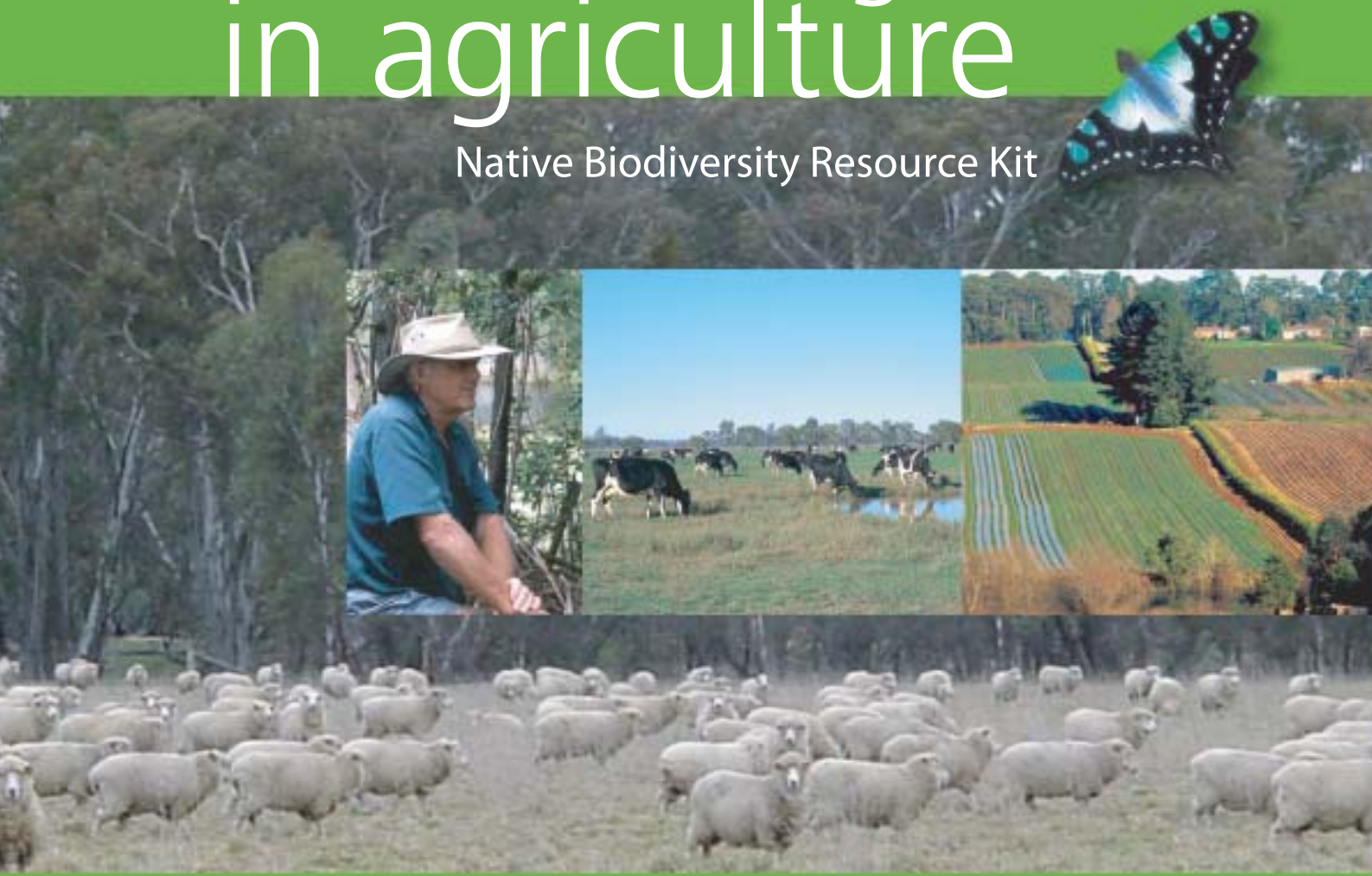
Department of Sustainability and Environment

Environmental management in agriculture

Native Biodiversity Resource Kit



Victoria
The Place To Be

Acknowledgements & Contents

Environmental Management in Agriculture - native biodiversity resource kit

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Imagine a new approach to farming that could assist production, sale of produce, and conservation of Victoria's native biodiversity. This Resource Kit provides the opportunity for Victorian farmers to differentiate their produce by substantiating native biodiversity in the green part of 'clean and green'.

By demonstrating their green credentials, Victorian farmers can have an edge over their competitors that benefits them, both in the marketplace and back on the farm. This Resource Kit captures the best of what is currently available to integrate native biodiversity within agricultural systems and establishes tools to identify the appropriate biodiversity standards that land managers can use to monitor sustainable agricultural practices.

