

DAV40

MANAGING LANDSCAPES TO MEET PUBLIC BIODIVERSITY AND FARM BUSINESS GOALS

FINAL REPORT (MILESTONE 8)

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ABSTRACT

Project title: Managing landscapes to meet public biodiversity and farm business goals

Start and finish date (year/month): September 2002 – April 2006

Project team members:

Jim Crosthwaite, Project Manager, DSE Melbourne

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Objectives

1. Demonstrate options and tools for landholders to achieve objectives for biodiversity and other public good issues while also meeting other goals, both business and personal.
2. Determine the capacity of landholders to achieve biodiversity goals in the context of 20 year visions for their properties and how they fit into the wider landscape.
3. Provide recommendations on how biodiversity targets (MDBC, NRE, CMA) can be achieved by using the Upper Goulburn-Broken as a case study.
4. Collect information about the requirements, from a farm business perspective, that must be met such that landholders will increase on-ground works and otherwise act to conserve biodiversity in a way that is consistent with state and regional priorities.
5. Identify and map revegetation priorities within selected sub-catchments from a biodiversity perspective. Identify least cost scenarios for achieving optimal biodiversity values, develop “current recommended practises” and feed these simple decision rules into relevant projects such as the MDBC Landmark project.

Methodology

The approach had four core elements.

It involved a case study approach to farm businesses. Eight case study properties, including two ‘lifestyle’ properties, were selected in 2 regions in the mid Goulburn Broken Catchment, including the Violet Town and Broadford regions

Inferential statistical methods, spatial modelling and rule-based modelling were used to analyse and model ecological data. Detailed financial, social, agronomic and native vegetation data was collected from each of the 8 case study farms. Maps were then constructed highlighting the location of native vegetation and its’ likely regional value as habitat, pasture production potential and gross margins for each paddock. From these maps, strategies for managing biodiversity and farm profits were devised.

Detailed economic analysis of these strategies was carried out using standard techniques for determining profitability and cash flow of strategies compared to a ‘do-nothing’ approach

Finally, standard extension techniques were used to engage a wide range of landholders, extension officers and others, and produce a number of communication products.

Implications

The farm business approach is potentially a valuable tool to assist new and existing programs of government agencies to achieve catchment-wide biodiversity targets.

The approach integrates biodiversity values, agronomics and economics, and is important for providing a realistic understanding of the alternative approaches for achieving biodiversity outcomes on private land.

In summary, we have shown that economically, financially and environmentally sound strategies exist for landholders in the mid and upper Goulburn Broken Catchment that will meet catchment management targets. The results indicate possibilities for reorganizing farms to achieve farm business goals of increasing profit in financially feasible ways and also achieve wider environmental goals. For 7 out of 8 properties investigated at least one of the four strategies we tested that improve environmental outcomes are also profitable and affordable. This is a significant finding in terms of opening up possibilities for redirecting agricultural investments in these landscapes so as to achieve more sustainable production systems and wider landscape change.

Attempts have been made to predict the potential changes in the extent and condition of native vegetation at broad scales that could occur through adoption of simple strategies at a farm scale. Results indicate that substantial areas could be revegetated through natural regeneration and that better grazing management has potential to improve native vegetation cover on up to 2 million hectares in Victoria alone.

The project has also shown how to successfully communicate findings about biodiversity management by framing this management in a farm business context. There has been a very positive response to the extension effort, particularly to field days that targeted both graziers and extension staff.

Collaboration

Goulburn Broken Catchment Management Authority
Arthur Rylah Institute (DSE)
University of Melbourne
Elders Limited
Landmark

Sponsors

Land & Water Australia
Department of Sustainability & Environment (DSE)

MILESTONE NO.:	8	DATE OF FINAL REPORT: 30TH APRIL 2006	
LWA PROJECT REFERENCE NO.:	DAV40		
PROJECT TITLE:	Managing landscapes to meet public biodiversity and farm business goals		
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OTHER COLLABORATORS	Bill Malcolm, University of Melbourne Vivienne Turner, ARI Neil MacLeod, CSIRO Kim Lowe, DSE Jim Shovelton, Mike Stephens & Associates Kate Bell/Tim Barlow GBCMA Peter Vesk, University of Melbourne		
PROJECT OBJECTIVES	1. Demonstrate options and tools for landholders to achieve objectives for biodiversity and other public good issues while also meeting other goals, both business and personal. Determine the capacity of landholders to achieve biodiversity goals in the context of 20 year visions for their properties and how they fit into the wider landscape. 2. Provide recommendations on how biodiversity targets (MDBC, NRE, CMA) can be achieved by using the Upper Goulburn-Broken as a case study. Collect information about the requirements, from a farm business perspective, that must be met such that landholders will increase on-ground works and otherwise act to conserve biodiversity in a way that is consistent with state and regional priorities. 3. Identify and map revegetation priorities within selected sub-catchments from a biodiversity perspective. Identify least cost scenarios for achieving optimal biodiversity values, develop "current recommended practises" and feed these simple decision rules into relevant projects such as the MDBC Landmark project		
MILESTONE 8 (from the Project Schedule) :	Components 1. Report on sociology research 2. Project evaluation report 3. Summary of further progress of policy - opportunities for influencing landholders through policy change 4. Summary of farm findings (scientific paper) 5. Summary of current status of case study farms (scientific paper) 6. Details on communication and adoption activities against the agreed communication plan. 7. Report on plans for ongoing communications/legacy of project		
ACHIEVEMENT RESULTS FOR COMPONENT 1:	<i>1. Report on sociological research</i> Family goals as well as current business situation were assessed during farm visits for the eight case study farms. This assisted development of suitable strategies for achieving public and private goals. The team also drew on in-depth interviews that studied the long-term motivations of selected landholders in the Goulburn catchment (Farmar-Bowers 2004). This research highlighted the importance of five personal drivers (family succession, enjoying farming, overcoming isolation, learning about farming, and educating children) to what opportunities landholders took up. In conjunction with DAV39 project, further research was commissioned to test the findings about motivations, and also to		

	examine the issue of opportunities further. The researchers were asked to comment specifically on farmer take-up of the strategies recommended by DAV40 and DAV39. Fourteen confidential in-depth interviews, involving twenty-one people, were conducted in western Victoria with farmers who ran a sheep enterprise as part of their farm business. It was found that how landholders responded to opportunities depended on how they fitted with their Personal Career Path (PCP). In general, the interventions most likely to be taken up by farmers voluntarily and perhaps enthusiastically, are those that farmers see as advancing their PCPs within the context of the needs of their families. Farmers would tend to take up more NRM options if they could see them contributing rather than as impositions. The researchers found that the approach of the 'farm business & biodiversity' projects was generally in accord with their findings approach, and that the communication products were likely to be well-received. However, it was found that education early in the PCPs of farmers is likely to have the most profound effects on how farming is carried out in the long-term. Nevertheless, programs that target NRM change directly can be successful, particularly if they account for where landholders are on their PCP. A copy of the report is attached. "Understanding farmer decision systems that relate to landuse"
ACHIEVEMENT RESULTS FOR COMPONENT 2:	<i>2. Project evaluation report</i> A project evaluation for both DAV40 and DAV39 was conducted by Jeff Coutts, and is attached. "Evaluation of native vegetation projects" Key findings are: – scope is there to make a significant contribution to regional catchment targets as the strategies are relevant to up to 6 million hectares in Victoria, and 10 million hectares across south-eastern Australia – considerable work has been undertaken to better understand approaches to managing native vegetation to maintain biodiversity on farms across the regions covered by both Farm business & biodiversity projects. – generally positive reaction and interest to significant efforts to engage with a large number of producers, their extension and advisory staff (public and private) and key groups such as Catchment Management Authorities and others.
ACHIEVEMENT RESULTS FOR COMPONENT 3:	<i>5. Summary of further progress of uptake of project findings into policy</i> See the attached EWR report titled "Policy uptake report". The most important policy achievement has been the development of a pilot project delivering incentives at the whole farm level. This is a \$500,000 DAFF-funded project under the Native Vegetation Pilot program. The pilot will be managed by Goulburn Broken CMA, drawing on expertise and findings from both recent Farm business and biodiversity projects, and also from projects trialling Market Based Instruments. Use of findings in regional delivery programs of DSE, DPI (Catchment & Agriculture Services) and northern CMAs. Individual extension officers are adopting the findings into their work (as evidenced by follow-up surveys), while more systematic incorporation into programs is occurring via managers of relevant programs (eg. Kim Lowe DSE, Malory Weston North-Central CMA). Findings are also likely to be used in DPI's Meat & Wool extension program. The management team for that program have requested funding to support this. A first funding bid failed, but the team is continuing to work closely with the Animal investment

