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New Zealand Outdoor Recreation Benefits

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Abstract

Millions of people participate in outdoor recreation activities in New Zealand every year. Economic recreation studies in the country concentrate mostly on market values. Market values only present part of the outdoor recreation benefit; while non-market values represent the other part. In this study, a meta-analysis is used to determine the non-market benefit of recreation. Results show non-market benefits from outdoor recreation to be over five billion dollars annually, exceeding market benefits of approximately four billion. New Zealand non-market values were then compared to those from a United States recreation database and results were favourably similar.

Keywords

Non-market valuation
Outdoor recreation
Consumer surplus
New Zealand

JEL Classification

Q51, Q26

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1. Introduction

New Zealand (NZ) is internationally renowned for its outdoor recreation activities; from the infamous Milford walking track to the legendary left hand surf break at Raglan. Over 75% of its residents and approximately 50% of its tourists participate in outdoor recreation activities annually, with sports like mountain biking, river kayaking, and recreational hunting and shooting increasing significantly in popularity¹ (Carter, 2006; Higham, 1998; Statistics NZ, 2007; Kearsley, 1997; NZTP, 1986; NZTB, 1993; Tourism NZ, 2007a; Tourism NZ, 2007b).

Each full twelve hour day that people participate in an outdoor recreation activity is considered a recreation day. A recreation day can be one person participating in outdoor activities for twelve hours or any other combination of people participating, such as four people participating for three hours each. According to the Ministry of Tourism (2007) and the Christchurch City Council (2003), with over four million international and domestic outdoor recreationists in 2006, we can estimate the number of recreation days in NZ to be 72.5 million days.

People that spend their days participating in outdoor activities are spending money in the form of petrol, equipment, food, lodging, and guides, that they would not normally spend if they stayed home. This is their market value contribution to the country's economy. The market value or economic contribution of outdoor recreation in NZ in 2006 was approximately \$3.8 billion (Ministry of Tourism, 2007). This is not the total economic value of outdoor recreation, however. The total economic value includes both market and non-market values, the latter of which evaluates the net benefit derived over and above anything the participant has paid. A good example of a non-market value is the value of spending the day on the beach. If you enjoy a day out on the beach, but do not pay an entrance fee, you still obtain a benefit from your enjoyed experience. This benefit is a non-market net benefit or consumer surplus value and can be expressed in monetary units (e.g., dollars) to make it easily comparable with market values.

Non-market valuation (NMV) was first developed and applied in the United States (US) in the 20th century. While its concept was originally developed by both economists and

¹ Increases of 70%, 50%, and 1588% respectively with tourists between 1997 and 2006 (Tourism NZ, 2007a; Tourism NZ, 2007b).

non-economists (Thoreau, 1854; Muir, 1912; Clark, 1915a; Clark, 1915b, Hotelling, 1947; Ciriacy-Wantrup, 1947), it was not put into practice until 1958 (Trice and Wood, 1958). In the 1958 study, basic NMV revealed preference concepts were applied to value a water-based recreational activity where people revealed how much they spent to go to the area to recreate. This methodology became known as the Travel Cost Method (TCM) (Trice and Wood, 1958) and is still a commonly used NMV technique used today. Shortly after the 1958 study, another methodology was created. In 1961, Robert Davis, seemingly unaware of the proposed NMV concepts, studied what people in Maine (US) would be willing-to-pay to participate in recreational hunting (Davis, 1963). This technique became known as the Contingent Valuation Method (CVM).

While a few scattered NMV studies were conducted in the 1960's, 1970's and 1980's, it was not until the Exxon Valdez environmental disaster of 24 March 1989, that it became more commonly used. The Exxon Valdez was an oil tanker that ran aground at Bligh Reef spilling eleven million gallons of oil into the waters of the Prince William Sound. This spill is regarded as the biggest environmental disaster in history causing extensive damage to millions of birds, fish and other marine life, while also damaging the coastline and nearby properties for a stretch of over 1,000 miles in Alaska (US). For litigation purposes, the true value of this disaster needed to be known and could only be accounted for by including both market and non-market values. In this way, a holistic benefit cost analysis was able to be calculated. To estimate the non-market values of the Valdez disaster, the CVM approach was used. Since then, CVM and other NMV techniques have been used extensively in relation to land and water management issues (Valdez CVB, 2007; Adamowicz, 2004; Bateman, 2002; Carson, 2000).