This Resource Kit has been developed as a result of a pilot project (Best Agricultural Practice for Native Biodiversity in Agriculture) that engaged a range of agricultural enterprises and farmers throughout Victoria. This project aimed to establish a practical and systematic approach for measuring and managing native biodiversity and sustainable agricultural practices. The project involved more than 20 farming properties and was undertaken between March 2001- March 2003. Beef, wool, fat lamb, grains and pasture production enterprises were all represented in the project. Farmer suggestions and feedback collated during the pilot project has formed the basis for developing this Resource Kit. A reference group of stakeholders provided additional comment and direction (this reference group included representatives from: Victorian Farmers Federation, Landcare, World Wide Fund for Nature, Sustainable Grazing Systems, Australian Conservation Foundation, and the Victorian Departments of Primary Industries and Sustainability & Environment).

This Resource Kit explains the practical steps involved in including native biodiversity as part of on-farm environmental management. It is not a stand-alone Environmental Management System. It contains all the necessary instructions, advice and support materials to support training and development of the biodiversity elements. Fact Sheets and Work Sheets are provided in a separate CD ROM to support the main text. This Resource Kit can also be accessed from www.dse.vic.gov.au.

The project has been supported by the Biodiversity and Natural Resources Division (Department of Sustainability and Environment) and by the Naturally Victoria Initiative (Department of Primary Industries).

1. Introduction

Environmental management in agriculture

1.1. Who is this Resource Kit for?

This Resource Kit has been produced predominantly to support facilitators and extension staff who work with land managers involved in balancing agricultural production and natural resource management. It is anticipated that a number of the Work Sheets will be used by motivated farmers to gain insights and skills for incorporating native biodiversity within their environmental management programs.

Facilitators and extension staff are encouraged to use and adapt the materials to suit their individual needs and are encouraged to promote the complete work sheet series to interested land managers. The more familiar they become with the various sections, Work Sheets and Fact Sheets, the easier it will be for them to motivate and raise farmers enthusiasm to undertake on-farm management of native biodiversity that is consistent with biodiversity performance standards. Figure 1 (see following page) indicates how the key components of this Resource Kit link and identifies which Work or Fact Sheets will enable land managers to establish targets and management actions to incorporate native biodiversity into an environmental program.