	program in DPI.
ACHIEVEMENT RESULTS FOR COMPONENT 4 & 5:	3. Summary of farm findings (scientific paper) 5. Summary of current status of case study farms (scientific paper) There have been 7 scientific articles written for this project, and also for the related project DAV39, since the last Milestone report as follows: 1. Crosthwaite, J., Moll, J. Dorrough, J. Malcolm, L. (2006) Profitability and financial feasibility of strategies to increase native vegetation in Victorian hill country. Paper presented to the Annual Conference of the Australian Agricultural and Resource Economics Society, Manly, February 2006. Submitted to Aust. J. Ag. & Res. Eco 2. Dorrough J, Moxham C, Turner V, Sutter G (2006) Soil phosphorus and tree cover modify the effects of livestock grazing on plant species richness in Australian grassy woodland. <i>Biological Conservation</i> 130, 394-405. 3. Dorrough J, Moll J, Crosthwaite J (submitted) Can intensification of temperate Australian livestock production systems save land for native biodiversity? <i>Agriculture Ecosystems & Environment</i>. 4. Vesk PA, Dorrough J (2006) Getting trees on farms the easy way? Lessons from a model on eucalypt regeneration in pastures. <i>Australian Journal of Botany</i> in press. 5. Moll, J., Dorrough, J., Crosthwaite, J. and Straker, A. (2005) Improving native biodiversity management on wool properties in central Victoria – investment analysis of four strategies. A paper presented to a Resource Economics Workshop 'Identifying production and environmental trade-offs at the farm level'. Organised by the AGSIP project AG13 in partnership with the Australian Agricultural and Resource Economics Society. 28 October 2005, Rockhampton. <i>To be published as conference proceedings; papers are with referees</i> 6. Dorrough J, Moll J, Vesk PA (2006) When is natural regeneration cheaper? Assessing the costs of getting trees on farms. Paper submitted to the 'Veg Futures The conference in the field'. Albury. <i>Currently being referred and to be published on-line</i> 7. Dorrough J, Moxham C (2005) Eucalypt establishment in agricultural landscapes and implications for landscape-scale restoration. <i>Biological Conservation</i> 123, 55-66.
ACHIEVEMENT RESULTS FOR COMPONENT 6:	6. Details on communication and adoption activities against the agreed communication plan. 1. 160 Landholder (dog collar) brochures have been distributed to landholders across the Goulburn Broken CMA to date, via Elders and Landmark and at various field days and events. It is likely that an extra 100 due will be distributed by the end of 2006. Numerous collars and brochures have also been distributed to LWA program and project staff, CMA, DPI and DSE extension officers. The attached document "Evaluation of dog collars" shows the distribution record. 2. A series of 3 extension notes have been designed and printed. These notes have been distributed to extension officers and attendees at field days run by either CMA or DSE across the Goulburn Broken CMA. They are now being distributed to regional DSE/DPI and CMA offices. They are attached as follows: "Extension note 1"; "Extension note 2"; "Extension note 3". 3. A website has been created under the DSE website, enabling access to information and documents from both DAV40 and DAV39 Farm business and biodiversity projects. 6. Presentations and displays have been made at several conferences and meetings since December 2005. These presentations are also listed in the attached "Communications record DAV40", and include presentations to Swanpool, Warrenbayne, Warby Ranges and Sheep-pen creek Landcare groups in the Goulburn Broken Catchment.

	7. A field workshop was held on a case study farm near Warrenbayne in early December 2005, to present the project findings to extension officers and program staff in the Goulburn Broken Catchment. This also provided an opportunity to survey all participants to gauge reactions to the findings. The survey results can be viewed in the attached documents; “Extension report 4 March”, “Producer Extension report”; “Case report final”
ACHIEVEMENT RESULTS FOR COMPONENT 7:	7. <i>Report on plans for ongoing communications/legacy of project</i> Ongoing communications for the project are planned, for beyond the project completion date of May 2006. Activities include regional “wrap up” dinners, poster displays at various events such as related project field days in the upper and mid Goulburn regions, and presentations to Landcare groups. The ongoing communications and legacy the project will leave, are outlined in the updated communications plan, which is attached, “Communications plan Dav40 May06”

SUMMARY OF PROJECT METHODS:

The approach had four core elements

- a case study approach
- inferential statistical methods, spatial modelling and rule-based modelling
- farm business analysis, and
- standard extension techniques

A case study approach to farm businesses was taken. Eight case study properties were selected in 2 regions in the mid Goulburn Broken Catchment, including the Violet Town and Broadford regions. The case study farms were selected based on being representative of their region, and a mix of commercial and “lifestyle” properties. Another nine properties were selected in the DAV39 project, strengthening the approach and confidence in the findings.

Detailed financial, agronomic and native vegetation data was collected from each of the case study farms. Inferential statistical methods, spatial modelling and rule-based modelling were used to analyse and model this data. Maps were then constructed highlighting the location and regional significance of native vegetation, likelihood of natural regeneration, pasture production potential and gross margins for each paddock. From these maps, strategies for managing biodiversity and farm profits were devised, and detailed economic analysis of these strategies was carried out using standard techniques for determining profitability and cash flow of strategies compared to a ‘do-nothing’ approach.

Each strategy was applied to each farm (via modelling), and the financial and impact on native vegetation condition and biodiversity was predicted for each case study farm. Broader scale estimates of likely changes in vegetation cover and condition across farms were also made. These changes in vegetation extent and condition were used to infer potential changes in habitat for other components of native biodiversity.

In conjunction to the testing of potential strategies this research project examined current relationships between grazing management strategies (including pasture sowing, fertiliser, grazing intensity and frequency of grazing) and vegetation composition and structure and the pattern and processes of eucalypt regeneration. To examine vegetation patterns and current distribution of eucalypt saplings agronomic and vegetation data collected across the 8 farms was combined with further data from the DAV39 properties, and data from adjacent public lands and reserves. To examine the processes and temporal frequency of eucalypt regeneration under varying management rules-based modelling, based on extensive compilation of existing literature, was used (this work was undertaken in collaboration with Dr Peter Vesk, University of Melbourne). These various forms of ecological data were used to inform the strategies tested and were integrated into economic analyses.

Standard extension techniques were used to engage a wide range of landholders, extension officers and others, and produce a number of communication products.

STATEMENT OF KEY FINDINGS, THEIR INTERPRETATION AND PRACTICAL SIGNIFICANCE AGAINST EACH PROJECT OBJECTIVE:

The research findings highlighted a number of ways landholders in the Goulburn Broken catchment can go about improving the condition and extent of native vegetation and biodiversity on their properties in line with meeting catchment management targets, at the same time as managing for farm profitability. Clear direction is provided for using incentives and education to trigger the necessary changes in management, and so make a major contribution to meeting regional catchment targets .

In summary, we have shown that economically, financially and environmentally sound strategies exist for landholders in the Goulburn Broken catchment. The results indicate there are possibilities for managing properties to achieve wider catchment management targets as well as meeting farm business goals of at least maintaining farm profits. For 7 out of 8 properties investigated at least one of the four strategies we tested that improve environmental outcomes are also profitable and affordable.. This is a significant finding in terms of opening up possibilities for redirecting agricultural investments in these landscapes so as to achieve more sustainable production systems that will contribute to wider landscape gains.

Objective 1. Demonstrate options and tools for landholders to achieve objectives for biodiversity and other public good issues while also meeting other goals, both business and personal. Determine the capacity of landholders to achieve biodiversity goals in the context of 20 year visions for their properties and how they fit into the wider landscape**Options and tools for meeting public and private goals**

The project has demonstrated that both lifestyle and commercial landholders in the mid Goulburn Broken Catchment, can help meet catchment targets for biodiversity and other resource management issues, at the same time as addressing farm profitability issues.

