ADDING JEWELS TO THE CROWN: THE MARGINAL RECREATIONAL VALUE OF NOOSA NATIONAL PARK AND IMPLICATIONS FOR USER FEES

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ABSTRACT

This study assesses the economic value held by recreational users for the replication of Noosa National Park, Australia. The lower bound benefits accruing to recreational users amounts to $19 per person per visit, resulting in a total annual use value of approximately $28 m-$44 m. We find a significant proportion of park users also hold non-use values for the park. The results lend weight to calls for the preservation of national parks with similar attributes. While user pays may present opportunities for better management of parks, user fees can be politically unpalatable, prevent equity in access, and create perverse incentives to create and manage parks solely for their recreational values rather than the broader set of ecosystem goods and services they provide.

KEY WORDS: protected areas; economic values; non-market valuation; user pays; estate expansion.

I. INTRODUCTION

Globally, public awareness of and concern for the environment has been growing in momentum since the middle of the last century (Ausubel, Victor, & Wernick, 1995; R. Carson, 1962; Dalton, 2015; Leopold, 1949; Muir, 1901). Environmental issues of heated economic debate include climate change (Crost, Duquennois, Felter, & Rees, 2018; International Panel on Climate Change, 2014), mineral and energy development (Brunnschweiler & Bulte, 2008; Weber, 2014; Werner, Vink, Watt, & Jagals, 2015), ship

groundings and oil spills (Cohen, 1986; Diamond & Hausman, 1994; Harrison & Lesley, 1996), water use and allocation to the environment (Daniel & Quentin, 2011; Quiggin, 2001), drought and fires (Martinez-Harms et al., 2017; Royal Commission into National Natural Disaster Arrangements, 2020; Sil et al., 2019; Vardon, Keith, & Lindenmayer, 2019) and pandemics (Herrero, 2020; Morin, Kinzig, Levin, & Perrings, 2018; OECD, 2020; Perrings, Levin, & Daszak, 2018). Over this recent period, there has also been ardent debate over mining (R. T. Carson, Wilks, & Imber, 1994) and forestry in (Ananda & Herath, 2006) and funding of national parks (Barrett, Pitas, & Mowen, 2017; Lee & Han, 2002; Pitas, Barrett, & Mowen, 2017; Vander Naald & Cameron, 2017), including logging and mining versus conservation of the world's largest sand islands (Buckley, 2004; Hundloe, McDonald, Blamey, Wilson, & Carter, 1990), and the conservation of Aboriginal culture through land rights (Gregory & Altman, 2018). This latter group of environmental issues relates to the key economic question around the allocation of natural areas for 'productive activity' versus the conservation of these areas for the ecosystem services that they provide. Protected natural areas provide a range of ecosystem goods and services to society, one of which is recreation (Clawson & Knetsch, 1966; de Groot et al., 2012). The conservation of these areas also reflects a number of non-use values held by members of society including existence, bequest and option values (Tisdell, 2017).

A focus in the literature on the economic value of natural assets like national parks and forests heightened in latter half of the previous century (Clawson & Knetsch, 1966) and continues in the current century (Driml, 2010; Rosenberger, White, Kline, & Cvitanovich, 2017) following a general government philosophy of user pays (Lee & Han, 2002; Thur, 2010) and the privatization of public assets (Kay & Thompson, 1986).

Population growth has also placed increasing pressure on coastal natural environments with prime locations being increasingly subject to the negative impacts of commercial and industrial infrastructure development proposals (Bohnet & Moore, 2010). With the increasing encroachment of development into natural areas, there has arisen the need to generate dollar values for un-priced natural assets. Such information can assist decision makers with trade-offs over the conservation or consumptive development of these natural assets. The purpose of this study is to provide a monetary estimate of the benefits received by recreational users of Noosa National Park in Australia. Naturally, users for the park will hold recreational use values but what is the magnitude of these and do they also hold non-use values for the conservation of the park? Such insights can lend weight to the argument for a greater allocation of resources by Government and other stakeholders to preserving natural areas and the ecosystem services they provide along coastlines where these resources are scarce.

The balance of the paper is organized into five sections. Section 2 provides a brief overview of the park in question. Section 3 reviews the literature on recent applications of the CVM to value natural areas, including those from Australia. Section 4 outlines the conceptual framework used to analyse the results and also provides a description of the survey design. Section 5 presents the results and a discussion. The paper ends with some concluding remarks.