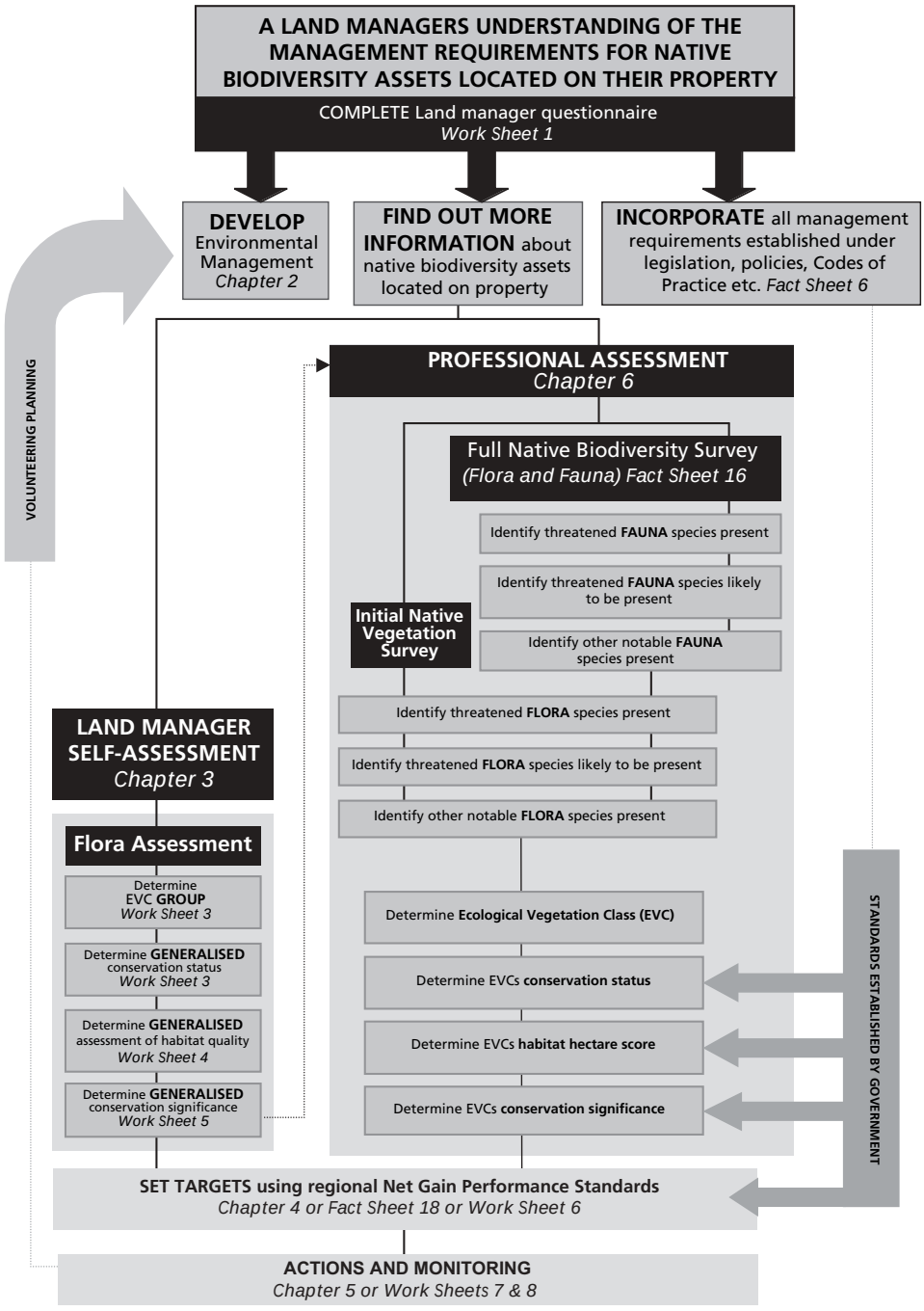
1.2 Benefits of biodiversity

Biodiversity is a new term and one that land managers 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 and management of resources and safeguarding life-support systems.

Biodiversity is part of sustainable land and water management. Sustainably managed farms are well placed to adapt to change and are vital in providing and maintaining a range of ecosystem services upon which agricultural productivity depends. Biodiversity can be considered as having two components - an 'intrinsic value 'and a 'biophysical process'. The intrinsic value focuses on the abstract aspects of biodiversity such as beauty and the right to exist, whereas the biophysical process focuses on the services that a balanced, viable and stable ecosystem provides.

Biodiversity can contribute to many aspects of our lives including our health and wellbeing, our relationships with family and friends, and the farm bottom line. Why should land managers care about managing biodiversity on their properties? What's in it for them? What benefits can they expect from incorporating biodiversity values as part of their daily farm practices?

Figure 1: Flowchart indicating options land managers may undertake to determine native biodiversity actions



The following table lists some of the benefits biodiversity can contribute to creating an ecologically sustainable property, adding value to the family lifestyle or increasing productivity. Whilst not exhaustive, this list provides a summary of biodiversity benefits and may provide a useful reference for land managers who are preparing a list of the individual strengths and opportunities of incorporating biodiversity into an environmental farm management program.

Table 1: Examples of how practices for managing native biodiversity may provide benefits to farming families

MANAGEMENT PRACTICES	BENEFITS TO FARMING FAMILIES	
Shelterbelt establishment		
	Increased shelter for stock, pasture and crops (resulting in increased production)	Better working and living conditions for the family
	Increased property value	Potential wildlife corridors
	Fewer stock losses	Return of bird and other wildlife species
	Legacy for future generations	Contributes to lower water tables
	Contributes to reduced erosion	Improved property landscape and aesthetics
	Spray drift moderated	Stabilises soil surface
	Increased stock health	Fire protection (slower wind speeds)
Retention of remnant vegetation		
	Habitat for birds, mammals and insects (potential reduction in insecticide use)	Increased gross value of pasture output (at its highest whenproportion of remnants is 34%)
	Increased shelter for stock, pasture and crops (resulting in increased production)	Reduced salinity, waterlogging, wind and water erosion problems
	Improved property landscape and aesthetics	Less reliance on introduced pollinators
	Conservation and protection of rare species	Natural regeneration of indigenous species
	Legacy for future generations	Seed supply for on-farm revegetation
	Potential for family recreational opportunities (bird watching, nature walks, etc)	Increased property values
Retention or establishment of native vegetation around farm dams and wetlands		
	Decreased stock fatalities	Safer working conditions
	Waterfowl eat the snail that hosts the liver fluke parasite in sheep	Natural filtration provides cleaner water for stock and homestead
	Interception & use of nutrients before entering storage	Increase in wildlife species
	Bank stabilisation	
Maintenance of native grasses		
	Fire protection (green fuel in summer)	Feed source (selective grazing) in summer
	Low rates of fertilizer required	Reduced micron size for wool
Wetlands established		
	Fire protection (firebreak and water source)	Family swimming area
	Drought back-up	Habitat created (with resultant natural pest control)

The conservation of biodiversity is important for four reasons:

Ecosystem processes
Biodiversity underpins the processes that make life and agriculture possible by providing ecosystem services. Healthy ecosystems are necessary for maintaining and regulating atmospheric quality, climate, fresh water, marine productivity, soil formation, nutrient cycling and waste disposal.

Economics
Our biodiversity is a reservoir of resources that remains relatively untapped. Australian plants and animals provide resources for research and development of foods and medicines. Native vegetation can provide protection from the wind and sun, contributing to improved stock health or crop yields. Native insects can provide valuable pollination services, important for horticultural and cropping enterprises, but also vital in maintaining long term pasture health.

