



National Environmental
Research Program

NORTHERN AUSTRALIA HUB

Improving biodiversity
conservation in
northern Australia

Improving the efficiency of biodiversity investment

What is the research about?

Northern Australia is home to some of the most intact ecosystems in the world. There is already a significant agriculture sector in the North¹ and there is a strong desire to promote further economic growth. Therefore, identifying ways to effectively protect biodiversity at the least cost and without imposing unreasonable costs on the agricultural industry is vital.

The Australian Government has made significant investments into a range

¹ Low intensity pastoralism covers 75% of the area and the industry generates a significant income. North Australia also produces 90% of Australia's mango and banana crops and over 23 million tonnes of sugar. In 2010-11, the gross value of North Australian Agricultural production at the farm gate was calculated at \$5.2 billion (ABARES).

of programs designed to encourage land managers to protect and enhance the country's natural resources. Some programs may involve trade-offs (e.g. when graziers are asked to exclude cattle from productive land), but some programs can generate co-benefits (e.g. increasing grass cover which is good for both cattle and water quality). Programs that generate co-benefits can, in some sense, be thought of as being more 'efficient' than programs which impose trade-offs since they improve biodiversity while also benefiting agriculture. Similarly, programs which offer rewards or incentives that are valued by land managers will be likely to achieve greater uptake and will greater benefit the environment than programs that promise rewards that are considered unimportant.

What this means, is that when trying to determine which types of biodiversity investments are most (or least) 'efficient', one should consider the extent to which the investments (a) generate secondary benefits or trade-offs to agriculture and (b) align with the priorities/motivators of land managers.

Key questions are:

- Is there a trade-off between biodiversity and agriculture?
- Are there some conservation activities which generate secondary benefits for agricultural productivity?
- Are there things we can do to promote biodiversity which may not generate secondary benefits, but which are unlikely to impose trade-offs?



- Are there cost effective ways to motivate people to participate in on-farm conservation programs?

Summary of method

The project answered the above questions by analysing a range of social, financial and environmental data for a range of agricultural properties. 137 properties from across

North Queensland (above Rockhampton) and in the Daly catchment (NT) participated in land manager surveys which asked about a wide variety of financial, social and management questions, including: the costs of farm activities, farm infrastructure, revenue streams, factors effecting productivity, and factors contributing to quality of life.

The land manager survey data was paired with environmental data for each property. This included characteristics such as soil type, rainfall, vegetation types, and presence of weeds or pests. It also included various indicators of biodiversity.



Summary of findings

- The research found little evidence of a trade-off between biodiversity and agriculture; indicating that conservation need not occur at the expense of agriculture across northern Australia.
- Programs that control weeds or pests were the most likely to generate benefits for both biodiversity and agriculture. These programs may thus be viewed favourably by land managers; finances permitting, some may even be willing to share some of the costs since they share some of the benefits.
- Programs promoting on-farm diversification, improved land management practices, or conservation-friendly attitudes could generate biodiversity improvements at no cost to agriculture.
- Social factors are vitally important to NRM policy. The research didn't uncover a significant link between profits and life satisfaction, but rather found relationships with family and friends were the single most important contributor to land manager's quality of life. On-farm conservation programs could increase their uptake and effectiveness by using social motivators, such as events and networking groups.



On-farm conservation programs might also be able to increase uptake and effectiveness by using social 'rewards' or sanctions.

Towards implementation

Our research suggests that programs promoting on-farm conservation are not at odds with the agricultural industry; some are even beneficial. If we only consider expenditures, and overlook secondary effects, we may spend too little on programs that generate co-benefits and too much on programs that impose trade-offs. Some land holders may be willing (if financially able) to help fund programs or absorb some of the costs of programs that generate co-benefits or positive social outcomes.

A simple example

Consider two hypothetical, 'environmental' activities that each cost \$1000.

Suppose the primary goal of the first activity is to reduce erosion by improving grass cover.

This extra grass cover may produce a benefit for agriculture - say, \$400. It is as if the 'true' (conservation related) cost of that program is only about \$600.

Suppose the primary goal of the second activity is to protect remnant vegetation by excluding stock from an area with good quality feed. This reduces income for the farmer - say, by \$1000. In this example, it is as if the 'true' (conservation) cost of that program is actually \$2000.

Promoting the social benefits of conservation programs may also improve the uptake and thus effectiveness of programs. Social events are relatively low cost and can generate significant benefits; similarly public rewards may be an effective way of encouraging further stewardship.

