Working with landholders to achieve long-term commitment to improved management of native vegetation
Working with landholders to achieve long-term commitment to improved management of native vegetation

All rights reserved. The contents of this publication are copyright in all countries subscribing to the Berne Convention. No parts of this book may be reproduced in any form or by any means, electronic or mechanical, in existence or to be invented, including photocopying, recording or by any information storage and retrieval system, without the written permission of the authors, except where permitted by law.

Disclaimer
The views expressed in this report are solely the authors, and do not necessarily reflect the views of Charles Sturt University, Landscape Logic, or any other individual or organisation consulted during the research.

Acknowledgements
The authors acknowledge the important contributions from our Landscape Logic partners, particularly David Duncan, Garreth Kyle and Graeme Newell (Victorian Department of Sustainability and Environment, Project 3) and Geoff Park (North Central Catchment Management Authority, Project 7) and Wendy Merritt (The Australian National University, Project 6). Also, Vanessa Keogh (Goulburn Broken Catchment Management Authority), Geoff Robinson (North East Catchment Management Authority), Damian Wall (Red-Gum Environmental Consulting) and Ted Lefroy (University of Tasmania) provided valuable assistance with this research.

The authors express their thanks to their colleague – Royce Sample, who conducted many of the interviews which contributed to the foundation of information on which the report is based. Also, their colleague – Simon McDonald, kindly produced Figure 1.

The research team sincerely thanks the landholders and NRM program managers who contributed their time and ideas to the research as interviewees. They are not listed in this report to preserve their anonymity.

Valuable comments on a draft version of this report were received from Mark Morrison, James Todd and Peter Wilcock, for which the authors are appreciative.

A copy of the full report is freely available from the Landscape Logic website, at www.landscapelogic.org.au.

List of acronyms
CERF – Commonwealth Environmental Research Facilities
CSU – Charles Sturt University
LPIS – Land Protection Incentive Scheme
MBI – market-based instruments
NGO – non-government organisation
NHT – Natural Heritage Trust
NRM – natural resource management
PMP – property management plan/planning
PPA – pest plants and animals
WFP – whole farm plan/planning
Working with landholders to achieve long-term commitment to improved management of native vegetation

Digby Race and Allan Curtis
Institute for Land, Water and Society, Charles Sturt University, Albury NSW.

Summary
This report documents research exploring the extent that environmental programs are able to enhance landholders' long-term commitment to improved natural resource management. The research involved fieldwork in Victoria, yet has findings that are of relevance to policy-makers and program managers operating in Australia's wider natural resource management (NRM) context. This research was conducted as part of the Landscape Logic (www.landscapellogic.org.au) research hub, funded by the Australian Government.

This report includes three major parts:
- an overview of the research (i.e. rationale, research focus and scope);
- a review of relevant Australian and international published literature and program documents; and
- our methods, key findings and conclusions from this research.

Rationale for this research
Although there are varying measures used to detect changes in natural environments, there is a distinct trend that the world is losing its biodiversity. The authoritative State of the Environment report (SoE 2006) confirms that trends in Australia are consistent with the global decline in biodiversity.

Since the late-1990s, Australian governments have invested $2.8 billion via the Natural Heritage Trust to improve Australia's natural environment. Understanding whether this investment will have an enduring impact is a critical question, particularly when much of this investment has been made to support works on private land that is outside the direct control of NRM agencies. Much of this investment is made on the basis that a small public investment will lead to more widespread and long-term changes in the management practices of rural landholders.

The challenge for policy-makers is to design and implement policy instruments that stimulate a long-term commitment by landholders to new land-use practices, beyond their immediate participation in an NRM program. Exploring the concept of landholders' long-term commitment to sustaining recommended NRM practices is critical if Australian governments are to maximise the environmental outcomes from limited public funding for NRM – to avoid both 'under-investing' (e.g. withdrawing support before NRM can be independently sustained) and 'over-investing' (e.g. investing additional resources in landholders and sites beyond what is required).

Research objectives
The overall goal of this research was to explore how NRM programs using commonly applied approaches for engaging landholders (i.e. fixed-grant and market-based instruments) can foster a long-term commitment by landholders to new land-use practices, beyond their immediate participation in an NRM program. Exploring the concept of landholders' long-term commitment to recommended NRM practices is critical if Australian governments are to maximise the environmental outcomes from limited public funding for NRM – to avoid both 'under-investing' (e.g. withdrawing support before NRM can be independently sustained) and 'over-investing' (e.g. investing additional resources in landholders and sites beyond what is required).

This research was framed by the following objectives:
- to better define the concept of 'long-term commitment' by landholders to improved NRM management practices;
- to identify program characteristics that are likely to lead to long-term commitment by landholders to improved NRM practices, including how different program characteristics interact with other factors (e.g. personal attributes of landholders, wider operating context); and
- to explore the extent it is possible to predict the success of programs in building long-term commitment by landholders to conserving and enhancing native vegetation.
Key lessons from literature

Our review of the NRM literature in Australian and internationally provided a valuable conceptual framework for this research. Some of the key lessons from the published literature were:

- while demographic change amongst rural communities can lead to ‘fragmentation’ of land ownership (e.g. increasing number of non-farmers in highly ‘liveable’ landscapes), this may also lead to greater connectivity of forests on private land – with such change occurring beyond the direct influence and investment of NRM organisations;
- ‘low-cost’ participants in NRM programs (i.e. those who require little support for their involvement) may be the most likely to continue with the approach to the program’s recommended NRM, yet the program may have achieved little environmental ‘additionality’ (i.e. environmental gains that occur without program support). Engaging ‘low-cost’ landholders in NRM programs may serve as a ‘stepping stone’ for seeking their participation in more ambitious or challenging approaches to NRM;
- programs seeking a high degree of ‘additionality’ may need to ‘purchase’ environmental gains from ‘high-cost’ participants over an extended period, perhaps even in perpetuity;
- in the absence of payments to cover the costs of ‘active’ management, both commercial farmers and non-farmers are most likely to engage in, and be committed to, recommended NRM practices if these can be achieved and sustained with ‘passive’ management (e.g. low-input NRM practices);
- voluntary participation in an NRM program by landholders may not indicate a long-term commitment to the NRM organisation’s view of ‘best practice’ NRM;
- encouraging landholders to participate voluntarily in NRM programs is preferred when seeking to engender a long-term commitment, rather than compulsory participation, although in extreme situations compulsory changes to land-use may be unavoidable (e.g. unacceptable pollution, threats to endangered species); and
- providing support to local community-based groups and networks (e.g. Landcare) is an effective pathway to promote ‘best practice’ NRM, however this approach will have less influence on the land-use of non-members.

Key findings from this research

The key findings from our research are summarised below.

The concept of a ‘long-term commitment’ by landholders

1. In an NRM context, a long-term commitment can be defined as a landholder’s willingness to achieve the long-term goals of the original investment beyond the contracted agreement for an extended period of time, and practices expected to achieve the NRM goal have become an established and integral component of the property’s management. We suggest that landholders willing to sustain the management intent (not necessarily the same land-use practice) without major program support for 10 years or longer would reflect a long-term commitment.
2. NRM programs need to have an enduring influence if the recommended NRM practices cannot be easily maintained independently by landholders. Parallel and successive NRM programs have the potential to reinforce ideas and knowledge, and provide follow-up support to galvanise a landholder’s long-term commitment to pursuing recommended NRM.
3. The extent NRM practices can be feasibly maintained by landholders is an important factor for achieving long-term ‘additionality’, especially if policy-makers are seeking landholders to maintain new approaches to NRM largely unassisted by on-going program support. Our results also indicate that landholders’ involvement in small-scale or passive NRM programs can be valuable for attaining knowledge and confidence, before undertaking large-scale works. Our research challenges some of the NRM literature in that it indicates that many ‘low cost’ participants went on to undertake works on an additional area, if not a larger scale – revealing the ‘additionality’ that can be achieved by engaging ‘low cost’ participants. That is, the accumulation of small changes or improvements in NRM can provide considerable environmental ‘additionality’ over a long-term period.
**Program characteristics that build a long-term commitment by landholders**

4. Changing land-use can lead to ecological responses that are not always predictable, such as increasing levels of pest plants and animals. Rigid agreements that don’t reflect the changing ecological characteristics of a site may undermine the landholder’s long-term commitment to maintaining the NRM investment, and erode their interest in undertaking further NRM work. NRM programs that can be tailored to changing site conditions have more appeal for landholders and so, are more likely to encourage them to maintain their long-term commitment to their NRM investment.

5. Participation in NRM programs provides access for landholders to enabling support (e.g. financial and technical support), but can be a misleading indicator of a landholder’s likely long-term commitment to maintaining the NRM practices. Long-term commitment can be compromised if landholders are required to undertake substantial on-going management interventions, particularly if they had been previously paid to do that work and the payments end.

6. Higher levels of knowledge allow landholders to make better informed decisions, and subsequently underpin development of realistic plans for landholders to implement and maintain. Arguably, better informed investments in NRM are more likely to be successful and so reinforce a landholder’s long-term commitment to recommended NRM practices.

7. Stewardship payments have the potential to underpin a landholder’s long-term commitment to pursue recommended NRM. However, if stewardship contracts and payments are seen to be unfair (i.e. the arrangements do not reflect the relative benefits, costs and risks contributed by each party), then such an approach can erode a landholder’s trust in the NRM organisation and jeopardise the original NRM investment – potentially undermining their long-term commitment to adopting recommended NRM practices.

8. Effective long-term relationships between landholders and NRM program staff are a key ingredient in supporting land-use change to achieve NRM outcomes. Long-term relationships between landholders and NRM organisations provide scope to engender a long-term commitment amongst landholders to NRM outcomes.

9. The characteristics of programs that were effective in engendering a long-term commitment by landholders to achieving improved NRM outcomes are listed in the box below.

---

**Program factors contributing long-term commitment by landholders to recommended NRM**

1. Ensure credible and experienced staff are able to provide on-going extension activities with landholders throughout the program’s period of operation (design stage through to follow-up monitoring and evaluation stage);

2. Encourage landholders to complete an approved whole farm planning (property management planning) short-course (or equivalent), before they’re eligible to receive program support (say above $5,000) – materials and/or stewardship payments;

3. Identify and develop low-cost and low-input NRM strategies that landholders can feasibly implement, so that the desired outcomes can be achieved with relatively passive management (i.e. low-input NRM);

4. Provide adequate and relevant information and advice to landholders so they can make informed decisions about their participation in a program (e.g. provide access to a range of expertise so an in-depth and integrated plan can be prepared by landholders);

5. Commit program staff to undertake regular site assessments with landholders (e.g. annual visits) to assess, record and provide feedback about progress, advice on next steps and reinforce landholder commitment to active ongoing management; and

6. Allow for adaptive management of specific sites and corresponding flexibility in the ‘terms of agreement’, with scope for review of the agreement at the mid-point of the period (i.e. foster a perception of fair cost-sharing arrangements, clarity of roles in agreement).
**Predicting a long-term commitment by landholders**

10. Changing the behaviour of landholders who don’t share the values and/or goals of NRM programs is likely to be more expensive, than for landholders who share similar values and/or goals. However, on-going engagement can allow landholders and NRM staff with very different views to develop a shared understanding, perhaps developing a shared goal over the longer-term. Having a shared goal between a landholder and the NRM organisation appears a good predictor of long-term commitment to maintaining the NRM investment.

11. Landholders should be encouraged to adopt NRM practices that they can feasibly maintain over the long-term. Further research and development is warranted to identify a suite of low-cost and low-input NRM strategies (i.e. passive management) that can be feasibly pursued by landholders in most contexts.

12. The sense of ‘ownership’ a landholder has towards an NRM investment is a strong indicator of their likely long-term commitment to achieving the investment objectives. Developing a sense of ‘ownership’ amongst landholders could be achieved by allowing them to be primarily responsible for the design, implementation, financial management and long-term management of the NRM investment. The intention by a farmer to transfer their property to the next generation within their family appears to be another predictor that an investment in successful NRM works would be maintained over the long-term.

13. Advancing the concept of ‘ownership’ in terms of its importance in building a long-term commitment by landholders to improved NRM, we suggest the approach of using cooperative performance-based incentives (PBI) should be trialed and assessed in the Australian context. In the NRM context, a cooperative PBI can bring together neighbouring landholders to collectively agree on and oversee the payments for improved NRM outcomes. This approach could capitalise on Australia’s considerable investment in fostering local Landcare groups over the past two decades and enhance landholders’ ‘ownership’ of achieving improved NRM outcomes.
Contents

Summary 4
1. Overview of this research 9
2. A review of literature 12
3. Our research with Landscape Logic 20
4. Key findings and discussion 23
5. Conclusions 40
6. References 45
Appendix 1: Lessons from large NRM programs 47
Appendix 2: Overview of NRM programs using an MBI approach 48

Figures, Tables and Boxes

Figure 1: Location of study areas in Victoria 20
Figure 2: Model of how programs may build a long-term commitment by landholders to recommended NRM 42

Table 1: Characteristics of different policy instruments 11
Table 2: Characteristics of landholders interviewed 21
Table 3: Characteristics of different NRM programs for interviewees 21

Box 1: Factors linked to the adoption of new practices by landholders 14
Box 2: The participation spectrum 15
Box 3: Features of NRM programs for landholders using a market-based instrument 17
Box 4: Program factors contributing long-term commitment by landholders to recommended NRM 43
1. Overview of this research

1.1 A rationale for exploring long-term commitment to NRM

This report explores the likelihood that policy instruments can foster a long-term commitment by landholders to ‘best practice’ natural resource management (NRM) – specifically improved management of native vegetation. The rationale for this research is three-fold.

Firstly, exploring the long-term commitment by landholders to ‘best practice’ NRM appears important given the critical role of conserving native vegetation on privately owned land, the long-time frames required to ameliorate most degradation processes and that Australian governments don’t have the capacity to address these issues alone. Therefore, it is important that any public investment in on-ground work on private land leads to positive environmental outcomes. Given that the long-term goals of many NRM investments may not be realised until after projects have ceased or management agreements have expired, a critical aspect of NRM investments in general is whether it has led to a long-term commitment by landholders to sustain the recommended NRM practices. If not, much of a program’s on-ground investment may simply be one-off trials that fail to achieve the desired positive environmental outcomes in the long-term (Curtis et al. 2002; Race & Curtis 2007; Curtis et al. 2009). To the extent that occurs, public investment in on-ground works may be ‘purchasing’ a landholder’s participation for the duration of the program, but may not be engendering a commitment by landholders’ to maintain the outcomes of the investment after programs have concluded.

Secondly, there are claims by some analysts and policy-makers that approaches involving the direct purchase of environmental actions by landholders, such as via market-based instruments (MBI), are effective and efficient at achieving long-term changes. These claims imply MBIs are able to build a long-term commitment amongst participating landholders to sustaining the landscape management supported by this investment. As such, MBIs may be a preferable approach for investment in NRM rather than indirect approaches that focus on building the social and human capital amongst landholders as the precursors to restoration of physical landscapes (Curtis & Lefroy 2010). However, it is possible that the claimed success of these new approaches is related to the attributes of NRM organisations (e.g. an organisation’s credibility amongst landholders) or the effective implementation of programs (e.g. the approach used by experienced staff), rather than the specific attributes of a particular policy instrument.

Thirdly, there has been little effort to clarify what is meant by ‘long-term commitment’ in the context of NRM in Australia. Without some clarity, even agreement, about the meaning of this concept, it is difficult to assess the extent investments by governments and others in NRM will be voluntarily sustained by landholders. It would also be useful to be able to predict the extent of long-term commitment, particularly in terms of whether ongoing program support is likely to be needed to maintain landholder support for ‘best practice’ NRM.

Given the large investment made by Australian governments to address a range of NRM issues (e.g. $2.8 billion has been spent via the Natural Heritage Trust on improving Australia’s natural environment since the late-1990s), the extent this investment will have an enduring impact is a critical question – particularly when much of this investment has been made to support works on private land – outside the direct control of NRM agencies.

In this report, we draw on relevant literature, our previous assessments of regional and national NRM programs, and current research conducted in Victoria as part of the Australian Government’s CERF Landscape Logic research hub (www.landscapelogoic.org.au). The report includes:

- the rationale for this research;
- discussion to clarify the concept of ‘long-term commitment’ by landholders to improved NRM management;
- a review of Australian and international literature to identify the relevant lessons about landholders’ commitment to sustaining recommended NRM practices; and
- findings based on analysis of data obtained from in-depth interviews with 31 landholders and nine NRM program managers (n = 40). Interviewees were selected on the basis of their involvement in NRM programs operating in three Victorian landscapes where the Landscape Logic research was focused.

