



# Environmental and Lifestyle Values at Tūmai Beach Sanctuary

A report for Tūmai Beach Sanctuary prepared by  
Henrik Moller and Soren Ian Moller



*Ecosystems Consultants  
Report Number 2012/03*

**August 2012**



**Suggested citation for this report:**

Moller, H., and Moller, S.I. (2012) *Environmental and lifestyle values at Tūmai Beach Sanctuary*. Ecosystems Consultants Report No. 2012/03. 32+ v pages.

**This report was produced by:**

Ecosystems Consultants Ltd

30 Warden St

Opoho

Dunedin 9010

New Zealand

[www.ecosystemsconsultants.co.nz](http://www.ecosystemsconsultants.co.nz)

Telephone: 0 3 4730024 or 027 2268688

Email: [ecosyst@ihug.co.nz](mailto:ecosyst@ihug.co.nz)

Cover photo credits: Ashli Akins, Darren Scott, Henrik Mouritson, Lonna Lisa Williams

## **Executive Summary**

Tūmai Beach Sanctuary is situated about 45 Km north of Dunedin to the south and west of Pleasant River estuary and mouth. Twenty-three analyses of markets in United States and Australia showed that investors paid more for land with the types of lifestyle and environmental amenities that already are concentrated at Tūmai, including

- diverse and spectacular views, especially over water
- coastal location
- recreational opportunities
- rural qualities of tranquillity and privacy
- proximity to services and employment
- fast and reliable access by car and aeroplane
- proximity to protected natural areas and wildlife habitat.

The 'farm park subdivision' concept deployed at Tūmai Beach Sanctuary allows investors to buy a bigger lot than usually available in towns for their house and garden, and to obtain a share in a large communally owned lot between the privately owned properties. That communal block is managed by a 'body corporate' where all owners get a voting share and right to decide on community actions. In the Tūmai Beach Sanctuary case, around 43% of the 35 ha communally-owned block is being replanted in native forest and a local farmer maintains the pasture, controls weeds and harvests baleage from the remainder. The money earned from the hay is used by the body corporate to maintain roads, walkways, water and electricity supplies and to defray rates. Owners therefore obtain a relatively large private lot and all the advantages of rural and coastal living without the burden of usual lifestyle block land management and smallholder farming. However the main advantage of the farm park is that well-spaced building sites are gathered at prime high vantage points to maximise views of sea, estuary, river mouth and inland mountains.

The roads and house sites at Tūmai Beach Sanctuary are on high and stable ground. Therefore the expected sea level rise from climate change will not erode land or damage infrastructure at Tūmai over the next 100 years. The site is also completely free of woody weeds like gorse and broom that challenge farming and ecological restoration in many other lifestyle blocks and smallholdings.

The location, scenic and recreational amenities have already been capitalised into premier property prices that will be protected in a variety of ways at Tūmai. However investors can also expect higher than normal capital gains because the extensive planting of native forest and tussock grasses is in progress. The overseas hedonic pricing studies predict that afforestation up to around 40% land cover will lift prices by between 12% and 57%. Extrapolation to the Tūmai Beach Sanctuary situation predicts that individual lot owners will each gain between \$30,000 and \$142,500 over the next 10-20 years over and above normal property value rises simply because of the maturation of the native forest. Reinstatement of tidal flows to the 26 ha southern arm of the Pleasant River estuary is another important feature of the environmental care provisions at Tūmai which is already attracting abundant and varied bird life in the vicinity of the houses. Hedonic pricing studies demonstrate that this estuary restoration will also be capitalised into further increases in property values.

Classic economic approaches assume that individuals behave selfishly in markets and so will not pay for public goods like provision of conservation and ecosystem services when buying private property. Our review of attitudinal surveys and qualitative investigations in New Zealand challenges this assumption and asserts that some investors will indeed pay more for property at Tūmai Beach Sanctuary because conservation oriented coastal development provides 'existence values' and 'bequest values' for the benefit of all New Zealanders. Restoration of forest and threatened estuary habitats by private land owners is critically needed along much of the eastern coast of South Island because public funds are not available to do it. Increasing public opposition to environmentally insensitive coastal development is coupled with a growing 'green' property market and a diminishing supply of new coastal subdivisions, especially ones secure from climate change threats. Increasing demand for a diminishing resource will drive up property values at Tūmai Beach Sanctuary in the longer run. However, we caution against prediction of the precise amount of the lift in property prices because markets vary considerably and there have so far been insufficient hedonic pricing studies in rural and coastal New Zealand.

We recommend that (i) opportunities to be actively involved in conservation at Tūmai are developed, including design of ways that owners and visitors can contribute to bird and estuary monitoring; and (ii) covenanting to gain carbon credits from forest restoration be considered.

A diversity of lifestyle amenities and ecological values are concentrated at Tūmai Beach Sanctuary. Many investors may have little interest in the 'green credentials' of the development and will simply be seeking peace and quiet and scenic views or recreational opportunities. Such owners may nevertheless gain from the environmental integrity of the development through elevated resale values and associated capital gains from their investment. For others the opportunity to contribute to national conservation priorities in a pleasant, non-onerous and personal way will be a significant motivation for joining the Tūmai Beach Sanctuary community.

## Table of Contents

Executive Summary.....	iii
Acknowledgements.....	v
Introduction .....	1
Tūmai Beach Sanctuary Concept.....	1
The Research Brief .....	6
An Overview of Amenities at Tūmai .....	6
Added Value from Ecological Restoration at Tūmai .....	18
Growth in Capital Value as Tūmai Forest Grows .....	18
Added Capital Value as Coastal Wetlands Restore .....	21
Growing Environmental Support is Growing the Green Property Market .....	22
Opportunities to Actively Participate in Restoration Are Valued .....	24
Covenanting to Lock-in Conservation Efforts Is Valued .....	25
Discussion & Conclusions.....	26
References .....	29

## Acknowledgements

Relevant literature and advice was provided by Prof. Caroline Saunders (Agribusiness and Economic Research Unit, Lincoln University) for issues of covenants. Dr Rod Hay provided the photograph of the sealion on Tūmai beach (Fig. 6), the Yellow-eyed Penguin Trust provided photos of restoration at Tavora (Fig.7) and Irene Walton provided photos of the removal of the causeway (Fig. 3). Fiona Stirling provided comments and proof read and formatted the report. Preparation of the report was funded by Peter & Irene Walton (Walton’s Limited, 10 Rimu Lane, Wanaka), for Tūmai Beach Sanctuary (<http://www.Tūmaibeach.co.nz/>).

## Environmental and Lifestyle Values at Tūmai Beach Sanctuary

### Introduction

#### Tūmai Beach Sanctuary Concept

Tūmai Beach Sanctuary is situated about 45 Km north of Dunedin to the south and west of Pleasant River estuary and river mouth<sup>1</sup>. The land has outstanding rural and coastal views from a rolling hill landscape reaching 46m above the estuary and river margin. The land was farmed until 2009, and currently remains in pasture which is cut regularly and sold as feed for sheep and cattle. Extensive replanting of native trees and shrubs is stipulated as part of the resource consent to subdivide the area (Fig. 1). Planting began in 2009 (Figs 2 a-b) and will continue for the next decade until around 43% of the land will be restored to native vegetation. Another important component of ecological restoration at Tūmai is reinstatement of tidal flows into the southern arm of the estuary which was blocked off by a causeway inserted several decades ago so that the land could be used for feeding cattle (Fig. 3).

The first stage of this new subdivision follows a 'Farm Park' concept<sup>2</sup> where 16 purchasers will each gain a relatively large (0.36 - 0.85 ha; average 0.5 ha) private lot surrounded by a 35.6 hectare lot which is managed in common by a 'Body Corporate' legal structure called Tūmai Beach Services Ltd. Every purchaser is allocated a share in the ownership of that communal lot and thereby has voting rights and responsibilities for maintenance of services and land management. Farm parks are relatively common in North Island, and a few exist around Christchurch, but this is the only one available in southern New Zealand. Funds earned from harvesting baleage from the pasture remaining on the communal lot at Tūmai will be used by Tūmai Beach Services Ltd. to defray rates, and to maintain roads and walkways, water and electricity supply to individual house lots. This communal income will perhaps eventually also be used to create communal amenities for all the residents<sup>3</sup>. Planting of the native forest and sealing the public road from Waikouaiti<sup>4</sup> to the entrance to Tūmai Beach Sanctuary is a condition of the consent to develop the project and is to be paid for by Waltons Ltd., the developers of the whole Tūmai farm park concept.

---

<sup>1</sup> The Tūmai Beach concept is best documented at its website [www.tumaibeach.co.nz](http://www.tumaibeach.co.nz)

<sup>2</sup> <http://www.eskridge.co.nz/>; [http://www.buildyourdream.co.nz/buying\\_selling\\_property/farm-park-lifestyle-property-by-bayleys-1025](http://www.buildyourdream.co.nz/buying_selling_property/farm-park-lifestyle-property-by-bayleys-1025)

<sup>3</sup> A tractor has already been purchased for community use.

<sup>4</sup> Waikouaiti is a town of 1095 inhabitants (2006 Census) situated 5.5 km SW of Tūmai Beach Sanctuary.