Aesthetics and culture
Biodiversity is a fundamental part of values such as beauty and tranquility. Many Australians place a high value on native plants and animals, which contribute to a sense of cultural identity, spiritual enrichment and recreation.

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

Many farm families already understand the multiple benefits of native biodiversity and its important contribution to their rural lifestyle. Sue Loughridge (dairy farmer from South Gippsland) indicates that the original motivation for planting their steep, over-cleared property was driven by a range of different reasons. As a young farmer, her job was to check areas of heavy tunnel erosion for trapped calves. Today, with over 25,000 native trees and shrubs planted, the tunnel erosion has disappeared and native birds and animals have returned in greater numbers. The next generation of Loughridge farmers have never had to clamber through windswept and waterlogged paddocks with the expectation of finding dying stock. All family members have reaped numerous benefits from working to improve native biodiversity on the property. Whilst farm families receive valuable economic rewards from incorporating native biodiversity as an integral part of their property management, native biodiversity also contributes in non-economic ways to their overall 'wealth'. The Loughridge story is by no means unique and many rural families have discovered that native biodiversity contributes to their property and lifestyle in ways that they originally would never have anticipated.

1.3. Key principles

The key principles contained in this Resource Kit are inherent in ensuring a consistent approach to native biodiversity planning and management, whilst working toward sustainable farming outcomes.

Ecologically Sustainable Development

The long-term ability of agricultural systems to produce the food and fibre we need is under threat in many ways. Moving toward Ecologically Sustainable Development (ESD) of farming practices and systems is necessary to ensure that the viability of our economic, social and environmental resources across our rural landscape is improved. 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 the 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.

Ecosystem Services
Native biodiversity includes the ecosystems in our land and water. Ecosystems provide numerous benefits that make agriculture productive. These benefits include pollination, waste absorption and breakdown, maintenance of soil health and fertility, and provision of shade and shelter (see also CSIRO Ecosystems Services Project www.ecosystemservicesproject.org)

Assessment
Native biodiversity varies greatly across Victoria and so assessments for each individual property are required to determine the presence of native species and vegetation types to adequately inform the farm manager of the presence of native biodiversity assets. The information gained from assessments enables more efficient and effective farm management decisions and actions.

Priorities
The community has identified obligations (voluntary and mandatory) in native biodiversity legislation and policy. Priorities for conservation of native biodiversity are based on the condition and viability of native biodiversity. Priorities will generally reflect Victoria's Net Gain goal, which is a performance standard established by state government (see also *Victoria's Biodiversity Strategy* and *Victoria's Native Vegetation Management – A Framework for Action*, both available as PDF downloads from www.dse.vic.gov.au).

Catchment Targets

Catchment targets for native biodiversity have been set using the Net Gain goal. Regional Native Vegetation Plans and Biodiversity Action Plans guide the extent of management (or level of intervention) required to protect and restore native biodiversity assets in the catchment (see also Victorian Catchment Management Council website www.vcmc.vic.gov.au)

1.4. Key terms: definitions

Biodiversity
Biodiversity, or biological diversity, is: *the variety of all life forms - the different plants, animals and micro-organisms, the genes they contain, and the ecosystems of which they form a part (Victoria's Biodiversity Strategy,* 1997). This Resource Kit focuses on the management of native biodiversity (see definition below) rather than encompass non-native species. This focus is necessary because *Victoria's Biodiversity Strategy* also fulfils Section 17 and the objectives of the *Flora and Fauna Guarantee Act 1988* that directs management and conservation efforts to native biodiversity.

Native biodiversity
Native biodiversity is restricted to the indigenous (local native) ecosystems of Victoria and their components, be they native plants, animals or microorganisms. Native biodiversity frequently occurs on-farm and in such circumstances depends upon rural landscapes for its survival.

See also the *Living Systems Resource Kit* for further information about including native biodiversity in property management planning (www.dse.vic.gov.au for free download).

Best Practice or Biodiversity Performance Standard
This Resource Kit uses the idea of a Biodiversity Performance Standard as a minimum level of attainment for protecting biodiversity assets. Victoria's Biodiversity Strategy sets the standard as a Net Gain goal, which is also articulated in the *Victoria's Native Vegetation Management: A Framework for Action* (see also Chapter 4: Targets: Work Sheet 6).

The performance standards established for native biodiversity have included the catchment targets for native biodiversity. Further details on these can be found in the Regional Catchment Strategies, prepared by individual Catchment Management Authorities.

Environmental Management Systems
An Environmental Management System (EMS) is a management tool for improving environmental performance through a defined process of planning, doing, checking and reviewing.

An EMS is flexible and self-directed. It is based on continuous improvement, which includes checking of progress by the land manager. An EMS will help to identify business risk and streamline farm and environmental management.

By itself an EMS may not guarantee an acceptable outcome for native biodiversity, and this Resource Kit advocates linking EMS and a performance standard. An EMS may include external audit and certification in the reviewing phase.