In the discussion of the key findings from our research, we have focused on:

- clarifying the concept of ‘long-term commitment’ by landholders to improved NRM practices;
- identifying a set of program characteristics that appear to be critical for building long-term commitment by landholders, including how different program characteristics interact with other factors (e.g. personal attributes of landholders, wider operating context); and
- exploring the extent it is possible to predict the success of programs in building long-term...
commitment by landholders to conserving and enhancing native vegetation.

In our conclusion, we outline the concept of ‘cooperative performance-based incentives’ and suggest it is an alternate mechanism that warrants analysis in the Australian context, as it appears offer advantages for enhancing the long-term commitment by landholders to the outcomes from NRM investments (it is currently trialled on a small-scale internationally and in Australia).

1.2 Context for this research
Given the sustained high level of industrial development since the mid-20th century, the estimate is that the world has now lost about 50% of its natural habitat (Balmford et al. 2003). The authoritative State of the Environment suggests these global trends are evident in Australia:

*Despite large investments and some promising responses, biodiversity in Australia continues to decline. Because of ongoing pressures and the legacy of past pressures, we cannot expect to see major reversals in this decline in the near future. (SoE 2006, p.i)*

There is an advanced understanding of the ecological principles for increasing biodiversity in natural and planted forests, with research continuing about how these principles can be applied in farmed or ecologically-fragmented landscapes (e.g. see Landscape Logic research by Duncan & Kyle 2010, Rumpff et al. 2010). The social context of these landscapes is changing (see Race et al. 2009a, b & c) and there is uncertainty about how to effectively engage with a heterogeneous population of landholders to enhance native vegetation on farmland. Understanding the synergies and trade-offs for different landholders who manage remnant native forests remains a somewhat vexed issue, and can be particularly challenging when attempting to ‘purchase’ improved management by landholders.

While there is considerable ecological knowledge about the link between forest management and biodiversity that has informed government programs and industry practices – both in Australia and internationally, it remains difficult to identify the critical ‘ingredients’ of NRM programs that change individual’s thinking and behaviour towards new approaches to NRM over the long-term. Even for NRM programs with high participation rates, this may not mean that the program has passed the test of ‘additionality’ – the added adoption of practices or change in behaviour that a program has stimulated, beyond the level of adoption or change that may have otherwise occurred.

Public investment in many NRM programs, including the National Landcare Program (Curtis & De Lacy 1995), is often made on the basis that a small public investment will lead to more widespread and long-term changes in the management practices of rural landholders. This logic has considerable appeal for governments in Australia where there is a large land mass, a large number of seemingly intractable environmental threats, a limited tax base, and wavering commitment from a largely urbanised society to address problems in distant rural landscapes (Curtis & Lockwood 2000). The challenge for policy-makers is to design and implement policy instruments that are effective in stimulating a long-term commitment by landholders to additional or new management practices, beyond their immediate participation in an NRM program.

1.3 Defining ‘long-term commitment’
The principal program for investing in NRM by the Australian government since 1997 – the Natural Heritage Trust (NHT) – seeks to foster cooperation between communities, industry and all levels of government to achieve ecological sustainable management. This goal implies that an on-going investment by government is envisaged until the preferred NRM is achieved (Environment Australia 2001). Although it is often implied in program documentation that policy instruments are seeking to lead to a long-term commitment (e.g. government support for landholders to establish farm forestry, inherently a long-term venture), it is rare for there to be a clear definition of what is meant by ‘long-term commitment’. A long-term commitment could relate to a time-frame or it could refer to a behavioural outcome, as demonstrated by active management of an area that is consistent with the original management principles. In the NRM context, the term ‘sustainable’ is commonly used which Earl et al. (2005) argued is used to imply an environmental state that remains balanced over the long-term.

A ten-year period is commonly accepted in the literature as a threshold for distinguishing between short and long-term social phenomena, including lengths of rural residence (Mendham & Curtis 2010). It may be more problematic to assume that landholders should demonstrate commitment through active management over that time frame. For example, it is clear from adoption studies that non-adoption of best-practice NRM might be sensible for a particular landholder if circumstances change (e.g. it may be prudent for a retiring farmer not to invest in establishing perennial pastures). It may also be problematic to expect a landholder to actively manage a site in a way that is consistent with the original practice, if that would involve the landholder incurring considerable expenses.
1.4 NRM instruments used in Australia

A variety of NRM policy instruments have been applied in Australia, with a mix of voluntary and compulsory, financial and technical, individual and group-oriented approaches [refer to Table 1]. In most regions of Australia, several instruments can be operating simultaneously, making it complex to identify the influence of individual instruments on a landholder's long-term commitment to maintain the intent of an earlier NRM investment.

Where multiple instruments and NRM programs are operating simultaneously in a region, the impact of one policy instrument can dilute or mask the contribution of another. For example, landholders in an area may have developed sufficient confidence to express interest in an MBI advertised through the media as a result of gaining knowledge of the technical aspects of NRM and gaining trust in NRM agencies by their involvement in Landcare or property management courses. While it may appear advantageous to offer a suite of mechanisms to landholders, it can also lead to unintended outcomes – not always positive. For example, the introduction of restrictions on the use of native vegetation (e.g. restricting livestock grazing in remnant bush) may undermine voluntary efforts by landholders to allow native vegetation to mature, so they don’t forgo potential grazing rights in the future.

While there is evidence of links between many policy instruments and implementation of improved NRM practices, there is continued uncertainty about the capacity of different policy instruments to engender long-term commitment amongst landholders to new approaches to NRM. Adding to this uncertainty, is that the process and quality of implementation of policy instruments is also likely to influence the NRM outcomes achieved, including the extent landholders develop a long-term commitment to recommended NRM practices. That is, the extent agencies have achieved best-practice program implementation may be a more critical factor than the specific attributes of individual policy instruments.

Table 1: Characteristics of different policy instruments

<table>
<thead>
<tr>
<th>Policy instrument</th>
<th>Nature of engagement</th>
<th>Time of operation</th>
<th>Influence on landholder’s NRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regulation/legislation (e.g. controls on clearing native vegetation)</td>
<td>Compulsory</td>
<td>On-going</td>
<td>Enforces minimum NRM standards</td>
</tr>
<tr>
<td>Covenant (i.e. binding agreement on land title)</td>
<td>Voluntary</td>
<td>On-going</td>
<td>Enforces agreed NRM standards</td>
</tr>
<tr>
<td>Fixed incentives (e.g. support for capital works)</td>
<td>Voluntary</td>
<td>Short- to medium-term</td>
<td>Encourages changes to NRM by offering financial support for initial capital works</td>
</tr>
<tr>
<td>Market-based incentives (e.g. stewardship payments determined by tender)</td>
<td>Voluntary</td>
<td>Short- to long-term</td>
<td>Encourages on-going changes to NRM by offering financial support for capital works &amp; stewardship payments for on-going management for up to 10 years</td>
</tr>
<tr>
<td>Education/training (e.g. completion of PMP)</td>
<td>Voluntary</td>
<td>Short-term</td>
<td>Engages landholders in property diagnosis and design</td>
</tr>
</tbody>
</table>
2. A review of literature

2.1 Responding to the loss of native vegetation on farmland

Given the sustained high level of industrial development since the mid-20th century, the aggregate estimate is that we have now lost about 50% of natural habitats (Balmford et al. 2003), with a growing list of endangered species (Butchart et al. 2004). Deforestation of native forests, largely due to increased agriculture, urban and infrastructure development, directly contributes to the loss of biodiversity (FAO 2005). At a global level, deforestation rates appear to be slowing, although there is a wide variation in this rate between countries. Positively, some countries are now able to report an increase in the total area of forests, mainly because of the establishment of new forests – restoring degraded landscapes and contributing to biologically rich environments (FAO 2010).

The ecological principles for increasing biodiversity in forests are well established (Bennett et al. 2000; Lindenmayer et al. 2002; Salt et al. 2003). These can be summarised as:

- Location – increasing the connectivity between forests and the links to waterways;
- Configuration – increasing the size of forests, design forests to reflect landscape features;
- Species composition – increasing species diversity and use local native species;
- Physical complexity – increasing the structural diversity of forests (e.g. leaving debris on the forest floor), creating mixed-age forests (e.g. retaining old trees) and ‘patchiness’;
- Ecological management – increasing the mimicry or stimulation of natural processes (e.g. varying fire and harvesting regimes).

How to implement these principles in highly modified (agricultural) landscapes remains a vexed issue. Designing effective policy instruments is further complicated in that NRM on private farmland is not just an ecological process, but also a socio-cultural and economic process as well. For instance, landholders and NRM agencies don’t always share the same views on how best to repair the ecological functions of degraded landscapes and what are the desirable outcomes. In many cases, widespread revegetation of farmland with species-rich native flora is not a socially acceptable option for landholders. The challenge is to find the mix of policy instruments that is both socially-acceptable and builds the capacity of landholders, to undertake NRM work beyond the capacity and scale of what governments can directly fund. Enhancing landholder’s long-term commitment to NRM is thought to be vital if the public investment via different policy instruments is sustained beyond governments’ direct action and investment period.

There has been a sustained call to achieve multiple benefits from native vegetation, in particular forests, largely to achieve a balance between conservation and production interests (Noble & Dirzo 1997; Lindenmayer & Hobbs 2004). While forest management practices have changed over the years, the broad intent for multi-purpose forests has remained relatively constant. Yet understanding the synergies and trade-offs between how landholders manage remnant native forests and ecological values remains a somewhat contested issue, and can be particularly challenging when attempting to achieve public benefits from private forests. The increasing community concerns in south-east Australia of uncontrollable bushfires in re-forested landscapes is adding to the challenge of encouraging landholders to sustain their long-term commitment to protecting native vegetation. New issues may emerge in the public’s consciousness that counter the intent of NRM programs (e.g. native vegetation increasing the fire risk and harbouring pest plants and animals), undermining a landholder’s long-term commitment to their earlier view of ‘best practice’ NRM. That is, participation in an NRM program may not guarantee a landholder’s long-term commitment to the goal of a specific policy instrument, particularly if the landholder’s context changes and the NRM practice is no longer desirable.

There has been considerable research on the characteristics, intentions and values of the large population of landholders in the United States (US) with non-industrial private forests (NIPF), who own and manage 93 million hectares of largely native forest (Erickson et al. 2002). There are about 10 million NIPF owners in the US, although the pattern of ownership is changing – with the trend for new, non-farming NIPF owners with smaller properties. In response to this demographic change, some analysts called for greater investment by NRM organisations to foster ‘… collaboration amongst landholders to offset the effects of landscape fragmentation’ (Erickson et al. 2002, p. 103). However, of interest is that greater fragmentation of ownership has seen an increasing consolidation and connectivity of NIPF forests, rather than increased forest fragmentation – phenomenon also found in Australia (Morrison et al. 2008), resulting in positive landscape change without direct NRM programs.

While demographic change amongst rural communities can lead to ‘fragmentation’ of land ownership (e.g. increasing number of non-farmers in
highly ‘liveable’ rural landscapes), this may lead to greater connectivity of forests on private land – with such change occurring beyond the direct influence and investment of NRM organisations.

2.2 Engaging diverse landholders

There has been considerable research of social change in rural Australia – with some rural landscapes de-populating and others re-populating (Hugo 1996; Lawrence et al. 1996; Curtis et al. 2000; Smale et al. 2002; Alston 2004; Barr 2005; Luck et al. 2010). Associated with many rural populations that are increasing, the socio-economic composition and property ownership patterns are becoming more diverse (Bekessy et al. 2006; Curtis et al. 2006; Mendham & Curtis 2010). This phenomenon in Australia is consistent with change in parts of Europe (Antrop 2004) and North America (Boody et al. 2005). Understanding the capacity and willingness of a homogeneous population of landholders could be argued to be relatively straightforward, and so allow a strong match with relevant NRM mechanisms. By contrast, engaging a highly heterogeneous population of landholders is expected to be far more challenging. For policy-makers it can be difficult to identify the critical ingredients of NRM programs that effectively engage a diverse mix of landholders (Dwyer et al. 1993; Smith & Weinberg 2006).

Understanding the relevant characteristics of the target population for an NRM program is essential for achieving a ‘close fit’ between landholders and NRM programs. Indeed, some researchers have argued that better differentiation of landholders prior to implementation will improve the efficiency and effectiveness of programs. For example, Ferraro (2008) discussed the value of differentiating landholders into ‘low-cost’ and ‘high-cost’ landholders, with labels referring to the cost level for programs to gain the participation of landholders.

‘Low-cost’ landholders are those who are likely to undertake land management that provides a similar environmental service, regardless of payments for environmental services (e.g. fixed grants, MBIs). That is, their land management is providing environmental services similar to that sought by an organisation’s environmental program, so little additional investment is required by the agency (i.e. low-cost). By contrast, ‘high-cost’ landholders are those who are not likely to provide the desired environmental services without considerable investment by an organisation’s environmental program. In terms of exhibiting a long-term commitment to new approaches to NRM that endure beyond or outside an organisation’s intervention, Dwyer et al. (1993) suggested it will only be those landholders who have modified their NRM for personal reasons, not for external rewards (e.g. financial payments, penalties), who are most likely to possess a long-term commitment. That is, ‘low-cost’ landholders are those most likely to have a long-term commitment to new approaches to NRM; however the challenge is that they may provide little ‘additionality’ of environmental services.

‘Low-cost’ participants in NRM programs (i.e. those require little support for their involvement) are often the most likely to continue with the approach to NRM advocated by the program, yet the program may have stimulated little environmental ‘additionality’. Programs seeking a high degree of ‘additionality’ may need to ‘purchase’ environmental gains from ‘high-cost’ participants over an extended period, perhaps even in perpetuity.

Positive or pro-environmental attitudes that reflect the NRM organisation’s goals increases the probability that landholders will participate in organisation-sponsored environmental programs (Luzar & Diagne 1999), and that their NRM will be enduring (Dwyer et al. 1993). However, effective implementation relies on getting all the components right – the combination of incentives and support to enhance a landholder’s capacity and alignment between the NRM program’s goals with that of the landholders. Particularly for commercial farmers, finding the balance between environmental and economic goals in the farm business is needed (Claassen et al. 2004). Even when landholders clearly express attitudes that are aligned with NRM programs, understanding their willingness and capacity to be actively involved in a specific program, or adopt recommended practices, can be complex with many factors involved (Vanclay 2004, Pannell et al. 2006) [refer to Box 1].

While most landholders already have a strong ‘land care’ ethic, at times there can be a tenuous link between their ethic and actions (Vanclay & Lawrence 1995). Costly, difficult, onerous or risky changes in land management are less likely to be adopted by landholders, even if the long-term benefits of such changes reflect their aspirations and values. Changes that can be made easily by landholders have a far greater likelihood of being adopted. Erickson et al. (2002) talked about ‘active’ and ‘passive’ management of small forests, with landholders more likely to adopt and maintain NRM practices that are relatively ‘passive’ (i.e. low-input). Aesthetic appreciation has been reported as the strongest motivator for owning and protecting small forests – both among farmers and non-farming landholders. While farmers reported economic
reasons more often than non-farmers, these reasons were reported as being less important than aesthetic or environmental issues. Indeed, receiving a financial payment was rated as the least influential factor motivating small forest owners (Erickson et al. 2002).

In the absence of payments to cover the costs of ‘active’ management, both commercial farmers and non-farmers are most likely to engage in, and be committed to, recommended NRM practices if these can be achieved and sustained with ‘passive’ management (e.g. low-input NRM practices).

Importantly in the Australian context, most small forest owners reported a strong preference for ‘hands off’ or passive management of their native forests, with this stronger for non-farmers. Agency programs need to recognize the changing ownership patterns of small forests and tailor incentives and support to different types of forest owners. Erickson et al. (2002, p. 110) suggested that:

Many (small forest owners) are probably unaware of the opportunities that exist for creative management. Therefore, management assistance programs could not only be geared to non-farm owners on small tracts, but to helping them develop non-economic outcomes like wildlife habitat, visual quality and recreation. These goals are not always overt in most existing programs.

Ferraro (2006) suggests that in a spatially concentrated region, it is more efficient and effective to have a single mechanism on offer, so not to make the promotion of NRM programs too confusing for landholders, particularly for those who have a low level of interest. Similarly, NRM programs that focus on a single ecological asset, such as improving water quality, which can act as a proxy or surrogate for a suite of environmental services, are likely to be easier to promote and implement (Wunscher et al. 2008). However, ultimately others have argued that targeted, funded technical assistance with ‘rental’ payments (similar to stewardship or management payments) for conservation is what is required for landholder participation (Kraham 2005).

2.3 Does participation in programs reflect a long-term commitment?

Even with high participation rates by landholders in an NRM program, this may not confirm the ‘additionality’ (i.e. added adoption or change due to program) or success of the program, particularly if the program was designed to stimulate long-term commitment of new land-use practices beyond or outside a program (i.e. extent there is an enduring voluntary commitment) (Morris & Potter 1995). Lobley and Potter’s (1998) evaluation of environmental programs in the UK found that while having relatively undemanding entry conditions is likely to encourage a high level or rate of participation, these typically require little from farmers in terms of behavioural changes. As such, programs can achieve a high level of participation and compliance but deliver little environmental ‘additionality’ (Lobley & Potter 1998).