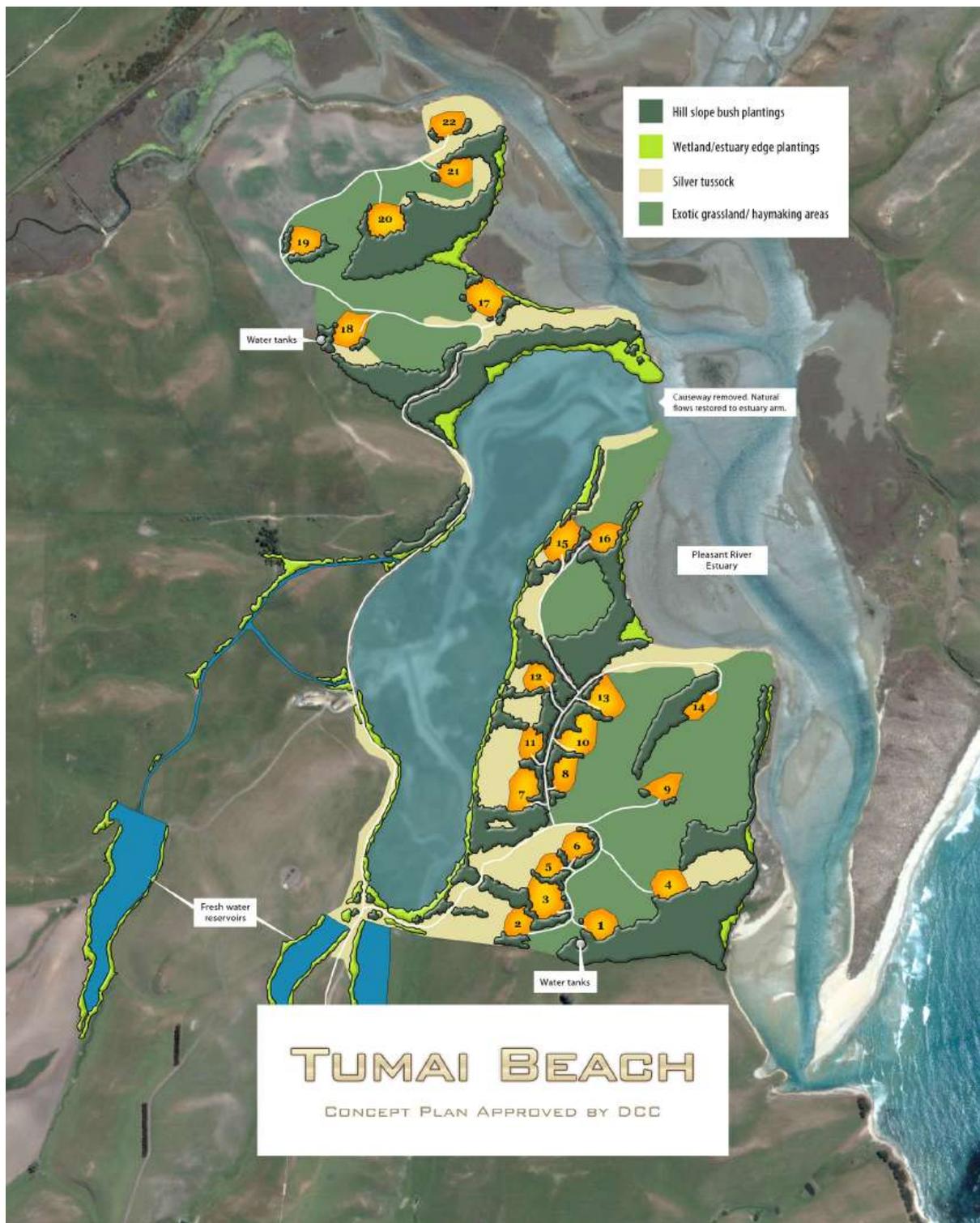


Figure 1: Tūmai Beach Sanctuary concept and ecological restoration plan from the website:

[www.tūmaibeach.co.nz](http://www.tūmaibeach.co.nz)



**Figure 2a: Regenerating forest at Tūmai Beach Sanctuary 2012.** Over 12,000 native trees and shrubs were planted in designated strips at Tūmai Beach Sanctuary in winter and spring of 2009. This is the first phase of re-vegetation of the dark green zones shown in Figure 1. These sample photographs are some of over 122 photo-points and associated GPS mapping and tree height measures done over the entire project area in the summer of 2011-12. That monitoring is being done by Waltons Ltd. to guide the remaining planting programme and meet a resource consent condition that the re-vegetation is monitored and reported to the Dunedin City Council.



**Figure 2b: Close up photos of regenerating forest at Tūmai Beach Sanctuary 2012**



**Figure 3: Photographs of the southern Pleasant River estuary arm before and after the causeway was removed in 2009. Photos by Irene Walton**

## **The Research Brief**

Many purchasers will buy into Tūmai Beach Sanctuary mainly for their immediate pleasure and lifestyle benefits of living there permanently or for holidays. Others will be attracted by the environmental features of the location and associated ecological restoration underway there. Even though Tūmai will be a great place to live now, the resale value of property will necessarily be a consideration for many investors. Therefore Waltons Ltd., on behalf of Tūmai Beach Services, commissioned this evaluation of the lifestyle and environmental amenities at Tūmai Beach Sanctuary and their long-term impact on resale values.

The first report from this evaluation<sup>5</sup> reviewed the New Zealand and international literature from ecological economics and ‘hedonic pricing’ models to ask whether ecological restoration usually results in increased property values. That meta-analysis of case studies is now downscaled for the Tūmai Beach Sanctuary case in this second report and combined with wider literature on why people purchase rural lifestyle blocks and engage in ecological restoration. The key question we seek to answer is whether the demand for property at Tūmai is likely to be strong and grow so that resale value is likely to be higher than for other coastal and rural lifestyle investments around Dunedin.

## **An Overview of Amenities at Tūmai**

Tūmai Beach Sanctuary combines the advantages of rural and residential lifestyles with an innovative environmental restoration project. Important characteristics of the property are highlighted by the current valuation report (Darroch Ltd, 5 May 2010). These include coastal, river, estuary and mountain views; access to the beach, river and estuary; and the short distance to Dunedin and the smaller rural support town, Waikouaiti. The valuation report notes that the subject sites are “superior and the development will appeal to the conservation minded middle to upper market”. Their review of recent sales (2005-2010) in similar coastal developments spread between Western Southland, Catlins and North Otago suggested that an average section price of \$250,000 can be expected. The institution of a farm park concept has allowed a relaxation of normal Dunedin City Council planning restrictions that stipulate a minimum section size of 15 hectares. Instead individual lots and designated building platforms at Tūmai have been gathered into high vantage points with outstanding views. The overall density of lots is still low and the building platforms are well-spaced, but concentration of the platforms close to the estuary, river and coast is unprecedented for new developments in Dunedin City Council and Otago Regional Council’s rural planning zone jurisdiction.

The Darroch report predicted a higher than average purchase price at Tūmai. This has been corroborated by our international meta-analysis of ecological economic and hedonic pricing investigations from the US and Australia<sup>6</sup> which identified many of the same general location benefits that the valuers at Darroch incorporated into their valuation for Tūmai. However some additional amenities relating to environmental assets were identified by our review (Table 1). It is

---

<sup>5</sup> See Moller (2012), available for download at: [www.ecosystemsconsultants.co.nz](http://www.ecosystemsconsultants.co.nz).

<sup>6</sup> These countries were chosen because of their similarities to New Zealand society as colonial settler states from the rich ‘developed’ world. He also included Canada in our search of the international literature, but no relevant Canadian case studies were identified.

remarkable that virtually all the amenities identified as increasing capital value overseas, and very few of the disamenities that erode prices, are present at Tūmai (Table 1).

Although New Zealand lacks hedonic pricing models for rural areas, there has been considerable rural social research that identifies many of the reasons that people purchase ‘smallholdings’<sup>7</sup> in New Zealand. These are predominantly ‘lifestyle block owners’, people who seek a rural life without any expectation that their small farming operation will produce significant food or fibre, nor household income<sup>8</sup>. The smallholders mainly purchase rural land to find peace and tranquillity, a feel for rural living that provides space, privacy and clean air (Figure 4). Many wanted a larger section than they could obtain in urban developments and a safe place to bring up their children (Figure 4). All these opportunities exist at Tūmai Beach Sanctuary. Eventually a communal gate will be installed on the main road into Tūmai to maintain the privacy already enjoyed from it being situated at the end of a side road from the main highway. There is safe swimming and recreation for the children on the estuary and the private lots are large (average 0.50 ha).

Some smallholders are attracted to keeping animals (stock, poultry and horses) and the challenge of learning how to farm (Figure 4). Clearly Tūmai cannot meet the needs of this minority portion<sup>9</sup> of the rural lifestyle market that seeks an active, hands-on, small farming experience<sup>10</sup>. In contrast, some respondents to the surveys also identified the chemicals, smells, mess and conflicts associated with animal husbandry and farming as disadvantages of living in the country (Figure 5). People who feel this way will prefer Tūmai where grazing is prohibited and farming activities are restricted to periodic cutting of baleage. An important disadvantage of living in rural small holdings for some people is the time commitment required for work, farm chores and property maintenance (i.e. to maintain fences and hedges, control weeds; and to drench, feed, water, shear and cull stock etc.). These land and animal care duties have virtually been eliminated on the communal ‘farmed’ lot at Tūmai by restricting production to baleage and transfer of all the labour, safety and operational requirements to cut the grass to a local farmer<sup>11</sup>. The residents and body corporate will manage the forest regeneration, roads, water supply and walkways, much of which will be done by contractors paid from the revenue received for baleage. As one real estate agent expressed it “*Tūmai offers a large townie-styled section in the country without the hassle of farming chores*”<sup>12</sup>.