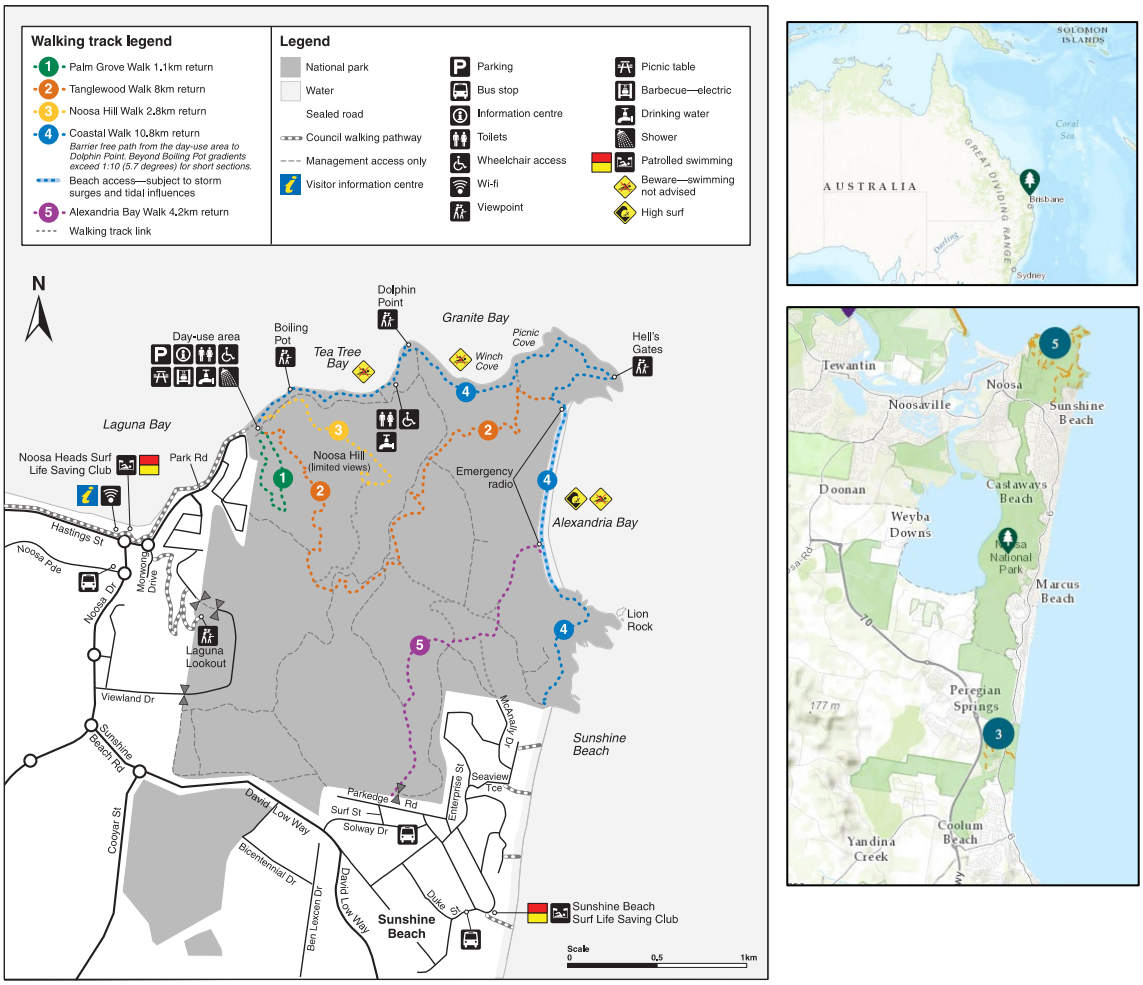
2. NOOSA NATIONAL PARK

Noosa National Park (NNP) has been postulated to be the jewel in the crown of Noosa Heads making the town a national and an international tourist destination, with over 4.6m visitor nights annually with tourism contributing approximately half a billion

dollars (AUD) in industry value-add of a regional economy worth over $2.8 billion (Lucid Economics, 2018, pp. 2, 8, 10). Pearson, Russell, and Woodford (2000, p. 43) using input-output modelling in 1998 found the park produced 797 jobs and $54m in direct, indirect and induced effects on the Sunshine Coast regional economy.

NNP is easily accessed from the Noosa Heads town centre on Hasting Street via Park Road (see Figure 1). NNP is also relatively close to the main population centre and capital of the state of Queensland, Brisbane being a 160km drive along the Bruce Highway (part of the national highway A1, see Figure 1) (Underhill, Sattler, Campbell, & Dodds, 1984, p. 268).

FIGURE 1: NOOSA NATIONAL PARK



SOURCE: (Department of National Parks; Sport and Racing, 2018a, 2018b)

This relative closeness to the state's capital and an iconic tourist location makes it one of the most highly visited national parks in Queensland (Queensland Parks and Wildlife Service, 1999). The park's main attractions include its scenic beauty, heathlands and wildlife, bush walking, un-spoilt beaches and foreshores and magnificent views of the coastline. The park consists of two main preserved sites as well as number of additional and subsequently added to the south of the Noosa region. The main site, which is subject of this study, covers an area of 430 ha wedged between the coastal towns of Noosa and Sunshine Beach (see Figure 1) (Underhill et al., 1984).

Admission to NNP like most national parks has traditionally been free of charge in Queensland (Australian and New Zealand Environment Council, 2000). In September of 1996, the Queensland Government announced the introduction of an entrance fee of $3 per person per visit, $10 per month, or $20 per year into Queensland National Parks. However by December 1996, the decision was rescinded after bad press and rapid political reconsideration.

3. LITERATURE REVIEW

CVM lends itself as a relatively inexpensive method of obtaining individual and social values for natural assets. When the demand or supply of a natural outdoor area is not known, CVM, like other stated preference techniques, can be used to estimate the individual's option price for entry (Brookshire, Eubanks, & Randall, 1983; Graham, 1981).

There was a boom in the use of CVM in the two decades leading to the end of the last century. During that time the prevalence of choice modelling methods has concurrently evolved (Rolfe, Bennett, & Louviere, 2000). The major source of skepticism about the validity and reliability of stated preference techniques is related to their hypothetical nature (e.g. see Mjelde, Jin, Lee, Kim, & Han, 2012). Also, all stated preference techniques suffer from strategic behavior where an individual may misstate their bid to preserve environmental resources or to encourage their extractive consumption. Other kinds of biases associated with stated preference techniques have been identified and solved in the literature with recent research indicating that such strategic behaviour tends to be infrequent and that careful survey procedure will reduce much of this bias (e.g. see Cummings, Brookshire, & Shultz, 1986; Mitchell & Carson, 1989; Tisdell,

Wilson, & Swarna Nantha, 2008). Mitchell and Carson (1989) and Arrow et al. (1993) have recommended best practice standards for CV studies which enable the biases to be eliminated or minimized.