Although, the guaranteed financial payments were important, the key determinant of participation in an NRM program for UK landholders was the ‘goodness of fit’ between the program and the landholder’s farming system and plans (Lobley & Potter 1998). However, others have suggested that people may respond to incentives by changing their behaviour, but when the tangible incentive (e.g. financial payment) is removed, they may simply revert to their original behaviour (Beilin & Reichelt 2010). This supports the earlier finding of Dwyer et al. (1993) that program mechanisms may be effective in changing individual’s behaviour, but achieve little in terms of building a long-term commitment to NRM after the program ceases. Furthermore, in the Australian context, having NRM programs that strive to get landscapes back to a pristine ecological condition may be both incredibly expensive and unachievable (e.g. due to profound structural changes and species extinctions in some landscapes) (Curtis & Lefroy 2010).

Also, there can be wide variation in commitment to NRM programs amongst participants, with some analysts talking about a ‘participation spectrum’
Working with landholders to achieve long-term commitment to improved management of native vegetation (Morris & Potter 1995). That is, participation per se in a program may not provide much insight into landholders’ strength of commitment to the program and its environmental goals, or intended behaviour post-program. Underlying passive participation (i.e. ‘low input’ by landholders) can be much higher than realised by program managers, and ‘… may conceal wide variations in the level of commitment of those actually enrolled’ (Morris & Potter 1995, p.60) [refer to Box 2]. Radical changes in land-use are likely to require higher investment by programs, compared to subtle changes in land-use. As such, complicated and expensive approaches to NRM may require ongoing support, such as financial payments in perpetuity and may need periodic adjustment to ensure payments maintain the relative competitiveness against other conflicting land-uses.

Voluntary participation in an NRM program by landholders may not indicate a long-term commitment to the NRM organisation’s view of ‘best practice’.

Passive participation may not be a problem for a program, particularly if it acts as a ‘stepping stone’ to encourage landholders to participate in more ambitious programs that might be offered in the future. However, there can be some uncertainty about whether ‘passive’ participants are simply ‘trying out’ (trialling) the new land-use practices, rather than having ‘adopted’ a more enduring land-use (Morris & Potter 1995; Curtis et al. 2008a). ‘Active’ participants may be valuable to programs beyond their own properties in that they could act as promoters or recruiters of other landholders for the program. Also, ‘active’ participants may also be targeted for adoption of more challenging or innovative land-use changes, with their initial participation in an NRM program the ‘stepping stone’ to further change (Morris & Potter 1995; Race et al. 2010).

Engaging ‘low-cost’ landholders in NRM programs may serve as a ‘stepping stone’ for seeking their participation in future in more ambitious or challenging approaches to NRM.

2.4 Influencing landholders’ NRM with a mix of policy instruments

There is a wide range of instruments or mechanisms that policy-makers can employ to influence landholders’ land-use practices (Binning & Young 1997, Miles et al. 1998; Lockwood & Walpole 1999; Earl et al. 2005; York et al. 2006; Curtis et al. 2008b). These instruments include:

- Fixed grants (sometimes referred to as ‘devolved’ grants) – financial and/or materials provided covering all part of the costs of on-ground work, often guided by a management agreement (e.g. Victoria’s LPIS);
- Market-based instruments (MBI) – negotiations between the ‘purchaser’ (state agency, regional NRM organisations) and ‘seller’ (landholder) for specified environmental services as guided by a management agreement (e.g. Victoria DSE’s Bush Tender);
- Tax concessions – approved costs associated with on-farm NRM may be offset against taxable income from other sources (authorised by the Australian Taxation Office) (e.g. Landcare-related work);
- Rate rebates – deductions to annual rate payments offered by some local governments for approved land management practices;
- Labour support – where landholders cover the direct expenses for on-ground NRM activities and state agencies, regional NRM organisations, or environmental NGOs, will organise a team of labourers (e.g. fencing, tree planting);
- Conservation covenants – where landholders

### Box 2: The participation spectrum

<table>
<thead>
<tr>
<th>Resistant non-adopters</th>
<th>Conditional non-adopters</th>
<th>Passive adopters</th>
<th>Active adopters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would not participate under any circumstances</td>
<td>Decided not to participate under existing circumstances but persuadable provided subsidy is made more commensurate with scheme conditions and/or a change in farmer/farm family circumstances</td>
<td>The ‘new conservationists’ – participants attracted by the financial inducements on offer and able to stay inside the ‘green box’ at minimal cost and inconvenience</td>
<td>The most committed participants, often conservationist farms with a history of countryside management activity – environmental innovators and potential demonstrators of best practice</td>
</tr>
</tbody>
</table>

Source: Morris & Potter (1995, p.58)
choose to place an enduring legal covenant on the property title to preserve existing native vegetation (e.g. supported by Trust for Nature), sometimes supported by rebates on local government rates;

- Certification – where landholders choose to join a special interest group that applies a degree of certification that a preferred NRM philosophy and/or practice is demonstrable (e.g. Victoria’s *Land for Wildlife*);
- Regulation or legislation – legal requirement for specific NRM practices or standards to be adhered to by landholders (e.g. formal approval required if seeking to clear native vegetation); and
- Enhancing human and social capitals – education and training programs (e.g. Property Management Planning) and supporting Landcare groups (e.g. strengthening local networks).

In every NRM region across Australia, a mix of these instruments is operating simultaneously. Yet managing this mix is complex, with multiple interactions between the different instruments – not all having a consistent outcome. For example, it may be difficult for government agencies to simultaneously enforce regulations that prevent clearance of native vegetation and encourage landholders to enter into voluntary long-term management agreements, with landholders uncomfortable with working closely with a single agency that has both the ‘carrot and stick’. Indeed, Dwyer *et al.* (1993) suggested that programs that provide external penalties (e.g. fines), or rewards (e.g. financial payments), to modify landholders’ NRM may actually impede the development of a long-term commitment to the organisation’s preferred NRM, as these undermine landholders developing intrinsic (personal) modifications to their behaviour. Conversely, a complementary mix of instruments can strengthen environmental outcomes, such as when legislative controls for minimum standards of land-use (e.g. regulations on clearing of native vegetation) and incentive programs assist interested landholders to achieve beyond minimum standards (e.g. *BushTender* provides payments to landholders to enhance their management of woody native vegetation).

In addition, the typical operating context for landholders has many other influences beyond a government’s suite of NRM instruments, with some influences much stronger than policy instruments (e.g. agricultural commodity markets, land prices, prolonged drought, demographic change) (Mendham & Curtis 2010; Race *et al.* 2007; Race *et al.* 2009a, b & c). Aside from the individual policy instruments themselves, several authors have argued that integrating spatial data, particularly when referenced with ecological or biophysical data, together with demographic information, will improve the targeting of instruments or programs – including improving the efficiency of payments for environmental services (Curtis *et al.* 2005; Wunscher *et al.* 2008). Nonetheless, careful assessment of the value of different instruments, including specific components or elements, is needed if to better understand how to foster the long-term commitment by landholders to NRM practices preferred by policy-makers.

### Learning from market-based instruments

There is strong support for market-based instruments (MBI) in Australia (Cutbush 2006; Eigenraam *et al.* 2005; Whitten *et al.* 2007; DSE 2008), with this mechanism (e.g. market-based auction system) viewed as achieving more efficient environmental outcomes than the traditional fixed-grant mechanisms [refer to Box 3]. The support for MBI is primarily because there is an incentive for both parties to truthfully disclose accurate costs and actions they can undertake (otherwise risk non-participation in the program), and the level of incentive payments can be tailored to individual properties and actions – with this efficiency enabling the program’s support to be extended to a larger number of landholders (DSE 2008). In this sense, NRM organisations can maximise the participation of landholders with the target environmental asset/service, by avoiding ‘over-payment’ to a smaller number of landholders that a fixed-grant approach may do. There are several state agency programs employing MBI in Australia to enhance the management of native vegetation on private land to achieve biodiversity outcomes. These programs include Land Management Tenders in New South Wales; *BushTender* and *EcoTender* in Victoria; and the *Vegetation Incentive Program* in Queensland (Cutbush 2006).

Despite the recent popularity of the MBI approach, some doubts have emerged about the effectiveness and efficiency of this mechanism (Morrison *et al.* 2008). For instance, the MBI approach assumes that landholders will want to form a contractual agreement with the agency promoting the MBI, and participate in the ‘market’ for environmental services – a market that typically has few competing purchasers. Some have suggested that one reason that MBI aren’t always effective is that landholders may not trust the ‘market’ dynamic to produce fair and beneficial results. This concern can be heightened if they are required to sign a legally-binding long-term agreement or contract (Luzar & Diagne 1999). By contrast, the fixed-grant
Working with landholders to achieve long-term commitment to improved management of native vegetation

The approach typically includes offering a set rate for reimbursement of capital works and has a non-legal management agreement, yet does not offer ongoing stewardship payments.

Calculating an appropriate level for stewardship payments can be complex, with potential risks for all investing partners. For example, markets can fluctuate and so alter the opportunity cost of long-term contracts, potentially restricting landholders’ ability to pursue more financially-rewarding land-use options. Also, the time needed to appreciably increase a site’s native biodiversity may take longer than the contract/program period, so arguably failing to deliver the NRM outcomes for the investing NRM organisation.

Ferraro (2008) also suggested that landholders and large organisations typically don’t have the same type or level of information (i.e. operate in an asymmetric market) to negotiate an efficient and effective MBI. Native forests are ecologically complex systems and it is very difficult for landholders to understand the value of their remnants or the extent and type of management required to enhance their condition (Eigenraam et al. 2005). If a landholder’s lack of knowledge leads them to ‘under-bid’ for their provision of environmental outcomes, they are at risk of being disappointed in the arrangements they have entered into and this may undermine their long-term commitment to improved NRM, or working with the same organisation in the future.

Programs that have some flexibility and allow landholders to negotiate the details of any agreement or contract (using either a fixed-grant or MBI approach) are likely to be more effective, but may cost more to implement per landholder and per hectare. To overcome this ‘inefficiency’, Lobley and Potter (1998) suggested there might be merit in a localised group of landholders forming their own association or cooperative, devising their own arrangements and negotiating an agreement with the contracting NRM organisation, providing an MBI with an ‘economy of scale’. This might also achieve greater cooperation between neighbouring landholders, and be more likely to achieve NRM change at the landscape-level, rather than at a smaller and more fragmented property-level.

Knowledge about the link between forest management and biodiversity has informed government programs and industry practices, both in Australia and internationally. For example, a pilot project in Finland trialled an MBI for non-industrial private forest (NIPF) owners to manage their native forests in a way that increases or safeguards biodiversity (METSO 2006). The MBI requires forest owners to voluntarily enter into a 10-year contract with the government for a financial payment to manage their forests to increase biodiversity. In effect, forest owners and the government negotiate in a market to ‘supply’ and ‘purchase’ biodiversity respectively. Essentially, the greater the gain in, and security of biodiversity that the government receives, the higher the potential payment to the forest owner.

Similarly, if the forest owner and government don’t agree on the level of financial payment, or the value of biodiversity, then no contract is issued. This project has been trialled in southern Finland where most native forests are in private ownership. An interesting insight from this experience is that forest owners’ ability to make informed decisions and negotiate the terms of agreement was critical to whether a contract was signed. While the level of payment was important, the more the forest owner retained ‘ownership’ over the assessment and negotiating process, the more committed they were to undertaking forest management for long-term conservation (METSO 2006). This isn’t so surprising, given that the personal values of owners of forests, especially native forests, are often reflective of a strong stewardship ethic of environmental care. While the focus for the project in Finland, and similar MBI elsewhere, is on locally native species, thinking by policy-makers has extended this concept to plantations of introduced species. For example, even large-scale introduced ‘plantations on ancient woodland sites’ in the UK are now recognised for the potential role in enhancing biodiversity with programs using the MBI approach to engage forest owners (Pryor & Smith 2002).

Engaging NIPF owners in MBI or other policy instruments via fair and mutually-beneficial agreements is the key, where landholders can make informed decisions and voluntarily enter into long-term contracts with ‘purchasers’ of biodiversity, so that the benefits, costs and risks are shared relative to each partners’ contribution.

Box 3: Features of NRM programs for landholders using a market-based instrument

- Agreements between agencies and landholders are negotiated at an individual level – with works and payments tailored to site and landholder requirements;
- Landholders nominate the required level of payment for them to adopt alternate NRM practices;
- Landholders’ management time can be incorporated into payments; and
- Payments are made over the period of the contract (e.g. 3 to 10 years).
**Contracts and long-term commitment**

Substantial changes in property ownership are occurring and new owners may have different values and plans to previous owners (Curtis et al. 2006). Long-term agreements can be a disincentive for some landholders to be involved in NRM programs, particularly if they have plans to sell or inter-generational transfer of the property, as the agreement would then place a burden on the new owners (Lazar & Diagne 1999).

Contracts between landholders and environmental organisations are complex (Mavhunga 2007, Vermeulen & Shell 2007) – offering both benefits and risks to all partners. Long-term contracts, whether for commercial enterprises or environmental works, carry some risks for investors – NRM organisations and landholders, such as when major changes in the operating context alter the opportunity costs. A risk is that one partner is left contractually-obliged to maintain their contribution for several years despite incurring higher costs than originally envisaged (e.g. increase in costs to control pests plants and animals that originate from neighbouring properties), or the outcomes being less than originally envisaged (e.g. payments being made for a site that has less regeneration of native species than expected). A shorter contract period is a way that partners can reduce this type of risk, with Morrison et al. (2008) reporting that landholders typically prefer 5-year contracts with review and possible renewal for a further 5 years, rather than a 10-year contract from the outset.

**Voluntary or compulsory participation**

The extent a new NRM practice is promoted for voluntary adoption, or is compulsorily required to be adopted, appears to make a difference to the level of commitment to maintaining the NRM investment by landholders. Walford’s (2002) research showed that commercial farmers had contrasting responses to policy measures depending on whether these were compulsory or voluntary. Even amongst farmers who are generally supportive of conservation measures, there can be a reaction against approaches that are compulsory. However, the costs and scale of change required by new regulations also makes a difference. For example, if new regulations require all landholders to achieve a minimum standard of NRM (e.g. control of farm pollutants from entering waterways), yet most landholders already exceed this standard, then the introduction of the regulation may be of little concern. Where a more substantive change is required, using a stepwise or adaptive adoption approach is thought to be more effective, where landholders can adopt change in a transitional way – either over an extended period or incremental change in practices.

Encouraging landholders to participate voluntarily in NRM programs is preferred rather than compulsory participation, although in extreme situations compulsory changes to land-use may be unavoidable (e.g. unacceptable pollution, threats to endangered species).

**2.5 Building human and social capital in NRM**

Given the considerable investment in NRM by Australian governments over recent decades via the National Landcare Program (NLP) and parallel NRM initiatives, agencies have provided considerable financial and technical support to local groups of landholders/community groups. Much of this support has been aimed at enhancing the skills and knowledge of individual landholders (human capital) to adopt new approaches NRM. In addition, the support via the NLP has been aimed at strengthening the local networks of landholders to undertake group activities (e.g. neighbouring landholders cooperating for pest plants and animals control) and to establish constructive partnerships with NRM organisations and the private sector (social capital) – the essence of Landcare. The logic of investing in human and social capital is that the combined effort and resources would lead to landscape-scale improvements in NRM.

Investment through Landcare in the human and social capital of landholders (e.g. enhancing skills and knowledge, strengthening networks) appears to be an important contributor to achieving substantive changes to land management over a period of 5–10 years (Curtis et al. 2008b; Curtis & Mendham 2010). That is, it seems there is some evidence that this type of approach leads to longer-term commitment. Of course, involvement in on-ground work can also lead to the development of human and social capital, as landholders ‘learn by doing’ – a reinforcing and iterative process. For example, Curtis et al. (2008c) reported that Landcare members were more likely to participate in group meetings, workshops and other training than non-members. In turn, this translated into Landcare members undertaking more on-ground work consistent with ‘best practice’ NRM (e.g. fenced areas of native bush to control livestock access, control of pest plants and animals, planted trees and shrubs), than non-members (Curtis et al. 2008b, p.15).
Providing support to local community-based groups and networks (e.g. Landcare) is an effective pathway to promote ‘best practice’ NRM, however this approach will have less influence on the land-use of non-members.

