

Introduction

Never before has biodiversity conservation been viewed, as it is in this Resource Kit, as making a truly positive contribution to Victorian agriculture, to farm families and rural communities. For the first time, materials to help agricultural industry training providers and educators to explain biodiversity, in all its facets, to present and prospective farmers have been compiled. This Kit is based on the value systems and drivers that underpin rural cultures and decision-making. It offers a new and exciting approach to biodiversity education.

The Kit aims to help landholders understand the opportunities for biodiversity to contribute to their lifestyle and family business. It responds to the need for increased knowledge of how we can manage sustainably and provide opportunities for our children. Through activities, fact sheets, case studies and discussion, it demonstrates that biodiversity conservation is both practical and fulfilling.

It has only recently been recognised that private landholders have a major role to play in conserving biodiversity. Over 60% of threatened Victorian ecosystems occur on private land. With that recognition comes a range of new opportunities and responsibilities for farmers.

The Commonwealth government recently identified, as a priority for agricultural research, projects that maintain ecosystem function; avoid adverse off-farm impacts; and work towards ecological sustainability and promotion of biodiversity protection (Warren Truss, Minister for Agriculture, Agriculture Fisheries Forestry Australia). Farmers need to understand what biodiversity is and how to manage it if they are to participate in sustainable land management in the 21st century. The approaches taken in this Resource Kit offer a useful starting point.

How to use this Resource Kit

Who is the Resource Kit for and how is it different?

This kit provides information and a process to enable educators working with rural communities to understand the link between native biodiversity and landholder values. It repackages biodiversity information in a format that helps in defining what motivates landholders and turns them on to biodiversity and recommends expanding the variety of learning approaches in order to engage with more of the audience.



The intention is to regularly update materials as new information comes to light. Check for updates on the Department of Sustainability and Environment's website www.nre.vic.gov.au and follow links through Conservation and Environment—Biodiversity—Rural Landscapes to Living Systems. This kit provides information and a process to enable educators working with rural communities to understand the link between native biodiversity and landholder values. It repackages biodiversity information in a format that helps in defining what motivates landholders and turns them on to biodiversity and recommends expanding the variety learning approaches in order to engage with more of the audience.

This kit helps to identify some of the business and personal opportunities available through improved natural resource management. It has been prepared in response to government vision, and to the broader community expectation that agribusiness look for new opportunities to contribute to biodiversity conservation and to sustainably managing natural resources.

Major Outcome - turning people on to biodiversity

It is hoped that participants will leave a training program that has integrated the process defined in this Kit with a strong desire to include biodiversity as part of their property management goals. A measure of the success for the integration of biodiversity would be that at the conclusion of a course landholders would ask *'where can I learn more about biodiversity?'* and *'what can I do on my property for biodiversity?'*

This Kit *is not* about providing an all-inclusive biodiversity education program, rather it introduces the key drivers motivating people to include biodiversity within property management. It encourages educators and facilitators to use these drivers in discussions which highlight the role of biodiversity in achieving personal and property management goals (for information on existing educational programs refer to References: Courses – biodiversity and natural resource management.) This kit provides an introduction to biodiversity and encourages participants to explore the full range of potential benefits.

Key Drivers and Turn Ons

This Resource Kit identifies four major drivers that motivate people on the land to incorporate biodiversity into farm management practices. These drivers are the values of **wellbeing, relationships, sustainability** and **wealth**. Where practical, discussions and examples for incorporating biodiversity into farm management are grouped around these major values.

The kit also includes a framework for turning people on to biodiversity. Turn ons include experiences in the bush, understanding, mentors and spiritual feelings. The key drivers and turn ons are the crux of this new approach to teaching biodiversity. We strongly encourage users to understand them in detail and contemplate the powerful messages they contain.

Kit Outline

The Resource Kit has been organised into three categories, each providing different resources that will enable educators and facilitators to deliver a program that integrates biodiversity within an existing training course.

Activities

Activities provide an exciting and fun learning environment and the kit includes a range relating to teaching adults about biodiversity and natural resource management. Activities have been prepared as individual work sheets. Each activity should take no more than 15 minutes to complete. They can be incorporated into existing programs and be used to examine the different drivers landholders have for managing or becoming involved in biodiversity. Activities have been selected to demonstrate different learning outcomes. By linking these to similar learning outcomes within an agribusiness course, the educator or facilitator will be able identify where biodiversity might contribute to achieving course objectives.

Fact Sheets

Adults often want to know the facts and research that underpin decision-making. The fact sheets provide this information in a clear and concise format that provides background information for educators. Individual sheets may be copied and distributed to course participants to provide case studies, statistics or issues-based information on biodiversity management.

'Signposting' information

This last category can be used in response to the "tell me more" question. It lists contact details, references and a calendar of grants and events. It can be used to direct motivated landholders to organisations promoting and dealing with biodiversity and natural resource management and will enable them to access additional information and advice.