Following the Exxon Valdez oil spill in the last century, the United States of America Congress passed a law in 1990 which, among other things, made provision for the recovery damages. An expert panel led by Kenneth Arrow was nominated to write regulations for damage assessment. The panel concluded: '…CVM studies can produce estimates reliable enough to be a starting point of a judicial process of damage assessment including lost passive use values' (Arrow et al., 1993, p. 4610).

Much of the criticism of CVM arose during the assessment of damages from the Exxon Valdez spill. R. T. Carson (2012, p. 27) makes the salient point that CVM delivers estimates used in benefit-cost analysis, not damage assessments, offering 'a practical alternative for reducing the use of either' extremes of limitless or no value for environmental goods and services.

The application of non-market valuations such as the CVM in Australia has not been as widespread as in Europe (Cook, Eiríksdóttir, Davíðsdóttir, & Kristófersson, 2018; Júdez, de Andrés, Pérez Hugalde, Urzainqui, & Ibañez, 2000; White & Lovett, 1999) or the United States (Boyle et al., 2016; Chatterjee, Triplett, Johnson, & Ahmed, 2017). Despite this, there have been a number of applications of the contingent valuation method to national park and forest valuation in Australia, some of which are summarised in Table 1.

TABLE 1: A SELECTION OF AUSTRALIAN CVM STUDIES OF FORESTS AND NATIONAL PARKS

Authors	Goal	Unit of Value, Payment Vehicle	Survey method, sample	Estimated value
Bennett (1984)	Existence benefits of Nadgee Nature Reserve, NSW	1979 $/respondent/annum, once only payment	Personal interview, 544 Canberra residents	Mean WTP = $27.08
Hundloe et al. (1990)	Preservation benefits of Fraser Island	1989 $/respondent/annum, annual increase in taxes	Mail, 1188 users and 800 non-users (national sample)	Median WTP/person/annum; users = $316; non-users = $187; national = $205; Aggregate WTP (national) = $644.8m/annum
Delforce et al. (1986)	Recreational benefits Flinders Ranges, SA	1982 $/trip, extra WTP to travel to Flinders Ranges	Personal interview, 97 tourists; mail survey, 77 tourists	$35.88 per trip
Imber et al. (1991)	Preservation benefits of Kakadu Conservation Zone	1990 $/respondent/annum for 10yrs	Personal interview, 502 from Northern Territory and 2,034 national sample	Aggregate median WTP/annum Minor Impact = $647m Major Impact = $1,518m
RAC (1992)	Preservation & recreational benefits of Natural Estate areas in NSW and Victoria	1991 $/household/annum, higher prices for timber and taxes	Mail, 500 respondents, 50% response rate	Median WTP/household/annum 100% preservation = $43.50 50% preservation = $140 10% preservation = $200
Majid et al. (1983)	Preservation & recreational benefits of 2 extra parklands in Armidale, NSW	1982 $/respondent/annum	Personal interview, 140 households	Recreation value: Park 1 = $4.7, Park 2 = $5.5 Total value (recreation+non-use values): Park 1 = $11.50, Park 2 = 12.9 Increments to already established parks: Park 1 = $3.8, Park 2 = $5.3

Sources: Noted in the table.

One of the early studies undertaken by Bennett (1984) estimated the existence value of Nadgee Nature Reserve on the south coast of New South Wales in Australia. The area is noted for its diverse natural environment and is home to three species of endangered birds. The personal interview technique was used and the payment vehicle was in the form of a once only payment offered as a tax increase or a donation to a conservation organisation. The sample comprised 544 adult residents in the Canberra area. The mean willingness to pay (WTP) was $27.08 per person per annum (in 1979 dollars), with a standard error of $69 (see Table 1). The WTP estimate was consistent with *a priori* expectations, being positively correlated with age and income. However, responses to the WTP question included a high proportion of protest bids and this, coupled with the high standard error, could be evidence of strategic bias. Strategic bias can result from so-called 'free riders' and zero bidders who are protesting against the valuation exercise or government policy. Twenty five percent of the sample provided zero bids with a small proportion of these being viewed as genuine zero bids. In order to address these problems, Morrison, Blamey, and Bennett (2000) practitioners should ensure that the payment vehicle is 'plausible and non-objectionable' within the relevant institutional and cultural context including by covering all people and by ensuring that the payment is not once-off.

The Resource Assessment Commission (1992, RAC) conducted a CV study to evaluate the preservation values of national estate areas in south-eastern New South Wales and East Gippsland (Victoria) forests. Using a mail-out survey, 5000 respondents were sent the questionnaire with 50 per cent responding. The payment vehicle was higher prices for timber and increased taxes. WTP to preserve forests against logging was sought for 100 percent, 50 percent and 10 percent preservation in the Natural Estate. Median WTP

were $43.50, $140 and $200 per household per annum for the three levels of preservation respectively. Respondents preferring a balance of logging and conservation explained the inverse relationship between WTP and preservation percentage. The difference may also be due to embedding or part-whole mental account bias as discussed by Hausman (2012) and to avoid this, WTP should be subject to the scale and scope of provision of the environmental good or service in question.