Issues of sea-level rise associated with climate change did not feature in earlier surveys of smallholders because those surveys were targeted more broadly at rural areas rather than ones along the coast, and probably because awareness of sea level incursions is only recently rising in peoples’ consciousness. The last comprehensive review of climate change impacts on New Zealand<sup>13</sup> predicted that sea level rise, coupled with increasing storm events, will inundate and do considerable damage to many coastal areas and its infrastructure (roads, services, buildings and

---

<sup>7</sup> Several studies are reviewed by Fairweather & Robertson (2000) and updated by Cook & Fairweather (2005 a & b)

<sup>8</sup> Cook & Fairweather (2005 a & b).

<sup>9</sup> The various studies by Fairweather and colleagues assess the portion of the smallholders seeking a more active farming role and income to be around 10%.

<sup>10</sup> Though owners wishing to keep horses are likely to be able to lease grazing on neighbouring farms.

<sup>11</sup> The neighbouring farmer currently has an annual arrangement to cut the grass.

<sup>12</sup> Bill Miller, Southern Wide (SRM Realty Ltd., Dunedin).

<sup>13</sup> Hennessy *et al.* (2007).

natural habitats). For the sake of planning and risk management, the New Zealand Government has adopted an expectation that sea level will rise 0.5 – 0.8m above the 1980-1990 average by the year 2099<sup>14</sup>. Undercutting of fore-dune systems and coastal cliff slips is evident in some parts of alternative nearby coastal settlements i.e. Karitane, Shag Point and Moeraki. The roads approaching Tūmai Beach Sanctuary are generally on high ground and inland, as are the main roads and house lots within the subdivision. The lowest house site is 9 metres above sea level. Geological surveys confirmed that all the lots are stable<sup>15</sup>. Long term impacts of sea-level rise at Tūmai are therefore very unlikely to affect housing and infrastructure in ways threatening nearby coastal settlements<sup>16</sup>.

The spit that forms Tūmai Beach itself is called the 'Pleasant River Sand Spit Conservation Area' and administered by the Department of Conservation. It forms a prominent part in coastal views and offers considerable scope for generating added conservation benefits if it were more actively managed in future<sup>17</sup>. The beach itself offers a private and spectacular walk, and it is periodically visited by New Zealand nationally threatened sealions<sup>18</sup> (Figure 6).

---

<sup>14</sup> MfE (2008)

<sup>15</sup> Robins (2007).

<sup>16</sup> However it might eventually alter the appearance and vegetation on the sand spit which forms the back of the main Tūmai Beach itself.

<sup>17</sup> Little Penguins (*Eudyptula minor*) and maybe Yellow-eyed Penguins (*Megadyptes antipodes*) could be encouraged there, along with Pingao, an endangered native sedge (*Desmoschoenus spiralis*; <http://www.doc.govt.nz/publications/conservation/native-plants/pikao-or-pingao-the-golden-sand-sedge/botanical-information/>).

<sup>18</sup> *Phocarctos hookeri*; <http://www.sealiontrust.org.nz/>

**Table 1: Factors increasing the price paid for rural and lifestyle properties.** The effects that raise prices are identified and reviewed by Moller (2012).

Factor	Effect that raises price paid	Features at Tūmai Beach Sanctuary
1	Good views, especially overlooking water (sea, lakes, rivers and estuaries)	<ul style="list-style-type: none"> <li>• All house sites and walking tracks/roads at Tūmai have views over water.</li> <li>• Lots 1, 4, 9 and 13 have especially wide views of sea and coastline.</li> <li>• Many of the other lots have some sea view, but mostly they focus on estuary and river with salt marshes in the foreground and rural and mountains views beyond.</li> <li>• Restrictions on the height of introduced trees (maximum 1.5 m) and exclusion of hedges, fences, walls or monumental gates will preserve views and open spaces.</li> <li>• The planting plan for woody vegetation and native tussock is designed to preserve views from the house sites.</li> <li>• All house sites are north facing to maximize solar gains.</li> </ul>
2	Diversity rather than uniformity of views	<ul style="list-style-type: none"> <li>• Views of inland mountains (Kakanui Range -snow covered in winter).</li> <li>• Views of water: the flowing Pleasant River; the still water of the tidal estuary; and the constantly-moving sea with surf breaking on Tūmai Beach and around the river mouth.</li> <li>• The view of the untouched wilderness of the sand spit (a Department of Conservation reserve) across the estuary.</li> <li>• Rural landscape views surrounding the development and changing with the farming seasons.</li> <li>• All the building platforms are configured so very few houses in view of each site.</li> </ul>

Table 1 continued:		
Factor	Effect that raises price paid	Features at Tūmai Beach Sanctuary
3	Relatively close to cities or towns that supply services, employment and schools	<ul style="list-style-type: none"> <li>• Tūmai is within the Dunedin City Council jurisdiction.</li> <li>• The closest town to Tūmai is Waikouaiti (pop. 1,095<sup>19</sup>) at 5.46 km distance (5 minutes drive). Palmerston (pop. 1020<sup>20</sup>) is 16 km north (12 minutes drive).</li> <li>• Dunedin (pop. 122,000<sup>21</sup>) is 44.5 km south (45 minutes drive).</li> <li>• Waikouaiti (<a href="http://www.waikouaiti.co.nz">www.waikouaiti.co.nz</a>) has a primary school, new events centre, doctors' rooms, library, various shops (including grocery, bakery, hardware) two cafes and a pub, petrol station, one police officer, volunteer fire brigade.</li> <li>• Palmerston has East Otago High School (levels 7 -13, approximately ages 10 to 18 yrs) and a primary school (levels 1-6, ages 5 – 9 years old).</li> <li>• Dunedin city is one of New Zealand's main centres: its public hospital is a major teaching hospital to the University of Otago's Medical School. It is serviced by rescue helicopters and ambulance. The main private hospital is Mercy Hospital. The city has all the facilities of a major centre (symphony orchestra, art gallery, law courts, police station, library, port, etc.) including the University while retaining the feel of a small city.</li> <li>• There is a bus service between Waikouaiti and Dunedin with 3 return trips daily Monday to Friday<sup>4</sup>.</li> </ul>
4	Reliable vehicle access and proximity to an airport	<ul style="list-style-type: none"> <li>• When four lots have sold the developer will widen the rural road leading to Tūmai Beach Sanctuary to 5.5 metres width and seal it. Tūmai is 5 km from State Highway 1.</li> <li>• Dunedin airport is 76 Km south from Tūmai.</li> <li>• Oamaru airport is 72 Km north of Tūmai.</li> </ul>

<sup>19</sup> NZ Consensus 2006

<sup>20</sup> NZ Consensus 2001

<sup>21</sup> <http://www.dunedin.govt.nz/>

Table 1 continued:		
Factor	Effect that raises price paid	Features at Tūmai Beach Sanctuary
5	Close to recreational opportunities (swimming, boating, fishing, tramping, skiing, cycling, horse-riding)	<ul style="list-style-type: none"> <li>• <b>Horse-riding</b> is popular around Tūmai with a riding school just north of Palmerston. Otago hosts a week long cavalcade annually with 500 participating in 2012. The Otago Rail Trail from Middlemarch to Clyde is for horse-riding as well as cycling and walking. Horses are exercised on nearby Matanaka Beach.</li> <li>• For <b>tramping</b> Tūmai is less than a day's drive from the most spectacular tracks in New Zealand in Central Otago and Fiordland. The Silverpeaks (30 minutes drive south) or the Mackenzie Basin (223 km from Tūmai up the Waitaki Valley) offer more immediate tramping tracks.</li> <li>• For <b>boating</b> and <b>fishing</b> enthusiasts, Tūmai has its own launching ramp and the river mouth can be negotiated in smaller boats. There are boat ramps at Karitane and Moeraki along with boat clubs and fishing clubs. Both townships have annual fishing competitions. <b>Surf casting</b> is possible from Tūmai Beach and white-baiting in the river mouth and flounder and cockles can be harvested from the estuary. The nearby Waitaki River is acclaimed for its <b>fly fishing</b>.</li> <li>• The estuary at Tūmai is ideal for <b>kayaking</b> and is clean and safe for <b>swimming</b>. Waikouaiti and Karitane Beach are popular swimming beaches.</li> <li>• Tūmai beach is good for surfing, as is nearby Karitane.</li> <li>• Tūmai Beach and the estuary are also great for kite boarding.</li> <li>• The closest <b>golf course</b> is Waikouaiti Golf Club (semi private, 9 holes) at Matanaka Beach, 5 minutes drive away.</li> <li>• For <b>skiing</b> Queenstown and Wanaka, main ski centres in New Zealand are 4-5 hours drive away. There are smaller ski clubs at Ohau or Tekapo in the Mackenzie Basin.</li> <li>• <b>Cycling</b> is also gaining popularity as cycle trails begin to proliferate throughout the Otago area. Ranfurly is 88 km from Tūmai and is one of the starting points for Otago Rail Trail.</li> </ul>

<b>Table 1 continued:</b>		
<b>Factor</b>	<b>Effect that raises price paid</b>	<b>Features at Tūmai Beach Sanctuary</b>
6	Near or on the coast	<p>Tūmai Beach Sanctuary is one of very few new developments north of Dunedin and right on the coast. Virtually no land with sea views and with consent to build dwellings remains on the coastal strip of towns between and Tūmai (Doctors Point, Waitati, Blueskin Bay, Karitane and Waikouaiti).</p> <p>Shag Point, Moeraki and Kakanui are further north and the coastal strip within these townships is also built out. There are some vacant coastal lifestyle blocks (5-15 ha) just north of Moeraki and around Kakanui, but the views are either directed inland, or the permitted housing sites are well back from the coastline itself.</p>
7	Reliable water supply	<p>Provision is made for three reservoirs and water treatment at Tūmai and a condition of the development is that everyone must collect rainwater from a roof area greater than 120 m<sup>2</sup>. Rainwater harvested from the roof is likely to supply a third of household needs in most years. This keeps the pressure off the communal water supply which is calculated to secure water supply for all 16 households unless the most prolonged dry spell (23 months) recorded at nearby Palmerston over the past 25 years is exceeded<sup>22</sup>. Provision of normal storage tank volumes for rural North Otago (40,000 – 60,000 l) is therefore likely to secure water supply for an average household without the need to buy emergency top-ups supplied by tanker.</p>
8	Partly but not predominantly forested	<p>The plan for planting targets 43% (29.24ha) of Tūmai in native vegetation (the majority of which is forest, the rest native tussock), with the remaining 57% being the open pasture of the communal lot as well as the house lots and roads. Tūmai is 68.5 ha in total<sup>23</sup>.</p>