Defining Biodiversity

What does biodiversity mean, how do you define it? Ask around and it doesn't take long to realise that there are many different definitions of biodiversity. Some people consider trees alone represent biodiversity, whilst others take a global view of the diversity of resources available to agriculture and see conserving rare breeds of domestic animals as conserving biodiversity.



Australians have a low awareness of the term biodiversity and a poor understanding of the concept. A national AC Nielson phone poll (1999)¹ found that while 4 in 10 Australians had heard of the term, only 1 in 10 understood the concept. The remainder thought the term was concerned with financial planning (buy-diversity) or alternative lifestyle (bi-diversity). This awareness rate has remained static since the early 1990's.

Biodiversity (or biological diversity) refers to the variety of life forms; the different plants, animals and microorganisms, the genes they contain, and the ecosystems they form. The concept emphasises the interrelated nature of the living world and its processes. It is not static, but is constantly changing. It is more than just a living catalogue of species. Biodiversity includes ecosystems (the web-of-life). Australia is home to over one million different native plant and animal species, and hundreds of different ecosystems. It is the local ecosystems that provide the services, such as clean air and water, on which we all depend and which are vital to agriculture. Many interactions, such as pollination, would not be possible without the presence of other species and processes.

Biodiversity is usually considered at three different levels genetic diversity, species diversity and ecosystem diversity.²

Genetic Diversity: the variety of genetic information contained in all of the individual plants, animals and microorganisms

Genetic diversity is the genetic building blocks of all life and occurs within and between populations of species as well as between species. Genetic diversity also produces easily seen differences in many native Australian species, such as the White-cheeked Rosella, which has yellow head plumage in north Queensland, red head plumage in southern Australia, and black head plumage in the Northern Territory. Genetic diversity is the basis of crop resistance to disease and weather, can produce differences in products such as varieties of corn, or can contain genotypes that help when selecting cultivars to rehabilitate degraded systems e.g. salt resistant *Eucalyptus camaldulensis* (River Red Gum).

¹ Glanzig, A., (2002). *Australians Current Awareness and understanding of Biodiversity issues Confronting its Conservation*. www.cbn.org.au

² Environment Australia., (1993). *Biodiversity and its value*. Biodiversity Series, Paper No. 1. www.ea.gov.au/biodiversity/publications/series/paper1/

Species Diversity: the variety of living species

This is the most common way people think about biodiversity. At the global level, an estimated 1.7 million species have been described to date; current estimates for the total number of species in existence vary from five million to nearly 100 million. In Australia, with an estimated total number of native species (excluding bacteria and viruses) of 475,000, about half are known, but only a quarter formally described. In agriculture, species diversity is represented as the range of crops grown and is vital to the fishing, forestry and wildflower industries.

Ecosystem Diversity: the variety of habitats, biotic communities and ecological processes

Australia has a broad range of ecosystem types ranging from arid lands to tropical rainforests, to the sea grass beds found in many of our coastal waters. The number of different ecosystems in Australia is thought to be in the hundreds. Ecosystem diversity also describes the tremendous diversity present within ecosystems in terms of habitat differences and the variety of ecological processes.

Successful agricultural production and sustainable use of resources is based on understanding the role these individual ecosystems play in enabling farmers to grow plants and stock the land. The provision of clean water, renewal of soil fertility, even the pollination of crops is all based on the farmers understanding of ecosystem diversity.

Biodiversity and Victorian Farming Properties

Biodiversity is a new term and one that we all need to be familiar with, as it affects us all and is a fundamental part of our lives and all agricultural production. Maintaining biodiversity is much more than just protecting wildlife and their habitats in nature conservation reserves. It is also about the sustainable use of resources and safeguarding life-support systems. Biodiversity is part of sustainable land management. Sustainably managed farms are well placed to adapt to change and are vital in providing and maintaining a range of ecological services.

Agricultural Biodiversity

Agricultural biodiversity includes all components of biological diversity of relevance to food and agriculture, including genetic crop and livestock resources.

Agricultural biodiversity:

- provides food,
- provides income and materials for clothing, shelter and medicine.
- performs ecological services essential to human survival, such as nutrient cycling, pest and disease regulation and pollination.

Much has been written about the impacts on biodiversity from land use practices, but only limited work has been done on how farmers, the "custodians of biodiversity," manage their resources to sustain and enhance them.

Defining Native Biodiversity

Biodiversity is a broad term and can be applied to many different situations.

For the purpose of this kit the term biodiversity will be restricted to the indigenous (local native) ecosystems of Victoria and their components, be they native plants, animals or microorganisms.