Lockwood, Loomis, and DeLacy (1993, p. 233), in a related study to that of the RAC (1992), found Victorians were WTP $52 per household and $41m annually to reserve unprotected East Gippsland national estate forests in national parks. By precluding forest use in timber production, Lockwood et al. (1992) found forest preservation benefits exceeded costs by $543m. Despite these overall results, residents closer to the forest areas valued the market benefits from forest production more highly the benefits from preservation.

Majid, Sinden, and Randall (1983) used CVM to value two new parks and increments to nine existing parks east of Armidale in New South Wales, now listed as part of Gondwana Rainforests of Australia World Heritage listing. Using direct interview and iterative bidding the two news sites were valued, including one with unique rock formations and another with Aboriginal sacred sites. The respective sites had recreational values of $4.7 and $5.5 per person per annum. The total economic value, the sum of use and non-use values, was estimated at $11.5 and $12.9 per person per annum respectively. As a result, non-use values were found to exceed use values in these cases and excluding such estimates could result in significant social losses where preservation is not supported. The study also found that respondents were WTP $3.8

and $5.3 respectively per person per annum for parks as an increment to ones already established. Stand-alone parks were therefore found to be more valuable that considered as increments.

The remainder of studies provided in Table 1 provide a broad brush overview of the use of CVM in valuing national parks areas, including preservation and recreational benefits from preventing mining in Kakadu National Park in the Northern Territory (Imber, Stevenson, & Wilks, 1991), recreational benefits of Flinders Ranges in South Australia (Delforce, Sinden, & Young, 1986), and preservation benefits of Frazer Island in Queensland from non-extractive uses (Hundloe et al., 1990)

In a more recent study, Wilson and Tisdell (2004) undertake a CVM study of Lamington National Park in Australia and find that people are more willing to accept users entrance fees where they know that the funds will be used to benefit for the national park in question and its visitors. International visitors were also found to be more accepting of user fees and willing to pay more than Australians, while people from Queensland were found to be least accepting amongst the states of Australia. Fleming and Manning (2015) found that park visitors to Frazer Island in Australia preferred to forgo some access rights to deliver better environmental outcomes and reduce crowding and that visitor caps was preferred to peak-pricing.

Other examples of studies in the international literature related to peak load pricing of high alpine peaks in Colorado (Loomis & Keske, 2009), whether marine recreators are also willing to pay for terrestrial biodiversity conservation (Roberts, Hanley, & Cresswell, 2017), modelling access to and demand for Gros Morne National Park in

Newfoundland (Martínez-Espiñeira & Amoako-Tuffour, 2008), and using local people in the future management of Korup National Park in Cameroon (Mbile et al., 2005).

Finally, specific to the case study park, Pearson, Tisdell, and Lisle (2002) found that glimpses of NNP provided a seven percent increase in land values while being within walking distance of the park had little effect because of dis-amenities such as parking problems and unsavory people. Ocean and distance to ocean had the greatest impact on price. Pearson (2002, p. 2) also found that a view of NNP provided some $38 million in increased unimproved land valuation for properties in Noosa.

4. CONEPTUAL MODEL AND SURVEY DESIGN

We assume, for simplicity, that the individual's utility or well-being depends on the consumption of market goods (x) and environmental and recreational services (z) provided by a park. Specifically:

$$U = f(x, z, s) \qquad (1)$$

where s is a vector of socio-economic variables such as age, income, education etc. An increase in the supply of z increases utility, which is reflected in the individual's WTP for additional quantities of z. When offered an increment in the quality of z, the individual chooses inputs (e.g. travel time) to minimize his or her expenditures. Thus, the individual solves the dual problem:

$$Min \sum(p_x x + p_z z) \ subject\ to\ U = f(x, z, s) \geq U_0 \qquad (2)$$

where p_x and p_z are the respective prices of market and environmental and recreational services. U_0 is the initial level of utility. The solution to this dual problem is an expenditure function, $e(p_z, z_0, s, U_0)$, which defines the minimum expenditure that yields a utility level of U_0 corresponding to a quality of environmental and recreational services of z_0. Letting e_0 be the corresponding level of total expenditures, we can write:

$$e_0 = e(p_z, z_0, s, U_0) \quad (3)$$

Suppose an individual is asked for their WTP for a higher level of environmental or recreational service, say z_1. He or she will respond with an amount equal to the compensating variation of his or her surplus. At constant utility and total expenditure, e_0 will be given by:

$$e(p_z, z_0, s, U_0) = e(p_z, z_1, s, U_0) - WTP \quad (4)$$

Rearranging, WTP is given by:

$$WTP = e(p_z, z_1, s, U_0) - e(p_z, z_0, s, U_0) \quad (5)$$

This is equal to the maximum expenditure that keeps the individual's utility at the initial level

$$U_0 = U(I, z_0) = U(1 - WTP, z_1) \quad (6)$$

where I is income. Figure 2 graphically outlines these mathematical relationships.