Higher levels of social capital contribute to a cooperative, resilient and prosperous community, and are thought to be strongly linked to the implementation of sustainable NRM (Pretty & Ward 2001; Sobels et al. 2001; Pretty 2003; Krishna 2004; Cramb 2006). This is also reflected at the household level, where people engaged in high levels of social capital ‘… tend to have higher incomes, better health, higher educational achievements, and more constructive links with government’ (Pretty 2003, p. 1913-4). Knowing how social capital is created and expressed allows a clearer understanding of practical strategies that can be developed to increase this aspect of a community – for NRM or any other community-based initiative. For example, NRM organisations may choose to invest in:

- activities and processes that recognise and support members to attend regular meetings of a community;
- encouraging members to visit each other’s properties or sites of interest to exchange experiences and develop new ideas (within a community, or to a neighbouring community);
- organising forums where members develop shared ‘action’ plans; and
- organising ‘outside’ people and organisations to establish meaningful connections with the community (e.g. raise awareness of new policies and programs, undertake trials of new management approaches or products, increase knowledge of commercial markets).

Much of the literature discusses social capital in relation to the management of communal or public resource, however the concept can also be applied to the management of private resources in pursuit of a collective interest or objective, such as participation in NRM groups organised at a local or community level (e.g. Landcare groups) (Sobels et al. 2001; Curtis & Cooke 2006). Local Landcare groups have developed in capacity and number since the early-1990s in Australia, and are now generally recognised as one of the most effective ways of working with groups of landholders to address NRM issues affecting private land. Working through localised groups and networks, activities at the property and catchment-scales can be integrated in ways that allow Landcare activities to address the causes of land degradation (Curtis & Sample 2010). As such, some examination of the social capital of local groups appears warranted.
3. Our research with Landscape Logic

3.1 Research approach

Australian governments have made considerable investments to improve the NRM outcomes from highly-modified (agricultural) landscapes. Much of this investment has been of a catalytic nature, in terms of building the capacity of landholders to adopt ‘best practice’ NRM and continue that work on an enduring basis, beyond the direct support of NRM programs. That is, much of NRM policy is built upon the assumption that once landholders have received initial program support, they will retain a long-term commitment to voluntarily pursuing recommended NRM practices.

The overall goal of this research was to explore how NRM programs using commonly applied approaches for engaging landholders (i.e. fixed-grant and market-based instruments) can foster a long-term commitment by landholders to recommended NRM practices. Our research was grounded in understanding the experiences of landholders who manage native vegetation on farm-land in Victoria, and NRM staff with experience of programs seeking to enhance the management of native vegetation on private land. The objectives of this research were to:

- clarify the concept of ‘long-term commitment’ by landholders to improved NRM practices;
- identify a set of program characteristics that appear to be critical for building long-term commitment by landholders, including how different program characteristics interact with other factors (e.g. personal attributes of landholders, wider operating context); and
- explore the extent it is possible to predict the success of programs in building long-term commitment by landholders to conserving and enhancing native vegetation.

The fieldwork for our research was focused on landholders who had experience with NRM programs in the three Victorian case study areas that were the focus of considerable research effort within Landscape Logic – in the North East, North Central and Goulburn Broken CMA regions [refer to Figure 1]. These regions have a diversity of land-uses, have received considerable investment aimed at the protection and enhancement of native vegetation on private land, and are thought to offer possibilities for further improvement in NRM due to land-use changes and the presence of remnant native vegetation. More extensive discussion of the ecological and socio-economic characteristics of the case study areas is provided elsewhere (see Duncan & Kyle 2010; Race et al. 2010).

In this research, we sought to understand the experiences of landholders and program managers involved in a mix of NRM programs that used approaches with fixed-grants and/or MBIs. We also deliberately identified individuals with different perspectives of the same programs: landholders and program managers/staff. We also focussed on individuals who had experience of programs over at least five years so that we had informants with the

![Figure 1. Location of study areas in Victoria](image-url)
capacity to discuss the concept of long-term commitment. Our informants were purposefully selected for their experience of specific NRM programs (Blakie 1993; Bryman 2008). That is, there was no attempt to take a random sample that would be representative of landholders across the three study areas and include those with and without experience of NRM programs. Indeed, we deliberately sought a dichotomy amongst our sample of landholders so we could understand the experiences of landholders involved in NRM programs using either fixed-grants or MBIs, with a small number of landholders having experience of both approaches.

Our sample of 31 landholders was identified by consulting several regional NRM staff. Landholders were selected to achieve a spread across a mix of property sizes and primary occupations (i.e. farmers and non-farmers) [refer to table 2], involvement in different NRM programs, and geographic spread throughout the three study areas. Of the sample, a group was identified who had been involved in NRM programs offering the traditional fixed-grants and education/training courses (n = 19), with two landholders in this group who had lodged unsuccessful bids to join NRM programs using an MBI approach. Another group was identified who had been actively involved in NRM programs employing an MBI approach (n = 12). While this group of landholders had experience with MBI incentives, they also had experience with fixed-grant incentives, largely because these had been operating within the NRM context for several decades compared to the relatively shorter period for programs using an MBI approach (i.e. post-2000). All landholders owned properties larger than 10 hectares.

We interviewed landholders involved in the following programs.

**Fixed-incentive programs**

- Victorian Department of Primary Industries’ (DPI) Land Protection Incentive Scheme (LPIS).
- National Landcare Program (NLP) via local Landcare group (e.g. via the NLP’s Community Support component to assist promote the uptake of a variety of soil, water and native vegetation conservation practices within the context of operating farms).
- Trust for Nature’s Care of Remnants Incentive Scheme (CORIS), and
- CSIRO and North East Catchment Management Authority’s Heartlands.

**Market-based incentives:**

- River Tender, Bush Returns, Green Graze & BushTender

**Education/training:**

- Whole farm Planning/Property Management Planning courses

Table 2: Characteristics of landholders interviewed

<table>
<thead>
<tr>
<th>Experience with fixed-grant incentives</th>
<th>Experience with market-based incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>(n = 19)</td>
<td>(n = 12)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Farmers (n = 10)</th>
<th>Non-farmers (n = 9)</th>
<th>Farmers (n = 5)</th>
<th>Non-farmers (n = 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median property size (ha) [range]</strong></td>
<td>544 ha [179 – 3,000 ha]</td>
<td>351 ha [197 – 990 ha]</td>
<td>1,000 ha [650 – 1,200 ha]</td>
</tr>
<tr>
<td><strong>Median % on-farm income [range]</strong></td>
<td>97% [65% – 100%]</td>
<td>33% [0 – 50%]</td>
<td>100% [80% – 100%]</td>
</tr>
</tbody>
</table>

Table 3: Characteristics of different NRM programs for interviewees

<table>
<thead>
<tr>
<th>Policy instrument</th>
<th>Nature of engagement</th>
<th>Time of operation</th>
<th>Influence on landholder’s NRM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed-grant incentives: LPIS, NLP, CORIS, Heartlands</td>
<td>Voluntary entry to program, then management agreement</td>
<td>One to 10-year management agreement</td>
<td>Encourages changes to NRM by offering financial support for initial capital works</td>
</tr>
<tr>
<td>Market-based incentives: River Tender, Bush Returns, Green Graze &amp; BushTender</td>
<td>Voluntary entry to program, then binding contract</td>
<td>3-to 10-year contract</td>
<td>Encourages ongoing changes to NRM by offering financial support for capital works &amp; stewardship payments for ongoing management for up to 10 years</td>
</tr>
<tr>
<td>Education/training: Whole farm Planning/Property Management Planning courses</td>
<td>Voluntary</td>
<td>Short-term</td>
<td>Engages landholders in a structured process of diagnosis of the environmental condition of their property &amp; design of improved NRM practices</td>
</tr>
</tbody>
</table>
Market-based programs

- North East CMA’s River Tender,
- Goulburn Broken CMA’s Bush Returns and Green Graze, and
- Department of Sustainability and Environment’s BushTender.

Most of our interviewees had been involved in multiple NRM programs, with varying program elements [refer to Table 3] [refer to Appendix 2 for further details about individual NRM programs]. Given our field research was conducted in Victoria, all landholders reside in a jurisdiction where there have been legislative controls on clearing native vegetation on private land since the late-1980s (under the Victorian Planning and Environment Act 1987, clause 52.17), and so was a common influence on all landholders interviewed.

A similar approach was used to identify a sample of experienced NRM program managers to be interviewed (n = 9), with a mix of staff selected who had:
- worked in one of the three study areas;
- more than 5 years professional experience in the NRM sector;
- been involved in different NRM programs; and
- worked for different organisations (e.g. government and non-government organisations).

The in-depth interviews were conducted using a semi-structured approach framed by pre-determined key questions, outlined below (Minichiello et al. 1995; Bryman 2008). The interviews were typically of 1 to 2 hours duration, and conducted face-to-face with a single researcher. Audio recordings and/or hand-written notes were made with the interviewees’ permission. The interviews were conducted during August to November 2009. Our results presented in this report are based on the combined data generated from in-depth interviews (N = 40) with:

- 19 landholders involved in fixed-grant NRM programs;
- 12 landholders involved in market-based NRM programs; and
- 9 NRM program managers.

Our research primarily collected qualitative data through the interviews. A limited range of socio-economic and agronomic data were also collected (e.g. property size, proportion of income from on-farm, age) to ensure that the interviewees included a cross-section of landholders in the regions [refer Table 2]. The qualitative data were analysed by identifying the key themes (topics, issues, perspectives) from each interview. The key themes discussed with landholders related to:
- their experiences with NRM programs;
- changes made to their management of native vegetation;
- the extent they would sustain their management of native vegetation beyond the period of a program’s agreement/contact; and
- features of preferred NRM programs.

The key themes discussed with program managers related to:
- the type of landholders engaged in the NRM programs they managed;
- how the legacy of a program’s investment in improved NRM could be secured; and
- the concept of a ‘long-term commitment’ by landholders to recommended NRM.

The themes from all interviews were compiled and aggregated, to obtain an understanding of the range of experiences across all interviewees. Some direct quotes from interviews are included in this report to illustrate particular experiences or opinions, and are coded according to the broad category of the interviewee (i.e. farmer, non-farmer, program manager).
4. Key findings and discussion

4.1 Defining ‘long-term commitment’

Our search of the literature found the terms ‘long-term’ and ‘commitment’ to be regularly used in the NRM context, yet accompanied by very little discussion of what is meant by each term. It seems a relevant discussion to have given that so much of the NRM investment in Australia is predicated on undertaking landscape restoration activities to achieve sustainable NRM in the long-term that can be maintained by landholders committed to recommended practices.

As Earl et al. (2005) suggested, the term ‘sustainable’ is often used in the NRM literature to imply achievement of desirable NRM outcomes over the long-term. However, defining exactly what is meant by a ‘long-term commitment’ in the NRM context is challenging for a number of reasons, including the following that were identified in the literature reviewed earlier:

- land-use practices may not always be known, and may need to change over the long-term to achieve a specific NRM outcome;
- landholders may not be able to sustain recommended land-use practices over the long-term even though they may aspire to; and
- participation in a NRM program by landholders may not reflect a long-term willingness to continue recommended practices beyond the program.

We now explore these issues, and others that will shape our understanding of long-term commitment, through the insights gained through our interviews. Some of our informants explained that the full implications of recommended changes in land-use practices may not be evident for many years, such as when planting seedlings to re-forest farmland. This makes it difficult for landholders to be fully committed to the change in land-use until the benefits and costs over the long-term are known. Some landholders commented:

“… we like the idea of having more of the native birds around here, but we’ll have to wait and see to know if we’ve done the right thing (revegetation works) …” [non-farmer, NF]

“… we’ve received mixed messages about how to get the understorey back under the trees … in the end, we’ll make our own minds up …” [farmer, F]

In a practical sense, a landholder’s long-term commitment may not always be apparent in terms of land-use or practices. For example, a landholder may have a sustained commitment to increase native biodiversity on their property and participate in a tree-planting program, yet over time their ability to maintain areas of woody vegetation (e.g. adequately control pest plants and animals) may diminish due to economic or physical constraints. Hence, a landholder’s long-term commitment to what is considered ‘best practice’ NRM may not always be evident in their behaviour. Some comments by landholders that reflected this dilemma included:

“… we like the bush, don’t get me wrong, but planting more trees around here without support to control the rabbits and blackberries is a waste of time …” [F]

“… I don’t mind doing the fencing (around remnant vegetation), but who do they think is going to maintain it when the program’s finished and they’ve all (program staff) have disappeared …” [F]

Conversely, a change in land-use or practice may not reflect a commitment to a new approach to NRM, particularly if a landholder’s participation in a program is simply a pragmatic business decision to access additional resources or other support (e.g. access to subsidised fencing to improve livestock management). Nonetheless, organisations may seek the involvement of landholders for other reasons (e.g. important biodiversity is on their property, or their property has a source of wider environmental degradation). Reflecting this situation, one landholder commented:

“… I got involved (in the NRM program) so I could get access to the cheap fencing … I wanted to fence out the scrub (remnant bush), it’s a nuisance having to round up the stock in there … if they were going to pay me, they could have all the scrub …” [NF]

There appears some evidence that a long-term commitment can be shared or transferred between people. For example, if a major land-use decision was shared by the wider family (including multiple generations), then there would more likely be a commitment to sustain the new land-use practice over the long-term by different family members. One farmer commented:

“… it was a big decision for us to go out of dairy (3rd generation dairy farmers), but it has been great … we’ve been able to change the way we manage this place … we enjoy it more … the kids love it here … they know it’s their place too …” [F]

There also appears to be a practical dimension to maintaining a commitment to recommended NRM practices over the long-term. As theory suggests, if the change towards ‘best practice’ NRM
different NRM practices require varying levels of on-going input by landholders to achieve the desired outcomes (e.g. control of erosion may require one-off physical work, whereas improving native biodiversity may require on-going pest and weed control); and

- some NRM works may take a long-period before, or be difficult to quantify, the desired outcomes, with different program managers using a range of intermediate milestones (proxy indicators) to gauge landholders’ progress towards the NRM outcomes (e.g. absence of weeds and richness of native flora may be used to assess likely improvement in native biodiversity).

Comments by program managers reflecting a range of views about what constitutes a long-term commitment by landholders included:

…” when the Landcare work has had time to have an impact … so for some things like putting in new infrastructure like fencing, troughs, rock work, the benefits for water quality can happen pretty quickly. But creating habitat for some rare native animals or birds can take years …” [program manager, PM]

…” some land improvement work is easier to maintain, so it’s easier for landholders to maintain their so-called commitment to it. If landholders are happy with the results, then generally they’ll do their best to maintain the site … sometimes it doesn’t always work out that way, too many weeds, branches knocking over fences … when you drive past a property you’ve had work on, you can tell pretty quickly whether their (landholder’s) heart is in it or not …” [PM]

…” farmers with a vested interest in NRM works will usually maintain things … like fencing out creeks, if it has improved the management of their stock then they’re going to be keen to follow through on it …” [PM]

…” getting landholders to complete a full-on whole farm planning course is a good sign … that they’re thinking long-term, so when they get access to the resources they should get things done …” [PM]
Information from our interviews with landholders and program managers indicates that the period of time from when a long-term commitment becomes apparent depends on several factors:

- the time taken for different NRM practices to mature (to have a discernible impact on environmental conditions), so landholders can then determine if sustaining a particular practice is desirable;
- the ease for landholders to physically maintain the recommended NRM practice (or goal of the NRM practice); and
- how consistent the recommended NRM practice is to the context and aspirations of landholders (e.g. the operating context or personal circumstances may change for landholders over the 'long-term', perhaps making formerly recommended NRM practices no longer desirable).

In terms of defining what might reasonably be considered ‘long-term’ in the NRM context, we suggest the recommended land-use practice needs to become largely a ‘stand alone’ (without major program support) and integral component of the property’s management. At this point, landholders can be in a position to ascertain the full implications of the NRM approach. We suggest that once the land-use practice has become established, a practical threshold period of 10 years could be applied to define ‘long-term’.

Based on this research, we suggest ‘commitment’ can be defined as a landholder’s underlying aspiration or willingness to sustain the property’s management in a way that is expected to achieve the goals of the NRM investment (project). That is, while land-use practices may change over time, if a landholder’s maintains a willingness to achieve the long-term landscape goals or outcomes then they could be considered to have maintained their commitment.

In an NRM context, a long-term commitment can be defined as a landholder’s willingness to achieve the goals of the NRM investment beyond the contracted agreement for an extended period of time, and practices expected to achieve the NRM goal have become an established and integral component of the property’s management. We suggest that landholders willing to sustain the management intent (not necessarily the same land-use practice) without major program support for 10 years or longer would reflect a long-term commitment.

4.2 Program factors that influence a landholder’s long-term commitment to recommended NRM

Program support to gain short-term action and support long-term commitment

Participation by a landholder in an NRM program should not be assumed to indicate their long-term commitment to sustaining the original NRM investment. However, without any participation in a program, it is difficult to argue that a program has had any appreciable influence on a landholder’s long-term commitment to pursuing recommended NRM.