Objectives for biodiversity management were defined by using biodiversity targets specified by the Goulburn Broken CMA, in its Regional Catchment Strategy (2003). These targets are:

- maintain extent of all native vegetation types at 1999 levels in keeping with the goal of “net gain” listed in Victoria’s Biodiversity Strategy.
- Improve the quality of 90% of existing native vegetation by 10% by 2030
- Increase the cover of all endangered and applicable vulnerable EVC’s to at least 15% of their pre-European vegetation cover by 2030.
- Increase 2002 conservation status of 80% threatened flora and 60% threatened fauna by 2030.

Other major public good issues in the mid Goulburn Broken Catchment relate to salinity and water quality. These were not specifically a focus for this project. However, the project findings have particular relevance, as achievement of targets for these NRM issues depend on increasing the perenniality of native vegetation. This has been a major focus for this project.

The research undertaken in this project has focused on understanding the relationships between farm activities and the current extent and function of native vegetation. This information has been combined with vegetation priorities at regional catchment scale to develop spatial priorities for actions at a farm scale. The research has focused on the function, composition and extent of native vegetation as a surrogate for other components of biodiversity.

The project has developed some sound understanding of what is required to achieve regional biodiversity targets through its analysis of ecological, economic and agronomic data. The results from this research

indicates that substantial increases in the extent and condition of endangered, vulnerable and depleted vegetation types can be achieved .

By demonstrating several realistic approaches to maintain or increase farm profits, at the same time as improving the condition and extent of native vegetation on farm, the project has show how a major contribution to achieving wider landscape targets might be achieved.

Landholder capacity to achieve biodiversity goals

Farm business considerations are central to landholder capacity to make changes that achieve public biodiversity goals, although they are not the only factor. At least one of the four strategies investigated in this project is a good investment on seven of the eight properties (and on 15 of the 17 for both projects). This means that the relevant strategy passed the test of being profitable, having a fairly small negative cash flow before becoming positive, and being relatively low risk. Hence most landholders are able to afford one of four strategies that, if cumulatively adopted across the Goulburn Broken catchment would make a substantial difference to biodiversity and NRM outcomes.

The ‘good investment’ test does not mean that landholders are willing to invest. Issues affecting willingness include: level of environmental concern, family and business priorities, capacity to take on a major change at this time, perceptions about the investments, and credibility of advice they receive. Several of these factors are captured by the Personal Career Path concept, that was found to be important in social research commissioned by this project and DAV39. Investigating the range of such issues was beyond the scope of this project. However, personal goals of the case study landholders were recorded and also addressed in developing the four strategies outlined in the project findings. The personal and business goals of lifestyle landholders was in many ways similar to those of commercial landholders, with farm profitability an important driver, for at least “making the farm pay its own way”. Environmental goals for both types of landholders were also similar, with the general recognition that biodiversity and native vegetation management are important issues to address.

A survey of case study landholders carried out by UNE at the beginning and end of the project, supports the fact that there has generally been a very positive response to the project findings to date. The fact that DPI/DSE and CMA extension officers working in the Goulburn Broken CMA are keen on the project findings, and are adopting them into their work, indicates some confidence that landholders do have capacity to act on the findings.

Demand for presentations and attendance at various Landcare meetings across the catchment, suggest that landholders are very positive about the project results, however some on-farm investment is required and can dampen enthusiasm amongst some who attended the meetings. Even if the strategy is profitable, the level of investment required by landholders to adopt any of the four strategies on a significant scale on their properties, may be enough to limit adoption, unless monetary incentives could be accessed.

It is important to note that the four strategies examined were chosen from many possible farm strategies. Landholders do not have to fully embark on any one of the strategies. They can try them piecemeal, or in combination, on different parts of the farm. It is highly likely that many landholders will do this, given the positive reception of the project findings by landholders and extension officers. The issue in terms of achieving catchment targets will be whether the pace of change in improving the condition of native vegetation will be fast enough. It is not likely to be unless additional incentives are provided to *trigger* the changes in management required.

Objective 2. Provide recommendations on how biodiversity targets (MDBC, NRE, CMA) can be achieved by using the Upper Goulburn-Broken as a case study. Collect information about the requirements, from a farm business perspective, that must be met such that landholders will increase on-ground works and otherwise act to conserve biodiversity in a way that is consistent with state and regional priorities.

Requirements to be met for increasing actions to conserve biodiversity

From a farm business perspective, the requirements for landholders to increase on-ground works and otherwise act to conserve biodiversity in a way that is consistent with state and regional priorities are fairly simple. They must firstly be a good investment. The project has demonstrated the potential for at least one strategy to be profitable on most farms, including lifestyle properties. This and other requirements were addressed in the previous section.

The project also identified that grazing strategies were only profitable on some farms some of the time, being dependant on current stocking rates and fencing requirements. It also found that natural regeneration strategies were not generally a good short-term investment, because they didn't pay off within 15 years. The temporal uncertainty of regeneration made investment risky, however in the long term shelter benefits from established trees were significant. The implication is that for regional targets to be met, major public investment is required in order to influence the nature of private investment that will occur in the next 15 years or so. This project has identified the potential to *trigger* changes in that private investment so that it is consistent with meeting regional catchment targets. This approach is different to paying for ecosystem services. Instead of saying what should we pay for, it asks what is required to trigger the desirable change. By addressing the whole farm business allows strategies to be accurately costed, and practically evaluated and implemented. This whole farm approach evaluates each potential strategy to meet farm business and social goals, along with native vegetation goals, to also meet regional catchment targets. By addressing the financial impact of native vegetation and biodiversity management, allows landholders to make considerably better short and long term management decisions, and also highlights the potential level of incentives that may be required to trigger these changes.

The project has developed some sound understanding of what is required to achieve regional biodiversity targets through its analysis of ecological, economic and agronomic data collected from farms in the mid and upper Goulburn and combined further data collected on nine properties in similar central Victorian landscapes. The results from this research indicates that substantial increases in the extent and condition of endangered, vulnerable and depleted vegetation types can be achieved particularly through adoption of strategic grazing management of hill country that enhances perennial native pastures so to increase biodiversity value as well as production value.

However, there is also pressure on some farmers to intensify using fertiliser and sow introduced pasture species. Given current economic pressure and increasing land values, fertiliser strategies are likely to be attractive to many farmers. Because of this, the project examined a strategy that combines targeted fertiliser use on selected areas of the farm along with managing 15% of the property for biodiversity. It was found to be as attractive, or more attractive, an investment as grazing management changes on many farms, and dependant on the fertiliser history of the property. Communication products have emphasised the need for care with where and how fertiliser is used, given potential impacts on native vegetation and aquatic life.

Adjustment of the enterprise mix to include more cropping with less emphasis on grazing is likely where the landscape allows, which may also have negative consequences for biodiversity. For these farmers opportunities to meet broader vegetation goals depend on identification and conservation of priority areas on farm. We estimate that on most farms this is limited to 15% of the farm area, as areas managed larger than this are more difficult to offset by improving production on the most productive parts. The findings suggest that (on average) if stocking rates could be increased by about 20% on the most productive parts of a typical hill country farm in central Victoria, this should be enough to offset the costs of managing a total of 15% area of the farm for biodiversity management. In the Goulburn Broken, this would meet their catchment targets.

However, there is also pressure on some farmers to intensify. Given current economic pressure and increasing land values, fertiliser strategies to increase stocking rates are likely to be attractive to many farmers. Because of this, the project examined a strategy that combines targeted fertiliser use on selected areas of the farm while managing 15% of the property for biodiversity. It was found to be as attractive, or more attractive, an investment as grazing management changes on many farms. However we have estimated that managing more than 15% of the property for biodiversity, which in some cases may be

necessary to assist in meeting catchment goals, will not be affordable on many properties. Furthermore intensification on some farms is likely to proceed, but extensive voluntary conservation areas seem unlikely. If conservation areas were established, voluntarily or enforced, not all farmers could maintain their current financial situation.