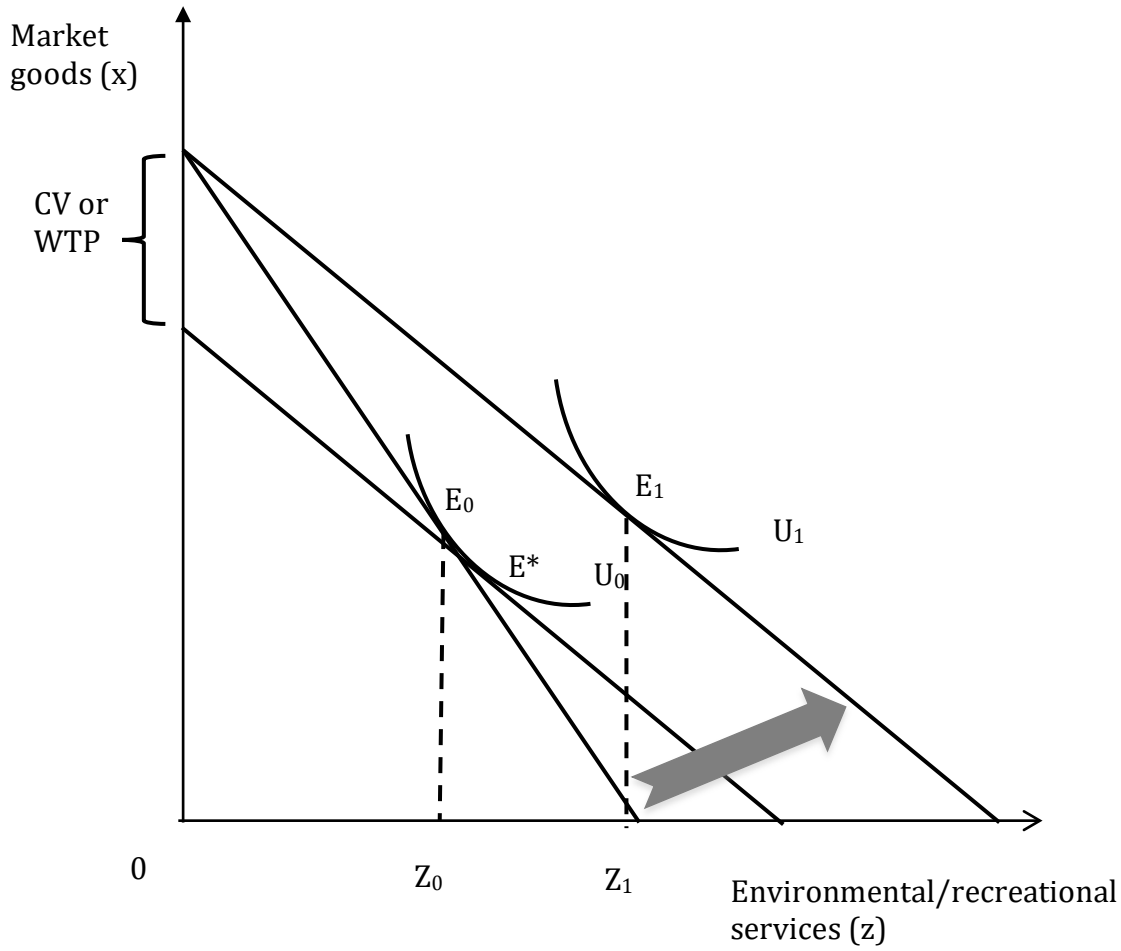


FIGURE 2: WILLINGNESS TO PAY FOR ADDITIONAL ENVIRONMENTAL SERVICES
Notes: The compensating variation (CV) or willingness to pay (WTP) by an individual for a higher level of environmental service, z_1, equates with the amount of money given-up at the new level of environmental and recreational service (new price) so as to make the individual as well off as she or he was prior to the service change, i.e., on the individual's original indifference curve U_0.

In analyzing the demand for environmental services of the national park, we first examine the probability that an individual will make a positive bid to participate in recreation. Conditional on that choice, we then examine the determinants of the dollar amount. Letting y be the individual's WTP, the estimating equations are:

$$p(y > 0) = f(z, s) \qquad (7)$$

$$y = g(z', s', \lambda) \qquad (8)$$

where p(y>0) is the probability of an individual deciding to make a positive contribution; z and z' are quantities of the environmental service (e.g., hours of recreation); s and s' are vectors of socioeconomic variables (e.g., age, income, education), λ is referred to as a Heckman selectivity term. The Heckman term arises because, assuming the decision to make a positive bid is endogenous, a selectivity bias could arise from considering Equation (8) only. To avoid this possibility we employ the Heckman two-step procedure (Heckman 1976). In the first step, we estimate Equation (7) across all observations using a probit model. In the second stage we estimate Equation (8) by OLS using elements with positive bids and including the Heckman selectivity term obtained from the first stage estimation. If this term is significant, it implies that there is a selectivity bias and its inclusion accounts for this bias.

4.1 Survey Design

The target population for the survey was visitors to Noosa National Park. The survey was conducted in October 1995. The survey instrument was originally tested in a pilot study with post-graduate students at the University of Queensland. Particular attention was paid to reference operating conditions suggested to minimize bias in CV studies (Cummings et al., 1986). A number of adjustments were made to the survey instrument after the pilot test.

In the main survey, potential respondents were randomly selected form the front entrance and nearby picnic area of the park. Following introductory questions on the

respondent's socioeconomic characteristics, they were asked a series of question on their travel to Noosa National Park, including travel costs and recreational experience.

To elicit WTP, respondents were asked to imagine that there existed a natural area exactly the same as NNP along the Sunshine Coast's coastline close to Noosa. However, the alterative site was not accessible to people to enjoy its wildlife, scenery and other benefits because no walkways had been constructed and the area was not yet protected under law as a National Park. Respondents were then asked if they would be willing to contribute to a trust that would provide the finances to protect the area as a National Park and make it accessible to people so that they could enjoy its recreational benefits. Where respondents were not willing to contribute to the trust fund, a question was asked to explain their reasoning. Those whom indicated a willingness to contribute were then asked the following question:

> *How much money, on top of what you now spend on other goods and services, would you be willing to contribute per person per visit?*

Respondents were offered a payment card with amounts ranging from $0-$0.5 to $8-$10 and over $10 (AUD 1995). Finally respondents were asked why they were willing to pay the range of amounts the preferred.