<sup>22</sup> MWH (Oct 2007) *Waltons Limited Property Water Resources*

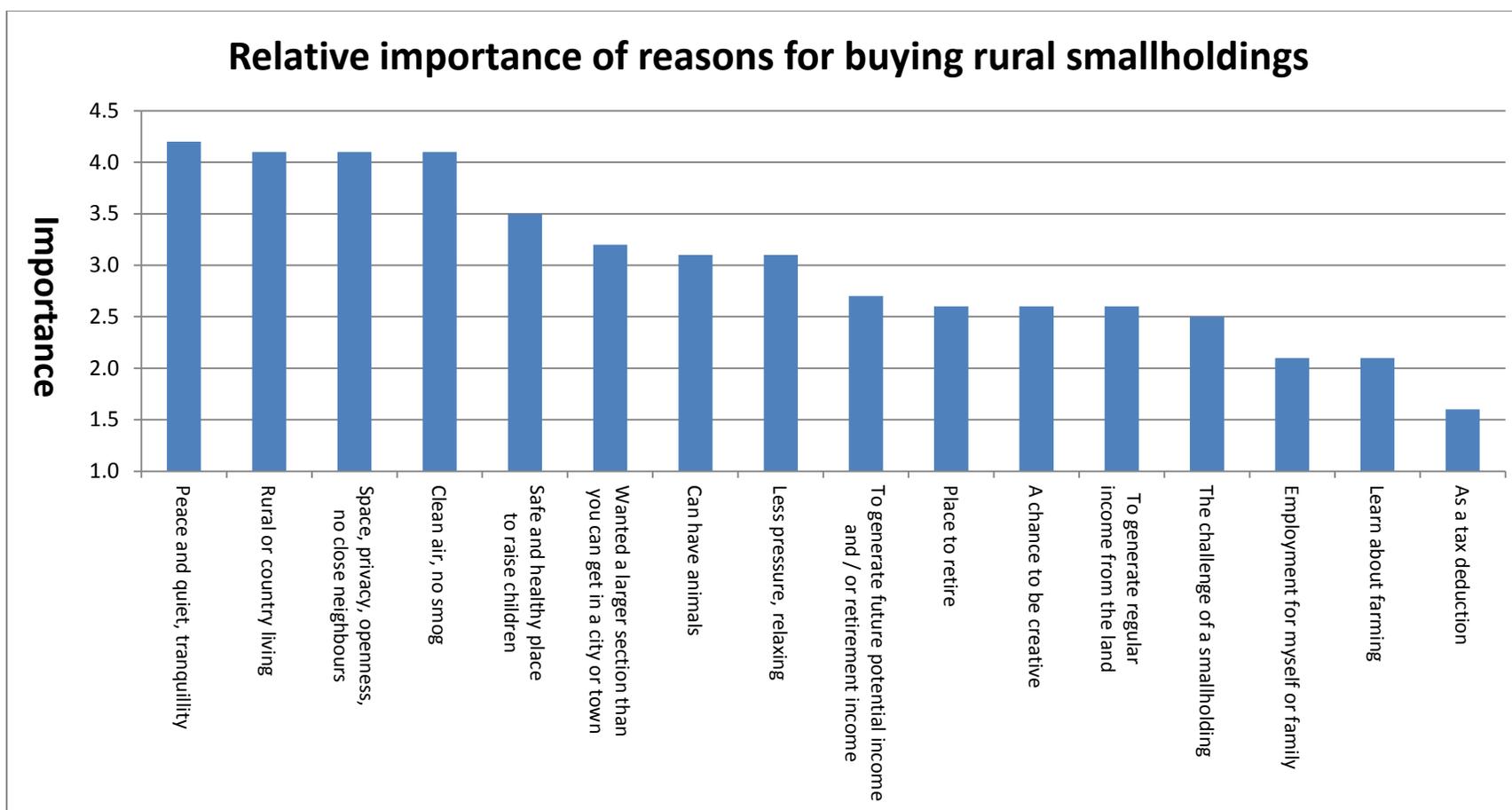
<sup>23</sup> [www.Tūmaibeach.co.nz](http://www.Tūmaibeach.co.nz)

<b>Table 1 continued:</b>		
<b>Factor</b>	<b>Effect that raises price paid</b>	<b>Features at Tūmai Beach Sanctuary</b>
9	Diverse landscape with fragmented forest patches and more complex natural forest edges	The landscape plan <sup>24</sup> provides for ribbons of trees and shrubs along roads and between house sites for privacy, and viewing chutes of silver tussock to preserve sea, estuary and river views from most house sites. Some larger forest patches will have communal walking tracks through them. Straight boundary lines on lots have been designated native planting regimes to avoid abrupt and linear vegetation transitions. Salt marshes and exposed soft sediments in the estuary provide varied colour and light.
10	Close to diverse wildlife habitat, wilderness and/or protected natural areas	Large scale planting of indigenous woody vegetation and restoration of the southern arm of the estuary (26 ha) provide large biodiversity benefits that are locked in for the long-term. Flocks of birds already frequent the restored estuary. Exclusion of grazing stock from the whole Tūmai complex will accelerate regeneration and makes restoration much cheaper and easier to maintain. The sand spit across the estuary is a safe and protected habitat for many sea birds and endangered New Zealand sealions which regularly visit the ocean beach (Fig. 6).
11	Providing active restoration and protection of biodiversity	As above.
12	Close to but not immediately next to rivers and wetlands, no risk of flooding	Only Lot 16 is immediately on the edge of the estuary/river and even this is raised to 9 metres above sea level and has stable ground, so the site is secure from flooding.

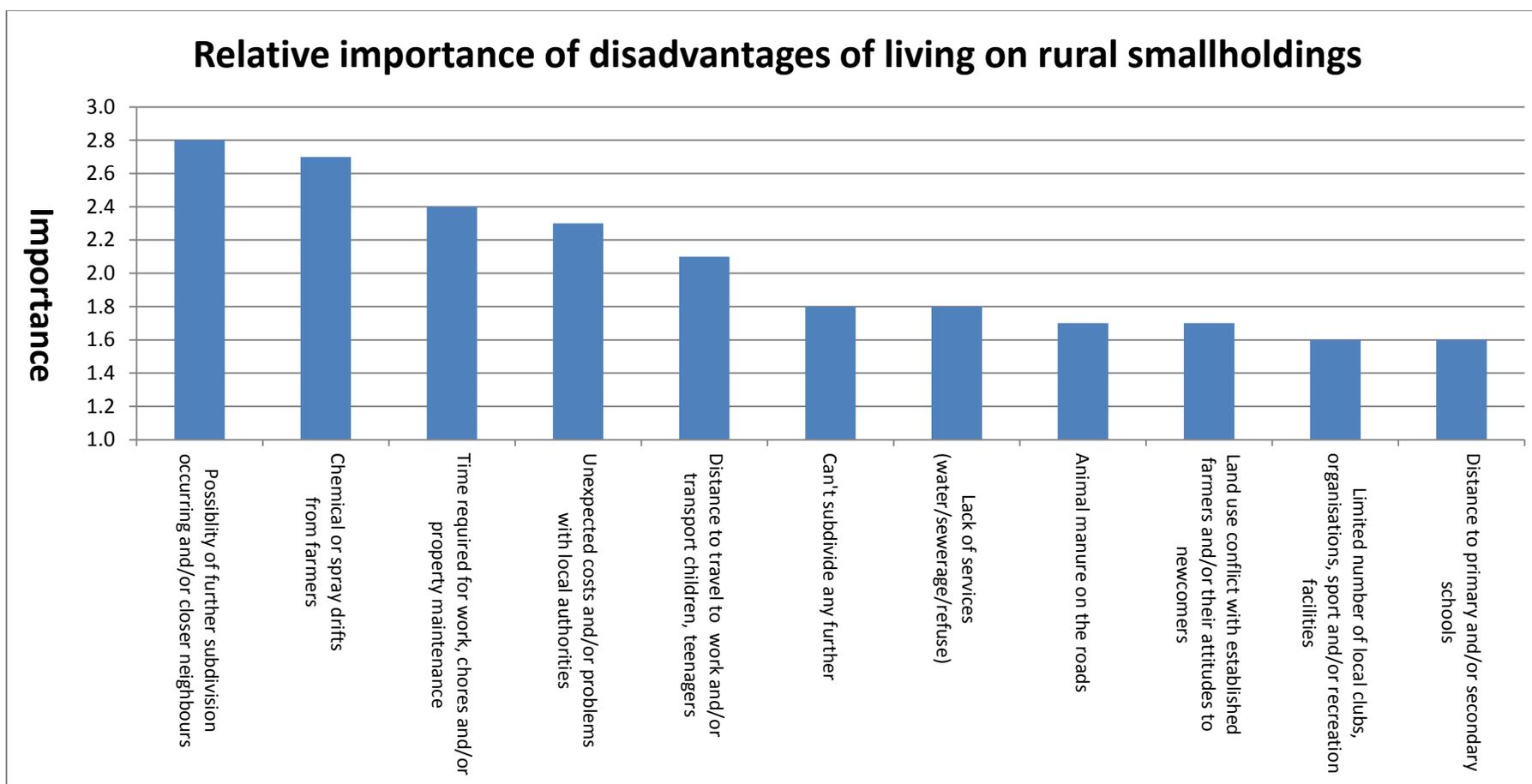
---

<sup>24</sup> Moore (2007)

<b>Table 1 continued:</b>		
<b>Factor</b>	<b>Effect that raises price paid</b>	<b>Features at Tūmai Beach Sanctuary</b>
13	No odours or insects	Exclusion of grazing stock from the whole Tūmai complex reduces farm animal smells and flies that normally breed in stock manure. Temporary odours are given off by exposed estuary soft sediments at low tide but quickly dispersed by onshore winds. There is one small pond below the road leading to Lot 14 and the esplanade, but otherwise no sources of stagnant water.
14	Productive potential (forestry or agriculture)	Two to three cuts of baleage in the last two years have provided significant income (\$20,000 p.a.) for communal use in maintaining roads and infrastructure and to defray rates, but we expect that the five year average income to be approximately \$15,000 p.a. once reduced grass growth during drought years are included.