For those farmers willing to adopt or continue low input systems (without additional fertiliser application) substantial improvements in cover and extent of native vegetation may be expected. We have identified that changes in grazing management could improve the profitability of these management systems, but again adoption may be limited by the level of private investment required and the smaller potential improvements in profitability.

Recommendations on achieving biodiversity targets

The project has provided recommendations on how biodiversity targets can be met at a catchment scale, through promotion of the 4 strategies highlighted in the project findings. The recommendations have been promoted using a whole farm approach that is relevant for both commercial and lifestyle landholders in the mid and upper Goulburn regions. This approach is of interest and relevant to both lifestyle and commercial landholders, as it highlights the impact of managing for biodiversity outcomes, on farm profitability, cash flow and investment requirements. These measures are of high relevance to these landholders, as financial barriers are one of the key barriers to adoption of any environmental works.

Attempts have been made to predict the potential changes in the extent and condition of native vegetation at broad scales that could occur through adoption of simple strategies at a farm scale. Results indicate that substantial areas could be revegetated through natural regeneration and that better grazing management has potential to improve native vegetation cover on up to 2 million hectares in Victoria alone.

As a result of the communication activities, the findings are being adopted in a number of ways across the Goulburn Broken CMA. Recent funding (DAFF) of a pilot incentives program designed to provide incentives for graziers to change their whole farm management to improve native vegetation as well as address farm business, provides an opportunity to test the DAV40 project findings more widely. Whole farm planning courses being carried out in the Goulburn Broken CMA, will also integrate the project findings. DSE and DPI extension officers working with native grasses and biodiversity projects in the Goulburn Broken CMA, have already requested extension notes and are communicating the project findings to landholders they are working with, at workshops, field days and farm visits.

Identifying and overcoming barriers to adoption, and incorporation of these findings into CMA and DPI/DSE extension programs and policy, is one of the key challenges of this project. Institutional arrangements may form a barrier to allow for the uptake of the findings by various programs leading to on-ground adoption. These include the investment processes, and institutional barriers between DPI, DSE and CMAs.

Extension staff who deal directly with landholders have existing relationships built on trust. It is important for these staff to feel confident and comfortable with the research findings before they can assist in promoting the benefits of the research. Landholders very rightly perceive risk with changes in management, such as intensive rotational grazing. Therefore it is important to gain confidence and support, which could be achieved through field days on properties where these techniques are already being used, and expert advice. However it should be recognised that a key aspect of this research has been informing and developing management options from practice based research, which is then used to inform programs to increase the adoption of practices.

The research findings can contribute to the goals of different native vegetation and biodiversity programs. These programs usually prioritise sites based on conservation significance of the vegetation community and the quality of the vegetation. The project discovered that the mid and upper Goulburn regions have large areas of low quality native vegetation that offer a significant opportunity for increased native vegetation outcomes when considered as a part of a whole farm or property management system. This also represents a shift in the approach to native vegetation management, moving from the 'locking up' mentality to sustainably using native vegetation as a part of the productive farming system.

A key implication for the way native vegetation programs are run is the immediacy of action needed to take advantage of ecosystem resilience in natural regeneration. Tree decline is advancing at such a rate that important opportunities will be missed if action is not taken within a few years.

There is a clear pathway to integrate biodiversity conservation messages into agricultural education and extension programs so that it is a management consideration in whole farm production systems. While conducting the research the project team has engaged extension officers and landholders involved in the Sustainable Grazing Systems (SGS), Best Wool 2010, and Landcare networks in the Goulburn Broken CMA, and indeed across central Victoria in relation to the DAV39 project.

Further work with institutions and organisations

There are opportunities for alignment or 'joining up' of policies and integration of program delivery to ensure clear and consistent delivery at the land manager level. This will not only result in optimising resources and knowledge, it will also stream-line delivery from an agency or service provider level and reduce the number of extension staff attempting to develop and maintain relationships with land managers.

In summary there are no major conflicts between the research findings and the broad direction of government policy. In terms of agricultural policy from industry or government the research findings might represent a shift, from merely minimising negative environmental impacts to the ability to demonstrate positive environment impacts from active agricultural production. The most significant challenge is finding the impetus for program managers and policy makers to change in light of these findings.

The first role of government might be to inform farmers that opportunities are available to change whole farm management plans to incorporate biodiversity management, without adverse impact on the farming business. This information would necessarily emphasise that there are several available strategies, and that careful case by case consideration and on-farm advice will determine which strategies are good investments for the particular property.

The second role of government might be to pursue initiatives that lead to greater uptake of the opportunities by farmers. For this role, the question becomes what policy will trigger change required to achieve sought after outcomes. It would also require careful evaluation of the possible initiatives. Auction based programs like Bush Tender (Stoneham et al., 2003) will have a role – what the fit is between such programs and whole farm based approaches requires investigation (Crosthwaite 2003).

Objective 3. Identify and map revegetation priorities within selected sub-catchments from a biodiversity perspective. Identify least cost scenarios for achieving optimal biodiversity values, develop “current recommended practises” and feed these simple decision rules into relevant projects such as the MDBC Landmark project.

The project identified and mapped detailed revegetation priorities at a farm scale in the 2 case study farm regions. This mapping incorporated sub-catchment scale native vegetation priorities and models of the likelihood of natural regeneration. Using this approach the implications of broader scale revegetation priorities and vegetation processes could be considered at a farm scale.

The revegetation priorities focused on improving the extent and condition of existing native vegetation. Manipulation of grazing management to enhance the probability of natural regeneration of trees and /or understorey was seen as a key strategy to achieving these goals.

Spatial predictive models of the likelihood of natural regeneration of eucalypts were developed through a survey across central Victoria. These models were applied at farm and catchment scales to determine the areas that could support natural regeneration under varying grazing management scenarios. Rules based modelling based on current best understanding of the processes of natural regeneration was used to predict the temporal probabilities of regeneration. This research was combined with farm scale financial models to estimate the costs of natural regeneration once temporal uncertainty has been considered. This

research underpins assessments of regeneration potential in the GBCMA under the “Bush Returns” incentives program and has significant potential to inform revegetation strategies across south-eastern Australia.

Approaches to improving the extent and condition of understorey vegetation were informed by assessment of current literature, new ecological work undertaken by this project, and concurrent research being undertaken on grazing management on native pastures in central Victoria and the South West Slopes of NSW. Models of vegetation condition were developed using empirical data and management variables. These models provide a simple framework for understanding current cover and diversity of native understorey vegetation and developing hypotheses to predict future vegetation cover under varying management. This was encapsulated in a simple state and transition model framework and used to provide ecological information to underpin economic assessments of grazing management strategies tested in this research. The recent DAFF funded native vegetation pilot will apply these models and the state and transition framework in assessment of on-farm strategies.

Environmental benefits of retaining and enhancing native biodiversity

The research undertaken in this research project highlighted that where intensive grazing management systems dominate few native plant species persist and regeneration of over-storey plants are unlikely. Bird abundance and diversity are also most impacted under intensive management. Intensive management is also well correlated with a general increase in the cover of annual grasses and forbs (broad leafed weeds). Thus it is apparent that where management leads to the loss of native biodiversity, there is an associated decline in overall environmental benefits.

This project has identified several approaches, suitable for varying management systems, that could lead to improvements in the current extent and condition of native vegetation across the existing farms. Much of the vegetation in the landscapes to which this project applies is either considered regionally endangered, vulnerable or depleted (eg. plains grassy woodlands, grassy woodlands, creek-line grassy woodlands, grassy forests). Thus the results obtained through this project have the potential to significantly contribute to regional native vegetation goals. The increases in the extent and condition of native vegetation are likely to also strongly contribute to broader environmental objectives such as salinity, soil and carbon management.

The project has produced 6 scientific research papers and numerous extension material detailing the benefits of or approaches to improving the extent and condition of native vegetation. The results have also been widely presented at research conferences, policy forums, grower meetings and field days

The following table lists the major findings from the research, and the implications for landholders, extension staff and regional programs/industry – the key audiences identified in the Bennett's Hierarchy, which guided project planning and implementation.