The average length of an interview ranged between ten and thirteen minutes. A total of 244 respondents were approached of whom 20 or eight percent refused to be interviewed. A total of 204 (84%) completed questionnaires were obtained.

TABLE 2: VARIABLES USED IN REGRESSION ANALYSIS

Variable	**Measurement**
Dependent	
WTP	Willingness to contribute to the trust fund:
Independent	
HOURS	Time spent at the park: hours
EDUC	Highest education level: primary school, High school, TAFE/Trade school, Tertiary, Other
INC	Before tax income (1995): $0-$7,000, $7,001-$15,000, $15,001-$30,000, $30,001-$50,000, >$50,000
EMP	Employment status: Full time employed, part-time, unemployed, homemaker, student, retired, other
ORG	Membership of outdoor or environmental organization: No=0, Yes=1.
GENDER	Gender: Female=0, Male=1.
AGE	Age in years: <18, 18-25, 26-35, 36-45, 46-45, 46-55, 56-65, >75

Table 2 summarises the variables used to analyse respondents' WTP for creating an additional area equivalent to the current are and quality of NNP. *A priori*, the more hours spent recreating in the park, then more a respondent is expected to value the

park and the higher their WTP. The more educated an individual, the greater will be the amount they are WTP for conservation and recreation. Income (INC) is expected to relate positively with WTP, with those on higher incomes having a higher capacity to pay, *ceteris paribus*. Those employed (EMP) are expected to have a higher WTP than those unemployed, where EMP has a positive relationship with income – of course this is not always the case, particularly for retired people, or the very wealthy whom live from passive income sources. Being a member of an environmental organization is also expected to result in a higher WTP for conservation. The demand for recreation and conservation is expected to be non-linear with age (AGE), being positive and negative throughout the human lifecycle. These relationships are expected, *ceteris paribus*.

5. EMPIRICAL RESULTS AND DISCUSSION

Table 3, column 1 presents the results for the probability of offering a non-zero (positive) WTP bid for conservation and recreation. HOURS is significant: the probability of making a positive bid is related to the length of time spent in the park. EDUC is also significant but has an unexpected sign. While all other variables are not significant, ORG and GENDER have the expected signs. Column 2 presents the results of the Heckman two-stage estimation. HOURS, EDUC, INC, EMP, AGE all have the expected signs but are not significant. ORG and GENDER have unexpected signs and are insignificant.

To further investigate whether the WTP bids differed according to socioeconomic characteristics, t-test were carried out for the following pairs of characteristics as presented in Table 4: workers or non-workers, high income (>$30,000 AUD 1995) or low income (<$30,000 AUD 1995), male or female, and member or non-member of an

environmental organization. While there is no significant statistical differences found between the WTP for these groups, in absolute terms workers' median bids are greater than non-workers ($5.48 and $4.60), and unemployed respondents are more likely to zero bid than the employed which is expected.

TABLE 3: REGRESSION RESULTS (T-STATISTICS IN BRACKETS)

Variable	**Probit** [a]	**OLS** [b]
Constant	1.481 (2.838)	5.463 (3.608)
HOURS	0.195* (2.404)	0.188 (0.195)
EDUC	-0.245* (-2.104)	0.352 (0.408)
INC	-0.056 (-0.613)	0.335 (0.871)
EMP	-0.102 (-1.616)	0.085 (0.195)
ORG	0.178 (0.784)	-0.496 (-0.591)
GENDER	-0.173 (-0.784)	0.433 (0.497)
AGE	0.036 (0.434)	-0.194 (-0.716)
λ [c]	-	-2.169 (-0.263)
n	204	158

Notes: a. Dependent variable is P(y>0). b. Dependent variable is WTP. c. λ is the Heckman selectivity term. * = significant at the 10% level for a two tailed test.

Overall, the mean WTP for recreation is $5.24 per person per visit and the median is $5.00 per person per visit in 1995 dollars. The relative closeness of the median and mean suggest that the bids are reasonably normally distributed and that there are few outliers. Given visitation estimates of over one to one and a half million visitors per annum at the time of the study (from personal communications with NNP Ranges and

the Department of Heritage in 1995 and subsequently in Queensland Parks and Wildlife Service (1999, p. 1)), recreational use values are estimated to be between $5.24 million and $7.86 million per annum in 1995 dollars.

TABLE 4: ANALYSIS OF WTP BIDS (STANDARD ERRORS IN BRACKETS)

Category	**Mean ($)**	**Median ($)**	**N**	**Percent zero bidders (%)**
Worker [a]	5.48 (4.15)	5.00	149	20
Non-worker [a]	4.60 (4.20)	3.00	55	29
p-value [b]	0.18			
High income (>$30,000)	5.54 (4.35)	5.00	1.06	24
Low income (<$30,000)	4.92 (3.96)	5.00	98	21
p-value [b]	0.29			
Male	5.38 (4.27)	5.00	126	23
Female	5.01 (4.02)	5.00	78	21
p-value [b]	0.54			
Member environmental organization	5.16 (3.89)	5.00	143	20
Non-member	5.28 (4.30)	5.00	61	24
p-value [b]	0.86			
Overall	5.24 (4.17)	5.00	204	22

Notes: a. A ‘worker’ is defined as someone who works full-time or part-time, all other categories are classified as ‘non-workers’. b. p-value is for a two-tailed t-test.