Discussion in this kit of biodiversity issues is generally confined to issues affecting rural landholders. Issues of 'global' or 'cosmopolitan' biodiversity (eg the identification of genetic biodiversity to conserve rare breeds, or ecosystem biodiversity to conserve, for example endangered Panda Bears) is outside the scope of this kit and the Living Systems Project.

Suggested Action

Use the term native biodiversity to refer to local native plants, animals and ecosystems.

Eco-agriculture

Eco-agriculture as a new form of agriculture, designed to raise farm production and incomes while increasing native biodiversity, particularly in biodiversity hotspots³.

Eco-agriculture is built on the concept of ecosystem management, by increasing wildlife habitats in non-farmed patches in agricultural landscapes and by enhancing the habitat quality of productive farmlands. Concrete measures for adopting eco-agriculture approaches include:

- creating more biodiversity reserves;
 - preventing conversion of wild land into agriculture;
 - crop intensification;
 - strengthening pest management.



The key criteria for determining a 'hotspot' is endemism (the presence of species found nowhere else) and degree of threat. The degree of threat is measured in terms of habitat loss. Hotspots have lost at least 70 percent of their original natural vegetation. The 'hottest of the hotspots' have lost more than 90 percent of their original vegetation.

³ - Bai, C., Penniman. T. and Wagner. L., (eds.) (2001). Summary of the International Symposium on Managing Biodiversity in *Agricultural Ecosystems Sustainable Developments*. The International Institute For Sustainable Development, Volume 63, Number 01 <http://www.iisd.ca/linkages/sd/mbae>

Biodiversity and Sustainability

'No species, and no generation, has a right to sequester Earth's resources solely for its own benefit.'

– State of the Environment Australia Report 1996

The essence of ecological sustainability is that resources are utilised at a rate at which they can replace themselves; they are left intact for future generations. The concepts of 'stewardship' and 'custodians of the land' have been accepted by many in the farming community as reflecting the role they play in managing their properties sustainably. Biodiversity is a fundamental pillar of ecological sustainability and was identified as one of the three core objectives in 'The National Strategy for Ecologically Sustainable Development':

- to enhance individual and community wellbeing and welfare by following a path of economic development that safeguards the welfare of future generations
- to provide for equity within and between generations,
- **to protect biological diversity and maintain essential ecological processes and life support systems.**

To achieve ecological sustainability we need to develop ways of using those environmental resources which form the basis for our economy in a way which maintains, and where possible, improves their range, variety and quality. Ecological sustainability therefore has two components – *maintenance and restoration*. The development of ecologically sustainable systems will require the development of agricultural systems that both *maintain* biophysical and ecological systems and restore the ecological landscape.

Biodiversity conservation is essential to achieving sustainable clean and **green** production. Many agribusinesses are currently preparing Environmental Management Systems (EMS) that provide clearly defined standards and measures of how well they are managing sustainable production. Many are now examining the role of biodiversity management as a key component of these EMS's.

There is a significant and growing market demand for greener production, with global markets increasingly seeking proof that products are sourced in a sustainable manner. Innovative farmers will identify and incorporate future opportunities to manage their properties sustainably, whilst businesses that are able to demonstrate sustainable production, including biodiversity protection, will be well placed to maintain market access when others may be excluded. Biodiversity of rural landscapes in Victoria has been in decline since European settlement:

- 94% of forest cover on private land has been cleared.
- Of 3,158 native vascular plant species, at least 1,479 are rare or threatened and 33 of these are thought to be extinct.

One in four of our mammal species has either become extinct or is threatened. This is clearly not ecologically sustainable. To respond we must:

- first achieve a situation of no further losses (no net loss) and then
- aim to improve conditions so that all species and ecosystems can survive (net gain) and establish conditions that would allow resources to replace themselves.



Identifying what turns people on to biodiversity

A Framework for Designing Biodiversity Education - 'Turn Ons, Values, Motivations

Turning participants on to biodiversity is the principal aim of this kit. So a key question to consider is how can you, as an educator, 'turn people on' if they aren't already.

A common approach to biodiversity education has been to reveal the underlying catastrophic consequences of biodiversity loss and expect that will change behaviour. Whilst this approach may suit some audiences, this kit recommends expanding the variety of approaches in order to engage with more of the audience.

Barr and Cary (2000)³ argue that in order to increase the adoption of natural resource management practices we need to acknowledge the diversity of 'farmers' and move beyond the innovators, early adopters and laggards model of extension. Extension needs to promote private benefits to the landholder. Innovations that have been profitable, or believed to be profitable, have been readily adopted. Landholders prefer less complex and observable outcomes. Barriers to change are often structural, so we must acknowledge that extension needs to be part of an overall strategy. They state that 'family and financial security are generally the highest priority goals for Australian farm families'.⁴

The kit has developed three approaches to promoting biodiversity:

1. Learning from what has 'turned on' others.
2. Relating biodiversity to landholder values.
3. Relating biodiversity to landholder motivations.