As expected, this research indicates that programs provide a valuable enabling mechanism, in that access to financial and technical support leads to the enactment of desired NRM practices. It appears that without the direct support from NRM programs, the aspirations of the landholders would largely fail to convert into on-ground works in terms of enhancing their management of native vegetation. That is, participation in NRM programs provides an important catalyst for landholders to achieve desirable changes in NRM, in turn providing the foundation for landholders to maintain an apparent long-term commitment to recommended NRM.

The capacity building from NRM programs provided to the landholders we interviewed included:

- assisting with site assessments and developing whole farm plans;
- bringing landholders into a communication network with experienced NRM staff and other landholders;
- providing financial support for the purchase of capital works (e.g. fencing); and/or
- coordinating the purchase and delivery of materials, and work by contractors.

A large majority of the landholders we interviewed reported they had been involved in a variety of NRM programs (e.g. Land Protection Incentive Scheme, Landcare, Heartlands), which had allowed them to undertake recommended NRM works at a faster rate, and/or on a larger scale, than they would have otherwise done. That is, while many were 'low cost', they were enabled to implement work on a larger scale than anticipated. Landholders most frequently reported the provision of materials (commonly fencing) was the most valuable contribution by the NRM programs. Comments by landholders that illustrate the value of program support, included:
'... the program tipped the balance for us, so we've done more fencing and planting than we would have otherwise done ...' [F]

'... being involved in (the NRM program) accelerated the rate, and increased the scale, of our changes ... overall we've increased the area of native vegetation and reduced grazing ...' [NF]

'... the program has allowed us to complete a huge amount of extra fencing we'd wanted to do for a long time ... its improved our farm management, so yeah we'll continue with the works after the agreement finishes ...' [F]

'... the cheap fencing was critical, which has led to an increase in native vegetation and, in turn, improved the aesthetics of this place ... and increased its capital value, I'm sure ...' [NF]

'... the support for all the fencing was the critical factor for us, so we could then increase the area of the native bush ... it has also improved the appearance ...' [NF]

'... the project suited us, the work was done on a large scale ... it's been impressive, made a real difference ...' [F]

'... it's been great, I reckon we've improved the capital value of our property by about 20% in about five years ...' [NF]

The need for a complete and sustained 'package' for NRM programs to be effective was expressed by all the program managers we interviewed. From the perspective of program managers, characteristics of an effective NRM program package included:

- flexibility in what support could be offered to landholders (not all landholders needed the same type of support) ('... CORIS was flexible ...' [PM]);
- transparency in what support the program offered (e.g. rate of reimbursement, type of materials) ('... CORIS was simple, it offered landholders fencing, which is always popular ...' [PM]);
- substantive support to make a difference to what the landholders’ are doing ('... fencing with 'a gate' is popular, shows we're serious but flexible ...' [PM]);
- give field staff the authority and resources to provide follow-up engagement with landholders ('... we've got to build relationships, take a long-term view of landscape restoration ... it won't happen overnight ...' [PM]).

In the case of the programs that used an MBI approach, the provision of financial payments to landholders to offset the time landholders spent managing the selected sites (either in part or full), commonly referred to as stewardship payments, was strongly supported by participating landholders. Stewardship payments provided participating landholders with the capacity to give effect to a long-term commitment to pursuing recommended NRM practices. An important aspect that has emerged from this research is that some landholders may retain a desire or willingness to continue with recommended NRM strategies after the conclusion of a project, yet not have the capacity to do so. Indeed, participating in NRM programs is often geared towards providing landholders with the capacity to implement pre-existing NRM goals.

The NRM programs using an MBI approach in which interviewees were involved had additional strengths, which included:

- experienced staff providing 1-to-1 advice with landholders,
- developing user-friendly and site-specific information (e.g. property management plan),
- providing financial support for capital works and/or materials,
- providing payments for time spent managing the site (i.e. stewardship payment),
- staff making follow-up visits and providing technical advice about site management, and
- agreements (contracts) for a 5-year period (10-year agreements supported if incorporating a degree of flexibility).

Most landholders explained that it was the 'package' of support provided by NRM programs that enabled them to undertake their desired NRM works, and when successful, maintain their long-term commitment to pursuing recommended NRM. In summary, an effective program 'package' for many landholders included the provision of capital (often fencing), coordination and on-going communication.

Beyond the immediate causality between program support and NRM work undertaken by landholders, is a more nuanced discussion about whether NRM programs have strengthened a landholder's commitment to sustaining the investment in NRM. An interpretation of the comments by landholders (see above) suggest that programs have simply "brought forward" the NRM work that many landholders would have achieved over a longer period. Yet given the relative expense of some NRM activities (e.g. revegetation with tubestock may cost $1,500 per hectare), we suggest that some works may never have been completed by landholders independently of NRM programs, or at least not on the same scale. The results from this study are consistent with parallel research undertaken by Landscape Logic, which found that very little work was undertaken by landholders in the study areas to improve the management of woody native vegetation ...
It is apparent that individual NRM programs often benefitted from previous or parallel programs (e.g. familiarising landholders to recommended practices, establishing relationships between landholders and NRM organisations). A key point here is that without on-going support, or at least an enduring influence (e.g. follow-up visits by staff, subsequent projects), landholders’ long-term commitment to recommended practices – particularly expensive land-use change such as revegetation – may diminish over time if they have little genuine prospect of achieving their aspirations. In our view, the provision of relevant and timely support for landholders is likely to contribute to positive short-term changes in NRM (i.e. within 5 years of investment), which will in turn reinforce their enthusiasm for implementing recommended NRM works – galvanising their long-term commitment.

Providing financial support to offset the cost of materials (most commonly fencing) was an important reason why landholders participated in NRM programs and, in turn, assisted landholders achieve their goals. Yet, it appears that NRM programs need to have an enduring influence (if not support) if the NRM practices cannot be easily maintained independently by landholders. Parallel and successive NRM programs have the potential to reinforce ideas and knowledge, and provide follow-up support to galvanise a landholder’s long-term commitment to pursuing recommended NRM.

Increasing the level of program support (e.g. offer higher financial incentives) does not always lead to interest by a greater number of landholders, particularly when the reciprocal agreements or the NRM changes required are correspondingly onerous. Conversely, NRM programs that offer a low level of support (e.g. technical information, minimal level of fixed-incentives) can appeal to a wider pool of landholders (i.e. ‘low cost’ participants), enabling them to pursue NRM practices that they can feasibly achieve. This view is consistent with other research that found relatively undemanding entry conditions are likely to encourage a high level or rate of participation by landholders, but these typically require little from landholders in terms of behavioural change (Lobley & Potter 1998). As such, programs can achieve a high level of participation and compliance but deliver little environmental ‘additionality’ in the short-term. Small short-term changes shouldn’t necessarily be discounted as small environmental gains may accumulate over the long-term and create a new socially-accepted standard of NRM, as landholders acquire expertise and confidence in new approaches to NRM.

The accumulation of short-term changes or improvements in NRM may provide considerable environmental ‘additionality’ over a long-term period. The extent NRM practices can be feasibly maintained by landholders is an important factor for achieving long-term ‘additionality’, especially if policy-makers are expecting landholders to maintain new approaches to NRM largely assisted by on-going program support.

**Long-term commitment conditional on alignment of program and landholder goals**

For the landholders we interviewed, participation in NRM programs was determined by the likelihood the program would assist them achieve their pre-existing plans. That is, few landholders reported that programs had changed their plans or views of NRM practices. However, if a landholder’s participation was a positive experience (e.g. met their expectations, assisted them to achieve their objectives, made desirable land-use changes feasible), then they reported they were more likely to maintain the NRM works – indicating a long-term commitment to the original goal of the NRM investment.

Comments by landholders illustrating this view included:

“… the program supported what we wanted to do …” [F]

“… the program has been great, we’ve done what we wanted to do …” [NF]

“… the project was aligned with our future plans, but it provided the materials so we could get on and implement it – we had the ideas and the project gave us the money to get it done … it helped us implement land-class fencing and improve our stock management … helped fence out the rough country …” [F]

“… we had wanted to do this for quite a while, so when we heard about the program we jumped at the chance …” [NF]

Engaging landholders in NRM programs was viewed by most program managers we interviewed to be an important starting point for changing approaches to NRM, with positive outcomes not always apparent in the short-term. Comments by program managers that explain this perception included:
“… even if the (NRM) work by landholders isn’t perfect, you can do a lot with enthusiasm…” [PM]

“… I’m happy to be pretty flexible with farmers, as I reckon I’d rather have them part of the program and achieving some (environmental) gains than not having them involved…” [PM]

“… I know plenty of farmers who keep coming back (to NRM programs) … it’s great to see them become more confident about it all, and after a while their farm becomes a very different place … they love showing me old photos of their property, and seeing how much it’s changed…” [PM]

“… often they know their long-term (NRM) goals, they just don’t know how to get there … giving them access to materials and some advice along the way means that we’ll get the positive environmental gains in the long-term … maybe not exactly as we first thought, but most of it…” [PM]

Even if NRM programs haven’t substantially changed the views of landholders, it appears the NRM programs have enabled landholders to move towards achieving their long-term goals and aspirations. Also, many landholders we interviewed reported being involved in multiple NRM programs (n = 22), with a large proportion of landholders we interviewed (n = 12) building up their investment in NRM to individual sites of 10 hectares or larger. Our research has revealed evidence that when landholders successfully achieve their short-term objectives from participating in NRM programs, they are likely to continue their interest, if not active engagement, in subsequent NRM programs – reinforcing their long-term commitment to pursuing recommended NRM practices.

There is strong evidence that the NRM programs have increased behavioural change amongst participants. That is, programs have made a substantial contribution to increasing the capacity of landholders to make management changes to enhance native vegetation. Most landholders reported participating in NRM programs because the programs enabled them to achieve their pre-existing goals, enhancing their long-term commitment to maintain practices consistent with recommended NRM.

**Adaptive management needed to support a long-term commitment to NRM**

Changes in native vegetation after altering land-use management can be difficult to predict, with some landholders reporting improvement in remnant native vegetation being slower than originally expected. One landholder suggested that improving remnant vegetation might be more difficult and unpredictable than establishing native vegetation by revegetation on ‘green field’ sites. Yet, other landholders reported improvements to remnant native vegetation in a relatively short period (e.g. within 5 years), with one landholder citing increased species diversity and natural regeneration, together with a decline in weeds, over a 4-year period. Programs that had a degree of flexibility were more appealing to landholders, as it allowed management of a specific site to be tailored to changing ecological conditions – thereby representing a lower risk to landholders and encouraged them to maintain a long-term commitment to NRM.

Some programs (e.g. BushTender, Bush Returns) had a specific focus on encouraging natural regeneration of native vegetation, so invariably involved landholders with sites of good potential for regeneration. Typically these sites were areas of low agricultural production (e.g. rocky slopes and hills), and with little history of being sown with introduced pasture species and fertilised. In most cases, landholders involved in these programs reported positive changes in native vegetation on sites covered by program agreements – suggesting the level of enthusiasm a landholder had towards their NRM investment may correspond to their long-term commitment (“… I’m amazed at what our bush has in it after decades of grazing … I thought we were doing OK just lightly grazing (with sheep), but now there’s all these smaller plants and orchids … it’s fantastic …”).

While reporting positive changes for native vegetation, many landholders also added that taking areas of farmland out of agricultural production still required a degree of on-going management. Several landholders explained that it can be difficult to assess and predict the level of pest plants and animals (PPA) that will occur on a site once taken out of agricultural production. For example, a heavily grazed site might have a large seedbank of weeds, that only become apparent when livestock are excluded – causing the initial predictions of the effort required for PPA control to be underestimated. In such cases, landholders reported that fixed and binding agreements were difficult to meet as the level of PPA was considerably higher than originally expected – increasing the workload and/ or cost for landholders. Some comments indicating concerns about an increase in PPA included:

“… we got more weeds than we expected … when we fenced out the livestock, a whole suite of weeds shot up…” [NF]

“… the cost of controlling the weeds has been much higher than I estimated … this needs to be taken into account as the program goes along…” [F]
“… it's really hard to give an accurate figure of how much it's going to cost over the decade (10-year period of agreement), especially when the management of the site changes … there needs to be some flexibility built into the agreement, so we're not falling behind (financially) by trying to do the right thing …” [NF]

Some program managers we interviewed also expressed the view that an adaptive approach was needed, particularly where considerable land-use changes were sought. For instance, re-establishing native vegetation on highly disturbed or modified sites may be more challenging than originally assessed. As such, most program managers expressed views reflecting a desire to incorporate a degree of flexibility into site agreements and contracts. Comments by program managers reflecting this perception included:

“… some of the sites we work on are really degraded, so it not as easy as just getting farmers to put up a fence … then can be a whole suite of weeds and grasses that get out of control … often the grazing actually keeps the weeds in check …” [PM]

“… we've structured some of our agreements so that we'll get contractors to maintain the sites for the first three years, mainly so the weeds don't take over while the landholder isn't looking …” [PM]

“… a lot of landholders can expect too much in the first couple of years … but we know the weeds will bounce back first before all the reveg (native plants) get established … they (landholders) can get a bit discouraged at first, thinking they've done all this work and the site goes backwards … so I reckon it's important we have a clause in the agreement to allow us to come back and be involved in the site's management, at least for the first couple of years …” [PM]

Some landholders expressed uncertainty about how sites covered by NRM programs should be managed post-agreement, with a desire for informed discussion with experienced people. This view held by landholders indicates a desire to maintain a long-term connection (relationship) with NRM organisations, so that concerns and uncertainty can be quickly addressed for landholders. Again, our research suggests that maintaining a long-term relationship between landholders and NRM staff provides an important foundation for building a long-term commitment by landholders to recommended NRM. Comments illustrating their uncertainty included:

“… all the advice so far has been about getting the trees established, we've done that … now I want to know how to manage the site in the longer term …” [F]

“… the trees are too thick, there's no space for the shrubs and grasses and other smaller plants … the original project manager has gone and it's hard to get someone from the office to come out here to talk about how to manage the bush get a better balance between trees and other plants …” [NF]

Some interviewees suggested that such a discussion could be facilitated by program extension staff. Other landholders reported that NRM agencies should remain willing to be actively involved with the management of sites covered by NRM programs (i.e. NRM organisations should also express a long-term commitment), such as undertaking further erosion control works or thinning densely spaced trees from natural regeneration, so the environmental outcomes of sites are optimised. Sometimes landholders continued with existing management, as indicated by the following comment:

“… yes, we had it (the site) well in hand, so after the program ended we just continued on with what we normally do …” [NF]

“… if the government wants us to keep the bush, they've got to be in it for the long haul too … maintaining the fences, keeping on to the ferals … it doesn't happen for nothing, we've still got a make a living …” [F]

“… I want to know they're (NRM staff) are going to be around for a while …” [NF]

There is an apparent risk if landholders are poorly informed at the start of the program, or ecological conditions change so that they incur costs beyond what was originally estimated, then only short-term changes (benefits) might be achieved. As landholders expressed, maintaining their long-term commitment to recommended NRM practices (e.g. on-going control of PPA) is dependent upon their perception of success of the works and fairness of the agreement (e.g. flexibility in agreement to accommodate changing environmental conditions).

Changing land-use can lead to ecological responses that are not always predictable, such as increasing levels of PPA. Fixed agreements that don't reflect the changing ecological characteristics of a site may undermine the landholder's long-term commitment to maintaining the NRM investment, and erode their interest in undertaking further NRM work. NRM programs that can be tailored to changing site conditions have more appeal for landholders and so, are more likely to
encourage them to maintain their long-term commitment to their NRM investment.

The cost of maintaining the outcomes of an NRM investment appears to be an important factor, with financially or physically onerous NRM practices likely to be difficult for some landholders to maintain after their participation in a program ceases. Projects that require considerable on-going, active management by landholders may be more likely to face this risk, as landholders may not be able to maintain the management input, particularly if they were being paid to do that work and the payments stop at the end of an agreement. As such, caution needs to be used when interpreting the short-term changes achieved by participation in an NRM program, particularly if the recommended NRM practices are costly or difficult to maintain, or become inconsistent with a landholder’s personal context (e.g. diminished resources for controlling PPA). Some comments by landholders indicative of this situation included:

“… I regret we’ve put up so many fences, as they just make more work for ourselves … we’re always going to get branches and whole trees falling over them … probably should have planted fewer but larger blocks of native veg, which I reckon would be easier to maintain …”[NF]

“… the more paddocks we plant, the more work we’ve created … controlling the weeds and rabbits, it’s a fair (sizable) commitment … we need Landcare programs that pay for some of these costs (on-going maintenance), the cost isn’t just getting it established …”[F]

Participation in NRM programs provides access for landholders to enabling support (e.g. financial & technical support), but can be a misleading indicator of a landholder’s likely long-term commitment to maintaining the NRM practices. Long-term commitment can be compromised if landholders are required to undertake substantial on-going management interventions, particularly if they had been paid to do that work and the payments end.