TABLE 5: CURRENT ESTIMATES OF TOTAL WTP FOR NNP [a]

Item	**Lower bound**	**Upper bound**
WTP/person/visit 1995 $AUD	5.00	5.24
Visitor days 1995	1,000,000	1,500,000
Total WTP 1995 $AUD	5,000,000	7,860,000
Visitor growth 1995-2018 [b]	47.38%	
Visitor days 2018	1,473,800	2,210,700
WTP $AUD/person/visit 2018 at r =		
3%	9.87	10.34
6%	19.10	20.02
10%	44.77	46.92
LB Total WTP $AUD in 2018 at r=		
3%	14,543,359	15,241,440
6%	28,147,735	29,498,827
10%	65,984,255	69,151,499
UB Total WTP $AUD in 2018 at r=		
3%	21,815,039	22,862,160
6%	42,221,603	44,248,240
10%	98,976,382	103,727,248

Notes: a. Visitation or WTP measures do not account for possible increasing scarcity of recreational experience or non-use values of NNP. b. Since 2006, visitor nights have grown from 3.75 m to 4.6 m in 2017.

Table 5 provides the value of these estimates in 2018 dollars, accounting for the general increase in visitor nights for Noosa region (Lucid Economics, 2018, p. 2) and using suitable discount rates of three, six and 10 percent to provide sensitivity. In 2018 dollars, the median recreational benefit per person per visit ranges between approximately $10 and $47, using corresponding three and 10 percent interest rates for escalation of the 1995 values. The median value is $19 in 2018 with a six spent discount rate. Taking account of growth in visitor numbers to Noosa over the period 2006 to 2018 and converting the general annual growth rate (which is moderated by growth and de-growth phases) to model the increase in visitor numbers to NNP, we estimate total annual WTP for duplication of recreation benefits from NNP in 2018 dollars to range between $15m and $104m, with a middle interval estimates of between $28m and $44m and an estimate $37m.

Key sample statistics (i.e. age, income, gender, education and employment) were compared to those from a visitor attribute survey conducted by the Queensland National Parks and Wildlife Service at this site (Queensland Parks and Wildlife Service, 1995). The results suggest that, in general, the sample in this study is reasonably representative of the population of park users. The relatively small magnitude of the standard error (4.17) compared to the mean suggests that the incidence of strategic bias is likely to be minimal.

Table 6 presents the results of the reasons for zero bids. Approximately 10 percent of the total sample could be categorized as protest bidders. This figure consists of eight percent of the sample whom believe that the government is obliged to provide free recreation services like those provided through additional parks and two percent whom were anti-tourist infiltration of the park. Only one person or 0.5 percent of the total sample was against the payment vehicle. Again, given these results the incidence of strategic bias is low.

TABLE 6: REASONS GIVEN FOR ZERO BIDS

Reason	**No.**	**Percent of total sample (%)**
Community service obligation [a]	16	8
Too expensive to pay	10	5
Not local resident [b]	9	4
Can use substitute site	5	3
Tourist infiltration	4	2
Against payment vehicle	1	0.5
Local resident	1	0.5
Total, zero bids	46	23
Total, sample	204	100

Notes: a. These people believe it is the government's duty to provide fee recreational services. b. These people do not live near the area.

Further examination of non-zero WTP bids in Table 7 suggests that respondent motives went beyond simply use value. Almost 30 percent of those willing to contribute to the fund gave reasons related to preservation and conservation of scarce natural resources

and protection of irreplaceable assets. About five percent of the total bids were explicitly related to bequest (4%) and existence (1%) values.

TABLE 7: REASONS GIVEN FOR NON-ZERO BIDS

Reason	**No.**	**Percent of total sample (%)**
Conservation value	46	23
Park upkeep/maintenance	41	20
Use value	32	16
Affordable	13	6
Bequest value	8	4
User-pays	5	3
Cost recovery	4	2
Education	3	2
Existence value	2	1
Fund research	1	0.5
Community service obligation	1	0.5
Need more parks	1	0.5
Restrict use	1	0.5
Total, non-zero bids	158	78
Total, sample	204	100

5.1 User pays

The concept of user pays during the 1980s and the decades that followed became a central at all levels of government (Lee & Han, 2002; Thur, 2010). While Queensland had reversed its eminent policy of charging users park entrance fees in late 1996, other Australia states and north America and Europe routinely charge for park entry.

From an economic viewpoint, the introduction of a reasonable user fee is desirable because the social marginal cost of using a park for recreation is not zero and is positive. There are costs of acquiring land, building infrastructure and signage, and ongoing maintenance, staffing, central administration overheads, cost of funds and the opportunity cost of funds that could be spent in other importance social service areas such as health and education. The need to recover these costs can provide a justification for a recreational user entrance fee.

In Figure 3, P* is the optimal entry price and P_0 is the current entrance fee of zero. Therefore with current pricing arrangements there is overuse of the park (inefficient allocation of resources); V_0 visitations occur instead of V* which is the optimal level of visitation. The introduction of a user fee ensures that the park is likely to be used in a way that is closer to the social optimum, where social marginal costs (SMC) and benefits (SMB) are equated. It is not necessary to know the exact level of SMC and SMB, rather as long as the fee is not too high, the use of the park moves closer to the social optimum. In this case the theory of second best will prevail in the practical management of the park.

