

P r o g r e s s

How do locals value their habitat?

Most people appreciate that healthy, sustainable landscapes must balance the competing demands of agriculture, industry and the environment. But in planning for the future, some tough decisions have to be made about the best way to configure land, what to trade-off and who's to pay for it. **Clare Peddie** reports on work at CSIRO that sets out to survey how people value their local Australian habitat.

Natural resource economist Dr Darla Hatton MacDonald of CSIRO Land and Water has been studying the choices people make when faced with complex decisions about their surrounding environment. Her research reveals insights into human behaviour and the trade-offs that people make – to protect their community and way of life, or uphold their beliefs in the value of habitat for native species.

'It's been suggested that there are so many pressures to clear and develop land, that it's difficult to imagine how policies will be put in place to preserve habitat, and slow the rate of biodiversity loss, without demonstrating the economic value of what is to be preserved.

'Putting the tangible benefits of agricultural production and some of the more intangible benefits (like habitat preservation) into the same context – dollars –



Residents near bushland habitat appear prepared to pay a levy to ensure it is protected and that its recreational and ecological values are maintained. David Maczkowiack

allows for a closer examination of the conflicting issues and values', she says.

Comparing costs and benefits

Some time ago, the South Australian Department of Water, Land and

Biodiversity Conservation (DWLBC) approached CSIRO and Rural Solutions South Australia for advice on how to improve their resource allocation to address major environmental issues.

'Their use of Benefit-Cost Analysis

'It's been suggested that there are so many pressures to clear and develop land, that it's difficult to imagine how policies will be put in place to preserve habitat...'

(BCA) was constrained by an inability to include monetary values for expected changes in the value of environmental amenities – such as habitat for plants, animals and birds,' says Hatton MacDonald.

Mr Andrew Johnson, the Department's Director of Natural Resource Management Support explains, 'This year across Australia, local, state and federal governments have allocated in the order of \$3 billion to land, water and biodiversity conservation.'

'That's no small sum of public money.

'While governments and the broader community have recognised the importance of our natural resources, our understanding of the real costs of rehabilitation or restoration of our natural ecosystems has also increased.

'These benefits and costs are normally used in standard BCA. However, we're looking to economics for alternative tools needed to prioritise as well as justify expenditure in these areas,' he said.

Choice modelling – a useful tool

A Steering Committee was formed to tackle the issue, with representatives from CSIRO, the DWLBC, the Department of Primary Industries and Resources South Australia, Rural Solutions SA, and the Department of Environment and Heritage.

Guided by this committee, Hatton MacDonald employed a tool known as 'choice modelling'. As she explains, choice modelling is based on the idea that individuals derive satisfaction from the properties or attributes of goods, services and experiences, including environmental quality. 'But everything comes at a cost, so they're forced to make a series of trade-offs when they find they can't have it all.'

As consumers we make these kinds of decisions everyday, at the supermarket for example. Most people are quite comfortable with the concept.

'A well-presented choice experiment

will convey the information in a way that minimises bias and engages the individual in a process of trading off outcomes against cost,' says Hatton MacDonald.

Choice modelling is not without its critics, but it is one of the few ways that economists can estimate what they call 'passive use values', like, for example, the value of knowing that a patch of wilderness is being preserved even if you know that you're unlikely to ever experience it for yourself.

'There are passive use values associated with ecosystem services and the preservation of indigenous species of plants, animals and birds. If these values are to enter the full cost-benefit analysis of natural resource management, then the estimates need to be directly comparable to the other costs and benefits,' she says.

A focus on the Upper South East

In the first of a series of reports on 'The value of habitat and agriculture', Hatton MacDonald and her colleague Mark Morrison from Charles Sturt University, describe a process used to elicit non-market values for habitat in the Upper South East (SE) of South Australia (see map).

'The Upper South East was chosen because it is an important area for a number of rare and endangered species of animals, birds and plants. A lot of scientific work has also been done in the area,' said Hatton MacDonald.

It is also an area that has proven particularly difficult to manage, with highly political and public debates over drainage schemes raging over decades. The extensive drainage of wetlands and watercourses has helped make agriculture profitable in the region, but it has also had a dramatic impact on the region's biodiversity¹.

¹ www.environment.sa.gov.au/biodiversity/bioplans.html

Options for land management

Hatton MacDonald's choice modelling survey asked about people's connections to the Upper SE (to agriculture and to the environment), and presented a series of options for land management.

The surveys were prepared in batches, with many different options presented, however, survey respondents were only ever asked to consider three options at a time. The first option was always 'continue current practices', with no new money and no new projects. The two alternatives represented different combinations of projects (with different price tags), which would then correspond to specified changes in the area of habitat available for wildlife.

Nearly 85 per cent of the respondents agreed that it was important to increase the size and quality of areas of scrubland, wetlands and grassy woodlands.

Using a series of statistical techniques, it was possible to hone in on the more popular options and identify preferences within distinct socio-demographic groups.