To date, there have been hundreds of NMV studies conducted worldwide. In the US, care has been taken to keep track of these studies. As of 2006, over 200 NMV studies for outdoor recreation have been conducted in the US. An extensive database was created to collect this information and from this, it was determined that an average day of recreation in the US provides people with a non-market benefit of \$61.57/day (2007 US\$) (Kaval, 2007; Kaval, 2006; Kaval and Loomis, 2003). In addition, it was determined that in 2006, there were approximately 924 million visitor recreation days on federal park lands during 2006. If there were a similar number of recreation days in 2007, this would result in an estimated non-

market value of \$56.8 billion dollars annually for recreation at federal park lands in the US, not including state, county, and city parks (Kaval, 2007).²

While NMV for outdoor recreation is extremely popular worldwide, the perception is that it is not as commonly used in NZ. We were determined to discover if this was true, and therefore, we conducted an extensive literature review to determine all available sources of NMV for outdoor recreation in NZ. We then created a database from this information with the goal of determining the NMV of outdoor recreation in NZ. This article is a result of our findings.

2. The Non-Market Valuation Recreation Database

Data for the NZ non-market outdoor recreation valuation database were collected from journals, reports, discussion papers, graduate theses, and selected authors of these papers. Search locations included NZ University libraries, Hamilton libraries, journal search engines, internet searches, and the NZ NMV database.³ Many of the studies found during the review used data that were derived from previous studies. The database we constructed for this exercise consists only of data that were derived from studies that collected and analyzed original data for NMV of outdoor recreation in NZ.

The resulting dataset includes 58 observations from 19 studies conducted between 1973 and 2002 (Table 1). Studies were conducted during 15 of these years with one to two studies being conducted during a study year. We believe that the first documented NMV study in the country to be a Master's thesis by Russell Gluck conducted in the early 70's that valued the recreational benefits of the Rakaia fisheries on the South Island (Gluck, 1974).

All database studies included consumer surplus valuation calculations that were converted to 2007 NZ\$/person/day. Information for 93 variables was recorded from each study. These variables were grouped into five general categories: (1) biographical details about each study, (2) survey details and calculated consumer surplus values, (3) details of the econometric methods used in the analysis, (4) study site details, and (5) notes on other significant information not already tabulated.

² Currently this database is being updated. Please refer to http://www.cof.orst.edu/cof/fr/research/ruvd/Recreation_History.html for more recent information (Rosenberger, 2007)

³ The NZ non-market valuation database is located online at: <http://oldlearn.lincoln.ac.nz/markval>.

Of the 19 studies collected, 26% were from reports or discussion papers, 37% from Masters Theses, and 37% from refereed journal articles. A majority of these publications focussed on recreation in general, but five specific activities were also studied: camping, picnicking, tramping, fishing, and mountain climbing (Table 1).

Table 1. Details from the studies in the NZ recreation valuation database (1973-2002).

Study No.	Item Valued	Author/s	Valuation Year	Type of Document	NZ Area
1	Fishing in Rakaia River	Gluck	1973	Thesis	South Island
2	Tramping on the Milford Walking Track	Woodfield and Cowie	1975	Journal	South Island
3	Forest Park Recreation in Coromandel Peninsula	Everitt	1982	Journal	North Island
4	Mt Cook National Park Recreation	Kerr, Sharp, and Gough	1984	Report	South Island
5	Mountain Climbing at Mount Cook National Park	Kerr	1984	Report	South Island
6	Angling and Recreation at Wanganui River	Sandrey	1985	Journal	North Island
7	Saltwater Angling/Lobster Diving	Cairns	1985	Thesis	South Island
8	Recreation at Tararua Forest Park and Arthur's Pass National Park	Kerr and Manfredo	1988	Journal	All of New Zealand
9	Recreation at Upper Wanganui and Whakapapa Rivers	Cocklin, Fraser and Harte	1988	Journal	North Island
10	Recreation at Bottle Lake Forest	Walker	1989	Report	South Island
11	Hollyford Valley Track Recreation	Kane	1990	Thesis	South Island
12	Kauaeranga Valley Recreation	Riley	1990	Thesis	North Island
13	Western King Country Recreation	Killerby	1991	Thesis	North Island
14	Recreation at Methven Lake	Mayer	1993	Thesis	South Island
15	Wellington Regional Park Recreation	Kerr	1994	Report	North Island
16	Angling at Tongariro River	McBeth	1997	Thesis	North Island
17	Saltwater Angling in New Zealand	Wheeler and Damania	1999	Journal	All of New Zealand
18	Rangitata River Salmon Angling	Kerr and Greer	2000	Journal	South Island
19	NZ Marine Recreational Fishing	Kerr, Hughey and Cullen	2002	Report	All of New Zealand