KEY FINDINGS	Implication of finding (what you need to do)		
	Landholder	Extension officer	Program/Industry
1. Adopting a whole farm business approach has potential to identify ways that farm goals and broad-scale native vegetation management can be achieved	A whole farm planning exercise including sound farm financial appraisal, will help landholders to pinpoint priority areas for improving stock carrying capacity and profits, at the same time as improving native vegetation management.	Promote the whole farm approach, including sound farm business analysis in the context of a whole farm plan, to landholders, to achieve both production and environmental goals	Promote the whole farm approach as a method of analysing the financial and environmental impact of alternative management strategies.
2. Paddock trees currently provide the potential to substantially increase tree cover through natural regeneration but tree decline could halve this potential in only 30 years	If managing for increased tree cover prioritise those places most likely to regenerate naturally.	Promote natural regeneration as the favoured form of getting trees back in the landscape where spatial likelihood is high	Promote/provide incentives for management strategies that increase the likelihood of broadscale tree regeneration.
3. Carefully positioned shelter trees can increase sheep performance and wool profits by \$1 /DSE per year in the long term, however this requires investment in fencing and temporary de-stocking of shelter areas.	Encourage the establishment of shelter trees in all paddocks, preferably in large clumps.	Promote the financial benefits and costs of establishing shelter trees	Promote/provide incentives for temporary fencing to encourage shelter trees
4. The most rapid and low cost increases in vegetation condition are likely to be obtained through natural establishment of trees and shrubs in native pasture	Encourage natural regeneration to establish shelter, through temporary fencing	Highlight the financial and biodiversity benefits of natural regeneration over conventional establishment methods	
5. There is much uncertainty about how long it takes for native plants to re-establish and this translates into risks and costs for the grower or investor. For this reason maintaining or enhancing the condition of existing native vegetation in moderate to good condition is far more cost effective than establishing new vegetation	Manage existing native vegetation better rather than establish new patches	Identify which native vegetation areas to maintain or enhance, and how	
6. The cover and richness of plant species declines exponentially with increased soil phosphorous, primarily as a result of fertiliser application	Reduce or eliminate phosphorous application on parts of the farm being managed for biodiversity	Identify the priority parts of the farm to manage for biodiversity, along with reduced fertiliser application	Incorporate information about native plant responses to phosphorus fertiliser into current industry programs
7. Approaches that seek to integrate native vegetation into an extensive low input production system may lead to the greatest gains in native vegetation condition and extent and have greatest potential to meet broader catchment targets			Incentive payments, for provision of ecosystem services, could be explored for those farmers willing to undertake extensive low input management systems
8. Changes in land management to improve native vegetation condition, have potential to be applied to approximately 2 million hectares throughout Central Victoria leading to substantial catchment scale benefits.		Promote the use of deferred grazing, targeted fertiliser use, natural regeneration and intensive rotational grazing to landholders	Management and incentives targeted at the whole farm can have broader regional and catchment scale outcomes

9. Frequent grazing and competition from introduced/improved pastures substantially reduce the likelihood of natural regeneration by paddock trees.	Use grazing management to enhance the likelihood of successful natural regeneration. Crash graze if seedlings absent and remove stock to promote germination and establishment	Promote those strategies that increase the likelihood of tree regeneration	Promote/provide incentives for appropriate fencing and investigate potential for incentive payments to control livestock and weeds where regeneration potential is high
10. Fencing to land class combined with Deferred grazing of hill country, can generate between 10-30% increase in annual profits and an increase in native vegetation condition on hills.	Fence according to land-class, and adopt deferred grazing management on these areas.	Promote ground cover and management benefits and investment costs of land class fencing Promote biodiversity and stocking rate/economic benefits of deferred grazing Promote environmental and weed benefits of deferred grazing to landholders.	Promote/provide incentives for land class fencing and watering points, particularly on
11. Improving profitability on productive parts of the farm, can offset biodiversity management on other areas of the farm—up to 15% of the farm area.	Correcting nutrient deficiencies on already productive paddocks, needs to increase carrying capacity by 17% on average to offset the extra costs of biodiversity management on 15% of the total farm area.. Adopting intensive rotational grazing across the property, needs to increase carrying capacity by 22%, to offset biodiversity costs	Promote regular soil testing on a paddock basis. Promote targeted fertiliser application, while managing least productive parts of the farm for native vegetation outcomes. Promote profit and native vegetation benefits of intensive rotational grazing.	Promote incentives for whole farm planning incorporating biodiversity management on priority parts of the farm. There is still much uncertainty as to the biodiversity benefits of rotational grazing. There is a need to encourage funding of alternative grazing strategies
12. On areas of the farm where landholders are intent on intensification through fertiliser application, there is little opportunity to integrate productivity and native vegetation. Under these circumstances native vegetation outcomes must be met through lands especially set aside	Fence off (with gates) and cease fertiliser on those areas managed for biodiversity outcomes alone	Identify the priority parts of the farm to manage for biodiversity	Incentives payments may be required to achieve more than 15% of the farm managed for biodiversity outcomes

HOW WAS 'SUCCESS' TO BE MEASURED IN YOUR PROJECT?

The pathway to success was identified with the help of Bennett's Hierarchy (see below), for four categories of 'next user' – farmers in the upper & mid Goulburn, other farmers in Victoria, extension officers and program industry staff.

Success was defined as:

- a) Two types of changes by case study landholders
- b) extension officers actively promoting results
- c) wider awareness of the findings
- d) program changes that result in:
 - better informed leaders and clearer understanding of the barriers to adoption of biodiversity management
 - acceptance of biodiversity management and farm business realities
 - increased ability to integrate project outcomes into programs
 - better program and project design – to incorporate biodiversity management

Surveys, phone calls, complete project outputs (ie. brochures etc), and feedback from meetings and conversations were used in the assessment of success. These results can be viewed in the attached evaluation report, by Jeff Coutts.

Program Logic: Managing landscapes to meet public biodiversity and farm business goals

SEE Conditions	Conservation & enhancement of native biodiversity while maintaining or improving farm profitability/viability for landholders in the UG
Results of Next Users' Work	Landholders modifying their farm management practices

Case study farmers		Farmers in Upper/mid Goulburn	Other farmers in Victoria	Extension	Programs
CHANGES ADOPTED BY NEXT USERS					
	- Have and understand a plan on changes to farming management systems to help increase the capacity to manage for biodiversity whilst maintaining or improving farm profitability/viability - Commenced implementation of low cost options			- Extension staff & consultants promoting results to landholders - Integration of results into other DSE/ DPI extension programs	
KASA					
Knowledge	Know how to access information on changes to farming management systems	Understand the farming systems that have been demonstrated by case study farms and how my farm differs Know how to progress from here		Better understanding on how to advise on biodiversity management and how it can be incorporated into farm business, and understanding of alternative management options to meet multiple objectives	Better informed leaders and clearer understanding of the barriers to adoption of biodiversity management
Attitudes	Better acceptance of, and increased capacity for management			Acceptance of biodiversity management and farm business realities	Acceptance of biodiversity management and farm business realities
Skills	Better decision making skills			Increased ability to integrate advice.	Increased ability to integrate project outcomes into programs
Aspirations	Better land & biodiversity management			Communicate results to farmers and lifestylers	Better program and project design – to incorporate biodiversity

Case study farmers	Farmers in Upper/mid Goulburn	Other farmers in Victoria	Extension	Programs
Reactions				
- Landholders interested in participating & learning from the project - Positive reactions to alternative farm management systems - Strong farmer attendance at field days and the like		Understand the project and know how to progress from here	Willingness to take part in the project and help adopt the results	Keen to observe the project and take up the findings
IMMEDIATE USERS				
- Case study farmers - Project staff	- Neighbouring farms, including lifestyle farmers - Project staff	- Other farmers in Victoria - Extension staff	- CMA staff - Other extension staff: - Ag service industry - Consultants - DSE/DPI extension officers, deliverers – Edge, Farmbis, etc - Landcare, LFW, GAV, TFN	- DPI programs - Industry groups - C&W - DSE programs - Biodiversity
Dissemination Activities				
- On-farm demo's/trials - Field days "Toolkit" of management recommendations for biodiversity management	- Presentations to landholder groups - Press releases "Toolkit" of management recommendations for biodiversity management. - Newsletters/flyers	- Presentations to extension staff - Press releases "Toolkit" of management recommendations for biodiversity management. - Newsletters/flyers	- Trial area meetings of project coordinators - Preparing material for courses, manuals, web sites etc - Incorporating material into project delivery - Workshops/seminars "One on one" work - Contributions to the "toolkit"	- Briefings - Seminars - Reports - Input to program reviews
Research Findings				