**On-going engagement enhances landholders’ long-term commitment**

Our review of NRM literature indicated that the individual’s knowledge is an important component of them undertaking land-use change. Some landholder interviewees reported the NRM programs had allowed them to undertake works from which they learnt about landscape restoration. Comments by landholders that illustrate these points include:

“… after being in the program for about eight years, I’m better informed about what’s involved in improving remnant vegetation, but I’m not necessarily more enthused … it’s a lot more work that I thought it’d be …”[NF]

“… we’ve been involved in quite a few (NRM) projects, four or five now … we’ve got a pretty good handle on how to get the best out of new plantings … where we should put them to get a win-win for the environment and the farm (business) …”[NF]

“… listening to what other farmers had done was great, we learnt a lot of practical ideas that you don’t get from reading books … hearing more from other farmers would be good, we hear the Department’s advice alright, but there’s nothing like seeing it from a farmer’s perspective …”[F]

“… we didn’t expect to get such a good result along the creek … we had done small plantings before, but now we know how to do it properly …”[NF]

As discussed above, many landholders we interviewed had been involved in multiple NRM programs over 10 years or longer, providing some evidence that they had a long-term commitment to be actively involved in adopting recommended NRM practices. Our results also indicate that landholders’ involvement in small-scale or passive NRM programs (e.g. Land for Wildlife) can be valuable for acquiring knowledge and confidence, before undertaking large-scale works. That is, our research indicates that many ‘low cost’ participants went on to undertake works on an additional area, if not a larger scale – revealing the cumulative effect of engaging ‘low cost’ participants. Comments that illustrate the cumulative effect of successive NRM programs included:

“… we had such a good result with the planting that when the (larger) program became available we had the confidence to do a larger area, we knew what to expect …”[F]

“… we been dabbling in Landcare for quite a few years, so we know how to plant trees and things … so it wasn’t a big deal (challenging) for us to get involved in the Heartlands project … we could handle the scale of works they wanted to do on our place …”[F]

“… I like to plant a couple of hundred trees each year, I can manage that … I know I can do it properly …”[NF]

Several program managers expressed similar views to that of landholders, supporting the benefits for achieving NRM outcomes by using an
incremental or step-wise approach so that substantial environmental gains can be achieved over the long-term. Comments from program managers included:

“... you've got to work at the landholder’s pace, and everyone is different ... you can tell when someone’s capable of taking on a big (NRM) project ...” [PM]

“... if you keep people (landholders) involved, even in a small way, after a while these small changes can add up to being something quite impressive.” [PM]

“... all our landholders involved in our (large-scale NRM) project knew what they were doing, they had been involved in revegetation projects for years ... ready to step-up the scale of works, they were serious about changing their farms ...” [PM]

Higher levels of knowledge allow landholders to make more informed decisions, and subsequently underpin development of realistic plans for landholders to implement and maintain. Arguably, better informed investments in NRM are more likely to be successful and so reinforce a landholder's long-term commitment to recommended NRM practices.

**Stewardship payments lead to on-going engagement and expected to lead to long-term commitment**

The concept of stewardship payments (i.e. receiving payments for environmental services) was well understood and accepted by the majority of landholders interviewed for this research. Indeed, even landholders with no direct experience of NRM programs that provide stewardship payments (e.g. programs with an MBI approach) were supportive of the concept, as these payments were seen to support landholders' on-going management of sites in a manner consistent with recommended NRM. Comments by landholders and program managers that reflected support for stewardship payments included:

“... the concept (of stewardship payments) is good ... I like being paid to manage the bush, I think it's fair if the government wants it protected ...” [NF]

“... the annual (stewardship) payments are good ... that works well for us, it means we get on and do what's needed ... weed control, ripping burrows, whatever ...” [F]

“... I like the staggered payments over the period of agreement ... I'm comfortable with performance-based payments ...” [NF]

“... it's an easy concept to sell to landholders, on-going payments for the management of the site ... it makes sense to most landholders ...” [PM]

“... programs that provide management or stewardship payments shows that we're (NRM organisation) committed over the longer term, not just getting sites established then walking away ...” [PM]

The contestable aspects of the concept were whether stewardship payments could account for the full, or holistic, value of the environment, and if the payments were a fair reflection of the arrangements between landholders and the NRM organisation (i.e. the arrangements reflect the relative benefits, costs and risks contributed by each party). Landholders were evenly divided as to whether the payments they were receiving under the current MBI programs were fair. Some positive comments included:

“... I think the payments are fair enough, if we've got to do the work ...” [NF]

“... I reckon the payments are about right ...” [F]

However, other landholders felt the payments were unfair, and didn't truly reflect the amount of work they were undertaking or the amount of land that they had taken out of agricultural production. For these landholders, it seemed that these issues were undermining their long-term commitment to maintaining 'best practice' NRM. Comments by landholders that illustrated these concerns included:

“... it's a lot more work than we thought ... getting rid of the rabbits and weeds is a much bigger job than we estimated. We probably took on too big an area ... I wouldn't tackle such a big area if I was to do this again ...” [NF]

“... we felt the staff were pushing us to do a lot of stuff we didn't want to do (for PPA control). I mean we were going along alright and doing it but they wanted too high a level of management for what they were offering ...” [NF]

“... I've looked at the tenders (for NRM programs), but I couldn't be bothered, I'd rather just pay for it. It's too bureaucratic for me and the funding too low to be realistic ...” [F]

“... well, I've used all of those. If there's a variety of schemes open to me - and that's important to have the ability to choose and negotiate - I'm happy to work with any of them and don't have a strong preference ... although I guess I have some question marks about the Tender process. I'm concerned that farmers may not be all aware of all of the costs that are involved and might put in
a rough tender and find afterwards - oh shit - I’ve got to do this, this and this. My fears are somewhat allayed because the department provides a guide on what you can claim but the competitive nature and landholder inexperience remains a worry. I know my neighbours have adjoining blocks that border my proposed bush for the Tender. Ideally they would all be approached, but that’s not in my interest since they might undercut me. The program in some ways is self-defeating …” [F]

“… the public good benefits are enormous, so there's no need for this penny pinching. I think the tender system is complicated for us because we don’t have any models or benchmarks to tender. I'm all for forward contracts and tenders for cattle because I understand them, but I don’t for carbon or trees and the future. I’d personally avoid those and would need a lot of advice before I’d go for a tender system …” [F]

We deliberately sought to interview landholders with experience of NRM programs, so the level of awareness and understanding of the concept of stewardship payments was expected to be higher amongst our sample. Amongst our informants there was also strong support for the linkage of stewardship payments to environmental activities or performance. That is, linking payments to the level and type of NRM works was well accepted and supported by landholders. Therefore, in our view stewardship payments are likely to be a valuable feature of NRM programs that are able to establish long-term commitment.

Several program managers also expressed concerns about NRM programs using an MBI approach, particularly if the payments were seen to be unfair. If payments were not viewed to be fair by landholders, then there was a risk that:
- landholders would withdraw from the existing program, and be hesitant to participate in future programs;
- it would erode the relationship between landholders and the NRM organisation; and
- this would undermine landholders’ long-term commitment to maintaining the recommended NRM practices.

Program managers made the following comments:

“… some landholders underestimated their costs … some because they lack the experience others so it would make their bid more competitive, so when the true cost of managing the bush hits the ‘hip pocket’, they may not be so keen (on being involved in the program) …” [PM]

“… I worry about the landholders who put a lot of effort into preparing a bid (to a program using an MBI approach), but get rejected … it might put them off working with us in future …” [PM]

“… one landholder told me he felt the (tendering) process was unfair, but he still went ahead with the agreement because he wanted something (assistance) and this was the only program suited to what he wanted to do …” [PM]

Landholders readily understood the concept of stewardship payments for environmental services, with widespread support for the use of stewardship payments. However, there was mixed views about the use of a ‘tendering’ approach to calculate payments for environmental services. Stewardship payments have the potential to undermine a landholder’s long-term commitment to pursue recommended NRM. However, if stewardship contracts and payments are seen to be unfair, then such an approach can erode a landholder’s trust in the NRM organisation and jeopardise the original NRM investment – potentially undermining their long-term commitment to adopting recommended NRM practices.

NRM staff influential in encouraging participation and long-term commitment

The approach and personal characteristics of the extension agent (field officer) was an important influence on landholder participation and ongoing implementation of preferred NRM practices. Many landholders reported very favourable impressions of the staff they had contact with. Comments by several landholders included:

“… the staff were very helpful and friendly … easy to work with …” [F]

“… staff are really good …” [NF]

“… (the staff) weren’t a problem, the fellow from Melbourne, I couldn’t fault him …” [F]

“… Bush Tender was good because it guaranteed long term funding. It was also good to have (the field officer) as a ‘sounding board’ to share information with and bounce ideas off …” [NF]

“… we were in that program because of (XXX). He was a goer. There was another young girl in there, she’d be out here watering trees – a goer. But apart from those two … dealing with those people – after the first time I dealt with them, I expected things to work and it did, so my expectations were met …” [F]

However, other landholders reported unfavourable experiences with NRM staff, as illustrated by the following comments:

“… I was interested about the … Tender and put
an EOI with (the Department) but never heard back from them so I decided to fence it out (in another program) and get it looking better …” [NF]

“… for us if you’re going to do it, you do it. The Tender is too time consuming, with government you can’t get onto people when you want to, maybe for hobby farmers it’s different but there’s a time issue when you’re trying to make a living …” [F]

“… the original one we were involved in (riparian fencing) (XXX) Creek, we did it through the CMA but no one else did much. Obviously their negotiation skills (of the other organisations) weren’t that flash …” [F]

“… another thing about this was the person running the … program told us they would do weed control for five years and when we inquired (after a couple of years) he had moved on and they said he shouldn’t have told us that …” [F]

The personal characteristics and approach used by extension staff with landholders affects landholders’ experiences of, and willingness to participate in, NRM programs.

A disappointment for some landholders was that the extension agent (field officer) with whom they had established a positive relationship was not involved in assessing the bids submitted by landholders. A common complaint by landholders interviewed was the lack of contact with NRM agency staff once the initial agreement had been signed. This is an important issue that affects landholder’s long-term participation and commitment. Several landholders reported they wanted greater engagement with the extension agent and other participating landholders, as a way to discuss and share ideas about site management. Comments by landholders reflecting these views included:

“… I’d like more contact with (the field officer) … when they’re making their annual visit …” [NF]

“… there was a real lack of extension material for us to use when preparing our (tender) bid … the lack of recognition for what we’ve done has been poor … we won’t bother contacting them again …” [NF]

“… I thought there was a lack of follow-up or any sort of interest by the staff, and we would’ve liked this … to be able to discuss the management of the site. Also, I’d like to hear experiences of other landholders involved in the same program, and see their sites … there’s not much sharing of ideas …” [F]

“… we don’t have much contact with the staff … I don’t really know if funding is still available for this sort of thing …” [NF]

Program managers had similar views to landholders in regard to the desire and value of NRM staff maintaining a link with landholders involved in previous or current programs, however achieving this appears far more problematic for staff – with trade-offs having to be made about how staff allocate their time and financial resources. Some comments by program managers that indicated the challenges they face despite seeking on-going communication with landholders, included:

“… you’ve got to have regular site visits, it shows you’re interested in what they’ve (landholders) done and you can discuss any issues that have cropped up … but it’s difficult to maintain the annual visits (by staff) …” [PM]

“… I raise this all the time at our (organisation’s) meetings, but new programs rarely have the budget to allow staff to go out and look at the results of our earlier programs … the focus is always on getting new sites established …” [PM]

“… it’s hard for new staff, they don’t know what was tried and worked with the early Landcare projects … it’s hard to build that corporate memory that goes back more than about five or ten years …” [PM]

While we acknowledge the difficult trade-offs that policy-makers and program managers have to make, our research suggests there is chronic failure in NRM programs to provide meaningful follow-up engagement with participating landholders. Aside from ensuring landholders are satisfied with the implementation of a program and understand the requirements of site management, follow-up between NRM staff and landholders allows a meaningful relationship to be fostered. Positive long-term relationships between NRM staff and landholders may also increase a program’s efficiency and effectiveness. That is, the longer landholders are actively engaged in NRM programs and information networks, the more skilled and knowledgeable they’ll become – arguably lowering the transaction costs of their participation (i.e. requiring fewer site appraisals and less training) and increasing the likelihood of information exchange with neighbouring landholders. Having the interest and support of neighbouring landholders is likely to engender a long-term commitment to maintaining the desired outcomes of NRM investments.

If program staff don’t follow-up with landholders it is likely that substantive changes, lessons and outcomes of NRM investments may not be fully
recorded or understood by staff. In turn, the lack of medium to long-term records may cause programs to over-estimate costs of implementation and under-value achievements. Also, even landholders who submitted unsuccessful bids to participate in NRM programs may warrant personal follow-up so to refine program implementation and/or gauge their interest in alternate or subsequent programs.

Policy-makers and program managers regularly face difficult trade-offs when seeking to maximise the benefits of NRM programs with limited funds and time constraints. However, in our view, excessive emphasis on funding on-ground works at the expense of investment in training and technical support for landholders (e.g. provision of whole farm planning courses), and providing extension staff with adequate time for adequate follow-up, risks ‘purchasing’ short-term without adequate consideration of achieving positive long-term outcomes.

Engaging landholders via long-term relationships with staff of NRM programs is a key factor in supporting land-use change to achieve improved NRM outcomes. Long-term relationships between landholders and NRM organisations contribute to engendering a long-term commitment amongst landholders to improved NRM outcomes.

*Management plans provide guidance for long-term action*

The majority of our informants participating in the programs using an MBI approach spoke positively about the management plans developed for their properties. Typically, the management plans were developed collaboratively between the landholder and the technical staff, including a field officer, ecologist, agronomist, etc. The plans were sufficiently detailed and specific to be informative and useful for landholders, and in many cases described how incremental or step-wise changes could be implemented. Well-conceived management plans were linked to, and developed alongside, whole farm plans (property management plans). As discussed earlier, assisting landholders to make informed decisions about their investment in NRM is likely to assist their long-term commitment to maintaining any land-use changes they undertake. Some comments by landholders supportive of the planning and on-going reporting processes they were involved in included:

“… the information they gave us when developing the plans was very good … the details were clear, it was all really relevant to us …” [NF]

“… the management plan is excellent … specific to our site, has flexibility …” [NF]

 “… the plan is really helpful, it sets out how we can achieve our goals over the next 10 years … it seems realistic for us …” [NF]

“… it’s straightforward … I like recording the changes, especially given these appear positive changes in the bush …” [NF]

“… I actually like the annual reporting … particularly if it’s approached like a ‘cooperative audit’ …” [NF]

“… the annual reporting good, but I’d still like more contact with the staff …” [F]

The program managers we interviewed expressed similarly positive views about the importance of involving landholders in a thorough planning process, before NRM works were undertaken. Some comments that indicated this view included:

“… Whole Farm Planning courses are very good for securing previous NRM investments, as well as securing future investments … it gives landholders ideas and time to think things through …” [PM]

“… having the different skills around the table with the farmer was great, made us all think about holistic landscape design … how it can a fit together and be implemented …” [PM]

“… getting new landholders to hear from experienced farmers works well, so they’re not just hearing from agency staff … makes it more real and achievable …” [PM]

One program manager reported that ‘whole farm plans’ (WFP, also called property management plans) were a valuable mechanism for securing NRM investments, with each NRM investment being “… another piece in the jigsaw”. To some degree, WFPs reflect a landholder’s future aspirations for their property, so any activity aligned with the WFP were likely to be secure investments – again, especially if perceived to be successful. A small number of landholders reported unease about not being an equal contributor to the preparation of a management plan, with the knowledge of ‘experts’ given greater weight than that of the landholder, illustrated by the comment:

“… it’s a nice looking plan, colour maps and everything, but I reckon they forget that we’ve got a make a living of this place before we can get some of these ideas off the ground … in an ideal world, it’d be nice to do it all … if they gave us the money, we probably would do it all, but it’s unrealistic at the moment …” [F]
Property management plans developed cooperatively between NRM staff and landholders (often as part of programs using an MBI approach) were well regarded by most landholders. Plans with achievable, incremental or stepwise changes and cooperative ‘audit’ processes encouraged landholders to maintain an interest in the NRM investment over an extended period.

Long-term agreements – risk or reward?