**Figure 4. Reasons why people purchased small land holdings near Christchurch in 2000, ranked from highest to lowest relative importance.** Data are from Table 12 of Fairweather & Robertson (2000). The vertical axis shows the mean score of 218 smallholders in response to a question about how important they considered sixteen motivations using a five point scale: (1) 'Not at all important'; (2) 'Slightly important'; (3) 'Moderately important'; (4) 'Very important'; and (5) 'Extremely important'.



**Figure 5. Perceived disadvantages of rural lifestyle by small land holdings near Christchurch in 2000, ranked from highest to lowest relative importance.** Data are from Table 19 of Fairweather & Robertson (2000). The vertical axis shows the mean score of 218 smallholders in response to a question about how important they considered eleven disadvantages using a five point scale: (1) 'Not at all important'; (2) 'Slightly important'; (3) 'Moderately important'; (4) 'Very important'; and (5) 'Extremely important'. Note that the vertical scale is smaller than for Fig. 4 i.e. disadvantages are seen as being relatively minor compared to the advantages of living on a rural smallholding



**Figure 6. The endangered New Zealand sealion hauls out on Tūmai Beach.** A mother and well-grown pup were seen there early in 2012, and this beach master hauled out at Tūmai in October 2011.

## **Added Value from Ecological Restoration at Tūmai**

Part of what makes Tūmai Beach Sanctuary unique is the concept of environmental restoration. The most significant features of the restoration plan are the re-establishment of tidal flows into the estuary arm and an extensive native planting programme around the wetland edges and hill slopes. In keeping with the concept of environmental care, further provisions take measures to control disturbance, pests and predators and harvest rainwater. Many people purchasing at Tūmai will be attracted mainly by its scenic and lifestyle values and opportunities for recreation. Others will invest for these and additional reasons related to its ecological and coastal conservation integrity. Careful building codes restrict the colour and height of buildings, and designated landscape building platforms will keep buildings clustered and out of view of all but a few immediate neighbours. Preclusion of fences and gates are aimed to create an aesthetically pleasing and sensitive coastal development with minimal impact on the outstanding coastal area.

The environmental restoration aspects of the project offer the potential for further property value increases as the wetlands restoration and native planting projects progress. The case for future value increases is primarily based on the results of relevant international case studies estimating the premiums paid for properties near restored coastal wetlands and forests<sup>25</sup>. Surveys have shown that New Zealanders place a high importance on biodiversity conservation and restoration. Therefore, in the context of increasing environmental concern, the ecologically friendly aspects of the Tūmai development concept may provide a second advantage by appealing to environmentally conscious investors.

## **Growth in Capital Value as Tūmai Forest Grows**

‘Revealed preference’ studies<sup>26</sup> use a statistical tool (multiple-regression) to analyse market transactions and estimate the extent that environmental features such as forests and wetlands influence nearby property prices. Unfortunately this technique has not been widely used in New Zealand to analyse rural land values. The single study we found from New Zealand looked at the determinants of rural land value and the determinants of changes in rural land value between 1989 and 2003<sup>27</sup>. Results showed that the value of rural land reflects the productivity of agriculture as well as potential returns to alternative land uses such as lifestyle or residential development. However, the effects of environmental features were not included in the analysis. In terms of change in value, the real value of rural land across all uses increased substantially over the study period. The highest value uses (including lifestyle properties) increased by 125-165%.

---

<sup>25</sup> A fuller review of the literature is outlined by Moller (2012). Here we summarise the most important findings for potential escalation of property values at Tūmai Beach Sanctuary in particular.

<sup>26</sup> Two main methods for studying the values people place on environmental amenities analyse ‘revealed preferences’ or ‘stated preferences’. Revealed preference methods analyse actual market transactions using a statistical tool (multiple-regression) to estimate the extent different property characteristics, such as proximity to environmental features, impact overall property prices. By estimating the premiums paid for certain property characteristics, revealed preference studies measure a very specific aspect of value in dollar terms. Moller (2012) includes a summary of theories of economic value and an assessment of revealed and stated preference methodologies.

<sup>27</sup> Stillman (2005).

A consistent finding across a number of revealed preference case studies is that the presence of trees and forests increases property prices. The premium associated with trees and forests is mostly attributed by various studies to the recreational and scenic values that they provide.

- A study of southwest Michigan rural land values found that property prices increase by 1.0% per 1% increase in the area of forest within a property<sup>28</sup>. Tūmai proposes to restore forest from scratch (zero percent cover<sup>29</sup>) to around 43%. If extrapolated to Tūmai, forest restoration alone will lift property prices by around 43% over other market fluctuations.
- A Wyoming study of rural lifestyle properties in the scenic Jackson Hole area produced even more dramatic results. Sales of vacant land increased in price by 37% if the property contained 'some trees' compared to land with little or no vegetation. This premium increased to 57% if the property featured 'many trees' compared to land with little or no vegetation<sup>30</sup>.
- Trees and forests in the surrounding area also have a positive impact on land prices. In Tennessee rural-urban interfaces, moving in from an initial distance of 1km from an evergreen forest lot to a final distance of 100metres away increased the average house price by 5.3%<sup>31</sup>.
- More modest increases in property values from adding trees were found in rural lifestyle blocks in Victoria, Australia<sup>32</sup>. Remnant woody vegetation<sup>33</sup> has a positive but diminishing marginal implicit price. The value of the lifestyle properties is maximised when the proportion of area occupied by indigenous vegetation is about 40%. In the Victoria study this would add around 12% to property values compared to nearby lifestyle subdivisions without forest. Tree cover exceeding 80% reduces property value below the value of property with no tree cover in Victoria.

It will take at least 10 years before a dispersed canopy of indigenous vegetation can be restored to much of Tūmai, and another 10 before it resembles a forest with a continuous canopy in the larger patches. Figure 7 shows the current emerging native forest at Tavora, 6 Km N of Tūmai, at five-year intervals since planting. Therefore the hedonic pricing studies overseas estimate a 12% - 57% increase in property values at Tūmai over the next 20 years from the growing forest over and above the effect of other improvements and any fluctuations in property market values. However, the findings of international studies must be treated with some caution as estimated values vary between studies from different geographical locations. The wide range of premium prices paid for trees overseas illustrates how each market is context dependent. The specific dollar values of these effects found in different studies therefore cannot be directly transferred to Tūmai Beach because the local market is too small and the landscape and social context of sales analysed elsewhere can not be assumed to apply exactly at Tūmai.

---

<sup>28</sup> Ma and Swinton (2011).

<sup>29</sup> One introduced tree and a small cluster of matagouri bushes were all the woody vegetation present at the time of instigating the Tūmai Beach Sanctuary.

<sup>30</sup> Spahr and Sunderman (1999).

<sup>31</sup> Cho *et al.* (2008).

<sup>32</sup> Polyakov *et al.* (2012).

<sup>33</sup> The authors defined this as trees above 2 m high. Apparently the trees are predominantly indigenous native species, but no evidence is presented to quantify this.



**Figure 7: Revegetation of riparian zones at Tavora by the Yellow-eyed Penguin Trust, photographed in 2003 (top left), 2004 (top right) and 2012 (below). Photos provided by the Yellowed-eyed Penguin Trust. This site is approximately 6 Km north of Tūmai Beach Sanctuary and has similar growing conditions, so it is the best guide to the expected growth rate and changing appearance of the forest expected at Tūmai.**

## Added Capital Value as Coastal Wetlands Restore

The values associated with wetlands and their impact on property prices is more ambiguous. Wetlands may provide positive amenity values such as open space, enhanced views, and wildlife habitat. On the other hand, they may also provide negative impacts ('disamenities') such as odours and insects. Different studies have reached different conclusions depending on the type of wetland and location of study.

- A study of southwest Michigan rural land values found that land prices increase by 3.1% per 1% increase in wetlands area within a 1.5km radius<sup>34</sup>.
- Based on a review of existing wetlands studies, it was found that wetlands in urban areas and wetlands with more open water generally have more value than rural wetlands and forested wetlands<sup>35</sup>.
- Coastal wetlands tend to be more highly valued than inland wetlands. In rural Carteret County, North Carolina, close proximity to inland wetlands was found to lower property values, while close proximity to coastal wetlands increased property values. Moving in from an initial distance of 180m from the nearest inland wetland to 18m away<sup>36</sup> decreased the average house value by 7.5%. Moving in from an initial distance of 180m from the nearest coastal wetland to 18m away increased the average house value by 10.2%<sup>37</sup>.
- Studies show a general trend of wetland restoration being correlated with increasing housing values<sup>38</sup>. For example, a study of the housing market of Fairfield, Connecticut indicated restored wetlands were associated with positive increases in nearby property values, while disturbed wetlands were associated with decreases in property values<sup>39</sup>.

