually reduced by such a listing, especially if marginal cost pricing of visits is not practised. Furthermore, if the extra visitors in this case are mostly from overseas this can add to the loss in *national* economic welfare.

Because many visits to most World Heritage properties are experiential in nature, problems arise in applying neoclassical economic theory for valuation because *ex ante* and *ex post* demand curves are liable to diverge. Demand estimates generated using TCM, for example, may fail to reveal *ex post* demand, and this can be a limitation for purposes of social valuation. The vast geographical areas over which several of Australia's World Heritage properties spread, as well as in some cases their fragmented nature, further limits the scope for applying the TCM (as well as some other methods) as a basis for determining the economic value of World Heritage properties.

Note that the above discussion has concentrated on touristic and recreational economic values from World Heritage listing. It has not attempted to consider the possible consequences of listing of all aspects of TEV. For example, the analysis gave limited attention to the consequences for non-use values of listing. The latter may in fact be the most important economic values for some World Heritage properties, for example, Heard Island and MacDonalld Island. On the other hand, politicians and public servants have frequently stressed that World Heritage listing of natural areas provides a boost to tourist and recreational use of these natural areas and has positive economic consequences. This article shows that while this is sometimes true, it is not always the case, even for those areas which are attractive for tourism and recreation.

It was argued that there are strong grounds for believing that World Heritage listing of properties favours their long-term conservation. To some extent, institutional lock-in occurs as a result of their listing. Economic, social and political factors (which were identified) are likely to reinforce the development of positive conservation attitudes once a property is listed. As illustrated by the Australian case, World Heritage listing can also provide political leverage. It enables the Australian Government, for example, to override decisions by state governments that could be detrimental to the conservation of World Heritage listed properties located within Australia.

12. ACKNOWLEDGEMENTS

We are grateful to Associate Professor Steve Harrison for his constructive comments on draft material used in this article and also to Professor Ralf Buckley, Dr Kreg Lindberg and John Ward of Griffith University for discussing aspects of it with us. This article also benefited from feedback from a presentation at the University of Western Sydney arranged by Dr Julie Wen. The usual *caveat* applies.

13. NOTES

1. BTR data in annual reports are expressed as a percentage of visitors to the respective states. In order to obtain annual visitor numbers to each site, the percentages for each site have been multiplied by the annual visitor numbers to the respective states.
2. Australian Bureau of Statistics (2001) data reveal that Sydney airport is by far the most important airport for passengers arriving and departing Australia. For example, in 1999, more than 7 million passengers travelled via the Sydney airport compared to 2.6, 2.3 and 1.4 million passengers for Melbourne, Brisbane and Perth respectively. Only 156,058 visitors travelled through Darwin airport. The figure for Cairns is 660,659.
3. Visitor numbers shown include both domestic and international tourists. Neither the years nor the source have been cited by Thorsell and Duffy and are assumed to be the figures for the mid-1990s. There is no other source (except for BTR) from which data for World Heritage sites can be obtained. There is a paucity of data in this area despite the importance of World Heritage listed properties as claimed by some government departments.
4. While it is argued by some in the tourist industry (such as tourist operators) that World Heritage listing would increase visitation numbers, organizations such as the Australian Conservation Foundation argue that World Heritage listing should result in more protection for World Heritage sites which could curtail tourist numbers to World Heritage sites. Nevertheless, the potential for increasing or reducing tourist visitor numbers to World Heritage sites is not the basis on which World Heritage sites are listed. However, World Heritage listing of a property increases Australian Federal government funding and may enable environmental pressure groups to press for more protection, such as limiting access to particular parts of protected World Heritage areas or restricting specific activities in certain areas, such as on the Great Barrier Reef. However, restricting access or limiting certain activities in protected

areas has been practiced even before World Heritage listing and is not restricted to World Heritage properties.

5. For a discussion about the specialist and generalist visitors in the context of wildlife tourism, see Duffus and Dearden (1990).
6. World Heritage listing of properties in Australia may also result in foreign visitors substituting Australia for other destinations.
7. This assumes that tourism or recreation are the only values of the natural areas concerned. However, as discussed elsewhere, such use value is likely to only be a part of total economic value.
8. This problem may, for example, be least for local outdoor recreational attractions frequented mainly by local domestic residents.
9. Tisdell and Wilson (2001) have noted the importance of this distinction in relation to tourism based on turtle watching. For most tourists, turtle watching is an experiential commodity.
10. When a property is very large, it is unreasonable to treat it as a point, as is done using TCM.
11. Hanley and Spash (1993, p. 90) state that the dependent variable can be both 'censored and truncated'. They point out that 'truncation means that as only visitors to the site are recorded, there is no information on the determinants of the decision to visit the site. Also visits are only recorded during the sampling period and may thus incorrectly describe the preferences of those visiting at other times of year. Censored means that less than one visit cannot possibly be observed. This implies that the dependent variable (visits) is censored at one, and that Ordinary Least

Squares estimates of demand parameters will be biased' (Smith and Desvougues, 1986).