Australia's National Framework for Environmental Management Systems (EMS) in Agriculture (www.affa.gov.au/ems_framework) seeks to promote improved environmental and natural resource management-including more efficient resource use, better protection/ management of biodiversity, and reduced flows of chemical off farms into water catchments.

See also:
Commonwealth of Australia (2003), *Introduction to Environmental Management Systems in Agriculture,* AFFA, EA, Canberra.

Anderson S., Lowe K., Preece K. and Crouch A. (2001), *Incorporating Biodiversity into Environmental Management Systems for Victorian Agriculture* (a discussion paper on developing a methodology for linking performance standards and management systems), Department of Natural Resources and Environment, Melbourne. www.dse.vic.gov.au

State of Victoria (2003), *An Action Plan for Adoption of EMS in Victorian Agriculture*, Departments of Primary Industries and Sustainability and Environment, Melbourne. www.dse.vic.gov.au

1.5 Government legislation and policies

International, national, state and local level government legislation and policy establish mandatory and voluntary protection and management of native biodiversity. This legislation and policy reflects the communities' aspirations for nature conservation. Voluntary expectations on land managers are expressed in government policy and strategy, which describe best practice for nature conservation as expressed at the international, national, state and local level.

A land manager will need to be aware of all legislation and policy requirements and information addressing native biodiversity protection and management and apply them to the farming situation. National, state and local laws may apply to native biodiversity protection at the farm level. Land managers need to check whether any action they wish to take, that may affect native biodiversity, is likely to have legal implications. Government policy and legislation has established performance standards which will assist them to establish objectives and farm policies that are reflected in targets for native biodiversity management.

Refer to the following websites to access electronic copies of Acts and Regulations. Most have advanced searching and browsing facilities that enable easy accessibility to specific clauses:

Biodiversity legislation: www.dse.vic.gov.au (follow prompts to Conservation and Environment then Legislation).

Victorian legislation and statutory instruments: www.dms.dpc.vic.gov.au

Commonwealth and State Acts: scaleplus.law.gov.au/

Australasian Legal Information Institute: www.austlii.edu.au/

International Treaties: sedac.ciesin.org

Refer to CD ROM *Fact Sheet 6: Victoria's Legislation and Policies – native biodiversity* for descriptions of relevant legislation and policies and examples of possible implications for land managers.

Following is a brief overview of the key conventions, legislation and policy related to native biodiversity in Victoria.

International conventions
There are a number of international agreements (e.g. Japan - Australia Migratory Birds Agreement, China - Australia Migratory Birds Agreement, Ramsar Convention on Wetlands) that exist to encourage the protection and conservation of wetlands or habitats of international significance. Adoption of relevant sections into an EMS is mandatory.

National legislation
At a national level the Commonwealth Government has legislated for the protection of biodiversity through the *Environment Protection and Biodiversity Conservation Act 1999* and other parliamentary acts.

State legislation
A range of legislation covers the protection of native biodiversity in the Victoria. These include the *Flora and Fauna Guarantee Act 1988*, *Catchment and Land Protection Act 1994*, *Planning and Environment Act 1987*, and the *Wildlife Act 1975.* Adoption of relevant sections into an EMS is mandatory. Under the *Planning and Environment Act 1987* all planning schemes contain objectives for the Conservation of Native Flora and Fauna (in the State Planning Policy Framework) and controls for Native Vegetation retention (in the Particular Provisions). These controls require a planning permit to remove, destroy or lop any native vegetation. Native vegetation includes any and all locally native trees, shrubs, herbs and grasses. These provisions are administered by local government.

State policies
Policies adopted by the Victorian Government, such as *Victoria's Biodiversity Strategy (1997)* and *Victoria's Native Vegetation Management: A Framework for Action (2002)* are relevant to land managers as they help to describe the communities expectations for conservation of native biodiversity. At a regional level policy and strategy is co-ordinated by agencies such as Department of Sustainability & Environment and Catchment Management Authorities. Adoption of state policies in EMS would demonstrate the farm practices that are seen to be desirable by the community.

Local strategies
At a regional level, Catchment Management Authorities and Local Government play an important role in natural resource management. Local government has a key role in conserving biodiversity by administering local planning schemes and enacting and enforcing local laws. These also specify minimum obligations that need to be achieved in an EMS. Catchment Management Authorities through their Regional Catchment Strategies and Native Vegetation Plans, and local government through their Municipal Strategic Statements (a component of all planning schemes in Victoria) establish, with the regional community, a vision for native biodiversity.