All landholders interviewed accepted the requirement to sign a binding ‘terms of agreement’. Programs using a fixed-grant approach were generally supported by short-term (e.g. 3 years of less) agreements, and often just a ‘works agreement’ (not legally-binding). The programs using an MBI approach had agreements that varied from 3-years (e.g. Green Graze) up to 10-years (e.g. Bush Returns). While most landholders were comfortable with a 5-year agreement, some landholders explained that they would be comfortable with a 10-year agreement if the terms could be re-negotiated (if needed) after 5 years. Comments that reflected these views included:

“… the period is good (5 years) but I wouldn’t be interested in a 10-year agreement … that’s too long, anything could happen in that time …” [F]

“… the management plan has a fair bit of flexibility in it, so I’m comfortable about signing a 10-year agreement … that’s fine for us …” [NF]

Landholders participating in NRM programs using an MBI approach were generally comfortable signing 5-year agreements as a requirement of their participation, with longer agreements acceptable if there was scope for management flexibility or re-negotiation of specific conditions. Willingness to commit to an agreement of 5 to 10 years provides some evidence of a long-term commitment.

A landholder’s willingness to sign a binding management contract for a lengthy period (e.g. 10 years) is an explicit commitment to ‘best practice’ NRM, albeit that longer agreements are typically linked to higher levels of program support (e.g. higher annual payments). An exception to this situation is when landholders voluntarily enter into a permanent (legally-binding) conservation covenant, as this is an explicit long-term commitment by landholders who typically don’t expect or receive on-going financial payments. In other words, commitment to a contract with a lengthy period provides some evidence of long-term commitment. However, it appears challenging to optimise the process for obtaining appropriate agreements – ensuring sufficient security and responsibility, yet avoiding being excessively bureaucratic. Even amongst the program managers we interviewed there were differences of opinion about the nature of agreements needed in the NRM context – particularly whether a legally-binding contract was necessary, as illustrated by the comments below:

“… these are large-scale investments, so we’ve got to have some security over public funds … agreements are registered on titles, just so the agreement isn’t lost with the transfer of title …” [PM]

“… large NRM investments probably warrant a title-binding agreement, but these (agreements) are too time consuming for small projects … nor do landholders want them, a ‘works’ agreement is enough …” [PM]

“… I don’t think we need legal agreements, just have simple written agreements and accept some wastage … good projects will generally be maintained by landholders … poor NRM shouldn’t be maintained anyway! …” [PM]

“… long-term agreements are good, they encourage people to be patient when rehabilitating degraded sites … not everything is going to happen in the first 2 or 3 years after the fence goes up …” [PM]

The length of agreements (contracts) tied to NRM grants were also reported to be influential on the outcomes of NRM investments, particularly if NRM staff undertook follow-up visits with landholders throughout the agreement period. While legal agreements provided program managers with an avenue to penalise defaulting landholders, cooperative agreements were preferred by both landholders and program managers for most NRM investments.

Also of interest from this research is that if NRM works were viewed to be successful over this period then the large majority of landholders are willing to voluntarily safeguard the changes thereafter. Some interviewees reported that 10-year agreements are better suited to situations where unpredictable environmental responses may occur. For example, where natural regeneration of a suite of flora is sought on sites with a depleted seedbank, degraded soils and intense grazing pressure (e.g. kangaroos), there may be little observable change in native vegetation for several years. Indeed, when investing in NRM works to rehabilitate highly degraded sites (e.g. land affected by dryland salinity) or landscape functions (e.g. polluted groundwater) where short-term ‘success’ may not be evident, a long-term commitment is at least implicitly acknowledged, if
not explicitly stated. Comments by landholders that reflected this view included:

“… we know it’ll take a while to attract the wildlife back here (revegetation site) … at least ten to twenty years, but that’s OK … whatever we do will be an improvement on what it was …” [NF]

“… you can’t fix some of these problems overnight, but we’re not going anywhere … we’ll be here for a while …” [F]

4.3 Predicting landholders’ long-term commitment to NRM investments

Alignment of goals between landholders and NRM programs

A considerable body of literature indicates NRM programs are most effective in achieving land-use changes when aligned to the values and aspirations of landholders. If the NRM activity is aligned with the landholder’s goals then it seems reasonable to expect that the landholder will have a stronger long-term commitment to maintaining the investment.

Nonetheless, having different values or goals may not necessarily prevent landholders and NRM organisations working together (Curtis & Mendham 2010), as the same NRM investment may satisfy two very different goals. For example, fencing out livestock from remnant vegetation may satisfy a landholder’s desire to more effectively manage livestock on productive pastures, as well as meet the desire of an NRM organisation to reduce the pressure of livestock on remnant vegetation. Careful program design can ensure that the goals of the landholder and NRM organisation are both accomplished. However, this becomes more problematic when seeking to ensure long-term commitment to an NRM investment beyond an agency’s direct involvement in the site. In this scenario, it’s possible that the landholder’s participation in an NRM program that provides support for fencing actually masks a landholder’s lack of interest in the goals of the NRM organisation (Curtis et al. 2009) – risking a diminished outcome from the NRM investment once active engagement with a program concludes. Some comments by landholders that revealed this issue included:

“… when the contract finishes, we’ll manage the bush as best we can … but they’ll be a low priority, once we’ve done everything we need to do on our productive land …” [F]

“… the fences have been handy … but it’s the livestock that keep us in business, not the native trees ...” [F]

“… these (NRM) programs are all very well, but some of the things they want us to do would send us broke … they seem to forget we’ve got to make a living off this place …” [F]

“… the money they pay us for managing the bush is good, it makes us get the job done … I’m not sure what we’ll do when the money stops coming … I can’t see us putting in the same amount of effort …” [NF]

It would seem, that the closer the alignment of goals then the greater the likelihood that the landholder will maintain the original intent of the NRM investment. A comment by one landholder that illustrated this point was:

“… (the project) helped us do what we wanted to do, I reckon we’d’ve done all the fencing eventually … but it’s great having it done, gives us a lot of pride about what we’ve achieved …” [NF]

While program managers said a match between the program goals and landholders’ suggested strong partnerships could be developed, several also explained they didn’t reject involving landholders who sought support from an NRM program (e.g. access to fencing), even if they have different goals. That is, NRM outcomes could be achieved even if not the primary objective of landholders (e.g. fencing out remnant bush to improve livestock management, rather than seeking to improve the health of the remnant bush). To achieve this, several program managers mentioned that being able to adjust their programs to match the interests of individual landholders was important, so that NRM programs could “… have something for everyone”. Also, some critical or strategic NRM investments required working with landholders who may not otherwise choose to be voluntarily involved (e.g. involving neighbours in efforts to control PPA). Comments by program managers included:

“… getting your ‘foot in the door’ is important with some landholders … once you engage on their terms, then it gives you a chance later on to talk about some of your ideas …” [PM]

“… it’s about ‘give and take’, being flexible … taking small steps and working together, even if you start from completely different perspectives …” [PM]

Changes to the behaviour of landholders who don’t share the values and/or goals of NRM programs are likely to be more expensive, than for landholders who share similar values and/or goals. However, on-going engagement can allow landholders and NRM staff to develop a shared understanding, perhaps developing a shared goal over the longer term. Having a shared goal
between a landholder and the NRM organisation appears a good predictor of long-term commitment to maintaining the NRM investment.

Our research has found some evidence that engagement between a landholder and an NRM program over a long period may lead to a shift in the goals – perhaps by both the landholder and/or NRM program. Some comments that reflect such changes include:

“… there were a lot of weeds in the first few years, but now it doesn’t take too much time to keep to them … the site is getting easier to manage …” [NF]

“… I’ve learnt a lot about the local environment … I didn’t realise there were so many different species of grasses, lilies, herbs … I come here to relax and bring friends to see the changes …” [NF]

“… I was quite prescriptive in the beginning, but now I’ve learnt to be more flexible with farmers, especially when I know they’ve got their ‘heart in the right place’…”[PM]

Also, the context in which landholders operate may change (e.g. choosing to reduce the scale and/or intensity of agriculture) and most landholders are continually responding to changes in the environment on their property and the feedback they receive from interventions they make. As professionals, NRM staff are also continually responding to their operating environment. In which case, the same end-point is achieved, in that the closer the alignment in goals between the landholder and the NRM organisation, the greater the likelihood that the landholder will remain committed to the NRM investment over the long-term. A comment by one program manager encapsulated this point:

“… while it’s fun to work with the most ‘willing’ landholders – they’re enthusiastic, listen to what you say, happy to get involved. But sometimes you have to work with the difficult landholders … who have a very different view of the world, and environmental management is a long way down on their list of priorities … but this can be where our biggest gains are made, if you can change the way these people manage their land you’ve had a huge win … it takes time, but can give you a lot of satisfaction …”[PM]

Working with landholders who share the same goals as NRM programs may not always be possible. Engaging landholders with different perceptions of NRM may be strategically or tactically important, and provide scope for achieving considerable environmental ‘additionality’.

Feasible change for landholders
As discussed above, several landholders and program managers expressed views that proposing incremental land-use change was a more effective way to approach landholders than proposing rapid change – particularly if the change was on a large-scale and/or complex. These informants explained that a staged or step-wise (incremental) approach to change was more likely to allow better integration with the wider farm management, implementation to be adjusted to suit local conditions, and landholders and NRM staff could observe and modify subsequent stages of implementation (e.g. take account of any unforeseen ecological responses). While many landholders were supportive of undertaking changes over a large proportion of their properties, an incremental or stepwise approach was viewed as the preferred strategy. Fostering change at a rate, and on a scale, that is comfortable for landholders would appear important if seeking to engender landholders’ long-term commitment to achieving the desired outcomes from the NRM investment.

Even amongst landholders who are enthusiastic about making changes to their management to achieve NRM outcomes, engagement is more likely to be successful and lead to a long-term commitment if the strategies employed are relatively low-cost and of low-input. Low-cost and low-input NRM strategies might include:

- revegetation by direct seeding (c/f planting tubestock),
- altering grazing management (e.g. rotational grazing, less intensive stocking),
- using livestock to control weeds,
- using fire to manipulate species diversity,
- applying strategic silvicultural (forestry) practices to increase woody heterogeneity (e.g. thinning of even-aged forests).

Comments by landholders reflecting their consideration of the efficiency of different NRM strategies included:

“… we’re keen to do the right thing, but it’s got to be realistic … we don’t want to create more problems, like letting the weeds and foxes get out of hand …”[F]

“… anything that fits in with our farm business and is easy to achieve, we’ll be right behind it … but as soon as it detracts from our main business – the sheep and cattle, then we’ll drop it pretty quickly … letting us graze some of these (fenced out) areas before summer is upon us will help us keep the weeds down and manage the fire risk …”[F]

“… we’ll do what we can, but we’ve got limited time and budget … so we’re careful about what we sign up for …”[NF]
Achieving positive long-term NRM outcomes without on-going direct program investment suggests that landholders should be encouraged to adopt NRM practices that can feasibly maintain over the long-term. Further research and development is warranted to identify a suite of low-cost and low-input NRM strategies (i.e. passive management) that can be feasibly pursued by landholders in most contexts.

**Extent of ‘ownership’ of NRM investments and predicting long-term commitment**

Small-scale NRM works are often a good way to start with landholders new to NRM, as it provides an opportunity for landholders to adapt advice to their properties (land management), learn about the implications of NRM works (e.g. NRM works may increase pest plants and animals), and consolidate the relationship between the landholder and NRM staff. Several interviewees said that the extent of ‘ownership’ landholders had with an NRM investment was a strong indicator of how secure the NRM investment would be over the longer-term. Developing a sense of ‘ownership’ amongst landholders could be achieved by allowing them to be primarily responsible for the design, implementation, financial management and long-term management of the NRM investment. There were consistent views expressed by landholders and program managers about securing the legacy of NRM investments:

“… we listened to what they (NRM staff) had to say, then went away and adapted the project to suit our farm … after all, we’re the ones who’ll still be here managing the place long after the staff have disappeared …” [F]

“… the program was just what we needed (provided fencing materials), we’d wanted to fence out the different patches of bush for a long time … slows you down having to round up sheep in the bush, and there’s no grazing value for them … so, we’re very happy we’ve done that …” [F]

“… programs need to give farmers ‘ownership’ … need to let people be involved with a site, as farmers are the ones who’re there year in, year out …” [PM]

“… getting the program-landholder relationship right … good engagement, you’ve got to hear their concerns and understand their interests …” [PM]

“… our (NRM) programs have got to make property management easier for landholders … you know, it’s got to be a win-win … good for farming and good for the environment, otherwise it won’t last …” [PM]

“… we know that a lot of our Landcare works will take time to show the benefits, but that’s OK because the kids will eventually inherit this place … they enjoy bringing their own kids here … the bush on our property has become a special place for our family …” [F]

“… my grandfather kept the hills covered in bush, that was a good decision – it showed a lot of foresight … we’ve continued to protect that patch of bush …” [F]

“… it’s great working with some of the older farming families, the ones who’ve been here for generations … you can see the benefit of what earlier generations have done, even though we wouldn’t plant the same species and exactly the same way, it’s still great to see today’s farmers building on what earlier generations have done … you know it’s in good hands …”[PM]

The sense of ‘ownership’ a landholder had towards an NRM investment was identified as a strong indicator of likely long-term commitment to achieving the investment objectives, with the
potential for new property managers to sustain the NRM activity if it was viewed as successful. The intention by a farmer to transfer their property to the next generation within their family appears to be another predictor that an investment in successful NRM works would be maintained over the long-term.

Challenging the trajectory of this result is that the three study areas that were the focus of research in Landscape Logic in Victoria – in the North Central, Goulburn Broken, and North East CMA regions – are undergoing considerable demographic change, with an increasing proportion of land area being managed by non-farmers. This led to discussion with interviewees about the security of NRM investments with non-farmers, and when properties were sold outside the family. Replies included the view that successful NRM works that were easily managed (e.g. low-input required, secure fencing), were valued by farmers and non-farmers alike. Also, interviewees reported that if the NRM works were successful and easily managed, then the investments would tend be valued by new owners. Indeed, several program managers reported that successful native vegetation projects often added appreciably to the capital value of rural properties, and attracted new owners favourably disposed towards the physical features of the property. Comments by landholders and program managers that supported this view included:

“… much of this country is being broken up for hobby farms … while I’m not that keen on this happening, especially on the good ground, when we sell that’s our superannuation … so keeping patches of bush, leaving the big old shade trees actually adds value to our place … years ago, it would have been a sign of a scrappy farm …” [F]

“… people buying the smaller properties like having the native vegetation along the fence lines, in corridors … supporting the local wildlife, they’re not here to make a living off farming … the country’s too hard for that anyway …” [NF]

“… we know ‘tree changers’ pay a lot more for properties with a good balance of native veg on it, particularly if it’s near town, with good roads, good views, that sort of thing … they don’t really care if it runs 1 DSE (dry sheep equivalent) or 15 …” [PM]
5. Conclusions

5.1 What is a long-term commitment to NRM?

Our review of NRM literature found little definitive discussion of what might constitute a ‘long-term commitment’, beyond what is implied by the term ‘sustainable’. The term ‘sustainable land-use practice’ is commonly used in the NRM literature and, while loosely defined, is used to imply that the land-use will contribute to improved environmental outcomes and could be maintained in perpetuity in a stable situation. Defining the period of a long-term commitment by landholders would appear helpful when seeking to gauge how long direct program support needs to be maintained, and the nature of that support. For instance, if program support fails to engender a long-term commitment by participating landholders, then any benefit from the public investment in NRM may simply erode after the support is withdrawn – arguably diminishing the value of the initial investment. Similarly, if programs continue to ‘over invest’ in landholders who are already likely to sustain the recommended NRM practices, then this too may represent a waste of public funds, especially if these funds could have been directed to achieve greater environmental ‘additionality’ on strategically important sites.

Defining exactly what is meant by a ‘long-term commitment’ in the NRM context is challenging for a number of reasons, including:

- land-use practices may not always be known, and may need to change over the long-term to achieve a specific NRM outcome;
- landholders may not be able to sustain recommended land-use practices over the long-term even though they may aspire to; and
- participation in a NRM program by landholders may not reflect a long-term willingness to continue recommended practices following the conclusion of direct program support.

Our research also revealed some evidence that a long-term commitment can be shared or transferred between people. For example, if a major land-use decision was shared by the wider family (including multiple generations), then there would more likely be a commitment to sustain the new land-use practice over the long-term by different family members.

Furthermore, there is a practical dimension to maintaining a commitment to recommended NRM practices over the long-term. As theory suggests, if the change towards ‘best practice’ NRM is relatively easy to sustain, of low cost, perceived to be successful, and add value to the property’s management, then there is a strong likelihood that the commitment can be maintained over the long-term. This seems to be a critical point in terms of sustaining the management intent of NRM investments between different generations of the farm family, or even future landholders. By contrast, if the changes are complex to maintain, expensive, appear unsuccessful, or restrict future opportunities, then it is likely to be difficult to engender a commitment in others to sustain them.