	Case study farmers	Farmers in Upper/mid Goulburn	Other farmers in Victoria	Extension	Programs
	- Capacity of landholders to incorporate biodiversity management into their farm businesses - Barriers to on-farm biodiversity management - Costs & benefits of revegetation techniques - Costs & benefits of incorporating biodiversity management into farming systems			- How to best communicate results - Preparation of a "toolkit" outlining various management options for biodiversity conservation. - How best to integrate biodiversity management into EMS to gain market advantage.	- Program changes that are needed to achieve the agreed outcomes - The capacity of landholders to achieve "optimal" local landscape design for biodiversity, and the types of trade-offs required - List of potential incentives for landholders in conjunction with each barrier to adoption of biodiversity management
RESEARCH ACTIVITIES					
	- Collection of farm financial records - Business planning session - Pasture assessment - Biodiversity assessment - Landscape visioning session - Bioregional & EVC mapping - Complete survey incorporating attitudes before & after change - Work with farmers/industries to develop the "toolkit" on options for capturing market advantage. - Pasture & biodiversity assessment - Research and technical papers published			- Identify potential case study farmers - Landscape visioning - Identify alternative farm management systems to incorporate biodiversity management - Organize farmer meetings - Help implement farmer surveys - Negotiations with farmers/lifeytlers & industry	- Involve key policy makers with the project. - Collaboration with similar projects across Australia
Resources					

MONITORING AND EVALUATION:

Project monitoring and evaluation was carried out using a number of methods. Over the life of the project, notes were recorded from all meetings attended regarding feedback and questions raised when talking about managing for biodiversity and farm business goals. Surveys were also carried out and analysed with the help of the University of New England, Armidale, near the beginning of the project, and again at the end.

There were also a number of “feedback workshops” held, particularly for woolgrowers and extension staff to provide the project team feedback on the various strategies developed and communicated by the team. A notable meeting held at Ararat, provided the team with critical feedback on how best to communicate the results to woolgrowers. Feedback meetings were held in each of the 3 trial regions.

Anecdotal evidence was also collected, such as quotes from woolgrowers at various field days, and made when interviewing for press releases.

Bennetts Hierarchy was used as a framework to evaluate the successes of the project. Each target audience identified, was assessed in terms of practise changes, skills, knowledge, aspirations, communications activities and messages.

Jeff Coutts from Coutts J&R/Pod Media, was engaged to pull of this information together into a usable format. The attached evaluation report uses all the above information collected by the project team, and draws conclusions from this material.

SUMMARY OF COMMUNICATION, TECHNOLOGY TRANSFER OR ‘ADOPTION’ ACTIVITIES:

(DETAILS OF THE FOLLOWING ACTIVITIES CAN BE SEEN IN THE ATTACHED DOCUMENT, “COMMUNICATIONS RECORD”)

1. Regional field days on selected case study farms, for local landholders
2. Distribution of landholder brochure outlining project findings to landholders across the catchment, via Elders and Landmark.
3. Presentations to Landcare and Bestwool groups in the trial regions
4. Extension officer field workshop, held at a case study farm at Warrenbayne
7. Presentation and display of results at numerous local, regional, national and international conferences and workshops
8. Press releases to Victorian print media, and regional Landcare network newsletters
9. Series of 3 extension notes designed and printed, and distributed to extension officers working with landholders across the GBCMA
10. Design and creation of web site to access project findings and background
11. Project update newsletter sent to all project stakeholders
13. Preparation of individual custom farm reports to each participating case study farmer
15. Publication of several research papers in peer reviewed academic journals

ASSESSMENT OF ANY COMMERCIAL POTENTIAL:**Market Potential Assessment:**

The project team have assessed the project outputs as having no market potential currently. This assumption doesn’t take into account the findings being integrated into existing courses notes and various extension programs.

LIST OF PRODUCTS

Products for landholders
❖ Brochure outlining findings for landholders
❖ Individual farm report for case study landholders
❖ 2 field days—Broadford and Violet Town on case study farms
❖ Access to project findings and more information via website
Products for extension officers
❖ Series of 3 “extension notes”, including case study examples
❖ Display poster with key findings for future landholder events
❖ Access to project findings and more detailed information via website
Products for industry/program staff
❖ Policy directions report
❖ Evaluation report
❖ Access to project findings and more information via website
❖ Map of regions that the project findings are applicable to
❖ 6 Published research papers
❖ Native vegetation management report
❖ Final report including key findings

WHERE CAN THE READER OF THIS REPORT OBTAIN ADDITIONAL INFORMATION

The project has its own web page located within the DSE website. with further details on the project, including a selection of papers and press releases that can be downloaded:

<http://www.dse.vic.gov.au> > conservation & environment > biodiversity & agriculture

OVERALL, WHAT ARE THE KEY LEARNINGS – GOOD OR BAD – FOR LWA FROM YOUR PERSPECTIVE**Main Points:**

- For regional vegetation goals to be met, will require a significant level of on-farm private investment.
- It is likely that adoption of the recommended management strategies would be sped up through a farm incentives program.
- Adopting a whole farm business approach has potential to identify ways that farm goals and broad-scale native vegetation management can be achieved
- Short time frames for ecological changes to occur meant some uncomfortable extrapolations for ecology and impacts on production
- There are some tradeoffs – native vegetation goals are harder to meet in intensively managed parts of the farm, current best practice for production will not lead to optimal native vegetation outcomes.

RECOMMENDATIONS ON THE WAY FORWARD

The research findings should be taken forward in the following ways:

1. Findings need to be incorporated into various programs and policy as follows:
 - o Multiple Outcomes projects in the natural resource field that are collaboratively managed by DSE, DPI and CMAs
 - o Extension programs across North-East and Central Victoria, including whole farm planning courses, EMS programs, and grazing programs.
- 2 DAFF have funded the further extension of the findings of the Farm business & biodiversity research, in a new “Native vegetation incentives for graziers” pilot program, as part of the Federally funded Native vegetation regional pilot projects initiative. This project will trial incentive payments to graziers to adopt changes to their whole farm management to gain native vegetation outcomes, based on the results from this project. If successful, there is potential for this whole farm approach to be trialled in a wider area and across different land types. An MBI application (which is currently being assessed in the final round), is applying for funding to carry this work out. If the whole farm approach is successful in gaining native vegetation outcomes and wide acceptance by landholders, there is potential that NAP/NHT could use this approach.
- 3 Testing the findings in other regions of Victoria, and more widely in south-eastern Australia.
- 4 Involvement in the national Evergraze project in NE Victoria. The project findings are relevant to this project, and the project team has been written into the proposal at a 10% contribution, to provide input into the farm economics and biodiversity component. With more resources, there is potential to make a major contribution to the national Evergraze project – the team contributed on ecological, economic and methodological grounds to the recent national workshop
- 5 Further research is still required to increase our certainty about the likely impacts of the possible management strategies on native vegetation and other components of native biodiversity. In particular our research has suggested that fertiliser applications have very negative impacts on native plant diversity and cover, but would such outcomes occur if alternative grazing management strategies were adopted? We have predicted that there is considerable spatial potential for eucalypt regeneration in these landscapes but we still have little information to predict when regeneration is most likely to occur. Anecdotally it has been suggested that rotational grazing strategies, particularly when it involves short duration grazing events (days) and long rest periods (months) benefit native vegetation and favour eucalypt regeneration. Such benefits need to be better documented.
- 6 Investigate further effects of the four strategies, and other ways of improving native vegetation, on land values. Mid-term comments on the economics method by Bill Malcolm identified ways in which this could be done.