2. Incorporating Native Biodiversity into Environmental Management

Environmental management in agriculture

Figure 2: The multiple entry levels of environmental management

Tier 1 No audit	
Tier 2 Self-audit	• Self-assessment • Action plan • Some environmental monitoring • Approach similar to Ontario EFP www.gov.on.ca/OMAFRA/english/environment/efp/efp
Tier 3 Self or 2nd party audit	**INDUSTRY EMS** • ISO 14001 compatible • Environmental Policy • Objectives • Monitoring • Review • Environmental Review • Long-term goals • Action plan • Recording
Tier 4 ISO14001 JAS-ANZ	**ISO 14001** • As Tier 3, plus 3rd party JAS-ANZ audit and demonstrated compliance with legal obligations and policy

2.1 A tiered approach to environmental management

Recent approaches to developing EMS-type systems have adopted a tiered approach (refer to Figure 2). This enables an easy 'entry-level' of participation (Tier 1) right through to a fully accredited EMS (Tier 4).

This Resource Kit has been designed to enable people to seek and use native biodiversity materials suitable for incorporating into any tier level and to integrate native biodiversity as part of an environmental management program, including:

- Whole Farm Plan
- Environmental Management System
- Agricultural extension program
- Biodiversity Action Plan
- Local Area Plan.

2.2 Environmental best management practice

'Best practice' is a term in current usage. It describes practices that are considered to be practical and are informed by the best-known outcomes achieved by others in the same enterprise.

Best practice for native biodiversity conservation is rapidly evolving as farming systems better suited to our local environmental conditions are developed. Best practice is judged according to its capacity to deliver biodiversity outcomes in a sustainable agriculture context.

Working voluntarily to achieve a recognised 'best practice' standard is not in itself legally-binding. However, if you make claims to the public through marketing or labelling of 'green' produce or about the practices in place to protect biodiversity then there would be an obligation to substantiate and meet those claims. Working to an agreed process standard, such as ISO 14001 (EMS), carries with it external auditing and requires continual improvement toward meeting set targets and legal obligations.

The EMS/best practice approach to native biodiversity planning incorporates:

- a logical analysis of assets, threats/impacts and actions to address them
- compliance with legislation
- a performance standard
- documentary evidence
- an audit process to check on compliance.

Using this approach enables claims about biodiversity protection and enhancement, or 'green' credentials, to be substantiated.

The information developed in this approach can also be used as a layer of information in your Whole Farm Plan - the native biodiversity layer.

Applying these 'best practice' approaches is consistent with Land for Wildlife membership (see: www.dse.vic.gov.au). Joining Land for Wildlife as well has the advantage of participating in a network of practitioners and so assisting continuous improvement, and obtaining ongoing advice and information.

The Natural Heritage Trust has funded a project in south-western Victoria on 'Environmental Best Management Practice on Farms'. Facilitators worked with individual farmers to develop farm self-assessment worksheets to enable them to benchmark their current farm practice. Farm management issues were organised into 10 categories (including native vegetation management). The potential benefits of the project to land managers include:

- gain confidence and data that landcare works are achieving results and to justify ongoing government support for subsidising landcare works
- have objective data to back up claims that they care for the land
- be able to take advantage of the potential to market their products as being produced using environmentally sustainable methods
- gain a sense of commitment to sustainable land use will be developed in the broader community
- be encouraged to adopt improved land use practices.

Regional Environmental Best Practices (Viticulture)	Focus on the viticulture industry in the Yarra Valley.	Department of Primary Industries, Knoxfield (03) 9210 9222
Enviroveg	A pilot program to provide grower guidelines for best environmental management by vegetable growers. Eight select areas (including biodiversity) that will establish benchmarks to encourage growers to demonstrate environmental performance. Includes assessment requirements and indicators to enable growers to check and monitor their performance.	Australian Vegetable & Potato Growers Federation (AUSVEG). (03) 9544 8098 **www.ausveg.com.au**
Environmental Best Practice for Sustainable Grain Production	Two farmer groups have developed self-assessment questionnaires, environmental monitoring tools and action plans to improve their environmental performance. The project is one of three projects funded by the Grains Research and Development Corporation to help assess the readiness of the Australian Grains Industry for EMS.	Department of Primary Industries, Rutherglen (02) 6030 4500

2.3 Codes of Practice

Most Codes of Practice are established as voluntary standards for the conduct of a range of environmental management activities. They have generally been developed by or in close consultation with, the industry concerned and do not necessarily reflect the views of government. But some Codes of Practice are legislated and can be legally binding.

A number different industry groups have recently developed Codes of Practice that can be used in conjunction with an Environmental Management System. These codes are reference documents that can be used to assist the 'do' and 'check' components of the EMS process (see Figure 3). Adopting environmental Codes of Practice will enable a land manager to improve the sustainability of their enterprise by maintaining and enhancing the quality of the environment and natural resources necessary to maintain that enterprise. Codes should contain details of environmental impacts, best practices (including performance indicators) and any legal obligations.

Table 2 indicates the type of performance standards that have been established in this project. For more information contact DPI Geelong, 136 186.