In general, the impact of wetlands on property prices is less clearly defined than the impact of trees and forests. However, there is a trend that wetlands with more open water, coastal wetlands and restored wetlands are associated with higher property prices. The restoration of tidal flows into the southern estuary arm at Tūmai will undoubtedly have added value to the properties nearby, providing wide views over water and attracting birds ('Use Values')<sup>40</sup>. The estuary currently shows the scars of previous use as a cattle rearing platform, vehicle tracks and lacks saltmarsh vegetation. However all of these reminders of the past will gradually fade and the area will take on a more natural and for most people, a more aesthetically pleasing appearance as restoration consolidates.

---

<sup>34</sup> Ma and Swinton, (2011).

<sup>35</sup> McConnell and Walls (2005).

<sup>36</sup> The closest allowed by the data.

<sup>37</sup> Bin and Polasky (2003).

<sup>38</sup> Hurd (2009).

<sup>39</sup> Earnhart (2001).

<sup>40</sup> See Figure 1 of Moller (2012) for the ways ecological economists divide total economic values.

## Growing Environmental Support is Growing the Green Property Market

Ecological and conservation science first principles identify several ways that the restoration efforts associated with development at Tūmai Beach will result in a 'net ecological gain'<sup>41</sup>. Plantings will significantly improve indigenous vegetation on the property and plans are being drawn up to direct and accelerate the natural succession processes towards a matai-totara-broadleaf coastal forest type that resembles what used to grow there before being cleared for farming. Not only will this provide a habitat for native flora and fauna, but also further stabilise slopes, reduce weedy areas and buffer the estuary from adverse effects. Fencing to exclude stock from the farm park will support the restoration measures by preventing trampling and grazing of indigenous vegetation, weed dispersal and effluent reaching the estuary. A superb feature of Tūmai Beach Sanctuary is a complete absence of shrubs and seed banks of woody weeds like gorse and broom which challenge farming and ecological restoration in many lifestyle blocks and smallholdings. Coastal wetlands are particularly degraded in New Zealand and considered of high conservation priority<sup>42</sup>. The saltmarsh within the estuary is degraded and unlikely to be sustainable in the long term under the status quo. The return of saltwater to the estuary arm will enhance native saltmarsh vegetation, providing a habitat for native invertebrates, fish and birds and there is scope for the community to actively intervene to accelerate restoration of the southern arm, as well as the saltmarshes flanking the main estuary and riverbed.

'Stated preference' studies<sup>43</sup> suggest New Zealanders as a whole place a high value on biodiversity conservation and enhancement<sup>44</sup>. An example of a case study demonstrating a significant 'willingness-to-pay' to support biodiversity conservation investigated community values surrounding wasp management options for Lake Rotoiti. Results showed that avoiding a decrease in native insect numbers that would result in 'few insects' remaining is worth about \$150 per year to the average household. Avoiding a decrease in native bird numbers that would result in 'few birds' remaining is worth about \$300 per year to the average household. These value estimates suggest that people would be willing to spend significant amounts of money to protect native biodiversity<sup>45</sup>. Two further surveys of New Zealand residents showed significant support for a hypothetical biodiversity restoration programme involving the planting of additional native trees on private and public land. Sixty percent of respondents were willing-to-pay to support these schemes<sup>46</sup>. Results indicated that a typical (median) respondent was willing-to-pay \$42 (2007 NZD) annually to support a biodiversity programme through the additional planting of native trees on private land, and \$82 to support a similar programme on public lands.

---

<sup>41</sup> Wildlands (2007b: 4).

<sup>42</sup> MfE & DOC (2000).

<sup>43</sup> Stated preference methods use surveys to construct hypothetical scenarios where respondents state their 'willingness-to-pay' for an environmental feature or quality. In contrast to revealed preference studies, stated preference studies capture a much wider range of values including 'non-use values' associated with the existence of environmental amenities and their bequest to future generations.

<sup>44</sup> Moller (2012).

<sup>45</sup> Kerr and Sharp (2008).

<sup>46</sup> Kaval et al. (2007).

About one-half of New Zealanders appear to have sustainability on their radar, but only one in four New Zealanders admit to following the conversation closely<sup>47</sup>. These people have a well-defined demographic profile (they are more likely to be male, to be older than 60 years old, and to have a university education). Most New Zealanders (83%) agree or strongly agree with the principle underpinning the sustainability issue (i.e. that countries should make decisions about the present, with the long-term future in mind).

There is ample evidence for a growing conservation ethic amongst New Zealand society as a whole<sup>48</sup>. This is demonstrated by:

- Creation of complex legislation for environmental protection and citizen's participation in determining local environmental management decisions<sup>49</sup>
- Increasing designation of protected natural areas in terrestrial and marine habitats
- Accelerating numbers of covenants voluntarily placed on private land with the help of the Queen Elizabeth II National Trust<sup>50</sup>
- Rapid and ongoing establishments of new conservation and ecological restoration initiatives run by community groups on both private and public lands, including creation of a national network of predator-resistant eco-sanctuaries<sup>51</sup>
- Increasing numbers of private conservation trusts and restoration agencies
- Increasingly active Regional Councils in facilitating environmental care amongst land owners and increasing regulatory requirements
- Escalating demands for cleaner water and more equitable distribution of water amongst users<sup>52</sup>
- Steady increase in Māori community-led fisheries management initiatives (mātaitai, taiāpure and Fisheries Act section 186 closures)<sup>53</sup>
- Rapid escalation of Quality Assurance schemes for eco-verification of minimal environmental impacts of food and fibre production<sup>54</sup>
- Increasing public consciousness and advocacy for protecting New Zealand's 'clean-green' image.
- Increasingly visible and active green housing initiatives in New Zealand and Australia<sup>55</sup>.
- Growth in the political support for the Green Party of Aotearoa New Zealand and emergence of stronger environmental policies amongst more centrist and right wing political parties

---

<sup>47</sup> Research New Zealand (2007).

<sup>48</sup> New Zealand's environmental history is reviewed by Pawson & Brooking (2002) within which Dann (2002) traces a strand to recent broadening of an earlier preservation and wilderness oriented environmentalism to a more pluralistic and sustainable livelihoods approach.

<sup>49</sup> Reviewed by Wheen (2002)

<sup>50</sup> See p5 of QE II Annual report (2011)

<sup>51</sup> Scofield et al. 2011, Innes et al. (2012); and see <http://www.sanctuariesnz.org/projects.asp> for details on 68 examples

<sup>52</sup> Hughey et al. (2010).

<sup>53</sup> [www.mahingakai.org.nz](http://www.mahingakai.org.nz)

<sup>54</sup> Wharfe & Manhire (2011)

<sup>55</sup> Reed & Wilkinson (2008)

These, and many other signals, suggest that there will be an increasing market for environmentally friendly rural and coastal development and potentially escalating resale values as the ecological restoration at Tūmai solidifies and becomes more visible.

## **Opportunities to Actively Participate in Restoration Are Valued**

Many investors at Tūmai may not wish to become actively involved in community-led conservation efforts and there will be absolutely no requirement that they do so. However, repeated studies in New Zealand and other countries are emphasising that some people want meaningful and responsible roles in restoring and managing their own local forest, wetland, lake, river, estuary or beach<sup>56</sup>. An army of green volunteers contribute to hundreds of restoration projects in New Zealand, and the Department of Conservation is shifting emphasis to become a facilitator of citizen scientists and conservationists rather than trying to do it all themselves<sup>57</sup>. Formal qualitative analysis of interviews of these private restorationists emphasise that they are motivated by a wide range of values, and that restoration of the ecological integrity of a site is only one of them. The common purpose and collaboration involved strengthens community networks and kinship links, strengthens people's commitment to their local place and reconnects them with their childhood and their cultural roots. Education and all sorts of less formal ways of learning build appreciation of natural, social and economic phenomena and develop skills amongst participants. Some investors will buy into Tūmai Beach Sanctuary partly because there is good ecological work to be done by themselves and that they will have a degree of autonomy to implement their own way of getting to a shared community vision. The inclusive constitution of the body corporate at Tūmai and regular income from harvesting the grass provides every opportunity for active participation in monitoring and restoration by those seeking such a role. We recommend that a protocol for Tūmai for counting birds in a standardised way and pooling the counts from all residents and visitors is developed first and another for monitoring the soft-sediment communities in the restoring estuary should follow. Ecological values for the small pond by Lot 14 and the margins of the water storage ponds could also be enhanced by planting and active management. Ongoing predator control once the forest has been restored may support added biodiversity.

---

<sup>56</sup> Phipps et al. (2011).

