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Insight

Realistic valuations of our clean green assets

Would you pay over $300 to ensure native birds remain at a single lake, even if you lived far away? Maybe, or maybe not. But recent debates on mining and hydro-power developments show comparing the benefit of different uses of environmental assets is both difficult and controversial.

Unless we have facts on the value that Kiwis place on their natural resources, the trade-offs between promoting economic activity and a clean, green environment are going to be based on who shouts the loudest. The risk is that we take the wrong course for New Zealand.

There are ways to estimate how much we value a clean, green environment. Given what is at stake, agencies responsible for natural and environmental resources need to invest in finding out how much the public values protecting the environment from degradation.

Many assets have a value, but no price

Not all uses of assets are traded in markets, where prices reflect scarcity. But no price does not mean no value.

The natural environment, for example, undeveloped land held for conservation, makes a number of valuable contributions to economic welfare and well-being:

- **Direct current use values** – such as from extracting materials from the environment (e.g. timber, fish) or commercial tourism activities.

- **Indirect use values** – or 'environmental services' that help maintain other activities (e.g. water and nutrient cycling in primary production). Their value can be indicated by the cost of the next best alternative for the same service, or by avoidance costs (e.g. lower risk of slips by planting trees).

- **Future use values** – or option values that show the value of retaining resources for future potential use.

- **Non-use values** – or the value of just having the resources there, without any particular intention of use, for their *existence value* (the pure preference for retention) or *bequest value* (the preference for passing on a resource intact to descendants).

Economists have devised techniques to infer values for changes in the environment.

There are various ways of estimating non-market values…

One of the ways economists have tried to infer the economic value of widespread public sentiment for preserving significant landscapes and their components – such as freshwater, mountain views and wildlife – is through *stated preference techniques.* Here people are asked their willingness to pay to preserve them. One method is *contingent valuation*, where respondents state their preferences for one scenario over another.

Another method is *choice modelling* where people are asked to record preferences between different scenarios. Choice modelling has long been used in market research to work out what combination of product attributes consumers most value. But its application to non-market settings is more recent. In Europe, choice models have identified preferences between open space and forest cover which have influenced the management of recreational sites. In Australia, they have been used to test public preferences for conflicting activities like allocating water between wildlife habitats, recreational activities and abstraction to support local industries and jobs in rural areas. Choice modelling provides comparable values for how much additional allocation to each use is worthwhile.

…but such surveys can have serious limitations

The values obtained from stated preference surveys do not always look realistic. People are responding to hypothetical questions, but 'guesstimating' how much one would be willing to pay without a market context is difficult to do. Responses may be distorted by "choice anchoring", in which respondents' answers are tied to some associated value (such as the starting point value suggested in a bidding process), or by a preference for cute furry animals over less visible or attractive but equally endangered amoeba, in which case surveys might not value the scientific attributes at most risk of degradation.

New Zealanders each pay about $200 per year for environmental protection

Stated preference surveys have reported substantial willingness to pay to protect individual sites and species. These amounts are higher than what New Zealanders are currently paying towards conservation, through local and central government bodies and directly.

The national willingness to pay for environmental activities such as biodiversity and landscape protection is made up of both public spending and private contributions such as donations of money and volunteers' time. Statistics New Zealand's *Environmental Protection Expenditure Account* identifies 25% of total *public* environmental spending by government agencies as being directed to biodiversity and landscape protection. *Private* contributions can be pieced together from other sources, principally Statistics New Zealand's *Non-profit Institutions Satellite Account.*

There is no comprehensive estimate of conservation support, but as a rough indication it covers:

- $78 million spent by local government on biodiversity and landscape conservation in 2007

- $241 million spent by central government in 2007, through the Department of Conservation, and support to the Nature Heritage Fund and QEII National Trust for conservation on private land

- $395 million by central government as the opportunity cost on property held for conservation[1]

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[1] Derived by annualising at 8% the value of conservation property recorded in the government's Financial Statement.

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- $29 million in subscriptions and donations received by environmental non-profit organisations

- $50 million donations in kind through voluntary labour

- an *unknown* amount of informal private voluntary donation of time and resources to conservation, including labour volunteered on work outside of NPIs and private individuals' efforts on their own land. This is probably not insubstantial: say around $35 million per year.