3. Results

After all consumer surplus non-market recreation benefits from the studies were entered into the database, they were converted to 2007 NZ\$/ person/ day for comparison purposes. Overall, the average consumer surplus value for outdoor recreation was \$71.27 per person per day. With 72.5 million outdoor recreation days in 2006 (Ministry of Tourism, 2007; Christchurch City Council, 2003), the average consumer surplus value can be translated into a non-market value for outdoor recreation of over 5.17 billion NZ dollars.

When separated by location, 45% of the observations were in reference to recreation on the North Island, 40% from the South Island and 15% of studies related to all of NZ (both islands). Even though there was a good distribution of studies between the different islands, it seemed that the recreation benefits on the South Island (\$138/person/day) were significantly higher than the recreation benefits on the North Island (\$25/person/day) and studies that did not specify an island or took place on both islands (\$34/person/day) (Figure 1). Further subdividing these results by location indicated that lower value activities such as picnicking and camping were researched only on the North Island, whereas higher value activities like mountain climbing on Mt. Cook or tramping in the Milford Sound, two iconic NZ locations, were located on the South Island, therefore, contributing to a difference in the average consumer surplus values between the two main islands.



Figure 1. Average non-market benefit or consumer surplus value for outdoor recreation activities in NZ (2007 NZ\$/ person/ day) in different study locations

Separating the recreation values by activities shows us that several activities have a much higher value to people than others. Here, we categorized activities by high benefit, moderate benefit, and low benefit. High benefit activities were those valued at over \$100/person/day, moderate benefit activities were valued between \$35-\$99/person/day and lower benefit activities were valued under \$35/person/day. Tramping in the Milford Sound and mountain climbing on Mt. Cook yielded values of over \$100/ person/day. These would be considered high benefit activities. Fishing provides a moderate benefit and lower benefit activities were picnicking and camping.

To further examine the effect of the activities, we grouped the recreation values by land based recreation, freshwater based recreation, and saltwater based recreation. Results show that 57% of the values calculated were from land based activities, while 28% and 15%,

respectively, were from freshwater and saltwater activities. Land-based recreation included tramping, picnicking and camping; freshwater-based activities include recreation on rivers and lakes; while saltwater-based activities are predominantly marine fishing. Although tramping in NZ, which is a land-based recreation activity, was reported to provide the highest recreational benefit among the studies, this is offset by low-benefit land-based recreation i.e., camping and picnicking. On average, freshwater based recreation provided the highest benefit with an average consumer surplus value of \$95/person/year. Land-based was \$63/person/day, and saltwater-based recreation was \$59/person/day. This implies that recreation on freshwater ecosystems in the sample, which is predominantly river based, consistently provided higher recreational benefits than in the other activity areas (Figure 2).

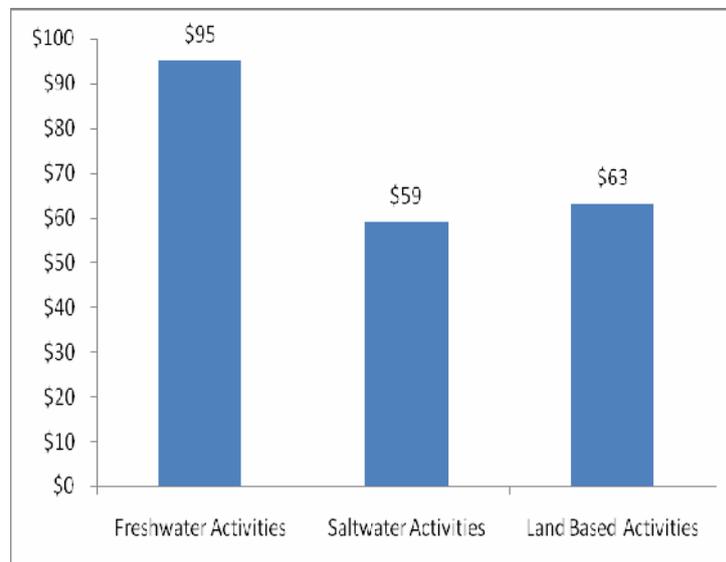


Figure 2. Average non-market benefit or consumer surplus value for outdoor recreation activities in New Zealand by activity location area (2007 NZ\$/person/day)