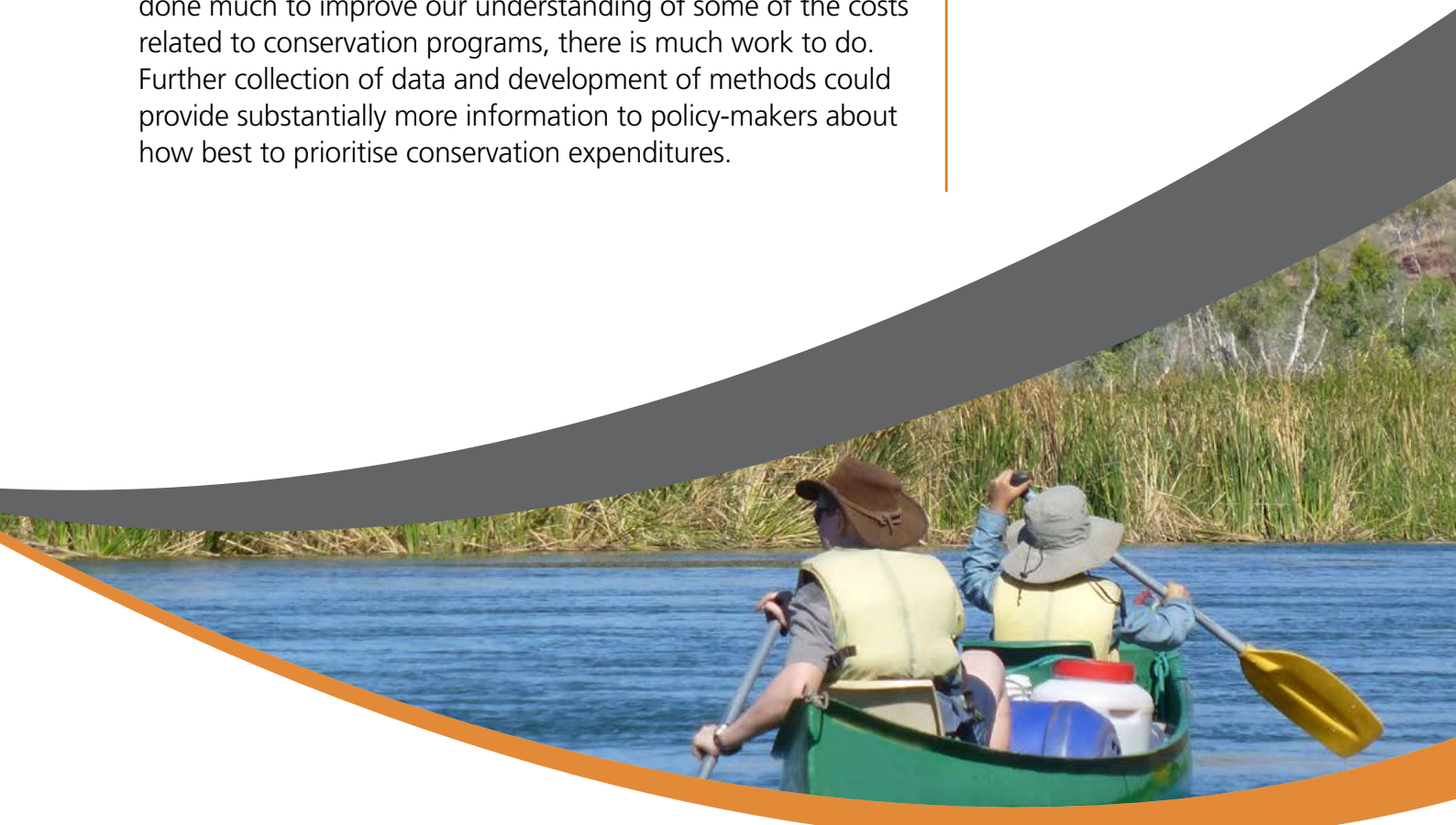
What's next?

It's clear that assessing the efficiency of existing biodiversity/conservation investments in agricultural settings is extremely difficult to do. It is firstly, hard to assess the costs and secondly to assess the benefits. While the research in this project has done much to improve our understanding of some of the costs related to conservation programs, there is much work to do. Further collection of data and development of methods could provide substantially more information to policy-makers about how best to prioritise conservation expenditures.

Further information

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For more information visit
[www.nerpnorthern.edu.au/
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