Table 2: Performance standards

FARMING ACTIVITY	BIODIVERSITY PERFORMANCE STANDARD
Vegetation Management	
Retention of indigenous trees/shrubs.	• 100% retention of remnants.
Planting/ cover of indigenous trees/shrubs.	• 5-10% cover of indigenous trees/shrubs.
Management/ fencing of native trees and shrubs.	• 20-50% native trees and shrubs fenced and managed appropriately (review for isolated paddock trees).
Establishing shelter belts and biodiversity corridors on windward side of paddock.	• 50-90% of paddocks and remnant vegetation linked with indigenous shelterbelts or corridors > 20m wide or 50-90% of paddocks contain a high density of trees.
Management of native grassland/ native pasture.	• Native pasture contains >10 native species/10m^2, with <25% weed cover. • 40 – 60% of the property managed to maintain the health of native vegetation.
Protection of remnants and habitat.	• Advice received re Conservation Covenant and/or Land for Wildlife registration.90 – 100% dead trees, hollow bearing trees managed for habitat.
Management of undisturbed natural areas.	• 50 – 75% of the undisturbed natural areas managed appropriately.
Water Management	
Fencing of waterways and dams.	• All dams and waterways fenced from stock and revegetated with indigenous species.
Restoration/ development/ protection of wetlands.	• 50 - 75% of low lying naturally waterlogged areas fenced with a managed grazing regime in place.
Erosion control on waterway crossings.	• Stable crossings (which do not act as a barrier for fish movement) in place.
Soil Management	
Management of stock in drought periods.	• Grazing/ stocking regime altered early to ensure no damage to the environment.
Controlling Spread of Weeds	
Control of weeds on property.	• Adoption of annual control programs which strategically and systematically treats all known weed infestations without any loss of native biodiversity values.
Nutrient Management	
Protection of waterway edge.	• 70 – 90% of waterways protected by a buffer strip of 30 – 50 metres or wider or • 90 – 100% of waterways protected by a buffer strip 5m or wider in flat areas.

Source: based on McFarlane, G., Trewick, K. & Heard, B. (2003) *Environmental Best Management Practice on Farms*, DPI, Geelong.

Environmental Guidelines for the Victorian Flower Growing Industry	Developed by Flowers Victoria (the representative body for commercial cut flower growers). EPA –approved ISO 14000-based guidelines cover the state's environmental-related legal requirements for flower farming and recommend good environmental practice beyond those currently required. Guidelines enable conduct of audits to ensure that legal requirements are met and to provide assurance to the community.	Flowers Victoria. (03) 9210 9460
Sunraysia Regional Code of Practice for Viticulture	Code divides vineyard activities into 14 practices, then establishes environmental objectives for each of these. Environmental impacts are listed against each of the objectives. These impacts may incorporate biodiversity. Native vegetation management included as one of the 14 practices. Project update available on website	Department of Primary Industries, Sunraysia. (03) 5051 4543 www.dpi.vic.gov.au/farming/enviro_viticulture

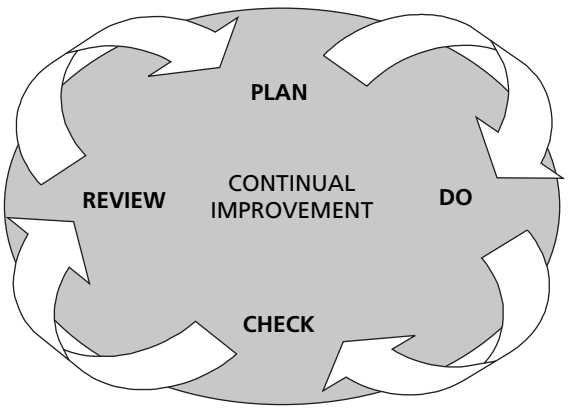
2.4 EMS frameworks

EMS is an integrated management system that businesses can use to identify and manage their impact on the environment and improve production efficiencies.

It is based on a 'plan, do, check, review' cycle that aims to achieve continual improvement in environmental, business and marketing performance. The EMS process allows businesses to address priority issues of concern to them. An EMS is a systematic and methodical approach to planning, implementing and reviewing businesses efforts to manage its environmental risks and impacts. It does not prescribe a focus on any single issue such as biodiversity, water-use efficiency or greenhouse, or set standards for their management. However, the EMS process draws on performance standards for managing such issues included in Codes of Practice, regional natural resource management objectives (such as catchment targets) and best management practices.

EMS can be integrated with other activities such as quality assurance and can, if desired, be certified to an international process standard e.g. ISO 14001.

Figure 3: The EMS process



Why adopt an EMS?