While landholders and program managers didn’t specify a period of time that indicated a long-term commitment to ‘best practice’ NRM, in our view this remains an important element of any definition of the concept. In terms of defining what might reasonably be considered ‘long-term’ in the NRM context, we suggest that practices expected to achieve the NRM goal need to become largely a ‘stand alone’ (without major program support) and integral component of the property’s management. At this point, landholders can be in a position to ascertain the full implications of the NRM approach. We suggest that once an approach to land-use expected to achieve the NRM goal has become established, perhaps a practical threshold period of 10 years could be applied to define ‘long-term’. As such, we suggest a practical definition of a long-term commitment is when landholders are willing to pursue practices expected to achieve the goal of the NRM investment for at least a period of 10 years, without major direct program support. However, we acknowledge that this definition needs to be grounded in a wider NRM context – socially, spatially and technically, and that further research to explore this concept is warranted.

5.2 Critical factors for engendering landholders’ long-term commitment to NRM

Participation by a landholder in an NRM program should not be assumed to indicate their long-term commitment to sustaining the original NRM investment. However, without any participation in a program, it is difficult to argue that a program has had any appreciable influence on a landholder’s long-term commitment to pursuing recommended NRM. Without the direct support from NRM programs, the aspirations of the landholders would largely fail to convert into on-ground works. That is, participation in NRM programs provides an important catalyst for landholders to achieve desirable changes in NRM, in turn providing the foundation for landholders to maintain an apparent long-term commitment to recommended NRM.

The need for NRM programs (comprised of a complete ‘package’) to be delivered on a sustained...
basis was reported by all the program managers we interviewed to be a critical requirement for enabling landholders to make improvements in NRM at the landscape-scale. In the case of the programs that used an MBI approach, the provision of financial payments to landholders to offset the time landholders spent managing the selected sites (either in part or full), commonly referred to as stewardship payments, was strongly supported by participating landholders. Stewardship payments provided participating landholders with the capacity to give effect to a long-term commitment to pursuing recommended NRM practices. An important aspect that has emerged from this research is that some landholders may retain a desire or willingness to continue with recommended NRM strategies after the conclusion of a project, yet not have the capacity to do so.

Furthermore, a key point from our research is that without on-going support, or at least an enduring influence (e.g. follow-up projects), landholders’ long-term commitment to recommended practices – particularly expensive land-use change such as revegetation – may diminish over time if they have little genuine prospect of achieving their aspirations. In our view, the provision of relevant and timely support for landholders is likely to contribute to positive short-term changes in NRM (i.e. within 5 years of investment), which will in turn reinforce their enthusiasm for implementing recommended NRM works – galvanising their long-term commitment.

For the landholders we interviewed, participation in NRM programs was determined by the likelihood the program would assist them achieve their pre-existing plans. That is, few landholders reported that programs had changed their plans or views of NRM practices. However, if a landholder’s participation was a positive experience (e.g. met their expectations, assisted to achieve their objectives, made desirable land-use changes feasible), then they reported they were more likely to maintain the NRM works – indicating a long-term commitment to the original intent of the NRM investment.

Engaging landholders in NRM programs was viewed by most program managers we interviewed to be an important starting point for changing approaches to NRM, with positive outcomes not always apparent in the short-term. Even if NRM programs haven’t substantially changed the views of landholders, it appears the NRM programs have enabled landholders to move towards achieving their long-term goals, and arguably making it feasible to achieve their aspirations.

The cost of maintaining the outcomes of an NRM investment appears to be an important factor, with financially or physically onerous NRM practices likely to be difficult for some landholders to maintain after their participation in a program ceases. Projects that require considerable on-going, active management by landholders may be more likely to face this risk, as landholders may not be able to maintain the management input, particularly if they were being paid to do that work and the payments stop at the end of an agreement. As such, caution needs to be used when interpreting the likely long-term outcomes from short-term changes achieved by participation in an NRM program, particularly if the recommended NRM practices are costly or difficult to maintain, or become inconsistent with a landholder’s personal context.

Many landholders we interviewed had been involved in multiple NRM programs over 10 years or longer, providing some evidence that they had a long-term commitment to be actively involved in implementing recommended NRM practices. Our results also indicate that landholders’ involvement in small-scale or passive NRM programs (e.g. Land for Wildlife) can be valuable for attaining knowledge and confidence, before undertaking large-scale works. That is, our research challenges some of the NRM literature in that it indicates that many ‘low cost’ participants went on to undertake works on an additional area, if not a larger scale – revealing the ‘additionality’ that can be achieved by engaging ‘low cost’ participants. Several program managers expressed similar views to that of landholders, supporting the benefits for achieving NRM outcomes by using an incremental or step-wise approach so that substantial environmental gains can be achieved over the long-term.

We acknowledge that funds for implementing NRM programs are always limited, and policy-makers and program managers face difficult decisions about the trade-offs when implementing programs. However, our research suggests there is chronic failure in NRM programs to provide adequate resources for staff to undertake meaningful follow-up engagement with participating landholders. Aside from ensuring landholders are satisfied with the implementation of a program and understand the requirements of site management, follow-up between NRM staff and landholders allows a meaningful relationship to be fostered. Positive long-term relationships between NRM staff and landholders may also increase a program’s efficiency and effectiveness. That is, the longer landholders are actively engaged in NRM programs and information networks, the more skilled and knowledgeable they’ll become – arguably lowering the transaction costs of their participation (i.e. requiring less site appraisals) and increasing the likelihood of information exchange with neighbouring landholders. Also, if
program staff are not able to have follow-up visits with landholders it is likely that substantive changes, lessons and outcomes of NRM investments may not be fully recorded or understood by staff. In turn, the lack of medium to long-term records may cause programs to over-estimate costs of implementation and under-value achievements, or make poorly informed predictions about the long-term environmental outcomes. In an NRM context, a conceptual model of how organisations might engender a long-term commitment by landholders to recommended NRM is presented below [Figure 2].

Also of interest from this research is that if NRM works were viewed to be successful by landholders at the conclusion of their participation in a program, then the large majority of landholders are willing to voluntarily safeguard the changes thereafter. Some interviewees reported that 10-year agreements are better suited to situations where unpredictable environmental responses may occur (although most landholders preferred 3 to 5-year agreements). For example, where natural regeneration of a suite of flora is sought on sites with a depleted seedbank, degraded soils and intense grazing pressure (e.g. kangaroos), there may be little observable change in native vegetation for several years. Indeed, when investing in NRM works to rehabilitate highly degraded sites (e.g. land affected by dryland salinity) or landscape functions (e.g. polluted groundwater) where short-term ‘success’ is not evident, a long-term commitment is at least implied, if not explicitly stated.

5.3 Predicting the success of programs in building long-term commitment by landholders to recommended NRM

Our research has revealed that a combination of program factors engender a long-term commitment by landholders to recommended native vegetation management [refer to Box 4]. These factors represent the characteristics of an effective NRM program in the current context of the three study areas in Victoria. It is noteworthy that the experience discussed by interviewees – both landholders and program managers – did not identify a ‘perfect’ program. While interviewees were positive about many attributes of NRM programs – programs using either fixed-grants or MBI approaches – there were also deficiencies that detracted from the same programs.

Overall, the factors that contribute to building the long-term commitment by landholders to enhance native vegetation management need to be combined as a single program ‘package’. Using some factors without others, as commonly occurs is likely to limit the effectiveness of an NRM program, and in turn limit a program’s capacity to engender a landholder’s long-term commitment to sustaining recommended NRM [Box 4, below].

Earlier research in Landscape Logic identified that landholders’ approaches to NRM are influenced by drivers that are often more powerful than NRM policy instruments (Race et al. 2009a, b & c). Hence, NRM programs need to be designed for and implemented into a dynamic operating context – with emphasis needed on ensuring programs are tailored to the personal situation of the target landholders. As such, the appropriateness of a program’s

Figure 2. Conceptual model of how programs may build a long-term commitment by landholders to recommended NRM.
Box 4: Program factors contributing long-term commitment by landholders to recommended NRM

1. Ensure credible and experienced staff are able to provide on-going extension activities with landholders throughout the program’s period of operation (design stage through to follow-up monitoring and evaluation stage);
2. Encourage landholders to complete an approved whole farm planning (property management planning) short-course (or equivalent), before they’re eligible to receive program support (soy above $5,000) – materials and/or stewardship payments;
3. Identify and develop low-cost and low-input NRM strategies that landholders can feasibly implement, so that the desired outcomes can be achieved with relatively passive management (i.e. low-input NRM);
4. Provide adequate and relevant information and advice to landholders so they can make informed decisions about their participation in a program (e.g. provide access to a range of expertise so an in-depth and integrated plan can be prepared by landholders);
5. Commit program staff to undertake regular site assessments with landholders (e.g. annually) to assess, record and provide feedback about progress, advice on next steps and reinforce landholder commitment to active ongoing management; and
6. Allow for adaptive management of specific sites and corresponding flexibility in the ‘terms of agreement’, with scope for review of the agreement at the mid-point of the period (i.e. foster a perception of fair cost-sharing arrangements, clarity of roles in agreement).

Our understanding of cooperative PBIs suggests this model could capitalise on the considerable investment already made in local Landcare groups and offer several advantages for NRM in the Australian context. For instance, a program adopting the cooperative PBI model could include the many strengths identified above with existing NRM programs using the MBI approach, but would place emphasis on making stewardship payments to landholders for real work undertaken (i.e. actual costs incurred), rather than anticipated work. We also believe that the cooperative PBI model would shift the emphasis towards fostering a cooperative partnership between landholders and the NRM organisation, rather than a competitive partnership (i.e. bidding against each other).

Also, paying landholders for real change would reduce the risk of locking both parties into a fixed agreement based on predicting the future management requirements of a site. The cooperative PBI model would allow for adaptive management and continuous improvement – as we learn about landscape restoration in a dynamic context (i.e. changing opportunity costs, variable ecological responses, changing climate, improving metrics). Such an approach would still ensure that landholders’ management is informed by expertise within

design to the landholder’s personal and operating contexts is as equally important as the program’s characteristics, when seeking to develop the interest and capacity of landholders, and subsequently their long-term commitment to recommended NRM.

5.4 A new model for NRM programs: Cooperative performance-based incentives

The NRM ‘marketplace’ in Australia is highly variable – across ecological zones, industry sectors and community segments. For example, the market for trading surface water for agricultural purposes is far more active and mature, than the so-called market for enhancing native biodiversity. The use of competitive tendering via an MBI approach with a small number of uninformed landholders appears problematic. In such situations, both the dynamism of an active market and negotiation between equally-informed partners can be highly constrained – limiting the value of the competitive tendering approach. Indeed, using a competitive MBI in an asymmetrical market is seen by some landholders as inherently unfair and there is evidence that these concerns can reduce a landholder’s long-term commitment to recommended NRM.

We suggest that further work be undertaken to trial and assess the concept of cooperative performance-based incentives (PBIs) in the Australian context, whereby neighbouring landholders collectively agree on and oversight the payments for improved NRM outcomes. Experience from cooperative PBIs piloted in the United States (Morton et al. 2006) indicates that this approach can harness the social capital of local communities to:

- gain agreement amongst neighbouring landholders on how recommended NRM practices can be implemented locally;
- gain agreement amongst participating landholders on how the limited funding should be allocated to optimise NRM (e.g. performance standards, payment levels, administration and reporting);
- increase landholder responsibility for NRM (i.e. neighbouring landholders share responsibility for optimising NRM in the local context with limited funding); and
- enhance agency-landholder relations as it shifts towards a collaborative partnership (rather than a contractor-provider model).

Working with landholders to achieve long-term commitment to improved management of native vegetation

43
the NRM agencies and that their actions are framed by an agreed site-specific management plan. One of the advantages of the cooperative PBI approach would be the opportunity afforded for greater ongoing engagement between landholders and NRM program staff which, this research suggests, would enhance the likelihood of landholders acquiring a long-term commitment to recommended NRM.

**Strengthening landholders’ long-term commitment to NRM**

Achieving practice change by private landholders on a scale sufficient to arrest the decline of biodiversity in Australia requires strategic intervention by governments. Given the complex interaction of factors affecting landholder decision making, the heterogeneity of rural landholders, and the limited capacity of governments to invest directly in accomplishing policy objectives, it is not surprising that most researchers advocate a suite of policy options be employed. However, in our view too much attention has been focused on the short-term benefits and costs of different options and insufficient attention paid to the ability of different approaches to engender a long-term commitment to recommended NRM amongst landholders. If greater consideration is given to the factors that lead to long-term commitment by landholders to NRM, then the different policy instruments might be appraised in a new light.
Working with landholders to achieve long-term commitment to improved management of native vegetation


Lawrence, G., Lyons, K. and Mortaz, S. (eds) (2006) Social Change in Rural Australia, Central Queensland University, Rockhampton, QLD.


Appendix 1: Lessons from large NRM programs

There is much research that suggests that it is a combination of elements – a comprehensive multi-dimensional program – that creates an effective program. Drawing on large-scale NRM and agricultural programs, in Australia and the United States, the important elements have been summarised below (Boxes A1 and A2).

Box A1: Key lessons from Heartlands

The Heartlands program developed strategies for targeting land-use change to improve NRM in selected catchments in southern NSW and northern Victoria during the early-2000s. Key lessons of the approach used include:

- Discovering the values, attitudes, aspirations and concerns of local communities is a fundamental step in the process of land-use change.
- Effective local implementation staff is a key element in achieving improved NRM.
- Technical support for catchment coordinators (e.g. interpreting research) is required to ensure that on-ground works are targeted for maximum effectiveness.
- A participatory research approach engendered community interest and support for improved NRM.
- A diverse but complementary set of approaches is required to encourage well targeted land-use change.
- The use of a variety of methods is appropriate for communicating and engaging with local communities.
- Efforts to promote land-use change that require long-term commitment from landholders are put at serious risk when financial assistance and other commitment by governments is limited to short-term projects with inflexible delivery timelines.


Box A2: Key lessons from Sustainable Grazing Systems

The management team reported the critical factors behind the success of the national SGS program were the:

- combination of research, a producer network, and a training program proved highly effective;
- whole program achieved a critical mass, which allowed allocation of sufficient resources;
- program goal based on the delivery (implementation) of services and activities;
- stability of personnel throughout the 5-year program;
- well-defined baseline information at the commencement of the program;
- broadly based steering group (e.g. included farmers, researchers); and
- strategic reviews (e.g. external evaluation at mid-term).

Appendix 2: Overview of NRM programs using an MBI approach

This research interviewed landholders involved in the following MBI programs:

**Bush Tender** (DSE): Bush Tender is an auction-based approach to improving the management of native vegetation on private land. Under this system, landholders competitively tender for contracts to better protect and improve their native vegetation. Successful bids are those that offer the best value for money, with successful landholders receiving periodic payments for their management actions under agreements signed with DSE. These actions are based on management commitments over and above those required by current obligations and legislation. In 2010, BushTender was offered in the Goulburn Broken Catchment area. Expressions of Interest closed on the 19th of March, with about $1 million available for landholders in this current bidding round [refer to www.dse.vic.gov.au].

**Green Graze** (GB CMA): The project delivered incentives and advice to graziers in the Goulburn Broken and North Central Catchments using a competitive tender. It encouraged significant change in how farming businesses are run so as to improve environmental outcomes. **Green Graze** targeted areas where land is typically managed for livestock production, to improve grazing management and environmental outcomes at a broad scale. The **Green Graze** pilot project has resulted in large areas of native vegetation being selected for improved grazing management, that are predicted to increase in perennial understorey diversity and natural regeneration. Five bids covering 2,032 ha were successful based on available funding. These graziers will receive total payments over three years ranging from $22,000 to $98,700. Management plans developed by bidding graziers designated significant proportions of the total farm as areas to be managed for improved native vegetation outcomes under **Green Graze** (Moll et al. 2007; 3-year agreements, $165/ha).

**Bush Returns** (GB CMA): Landholders are receiving almost $875,000 from the Goulburn Broken Catchment Management Authority (GB CMA) to regenerate vegetation on their own land as part of the **Bush Returns** program. An allowance to the value of $875,000 is being paid to 22 Landholders within the Goulburn Broken Catchment over a 5 or 10 year period to restore and regenerate vegetation on their land, with the program commencing in 2004. There have been two rounds of the **Bush Returns** program:
- **Round 1** (October 2004): total of 158 ha; $119,700 provided to landholders (3 landholders); average of 53 ha/landholder at $757/ha;
- **Round 2** (April 2005): total of 502 ha; $648,400 provided to landholders (15 landholders); average of 33 ha/landholder at $1,291/ha.

**River Tender** (NE CMA): an approximate budget of $2 million allocated over 4 years, with the aim of improving the extent and quality of riparian vegetation along the Ovens River and key tributaries. The River Tender project was offered over 2 rounds and involved about 43 landholders.