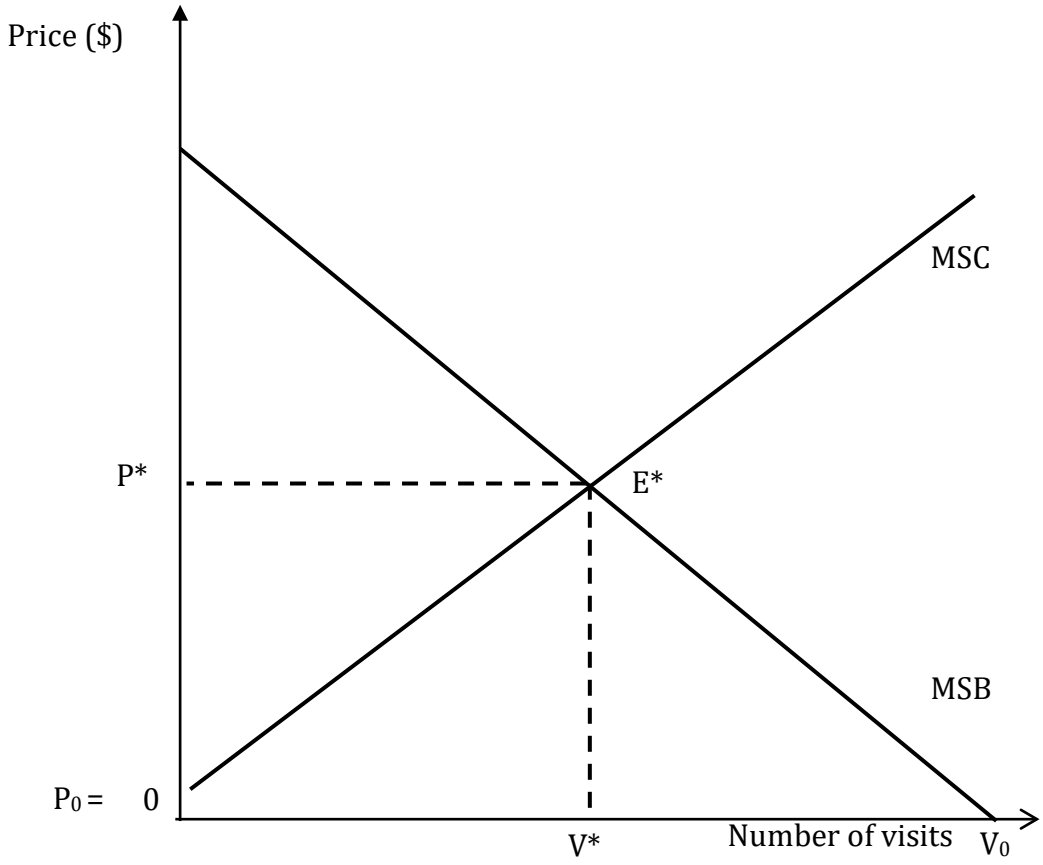


FIGURE 3: OPTIMAL ENTRY PRICE AND USE OF NATIONAL PARK
Notes: Current entry price is nil or P0, resulting in V0 level use. With the optimal entry price of P*, social marginal costs (SMC) are equated with benefits (SMB) and park use is restored to its social optimum at V*.

Equity and sustainability issues, cost recovery, increased quality of recreational experience, reduced vandalism and crime, redistribution of use, increased appreciation of user needs and preferences have all been presented as positive grounds for the implementation of user pays. However, such arguments have been criticized (Blackwell, 1995; Scoccimarro, 1992; Zaltan, 1984) on several grounds including: (a) historically there have not been user pays fees and this goes against tradition; (b) tax payers already have paid for the provision of parks and this would amount to double taxation;

(c) that National Parks exhibit characteristics of merit goods (Tisdell, 1993); (d) that parks should be conserved for their non-use values such as bequest and existence values which are typically not related to user fees and user behaviour; (e) user fees can degrade the recreational experience; (f) that there will be a reduction in recreational use and options and consumer surplus; and (e) that users fees may result in a reduction in supplementary funding for park management.

The economic efficiency argument assumes that those who have higher values for the resource would be willing to pay higher prices for entry. However, some respondents whom held high values for the park, were unwilling to pay for additional park provision due to income constraints. This is typical of the additional provision of goods and services generally; people are constrained by their disposable income and household budget.

6. CONCLUSION

The purpose of this study was to provide an estimate of the recreational value of Noosa National Park, as part of the ecosystem goods and services that parks provide, using a stated preference non-market valuation method and to discuss issues relating to user pays. The values ascertained are lower bound, reflecting an additional identical area like Noosa National Park along the nearby coastline being created. Excluding non-use values, the recreational benefits of the park amount to $19 (AUD 2018) per person per visit, resulting in a total annual use value in 2018 of $28 to $44 million. Responses to the survey questionnaire suggest that park users also hold significant non-use values. Based on the results, we conclude that preserved natural areas and the ecosystem goods and

services they provide along the Queensland coast have significant social value and need to be continued to be protected.

Whether user fees should be implemented for parks in Queensland and indeed more broadly across Australia and the world, is a public policy issue. There are grounds for charging users, particularly where the social marginal cost of use is high that can result from high visitation and scarce resources for park planning and management. Such a charge can help manage adverse environmental impacts and provide a much-needed source of income to fund park maintenance. However, implementing park fees where traditional park use has been free is a difficult political decision, and equity of access needs to be considered, particularly for those members of society whom have limited capacity to pay along with limited alternative recreational options. In addition, user fees may over-emphasise and over-allocate limited park resources to planning and managing recreation, whereas, as the results from this study demonstrate, people in society, including park users, also hold non-use values for parks. The ecosystem goods and services of parks go beyond recreation and these need due consideration in the planning and management of parks.

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