<sup>57</sup> <http://www.doc.govt.nz/publications/getting-involved/volunteer-join-or-start-a-project/start-or-fund-a-project/guidelines-for-community-conservation-partnerships/>

## **Covenanting to Lock-in Conservation Efforts Is Valued**

Research suggests that many New Zealanders appreciate covenants and resource management conditions that lock-in conservation benefits for future generations. For example, a survey of covenantees in the Canterbury region of New Zealand revealed that a high proportion had entered the covenant for altruistic reasons, the main attraction being protection in perpetuity from farming, forestry, building or quarrying should the land change ownership in future<sup>58</sup>. Conservation covenants may therefore have wider appeal and are best suited to areas of land which are small proportions of commercial holdings, which have well-defined management prescriptions, little active management, and little conflict between conservation and other objectives for the land. All these conditions are undoubtedly met at Tūmai Beach Sanctuary where forest and native tussock restoration is required on around 43% of the land. Tūmai is a case where an incentive for entering a covenant for conservation was a prerequisite for granting rights for housing or other development on adjacent land. Conservation oriented investors at Tūmai will be particularly attracted to the relatively high proportion of the area that is retired from grass production. The more usual covenants on rural land have a small percentage of the total area of the farm, with 65% of respondents in the Canterbury survey having 6% of their total area under covenant. Only in one was all the area under covenant.

Covenants seem to be well suited to the conservation of native bush where the objectives are clear and the conservation prescriptions fairly uncontroversial, and the area to be conserved is only part of a commercial land holding. The opportunity cost of creating covenants was judged “not insubstantial” by many landowners<sup>59</sup> and creation of forest on around half the communal lot at Tūmai will eventually reduce the income gained from baleage which is to be used to maintain roads and walkways, water supply and defray rates. One potential way of recouping income from land dedicated to restoring woody vegetation is to enter it into the carbon market through covenants established by the Emissions Trading Scheme (ETS). The market and associated legislation is complex, so it is not immediately clear whether Tūmai forest restoration will qualify and how much income it would generate. We recommend that the ETS is investigated in detail for potential inclusion of Tūmai in the coming year.

---

<sup>58</sup> Saunders (1996).

<sup>59</sup> Saunders (1996)

## **Discussion & Conclusions**

A diversity of lifestyle amenities and ecological values are concentrated at Tūmai Beach Sanctuary. Many investors may have little interest in the 'green credentials' of the development and will simply be seeking peace and quiet and scenic views or recreational opportunities. Such owners may nevertheless gain from the environmental integrity of the development through elevated resale values and associated capital gains from their investment.

Other more environmentally oriented investors will be justifiably proud of the ecological restoration and attracted to buy at Tūmai Beach Sanctuary because it contributes to important national biodiversity goals. Surrounding areas give some indication of the potential ecological value at Tūmai Beach. The Pleasant River estuary and particular sites within the estuary are listed in several local government publications for its conservation, ecological, or physical significance and scarcity<sup>60</sup>. Within the Otago Region, relatively unmodified saltmarshes have significant ecological value by providing important habitat for indigenous invertebrates, fish, and birdlife. Although no threatened fauna species were recorded at Tūmai Beach, the Longfin eel (gradual decline) and several threatened species of birds have been recorded in the past in the Pleasant River and estuary<sup>61</sup>. Tūmai Beach meets two out of four national priorities for the protection of indigenous biodiversity on private land. Tūmai Beach is part of the Waikouaiti Ecological District, where much of the coastal zone has less than 10% of its original indigenous vegetation cover remaining (National Priority 1). It is therefore classified as an acutely threatened land environment. National Priority 2 covers wetland vegetation<sup>62</sup>. Private investment in re-vegetation as part of responsible coastal development is needed on the east coast of South Island between the Catlins in the south, to Kaikoura in the north<sup>63</sup>. The Department of Conservation simply does not have the funds to acquire large amounts of farmland and restore it to forest, yet it is these warmer lowland sites that were naturally fertile and where biodiversity flourished most in the past<sup>64</sup>.

Some of the outstanding values of Tūmai identified from the national and international literature, especially scenic and lifestyle amenities, have already been capitalised in the sales prices of sections sold at Tūmai Beach Sanctuary<sup>65</sup>. The valuation presented by Darroch (2010) predicted future sale prices to be in top end of the range paid in recent sales of coastal sections in Southland and Otago. However this valuation does not appear to have incorporated a detailed inspection and scoring of the lifestyle and environmental amenities identified at Tūmai in this report. Nor was there any allowance for the way that the regenerating forest and restoration of the estuary will naturally enhance the aesthetic and ethical appeal of Tūmai Beach Sanctuary in the ways summarised in Table 1. Factors #2 (diversity of views), #8 (partly forested), #9 (mosaic of habitat patches and edges), #10 (protected natural areas) and #11 (opportunities to be actively involved in biodiversity restoration)

---

<sup>60</sup> Otago Regional Council (2004)J43 316152; Waitaki District Plan WDC, 2004; Dunedin District Plan (2006) Schedule 25.4, Site No.C107, E233200 N5514500.

<sup>61</sup> Wildlands (2007a).

<sup>62</sup> MfE 2007 (cited in Wildlands, 2007a: 11).

<sup>63</sup> The only significant areas of predominantly woody vegetation in this 600 Km length of coastline remains of Horomaka (Banks Peninsula) where the rugged terrain prevented wholesale forest clearance in the past.

<sup>64</sup> Perley et al.(2001).

<sup>65</sup> Thirteen lots on Stage II remain to be sold at the time of writing this report; a further 6 lots will eventually be available in Stage III of the development to the north and west of the estuary arm (Fig. 1).

will be greatly enhanced and increasingly visible over the coming 20 years. Land values will rise as the restoration of the forest and estuary become more conspicuous (well grown trees, abundant birds and bird song, natural vegetation and soft sediments in the estuary), and houses with low visual impact become bedded into the landscape. Overseas studies observed rises in purchase price of 12% (Victoria), 37% (Wyoming, 'some trees'), 43% (Michigan) and 57% (Wyoming, 'many trees') on forested properties compared to properties without forest. Darroch estimated an average lot price of \$250,000 at Tūmai in 2010. If the capital gains found overseas are extrapolated to Tūmai, they predict capital gains of \$30,000 to \$142,500 per lot over the next 10-20 years over and above other (and unknown) market fluctuations because the forest has been restored. Some added gain is also expected from restoration of the estuary. While we caution about extrapolating directly to the New Zealand and Tūmai Beach Sanctuary case, clearly some of the added capital gains from the forest regeneration are likely to be substantial. The target native forest cover at Tūmai (ca. 40%) is the preferred level of forest cover that elevates land values in Victoria.

We expect the overseas hedonic pricing analyses to generally underestimate willingness-to-pay for property at Tūmai Beach Sanctuary. This is partly because of doubtful economic axioms: Economic theory suggests that provision of the 'Non-use Values'<sup>66</sup> associated with conservation beliefs are not normally capitalised into land prices<sup>67</sup>. However, this conclusion is based mainly on underlying assumptions that individuals act in markets entirely for selfish reasons and will not pay for public goods which will be provided by wider society. It is therefore no surprise that the hedonic pricing analyses have been based on searching for broad scale biophysical and location predictors of willingness-to-pay, the type of metrics that can be read off a map or calculated from satellite imagery. A more nuanced and deeper analysis of justifications for purchasing particular parcels of land, including partly for conservation reasons, may well reveal some degree of willingness-to-pay for what are normally called public goods. Public good benefits are similar to private benefits<sup>68</sup>, and many of the more intangible 'use values', like recreation and aesthetic appreciation of a healthy environment align directly with 'existence' and 'bequest' values<sup>69</sup>. There is also potential involvement of an added New Zealand dimension here that celebrates national and cultural identity and an associated imperative to take personal responsibility and action to heal past environmental despoliation<sup>70</sup>. We suggest that many green-oriented investors will be attracted to Tūmai Beach Sanctuary exactly because of its provision of 'Public Good' by promoting conservation and that many will avoid distinguishing between private and public good returns. Willingness-to-pay for conservation benefits is probably especially likely in New Zealand where a neo-liberal social-political paradigm and lack of public finance prevent public agencies from investing in replanting of private farmland or restoring estuaries<sup>71</sup>.

We also believe that hedonic pricing evidence will underestimate capital gains at Tūmai Beach Sanctuary because the demand for green coastal development is increasing for a limited supply of

---

<sup>66</sup> These are often characterised as "Existence Value' and Bequest Value"

<sup>67</sup> Moller (2012).

<sup>68</sup> Saunders (1996).

<sup>69</sup> See Figure 1 of Moller (2012).

<sup>70</sup> Phipps et al. (2011; submit 2012).

<sup>71</sup> In many other countries private land owners are subsidised or financed entirely for ecological restoration on their own land.

such property. The amount of coastline is fixed and increasingly limited when area unsuitable for development is excluded. There has been rapidly rising opposition to further intensive coastal development in New Zealand and increasingly stringent planning to protect coastal recreational and environmental amenities<sup>72</sup>, and the number of green-oriented citizens is growing. In the long term then, competition for coastal sites, and especially ones with outstanding environmental credentials, is likely to intensify. If so, the value of Tūmai Beach Sanctuary properties will escalate more than for most other land investments and coastal developments which pay scant attention to environmental amenities.

Tūmai Beach Sanctuary creates an important model for coastal development which is especially rare in southern New Zealand where coastal ecosystem restoration is urgently needed. This type of privately funded ecological restoration is needed throughout much of the length of the east coast of South Island in particular. Tūmai was the name of a small railway stop just north of Waikouaiti and immediately inland from the development site. It is also the Māori instruction to mean “stand-up and be seen”<sup>73</sup>. By creating a model for integrated conservation and coastal development, Tūmai Beach Sanctuary is living up to its Māori name.