So the nationwide total for annual willingness to pay for biodiversity and landscape protection in 2007 dollars is about $433 million on annual expenditures, or almost double that at $828 million per year in total including opportunity cost of public conservation land. Averaged across Census 2006 counts, this is around $104 per person or $292 per household in expenditure, or $200 per person and $560 per household in total cost. These estimates are rough, but the assumed informal contribution would need to be hugely under-stated for the actual total to be significantly higher.

Surveys indicate that we say that we'd pay more

Table 1 shows findings from recent stated preference surveys on willingness to pay to avoid loss of certain environmental assets in specific locations.[2] This shows recorded values for average household willingness to pay to protect individual sites and species are high compared to average household spending of $292 per year (direct and indirect) on all biodiversity and landscape protection work, and against the $560 per household in total cost.

Table 1 Values from stated preference surveys

Willingness to pay to avoid	per household per year
Losing 4 bird species from Hamilton Lake	$144
Losing fish & mussels from Hamilton Lake	$137
Losing robust grasshopper, Mackenzie Basin	$95
Losing Bignose Galaxias from Mackenzie Basin	$110
Nelson Lakes: 1% rise in wasp sting probability	$5
Native birds becoming absent from Lake Rotoiti	$325
Insects becoming absent from Lake Rotoiti	$198

Source: NZIER

Whilst we might pay these amounts to save a species from extinction, would we really pay these for conserving a species in one location, say, if a flock of similar birds lived in the next lake system?

Lip service? What's behind the gap?

Such high values are not peculiar to New Zealand, but common to virtually all stated preference studies. That the values are so high relative to observed behaviour could reflect:

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[2] Bell B, Yap M, Cudby C & Scarpa R (2008) "Valuing indigenous biodiversity"; & Kerr GN & BMH Sharp (2008) "Valuing indigenous biodiversity"; Two papers prepared for FRST Project NIMMO501

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- respondents are not fully taking into account their income constraints and current spending behaviour when answering, despite extensive efforts in survey design to keep this front of mind

- rather than eliciting a pre-held preference for the subject matter the survey technique is *creating* a value by focusing on the subject resources and diverting attention from other options

- the expression of public willingness to pay through political processes and public funding is deficient and significantly understates public preferences for conservation.

Another possible reason is that stated preference surveys of the environment are commonly framed as after-the-fact valuations of sites or species known to be at risk. People will often dig deeper to recover from a disaster once it has happened, than take precautions against it.

For policy purposes, where risk will strike is not known, so a before-the-fact public willingness to pay to reduce the risk of losing components of diversity is more useful than the value of specific species or sites. Armed with such a value, the choice of where to direct limited conservation resources then becomes a technical question of which sites or species contribute most to diversity.

We have done it before

New Zealand has used stated preference techniques before. Transport users were asked to state changes to their travel behaviour in face of changing travel risks (e.g. icy roads). Their responses indicated a time-risk relationship which, combined with the value of travel time, gave an estimate of the willingness to pay for reductions in risk of fatal injury while travelling. This resulted in a value of statistical life of $2 million being adopted in New Zealand in 1990 (since updated for inflation).

Its practical effect has been to provide the evidence to convince funders that motorway median barriers and other safety features are worthwhile investments.

Getting the valuations right will improve decision making

When it comes to valuing reducing risk to human health in transport, stated preference valuation has been used one way and accepted by New Zealand policy makers. But when it comes to valuing reducing risk to environmental health, stated preference has been used in a different way that produces results that are out of kilter with observed public willingness to pay for environmental protection. Not knowing the appropriate value can lead to poor decisions either way – we might be investing too much or too little in protecting environmental resources, or protecting the wrong ones.

Recent debates over the value of natural resources for tourism, mining, energy and conservation show the difficulty of weighing up choices when some values are unknown. It is time policy agencies followed transport in finding out what is the public willingness to pay to protect the environment from degradation. Future decisions on competing use of resources could then be made without being in the dark (or misled) on one side of the balance of economic consequences.