LIST OF ATTACHMENTS:

The list of attachments on the CD ROM includes:

- Technical Reports
- Fact sheets
- Management Guidelines
- Landholder survey reports
- Evaluation reports/survey forms
- List of landholders involved with experimental trials/natural experiments/case studies (I'll need to check the privacy provisions here, but wanted to acknowledge their input where possible)
- Journal articles
- Newspaper/newsletter/ media articles and items
- Conference/Workshop Papers
- Other Publications
- Other

SUMMARY of MONITORING and EVALUATION ACTIVITIES
(Please cross-reference responses to more detailed reports where available)

Project code and title:

Managing landscapes to meet public biodiversity and farm business goals

Dates (over full life of the project): 2002-2006

Context issues that have affected project progress and outcomes (eg droughts, prices, legislation): These projects were established in the context of continued pressure on farm profitability while loss of native vegetation was recognised as a serious environmental issue resulting in loss of habitat and biodiversity. Much of this vegetation is managed by rural producers. The challenge has been to develop strategies to maintain and enhance biodiversity without impacting negatively on productivity and profitability.

Activities/outputs and people involved/reached

Activity and Outputs	No.	Landholders involved**	Service providers	Other* stakeholders	Comments
Activities					
Field sites (where research was undertaken)	8	8 landholders with a combined total of 5,057 hectares	2 private orgs, 2 gov. depts., 1 CMA		Case studies undertaken at these sites working closely with landholders
Courses					
Workshops	1	2	25 extension officers/agency staff		
Field days	3	95+ in trial area	3+ consultants and 1+ staff from related projects	2+ policy makers and 2+ program managers	
Steering Committee	7	0	5	2	Representatives from DSE, LWW, and CMA's
Presentations to groups, extension or program/policy	31+	250+growers in trial area,	10 consultants and 30 staff in related projects	20+ policy makers and 20+ program managers	
Conference presentations	4				Includes international conference – difficult to estimate numbers and type of participants
Outputs (numbers)					
Conference publications (say if abstracts or full papers)	10 abstracts 7 full				
Journal articles (say if published, in press or submitted)	7				Three published, three in press, one submitted
Fact sheets	3	30 landholders	30 extension	10	These relate to the series of

Activity and Outputs	No.	Landholders involved**	Service providers	Other* stakeholders	Comments
			officers		3 extension notes printed.in Feb 06
Brochures	1	110 – with an extra 200 to be distributed by August 06	65 with an extra 200 to be distributed by August 06.	50 to various LWA and program staff	These figures relate to the specific “dog collar brochures – other information sheets have been developed and circulated widely.
Media articles	21	5000+ statewide and nationally	50+ consultants and 50+ staff in related projects	50+ policy makers and 50+ program managers	
Web sites/sections	1				Project web site under the Victorian DSE web site
Tools or guidelines					
Other outputs	2	8 individual case study farm reports	1 map of area where findings are applicable		
Total people reached by project					Note may be some overlap

*Please list other stakeholder groups included in the table:

Landcare coordinators, Bestwool 2010 coordinators, LWA program staff, consultants who contributed to project

**Please comment on interaction with/numbers of “influencers” involved at any level:

Key outputs or products to emerge from project of direct value to landholders

Key findings, information or product developed through project	Level of relevance to landholders in project region or state (numbers of groups, hectares of land that could be impacted on)	Level of relevance to landholders beyond region or state (numbers of groups, hectares of land that could be impacted on)
Series of 3 extension notes	Relevant to landholders across Central Victoria who want more detailed information-up to 6 million ha.	Relevant to landholders managing hill country in south eastern Australia—Tasmania, South Australia, New South Wales, Victoria—up to 10 million ha.
Website	Relevant to all landholders in central Victoria—up to 6 million ha	Relevant to landholders managing hill country in south eastern Australia—Tasmania, South Australia, New South Wales, Victoria—up to 10 million ha.

Stakeholder Reactions – to the project and LWA in general

Stakeholder group	Summaries and examples of reactions (for example perceived usefulness or value of activities or products)
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Stakeholder group	Summaries and examples of reactions (for example perceived usefulness or value of activities or products)
Landholders	Overall, there was a high level of interest in the project and its activities amongst all groups.. Landholders in the trial areas and/or who attended presentations of the project and its findings at meetings showed a high level of interest in the information presented (especially in low cost options, deferred grazing and the inherent value of biodiversity) while showing a preference for improved pasture, raising concerns about fuel build up and pests and the need to be profitable. There was an early need expressed for strong economic data – which later emerged out of the project. Case study landholders were generally supportive of the activities and recommendations emerging from the project.
Service Providers	Extension officers, project leaders and regional program managers are comfortable with results. This has been demonstrated by repeated requests for the DAV40 project leader from CMA and other agency staff for him to give presentations to Implementation Committees, field days and Landcare group meetings. Most Extension Officers who attended presentations involving findings from both projects have recognised the relevance of the recommendations to landholders in their local district although some were of the opinion that the recommendations had limited relevance to landholders in flatter districts). Reactions from regional program managers (CMA, DSE, DPI) at meetings and field days indicate that there is a very positive feeling about the contribution that an approach that addresses farm business issues could make to achieving regional biodiversity targets.
Researchers	Two science publications published through this project have been described as extremely important and valuable contributions by science peers. Presentations to economics audiences have been very well received, and regarded as making important linkages between farm business analysis and environmental management. A presentation of research results at an international conference was well received and led to invitation for publication in a special issue of science journal.
Media reaction/ interest	The 2 farmer field days, generated media interest, with at least 3 stories/media articles written in response. The media has been interested in the project findings over the life of the project, and stories have appeared in a wide range of media such as, ABC radio, Stock & Land, Thinking Bush, Country News, and various Landcare network newsletters throughout the Goulburn Broken catchment.
Other stakeholders	Policy and program management responses from statewide program managers in DSE and DPI were very positive to findings emerging from the projects with follow-up actions following a Melbourne-based forum on the issues. DAFF have shown a lot of interest in the results and subsequently funded a 1 year pilot project trialing incentive payments to graziers to make whole farm change so as to improve native vegetation outcomes. There has been positive reactions from consultants involved in the project, such as Jim shovelton (MS&A), and various landholders not involved in the project and outside the Goulburn Broken CMA. Further to this, the changes in practice (see below) actually occurring provides evidence of important change in this area

Improvement in understanding or skills in relation to program objectives

Stakeholder group	Summaries and examples of gains in understanding or skills
Landholders	Case study landholders reported that they made changes as a result of interaction with the project in the areas of fencing, rotational grazing and financial records. There is some evidence of practice impact from other growers and landholders in line with key recommendations from the project. Most practice change in this broader group would be expected to occur over the medium term post-project. Case study landholders also expressed an improvement in understanding of the financial costs and benefits to their business of adopting strategies to manage native vegetation. The improved ability to identify native grasses was also considered a benefit by many landholders involved in the project. Identification of native grasses was carried out at all field days, and the level of interest from attendees was particularly high.
Service Providers	The information presented at the workshops had a positive influence on Extension and CMA staff perceptions of the importance of taking a whole farm approach towards conservation of biodiversity. They increased their capacity to place their advice in a whole farm context, while also knowing when to call in expertise (eg. production or conservation) that they do not have. They increasingly have the skills to incorporate aspects of the approach into their other work eg. whole farm planning, regional biodiversity planning.
Other stakeholders	The changes in practice (see below) actually occurring provides evidence of important change in this area

Changes in attitudes or motivation in relation to project objectives

Stakeholder group	Summaries and examples of changes in attitudes or motivation
Landholders	Studies by UNE associated with the project indicated that that graziers' attitude towards native grasses is changing (positively).
Service Providers	The changed motivation of extension officers and program managers is demonstrated by the considerable upwards communication occurring at managers meetings and program team meetings about the results and how the programs can change as a result (eg. whole farm planning). This is now occurring independently of the DAV40 project team members. The potential of the farm business approach to contribute to achieving regional biodiversity targets motivated Tim Barlow, regional biodiversity manager for Goulburn-Broken CMA, and Geoff Park, knowledge broker for the CMAs in northern Victoria, to take an active interest in the project and specifically to facilitate regional field days for extension officers. Program managers have also been motivated to become actively involved in developing the new DAFF-funded project.
Other stakeholders	The changes in practice (see below) actually occurring provides evidence of important change in this area