---

<sup>72</sup> <http://www.qp.org.nz/plan-topics/coastal-land-development.php>;  
<http://www.hawkesbaytoday.co.nz/news/recession-offers-chance-to-re-think-coastal-develo/1028826/>  
<http://www.waikatoregion.govt.nz/Environment/Natural-resources/coast/Coastal-pressures/Coastal-development/>

Hopper (2012)

<sup>73</sup> Dr James Williams from the University of Otago’s *Te Tumu* (School of Māori, Pacific & Indigenous Studies) advises that Tūmai is an instruction means to stand up. But in the case of the place north of Waikouaiti it refers to an incident where a man was being pursued and he hid from his pursuers in some long grass or such. When they approached up close he jumped up (Tūmai) and attacked them before they were able to get organised. He drove them off and escaped.

## References

- Bin, O. and Polasky, S. (2003) *Valuing Inland and Coastal Wetlands in a Rural Setting Using Parametric and Semi-Parametric Hedonic Models*. Department of Economics, East Carolina University: Greenville, NC.
- Cho, S-H., Kim, S.G., Roberts, R.K. and Jung, S. (2009) Amenity values of spatial configurations of forest landscapes over space and time in the Southern Appalachian Highlands. *Ecological Economics*, 68: 2646-2657.
- Cook, A. J. and Fairweather, J. R. (2005) *Smallholdings in the Selwyn District*. AERU Research Report No. 280, Lincoln University.
- Cook, A. J. and Fairweather, J. R. (2005) *Characteristics of Smallholdings in New Zealand: Results from a Nationwide Survey*. AERU Research Report No. 278, Lincoln University.
- Dann, C. (2002) Losing Ground? Environmental Problems and Prospects at the Beginning of the Twenty-first Century. In: Pawson, E and Brooking, T. (ed.) *Environmental Histories of New Zealand*. Oxford University Press, Australia.
- Darroch Ltd. (5 May 2010) *Valuation Report, Tumai Beach 375 Thornburn Road 1026/JD*
- Dunedin City Council (2006) *Dunedin District Plan, Schedule 25.4* (Site No.C107, E233200 N5514500).
- Duffy, D. C. and Capece, P. (2012) Biology and Impacts of Pacific Island Invasive Species. 7. The Domestic Cat (*Felis catus*), *Pacific Science*, 66(2):173-212.
- Earnhart, D. (2001) *Combining Revealed and Stated Preference Methods to Value the Presence and Quality of Environmental Amenities*. Department of Economics, University of Kansas: Lawrence, KS.
- Fairweather, J. R., and Robertson, N. (2000) *Smallholders in Canterbury: Characteristics, Motivations, Land Use and Intentions to Mov*. AERU Research Report No. 245, Lincoln University.
- Grayson, J. Calver, M. and Styles, I. (2002) Attitudes of suburban Western Australians to proposed cat control legislation. *Australian Veterinary Journal*, 80: 536-543.
- Hennessy, K., Fitzharris, B., Bates, B., Harvey, N., Howden, M., Hughes, L., Salinger, J., Warrick, R. (2007) Australia and New Zealand. In: Parry, M., Canziani, O., Palutikof, J., van der Linden, P., Hanson, C. (eds.) *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK, pp. 507-540.
- Hopper, L. (2012) *A Developer's perspective on Coastal Development in NZ*. [Online]Available from: [www.conferenz.co.nz/content/whitepapers/2012/leigh-hopper.pdf](http://www.conferenz.co.nz/content/whitepapers/2012/leigh-hopper.pdf)
- Hughey, K.F.D., Cullen, R., Kerr, G. N. (2010) *A Decade of Public Perceptions of the New Zealand Environment: A Focus on Water and its Management*. A Biennial Perception Survey of the Environment. Lincoln University.

Hughey, K.F.D., Kerr, G.N. and Cullen, R. (2010) Public Perceptions of New Zealand's Environment: 2010. *EOS Ecology*, Christchurch. vi+115 pp.

Hurd, J. (2009) Economic Benefits of Watershed Restoration. *The Political Economy of Watershed Restoration Series*, Wildlands CPR: Missoula, MT.

Innes, J., Lee, W.G., Burns, B., Campbell-Hunt, C., Watts, C., Phipps, H. and Stephens, T. (2012) Role of predator-proof fences in restoring New Zealand's biodiversity: a response to Scofield *et al.* (2011) *New Zealand Journal of Ecology*, 36(2), published online, available: [www.newzealandecology.org/nzje/](http://www.newzealandecology.org/nzje/) [accessed: 11 June 2012].

Kaval, P., Yao, R., and Parminter, T. (2007) *The Value of Native Biodiversity Enhancement in New Zealand: A Case Study of the Greater Wellington Area*. Working Paper in Economics 7/22, University of Waikato, Hamilton.

Kerr, G.N., and Sharp, B.M.H. (2008) *Biodiversity Management: Lake Rotoiti Choice Modelling Study*. Research Report No. 310, Lincoln University: Lincoln.

Lilith, M., Calver, M.C., Styles, I. and Garkaklis, M. (2006) Protecting wildlife from predation by owned domestic cats: application of a precautionary approach to the acceptability of proposed cat regulations. *Austral Ecology*, 31: 176-189.

Ma, S. and Swinton, S.M. (2011) Valuation of ecosystem services from rural landscapes using agricultural land prices. *Ecological Economics*, 70: 1649-1659.

McConnell, V. and Walls, M. (2005) The Value of Open Space: Evidence from Studies of Nonmarket Benefits. *Resources for the Future*, Washington, DC.

Ministry for the Environment. (2008) *Coastal Hazards and Climate Change. A Guidance Manual for Local Government in New Zealand*. 2nd edition. Revised by Ramsay, D, and Bell, R. (NIWA). Prepared for Ministry for the Environment. viii+127 p.

Ministry for Environment & Department of Conservation. (2000) *The New Zealand Biodiversity Strategy*. Ministry for Environment, Wellington, v + 144 pp.

Moller, S.I. (2012) *The Economic Value of Environmental Amenities and Restoration for Rural Land in New Zealand*. Ecosystems Consultants Report No. 2012/02, 22 + vi pages.

Moore, M. (2007) *Proposed Farm Park Waltons Ltd Landscape Development Concept*, prepared by Mike Moore, 7pp.

Moore, S. (2001). Cat confinement – does it work? *Urban Animal Management Conference Proceedings 2001*.

MWH. (2007). *Waltons Limited Property Water Resources*

Otago Regional Council. (2004) *J43 316152*.

Parliamentary Commissioner for the Environment. (2001). *Weaving Resilience into Our Working Lands: future roles for native plants on private land*.

Pawson, E. and Brooking, T. (Editors) (2002). *Environmental Histories of New Zealand*. Oxford University Press.

Perley, C., Moller, H., Hamilton, W.J., Hutcheson, J. (2001) *Towards safeguarding New Zealand's Agricultural Biodiversity: Research gaps, Priorities and potential case Studies*. Ecosystems Consultants Report 23, 230pp.

Phipps, H., Akins, A., Moller, H., Lyver, P.O'B., Kahui, V., Towns, D. (2011) *Cross-cultural values for restoring coastal forest ecosystems in New Zealand*. Landcare Research Contract Report LC 243. 135 pp.

Polyakov, M., Pannell, D., Pandit, R., Tapsuwan, S., and Park, G. (2012) "Valuing environmental assets on rural lifestyle properties", *Working Paper 120010, School of Agricultural and Resource Economics, University of Western Australia, Crawley, Australia*. 18 pp.

Queen Elizabeth the Second National Trust Annual Report (2011) Wellington, 26 pp. [Downloadable from: [http://www.openspace.org.nz/Site/Publications\\_resources/Annual\\_reports.aspx](http://www.openspace.org.nz/Site/Publications_resources/Annual_reports.aspx)]

Robins, M.J. (2007) *Geotechnical Assessment for Proposed Subdivision – Pleasant River Farm Park*. Geolink report, GTR 56.

Research New Zealand. (2007) *Special Report: The general public's views on Sustainability*. [Online] Available from: [www.researchnz.com/special-reports.html](http://www.researchnz.com/special-reports.html)

Reed, R., Wilkinson, S. (2008) *A Greener House, the Sustainable Property Investor's Guide to Buying, Building and Renovating*. Wrightbooks, Victoria.

Scofield, R.P., Cullen, R. and Wang, M. (2011) Are predator-proof fences the answer to New Zealand's terrestrial faunal biodiversity crisis? *New Zealand Journal of Ecology*, 35(3): 312-317.

Spahr, R.W. and Sunderman, M.A. (1999) Valuation of Property Surrounding a Resort Community. *The Journal of Real Estate Research*, 17(1): 227-243.

Stillman, S. (2005) *Examining Changes in the Value of Rural Land in New Zealand between 1989 and 2003*. Motu Working Paper 05-07, Motu Economic and Public Policy Research: Wellington.

Saunders, C. (1996). *Conservation covenants in New Zealand*. *Land Use Policy*, 13 (4), pp. 325-329.

Waitaki District Council. (2004) *Waitaki District Plan*.

Weller, F. (2011) Testing the power of an experiment to measure predator control and habitat complexity impacts on farmland bird abundance. *New Zealand Journal of Ecology*, 35: 44–51.

Wharfe, L. and Manhire, J. (2004) *The SAMsn Initiative: Advancing Sustainable Management Systems in Agriculture and Horticulture*. The AgriBusiness Group, Christchurch, New Zealand.

Wheen, N. (2002). A History of New Zealand Environmental Law. In: Pawson, E. and Brooking, T. (ed.) *Environmental Histories of New Zealand*, Oxford University Press, Oxford, pp 261-274.

Wildlands Consultants (2007a) *Ecological Assessment of the Waltons Ltd Property, Pleasant River Estuary, Otago*. Contract report No. 1773.

Wildlands Consultants (2007b) *Ecological Impact Assessment of the Proposed Coastal Farm Park, Pleasant River Estuary, Otago*. Contract report No. 1838.