Learning from what has 'Turned On' Others

A small survey of people who have developed a strong interest in biodiversity revealed that there were four key factors that initiated their interest:

- **Experiences** in the bush. These experiences may have come about in many ways including bushwalking, hunting, fishing, scouting, visiting family and friends, etc.
- **The associated feeling** that the natural environment contributes to a 'sense of place', is mysterious, defines us, offers more to learn, etc.
- **A 'champion' or 'mentor'** who provided inspiration and insight. The champion may have been a teacher, family or friend or celebrity.

⁴ Barr, N. and Cary, J., (2000). *Influencing Improved Natural Resource Management on Farms: a guide to understanding factors influencing the adoption of sustainable resource practices*. Bureau of Rural Sciences, Canberra.

- **Understanding** the nature of ecosystems and species, their diversity and uniqueness. For example through reading books, close observation of specimens, collecting, keeping, interacting, travel comparison, etc.

A combination of these factors is likely to work most effectively with an audience. It is well understood that people have a range of learning styles, which are inherent in their personality and individuality. So remember when designing a training program to include each of the four key turn ons.

How to use this approach

Examples include:

- Make sure the training program includes an experience in the bush.
- Discuss with participants how they feel when they are in the bush or how they might feel if there was no bush and native wildlife.
- Invite a biodiversity champion to speak to course participants.
- Have a researcher or an expert in ecosystems visit the group and discuss aspects of species and ecosystems and their management.

Key message

Biodiversity is an exciting and fundamental component of the world in which I live.

Suggested action

Review your education or training program to include one or more of these methods.

Relating Biodiversity to Landholder Values

This approach uses our understanding of core values and assumes that people will make decisions according to what they value. This assumption is not always true, particularly if basic needs including food, shelter and safety are not currently met. It is unlikely that adults are going to change their core values in the short term, so this method relates biodiversity to existing values. Internationally recognized core values include power, wealth, enlightenment, skill, wellbeing, affection, respect and rectitude.

The Living Systems project has identified four primary values that can be used to design educational approaches to a landholder audience:

- Wellbeing values.
- Relationship values.
- Sustainability values.
- Wealth values.

Of these, wellbeing appears to be the strongest overall value held. This is probably because it encapsulates elements of all the others. These are not the only values that are important, there are many others. For example, lower risk is an important value to some people. Biodiversity can contribute to reducing risks on farms through preventing extinctions and thereby providing options to future generations or, as shown in a case study included in this kit, by controlling erosion so that livestock no longer die after falling into erosion gullies.

Repeatedly asking trainees why something is important to them will help determine their core value (eg. Landholder: "We want to make more money from the farm." Trainer: "Why do you want more money?")

How to use this approach

The key question to consider is 'How does biodiversity contribute to my values?' An alternative is to look at how values would be affected if biodiversity is lost.

Biodiversity contributes to all our values in numerous ways. For example,

- **Wellbeing values** - it can contribute to health through less use of pesticides, to stress release through providing relaxing places to visit.
- **Relationship values** - biodiversity contributes to the options and experiences available to future generations.
- **Sustainability values** - biodiversity is a fundamental pillar of sustainability.
- **Wealth values** - by reducing input costs (such as for pest control) and through new opportunities.

As with all landholder training, participation of all members of the family is encouraged as this will reveal the breadth of values held within families.

Key message

Biodiversity contributes to what you value.

Suggested action

Base your education or training program around revealing existing core values and relate biodiversity to them.

Relating Biodiversity to Landholder Motivations

A review of the Australian literature revealed several factors that have been identified as key motivators of landholders, particularly farmers. Please contact the Living Systems Project if you require more details of this review. Key factors identified in the review included:

- **Increased efficiency** (saving time through efficiencies).
- **Product quality** (a pride in producing quality products).
- **Heritage** (a feeling of custodianship, or family tradition on the land and the land as home).
- **Care of the land** (wanting to look after an asset)

How to use this approach

These factors could be discussed during the training course, or as a preliminary exercise or during a field trip to a farm business.

For example:

- Have participants research the former biodiversity of their area by contacting relatives and local older identities.
- Discuss what the green means in 'clean and green' produce and how this might affect marketing and Australia's international position.
- Ask participants to write their own eulogy with reference to care of the land.
- Discuss the potential for biodiversity to contribute to managing land that might otherwise be a 'sink' for time and resources better spent in the most productive parts of a property.

Key message

Biodiversity can contribute to farm efficiencies, to higher quality products and is a fundamental part of the reason people choose to live in rural environments.

Suggestion action

Review your education and training program to reveal the contribution of biodiversity to the key motivational factors for farmers.

Conclusion

Each time you design a training program or activity, we recommend that you check it against these three simple frameworks. The activities section of this kit provides more detail on specific activities that can be used with adult landholders.