Changes in practice or information demand in relation to project work area as a result of project information or activities

Stakeholder group	Summaries and examples of practice changes (including numbers and areas of change where applicable and known)
Landholders	Case study landholders reported that they made changes as a result of interaction with the project in the areas of fencing, rotational grazing and financial records. There is some evidence of practice impact from other landholders in line with key recommendations from the project. Most practice change in this broader group would be expected to occur over the medium term post-project.
Service Providers	Regional program managers (CMA, DSE, DPI) are incorporating the thinking behind the project into their project planning for meeting regional biodiversity and NRM targets. They are also including information from the project into other programs. The focus of extension officers and project leaders (eg. Bush Returns) has changed focus, especially in the CMA. Rather than just concentrating on back paddock where remnant vegetation is found, a whole farm approach is increasingly being taken. Project leaders and extension officers are also using their own networks and meetings to communicate the approach and the findings. This is happening within the Landcare Coordinator's Network and the North-East Native Grasses group; the network is now initiating presentations to groups. Extension officers are reporting on the findings at field days, without DAV40 project team members being present. UNE studies noted that extension agents who attended presentations intended to extend all four strategies to landholders in their district in the next year. The author concluded that the workshops for production extension staff have, and will continue to have, a significant impact on their extension activities. Surveys of extension officers who attended workshops on project outcomes showed that half were currently using information and ideas from the project in their own work. Extension officers who met with case study landholders developed a set of key messages (and rules of thumb) from the information emerging from the projects. This included such things as "grazing properties with stocking rates <8 DSE/ha, have more scope to improve both farm profits and manage 15% area for biodiversity" and "Landclass fencing in hill country can improve both biodiversity & farm profits by allowing deferred grazing management".
Other stakeholders	DAFF are funding a pilot project to examine whole farm incentives delivery, based on the approach taken in DAV40 and DAV39. DPI and DSE policy branches have been very receptive to the work, and it is percolating into programs and potential funding initiatives. DPI Meat & Wool extension program initiated a funding bid to do further R&D building on DAV40 and Dav39. They have a strong presence in north-east Victoria, in and around the project areas. It is likely that they will incorporate findings into their existing programs. The North-East regional component of the national Evergraze program has invited the DAV40 project leader to be part of the program. The EMS pathways program (managed by VFF's Greg Smith, based in north-east Victoria) have expressed strong interest in being linked to the DAFF project, and hence indirectly to the farm business approach, and its roll-out.

DAV40 Broader productivity, environmental or social impacts and potential impacts of project

Key findings, information or product developed through project	Productivity benefits to date and potential benefit over the next 5 years (where possible include figures and assumptions made)	Environmental benefits to date and potential benefits over the next 5 years (where possible include figures and assumptions made)	Social benefits to date and potential benefits over the next 5 years (where possible include figures and assumptions made)
It has been shown, via a farm business approach, that there are opportunities to make significant changes on grazing properties that are a good investment and that deliver biodiversity outcomes that will make an important contribution to regional catchment targets. Stakeholders are taking these findings up, and incorporating them into programs and extension messages to landholders.	Small productivity benefits achieved over life of project from adoption of project findings, by a relatively small number of landholders including the eight case study farmers. On conservative assumptions, there has been an increase of 2 dse/ha at \$20/dse across 500ha (on 4 farms) – an increase in net profit, assuming no capital costs, of \$20,000. A more optimistic assumption would be for such an increase over 5,000 ha (greater adoption on 10-20 farms) – an increase in net profit of \$200,000. Given the numbers of extension officers now interested in the findings, and extent to which they are promoting them, such an increase is likely within one or two years, if it has not already occurred. Over a longer time period, and more fully accounting for capital costs, an extra net profit of \$1.2 million per annum can be expected across Victoria, and \$2.0m across south-eastern Australia. This is based on the following analysis. The findings are relevant to farms in Victoria that manage approximately 6m ha, and to 10m ha in south-eastern Australia. The area within these farms to which the findings about managing native pasture and remnant vegetation apply is approximately one-third – ie. 2m ha in Victoria and 3.3m ha across south-eastern Australia. If the approach were adopted on just 5% of the 2m ha in Victoria (100,000 ha), or 3.3 m ha in	Small environmental benefits have been achieved over life of project. Ecological responses to management can be slow and difficult to distinguish from inherent variation, particularly owing to climate. For this reason environmental benefits can only be coarsely estimated at this stage. Within five years we predict that there will be adoption of management that has the potential, given appropriate climatic conditions, for the following environmental outcomes within Victoria: a) A small increase in perennality and ground cover on between 50,000 ha and 100,000 ha (2.5% - 5% of 2 m ha). This has the potential to improve native vegetation condition, salinity, water quality and carbon sequestration. b). A small increase in condition (increased native understory cover, improved structure, increased regeneration of overstorey) of native vegetation (apart from native pastures) across 15,000 ha (5% of the predicted 300,000ha of remnant vegetation). c). Signs of a future increase in the area of remnant vegetation due to natural regeneration on the perimeter of existing	The social benefits from the project are considerable, at least for the landholders involved. The response from other landholders at project presentations suggests that others will respond in the same way. Industry and region-wide, the benefits will be significant. The following overview of the benefits is based on an assessment by the project leader of his dealings with the case study landholders and with other landholders (over 100) at meetings and presentations. It is supported in a general way by the results of the landholder interviews undertaken by UNE (although the questions were not framed directly to elicit this information). Landholders involved in the project have a greater sense of 'doing the right thing for the environment'. It gives them satisfaction, and relief, to know that grazing can go hand in hand with environmental management. They like to think that their industry is on the right path. They sense that their credibility as good managers is increased. It has given some of them improved confidence in existing farm practices, where they are consistent with the project findings. These landholders have more confidence now about investing in environmental management

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	south-eastern Australia (165,000 ha), it would require an average extra investment of \$12m or \$20m respectively (based on \$120 /ha in fencing and water)). With an average 10% return on this investment, net farm profits would increase by an extra \$1.2m or \$2.0m respectively per year. This is an approximate analysis. A more sophisticated economic analysis, using well-defined methods, is required if the potential net benefits are to be determined accurately. An expectation over five years is for such productivity gains to occur over 25,000 to 50,000 ha (this is a rough estimate based on the above assessment).	areas. This might be across 7500 ha (2.5% of farm area on 5% of properties). d) Signs of natural regeneration occurring around isolated trees and patches of paddock trees in paddocks. This might be across 7500 ha (2.5% of farm area on 5% of properties). These are at best guesstimates by the project team. We have endeavoured to be realistic. In the long-term, much more significant gain across 2m ha in Victoria and 3.3m ha across south-eastern Australia can be expected. If they occur such gains could make a significant contribution to catchment targets.	in future. They are happier that environmental management is not out of their reach. It also gives them hope for the future. The landholders are very interested in the financial outcomes. Positive business improvement helps them to become more positive about environmental management.

Other outcomes/benefits

Alliances developed with other projects	CRC/MLA Grazing and biodiversity in native pastures project (DSE, CSIRO); BushReturns implementation and research (with GBCMA and Uni Melb); LWW projects in Tasmania, NSW and SA; EVERGRAZE DPI Meat & Wool extension program
Examples of innovative activity stimulated by the project	private sector involvement in communicating conservation management new pilot project investigating application of delivery of incentives at a whole farm level production-orientated extension officers incorporating biodiversity conservation messages into their work
Emerging funding opportunities to build on project activities and outputs	DAFF native vegetation pilot project National Market based instruments initiative – funding bid passed the first round. Multiple Outcomes projects in Victoria potentially based on the approach Evergraze 2 in north-east Victoria

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Other projects or agencies that have picked up on findings	DPI programs, including Meat & Wool extension program but also extension officers in other programs DSE and CMA regional programs delivering extension in northern Victoria DAFF in identifying value of the work, and funding the native vegetation pilot Evergraze nationally, and in Victoria, have been very responsive to the approach and findings DPI and DSE policy branches have been very receptive to the work, and it is percolating into programs and potential funding initiatives
Other demand for information or outputs	