12. However, not all tourism is non-consumptive. For instance, recreational hunting is not and tourists can damage natural sites. Apart from nature-based tourism, some tourists travel to experience gastronomic delights and shopping. Furthermore, even though a visitor to a World Heritage site may engage in non-consumptive tourism on site, his/her journey would, in nearly all cases, result in the burning of fossil fuels and add to greenhouse gas emissions.
13. Unfortunately, World Heritage listing does not provide a cast-iron guarantee that non-use values will be conserved, as is clear from Nichols (2001).

14. REFERENCES

- Anon. (2010a). World Heritage Site. Accessed 8 January, 2010, from www.an.wikipedia.org/wiki/World_Heritage_Site
- Anon. (2010b). Table of World Heritage Sites by country. Accessed 8 January, 2010, from www.en.wikipedia.org/wiki/Table_of_World_Heritage_Sites_by_country
- Archer, B.H. (1989). Tourism and island economics: Impact analyses. Pp. 125-134 In G. P. Cooper (Ed.), *Progress in Tourism, Recreation and Hospitality Management*, Belhaven Press, London.
- Asafu-Adjaye, J. (2000). *Environmental Economics for Non-Economists*, World Scientific, Singapore.
- Australian Bureau of Statistics. (2001). Transport - International Passenger Activity. from <http://www.abs.gov.au>
- Balmford, A. and Whitten, T. (2008). Who should pay for tropical conservation and how could the costs be met? *Onyx*, 37, 238-250.
- Bateman, I.J., Brainard, J.S., Garrod, G.D. and Lovett, A.A. (1996). Measurement issues in the travel cost method: A geographical information systems approach. *Journal of Agricultural Economics*, 47, 191-205.

- Beal, D.J. (1995a). A travel cost analysis of the value of Carnarvon Gorge National Park for recreational use. *Review of Marketing and Agricultural Economics*, 63(2), 292-303.
- Beal, D.J. (1995b). Estimation of the elasticity of demand for camping visits to a national park in south-east Queensland by the travel cost method. *Australian Leisure*, 7, 21-26.
- Bennett, J. (1996). *Estimating the recreation use value of national parks*. Paper presented at 40th Annual Conference of the Australian Agricultural and Resource Economics, held at University of Melbourne, Victoria,
- Bureau of Tourism Research. (1991-1999). Annual Results of the International Visitor Survey - International Visitors in Australia. BTR, Canberra, ACT.
- Carr, L and Mendelsohn, R. (2001). Valuing coral reefs: travel cost analysis of Great Barrier Reef. *Manuscript*, Yale School of Forestry and Environmental Studies, New Haven, Connecticut. December 11.
- Clarke, H.R. and Ng, Y-K (1993). Tourism, economics, welfare and efficient pricing. *Annals of Tourism Research*, 20, 613-632.
- Clawson, M. and Knetsch, J. (1996). *Economics of Outdoor Recreation*, John Hopkins University Press, Baltimore.
- Duffus, D.A. and Deardon, P. (1990). Non-consumptive wildlife-oriented recreation: A conceptual framework. *Biological Conservation*, 53, 213-231.
- Dwyer, L. and Forsyth, P. (1993). Assessing the benefits and costs of inbound tourism. *Annals of Tourism Research*, 20, 751-768.
- Environment Australia. (2000a). Australia's World Heritage Properties: The Greater Blue Mountains Area. *Environment Australia Online*. from <http://www.environment.gov.au/heritage/awhg/whu/properties/blue.html>
- Environment Australia. (2000c). The Greater Blue Mountains Area World Heritage Values. *Environment Australia Online*. from <http://www.environment.gov.au/heritage/awhg/whu/properties/auswha/html>
- Fletcher, J.E. (1989). Input-output analysis and tourism impact studies. *Annals of Tourism Research*, 16, 514-529.
- Font, A.R. (2000). Mass tourism and the demand for protected natural areas: a travel cost approach. *Journal of Environmental Economics and Management*, 39, 97-116.
- Hanley, N. (1989). Valuing rural recreation benefits: an empirical comparison of two approaches. *Journal of Agricultural Economics*, 40, 361-374.