In the Adelaide sample, young respondents and older people (such as grandparents) were more likely to choose options that improved habitat than those in their middle age. Gender was also statistically



The study area for Hatton MacDonald's survey work. CSIRO Land and Water

Progress

South Australia's
Flinders Ranges.

Daniel Drake



The market price really represents the consumer's willingness to pay to use land for productive agriculture – it's the opportunity cost of preserving the habitat.

significant. Female respondents were also more likely to choose options that involve improvements in habitat area.

In the Upper SE and the rest of the state, having children was another positive influence. And in Adelaide, higher income levels were also associated with choosing options that included improvements in habitat areas.

Willingness to pay for habitat

The data were also used to determine the 'willingness to pay' (through the collection of a levy) of South Australians to maintain scrubland, wetland and grassy woodland habitats in the Upper SE 'in a healthy condition, for perpetuity'.

Willingness to pay for good quality habitat was around \$800 per hectare for scrubland, \$1100 for grassy woodland and \$1700 for wetland.

Interestingly, the willingness to pay for scrubland turned out to be quite similar to the current market price for land of that type. The market price really represents the consumer's willingness to pay to use land for productive agriculture – it's the opportunity cost of preserving the habitat. But South Australians were not willing to pay the market price for grassy woodland habitats. Willingness to pay for wetlands is more difficult to assess, as there is a limited market value for wetlands.

Hatton MacDonald adds, 'While we present the aggregated values for the state here, it is important to note that there are very strong regional differences in willingness to pay.'

Survey responses from people in the Upper SE were compared to those from Adelaide and the rest of the state.

'People in the Upper SE – the people living closest to these habitat areas – have very different preferences. They had a zero willingness to pay for grassy woodlands. And they had a low willingness to pay for wetlands relative to the preferences of

Adelaide and the rest of the state. But they valued scrubland areas more.'

After all, grassy woodlands are prime agricultural land. But Hatton MacDonald also believes that cleared land can have intangible value. 'Folk like things just the way they are, "thank you very much";' she says, 'people come to love the landscapes they live in – the place they call home'.

In direct contrast, people in Adelaide and the rest of state placed a higher value on grassy woodlands and wetlands over scrubland.

The dollar estimates represent willingness to trade off an amount of household income in the form of a levy each year. However, there are other ways to pay for these habitat improvements, including the reallocation of resources within the public sector.

Another report, yet to be released, will focus on the differences between using a levy and re-allocating the existing state budget towards habitat improvement. Indications so far are that there is widespread support for a levy, as opposed to a redistribution of public funds – away from public institutions like hospitals or schools for example.



A Chestnut-breasted whiteface, taken at Granite Downs in South Australia.

Department of the Environment and Heritage/Lynn Pedler

A valuable decision-support tool

Mr Johnson says state ministers have welcomed the findings, which indicate that South Australians value the preservation of healthy ecosystems into the future and support governments in assisting land-holders to manage these valuable assets.

This kind of work is going on all over the country, and Hatton MacDonald refers to studies by John Rolfe, Central Queensland University, on the value of Aboriginal rock paintings; Stuart Whitten, CSIRO Sustainable Ecosystems, on the value of wetlands in SA; and previous work by Mark Morrison on the value of wetlands and rivers in NSW.

But, further discussing the methodology of her approach, she cautions, 'You have to be careful about the sorts of things that you use choice modelling for.

'There are cases where it is really inappropriate, in circumstances that are highly emotive for example, because then you're measuring people's emotional responses to something that's very important to them – or belief systems. You don't ask people to trade-off something that is incredibly important to them. Aboriginal people, for instance, feel very strongly about country so you wouldn't ask them to trade-off something like that because it's not a trade-off they're willing to make.'

Hatton MacDonald's work has already started to be used in cost-benefit analysis in various areas of natural resource management across the country, and she now is planning further refinement of the recent results and the technique itself, including making the survey process more incentive-



Yellow Sandhill greenhood orchids growing in woodland near Tailem Bend, South Australia.

Department of Environment and Heritage/Black Hill Flora Centre, SA



Echidnas rely on remnant habitat areas. Hatton MacDonald showed that many people highly value their experience of local native wildlife. Willem van Aken

compatible and testing alternative payment 'vehicles' for habitat management.

'Hopefully this will all lead to the technique being more widely applied for decision support and therefore better decision-making about habitat priorities in Australia,' she said.

Hatton MacDonald recently presented the outcomes of her research at the BIOECON conference held at Kings College, Cambridge, England.

'We are now getting good interest



Coral gum, *Eucalyptus torquata*, blooms in South Australia's bush.

Department of the Environment and Heritage/John Baker

from other states, and from the UK, in the choice modelling process,' she said.

More information:

Hatton MacDonald, D. and Morrison, M. (2005) The value of habitat and agriculture. *CSIRO Land and Water Client Report*. See www.clw.csiro.au/publications/consultancy.

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