4. Discussion and Conclusions

In this study, a meta-analysis of the available literature was conducted to determine the non-market recreation benefits of outdoor recreation in NZ. We were successfully able to obtain 58 observations from 19 original studies conducted between 1973 and 2002. Results show that a person experiences a non-market benefit of \$71/ person/day in 2007 NZ\$ for each twelve hour recreation day in NZ. This results in an annual non-market benefit for outdoor recreation of over five billion annually. A similar study by Kaval (2007) conducted for US outdoor recreation values shows that the average non-market value was \$62/person/day in 2007 US\$. Accounting for current exchange rates, NZ numbers are favourably similar, with the average US recreational benefit higher by approximately 10 percent (NZ\$78 in the US

and NZ\$71 in NZ). Therefore, even though only 19 studies have been conducted so far in NZ on non-market recreation values, they are seen to be consistent with those estimated values in the US.

Subdividing the results by island showed that recreation activities on the South Island were valued higher than on the North Island. However, these results should be treated with caution since studies for many low value activities like camping and picnicking were located on the North Island while activities at some of NZ's iconic locations such as the Milford Sound and Mt. Cook were valued on the South Island. We believe this represents a locational study bias due to the lack of studies of other recreational activities that would provide more of a balanced representation. For instance, no recreational valuation studies have been conducted for surfing activities in Raglan or black water rafting in Waitomo; two perceivably high benefit activities on the North Island. In addition, no low value activities were accomplished on the South Island. If these studies were conducted, this might be able to mitigate the perceived location bias.

When grouping recreational benefits by activity, positive benefits were realized for all outdoor recreation activities. High benefit activities were tramping and mountain climbing, while low benefit activities were picnicking and camping (Table 2). These results concur with the results of Kaval (2007) and Kaval (2006) for outdoor recreation values in the US. Mountain climbing/ rock climbing⁴ and backpacking/tramping,⁵ were high value activities in both countries. Fishing was found to be a moderate benefit activity both here and in the US, however, the non-market benefit for fishing in NZ was slightly higher. We believe this might be because NZ is world renowned for its trout fishing⁶ and people travel from all over the world to fish here. There was a difference found between benefits for picnicking and camping in the two countries. In the US, these activities were moderate benefit activities but in NZ, they are only low benefit activities. Perhaps it is true that picnicking and camping are low benefit activities in NZ, or perhaps just more studies need to be conducted, since the number of observations in the NZ database was limited to one per activity.

⁴ Since mountain climbing includes aspects of rock climbing at high altitudes, we believe we can compare it to rock climbing.

⁵ Backpacking typically involves carrying a backpack and a tent for several days while tramping involves carrying a backpack for several days, but no tent is required as people are staying in a hut. For these reasons, we believe these activities are comparable.

⁶ Trout are not native to New Zealand.

Table 2: Non-Market Benefit of Outdoor Recreation by Activity
(2007 NZ\$/ person/ day) with High Benefit Activities valued over \$100/person/day, Moderate Benefit Activities valued between \$35-\$99/person/day and Lower Benefit activities under \$35/person/day.

	New Zealand	United States
Backpacking/Tramping	\$243.55 (5, 0.88)	\$ 169.13 (6, 0.44)
Mountain Climbing/ Rock Climbing	\$ 110.12 (4, 0.09)	\$ 141.64 (27, 0.69)
Fishing	\$ 81.77 (18, 1.75)	\$ 68.01 (173, 1.86)
General Recreation	\$ 33.86 (29, 1.03)	\$ 108.49 (52, 2.12)
Camping	\$ 14.74 (1, 0)	\$ 48.87 (48, 1.07)
Picnicking	\$ 7.00 (1, 0)	\$91.97 (13, 1.53)

Note: Values in parentheses represent (number of observations, coefficient of variation)

Despite the important benefits of NZ outdoor recreation activities and the usefulness of recreational valuation in policy decision making, the number of outdoor recreation NMV in NZ remains very limited. We recommend that more studies be conducted in the future, so that NZ outdoor recreation activities can be more thoroughly evaluated and represented. We believe this would be especially important for those outdoor activities that are experiencing rapid growth in demand and becoming increasingly important to the economy, such as mountain biking, river kayaking, blackwater rafting and recreational hunting and shooting.

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