- Hanley, N. and Spash, C.L. (1993). *Cost-Benefit Analysis and the Environment*, Edward Elgar, Aldershot, UK.
- Hundloe, T.J., McDonald, G.T., Blamey, R.K., Wilson, B.A. and Carter, M. (1990). Non-Extractive Natural Resource Uses in the Great Sandy Region. Report for the Department of Environment and Heritage (Qld), Brisbane.
- Imber, D., Stevenson, G. and Wilks, L. (1991). A contingent valuation survey of the Kakadu Conservation Zone. AGPS, Canberra. Resource Assessment Commission Research Paper, No.3.
- Johnson, R.L. and Moore, E. (1993). Tourism impact estimation. *Annals of Tourism Research*, 20, 279-288.
- Knapman, B. and Stanley, O., (1993). *Measuring environmental benefits: A travel-cost analysis of Kakadu National Park*. Proceedings of the Conference on Tourism Research, held in Canberra at Bureau of Tourism Research,
- Kriwoken, L. and Holmes, N. (2007). Emerging issues of Macquarie Island and Heard Island and McDonald Islands. Pp. 149-164 In L. Kriwoken, J. Jabour and A. D. Hemmings (Eds.), *Looking South: Australia's Antarctic Agenda*, Federation Press, Sydney.
- Maille, P. and Mendelsohn, R. (1993). International ecotourism and the valuation of tropical rainforest in Costa Rica. *Journal of Environmental Management*, 38, 213-218.
- Marshall, A. (1890). *Principles of Economics*, 1st Edn., Macmillan, London.
- Menkaus, S. and Lober, D.J. (1996). International ecotourism and the valuation of tropical rainforest in Costa Rica. *Journal of Environmental Management*, 47(1-10).
- Mulligan, M. and Hill, S. (2001). *Ecological Pioneers: A Social History of Australian Ecological Thought and Action*, Cambridge University Press, Cambridge, UK.
- Navrud, S. and Mungatana, E.E. (1994). Environmental valuation in developing countries: the recreation value of wildlife viewing. *Ecological Economics*, 11, 135-151.
- Nichols, W. (2001). World Heritage at crossroads. *Habitat Australia*, 29, 12-15.
- Pearce, D. (1993). *Economic Values and the Natural World*, Earthscan, London.
- Pigou, A.C. (1932). *The Economics of Welfare*, 4th Edn., Macmillan, London.

- Pugh, D. (2001). Central Eastern Rainforest Reserves of Australia. from http://www.nefa.org.au/wh_cerra1.html
- Smith, V.K. and Kopp, R.J. (1980). The spatial limits of the travel cost recreational demand models. *Land Economics*, 56, 64-72.
- Smith, V.K. and Desvouges, W. (1986). *Measuring Water Quality Benefits*, Kluwer, Boston.
- Stoeckl, N. (1995). A travel cost analysis of Hinchinbrook Island National Park. In B. Faulkener, P. Pearce, R. Shaw and B. Weiler (Eds.), *Tourism Research and Education in Australia: Proceedings of the Australian National Tourism Research and Education Conferences, 1994*, Bureau of Tourism Research, Canberra.
- Thorsell, J. and Duffy, T. (Eds.). (1997). *Australia's World Heritage*. World Heritage Publishing Pty Ltd., Melbourne.
- Tisdell, C.A. and Wen, J. (1997). Total economic valuation of protected areas. *Annals of Tourism Research*, 24, 992-994.
- Tisdell, C.A. and Wilson, C. (2001). Tourism and the conservation of sea turtles: an Australian case study. Pp. 356-368 In C. A. Tisdell (Ed.), *Tourism Economics, The Environment and Development*, Edward Elgar, Cheltenham, UK.
- Tisdell, C.A. and Wilson, C. (forthcoming). *The Economics of Nature-based Tourism and Conservation*, Edward Elgar, Cheltenham, UK and Northampton, MA, USA.
- Turner, R.K., Pearce, D. and Bateman, I.J. (1994). *Environmental Economics: An Elementary Introduction*, Harvester Wheatsheaf, London.
- Ward, F.A. and Beal, D.J. (2000). *Valuing Nature with Travel Cost Methods*, Edward Elgar, Cheltenham, UK.
- Ward, J.R. (2000). *The Net Economic Benefits of Recreation and Timber Production in Selected New South Wales Native Forests*. Unpublished Ph.D. Thesis, Griffith University, Gold Coast.
- Ward, J.R. (2001). *The Relative Net Economic Benefits of Logging and Tourism in Native Australian Forests*. Unpublished Ph.D. Thesis, Griffith University, Gold Coast.
- Wen, J. and Tisdell, C.A. (2001). *Tourism and China's Development: Policies, Regional Economic Growth and Ecotourism*, World Scientific, Singapore.
- West, G.R. (1993). Economic significance of tourism in Queensland. *Annals of Tourism Research*, 20, 490-504.

Williams, N., Berry, O., Fallon, S., Firow, E., LeNevez, C., Robinson, D. and Roddis, M. (2009). *France*, Lonely Planet Publications, Fitzroy, Victoria, Australia.

World Heritage Unit, Department of the Environment, Sport and Territories,. (1995). *Australia's World Heritage*. Department of the Environment, Sport and Territories, Canberra.

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