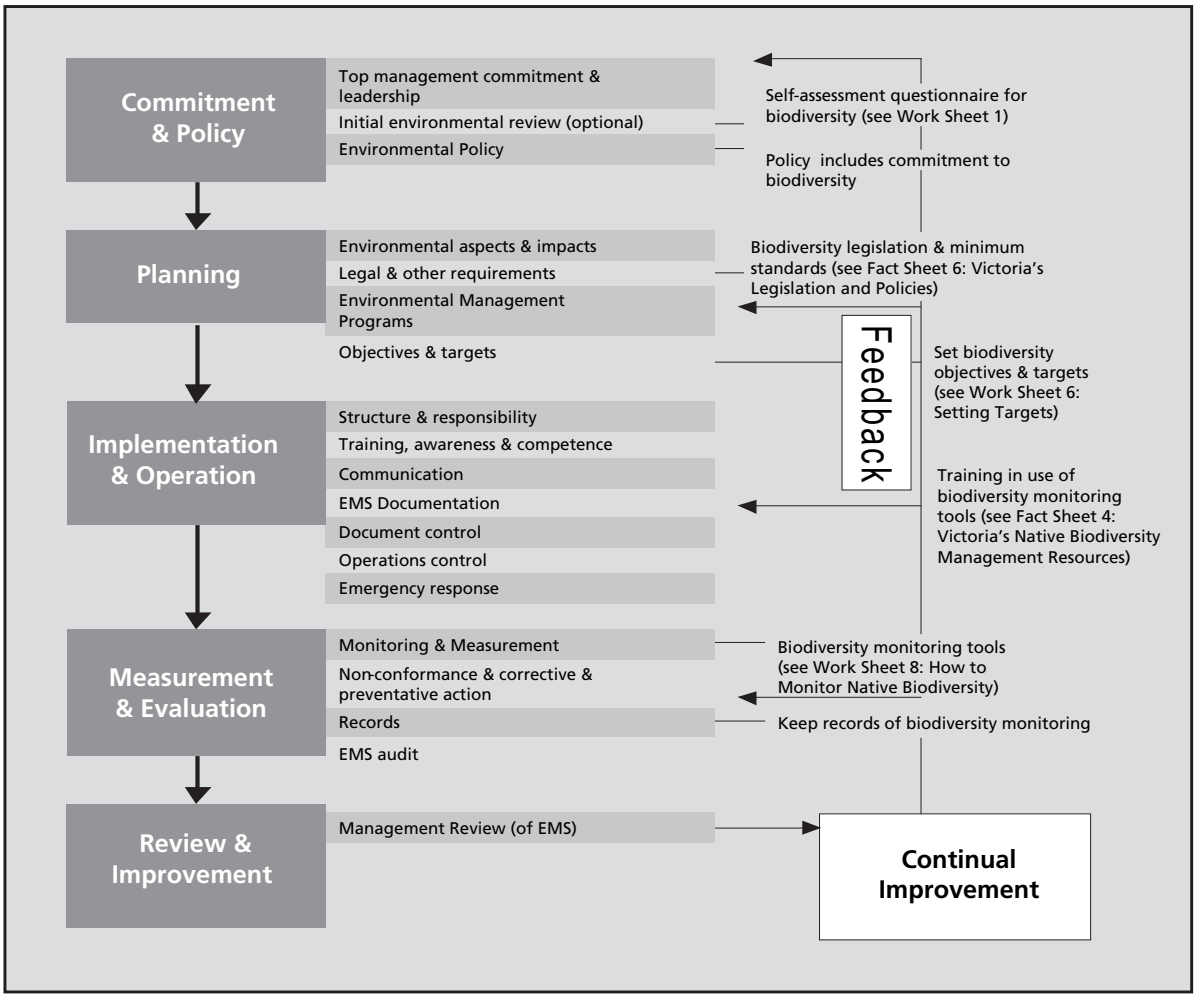
The benefits that could flow from the wider adoption of EMS and accreditation schemes in agriculture include:

- enhanced market prospects- improved market access, greater demand and possibly higher prices that reflect supply and demand
- improved capacity to compete with overseas producers and processors
- greater respect for, and credibility of, environmental claims - therefore greater confidence in industry's willingness to respond to public concerns
- increased ability to differentiate impacts of specific industries and individual producers operating within a region or catchment
- improvements in environmental performance
- a capacity to measure environmental performance and impacts, and target responses
- reduced risk of environmental degradation and associated costs
- greater capacity to meet goals articulated in international agreements, environmental policies and plans (at national, state and regional or catchment scales)
- a reduced reliance on voluntary measures and community education as the primary environmental policy instruments
- innovative and cost-effective regulation, compliance and enforcement mechanisms.

The very least that an EMS will achieve is to encourage continual improvement in the process of current practice that addresses environmental issues. Recent years have seen a growing acceptance and adoption of EMS, partly due to market pressures for business to reduce resource costs, meet regulatory obligations and demonstrate environmental responsibility.

Source: (Anderson, S., Lowe, K., Preece, K. and Crouch, A. (2001). *Incorporating Biodiversity into Environmental Management Systems for Victorian Agriculture*, NRE. Melbourne.

Figure 4: How components of this Resource Kit link to the ISO 14001 process.



ISO 14001

ISO 14001 is an example of an internationally recognised standard addressing environmental management and contains specific requirements, which can be externally audited and certified. It focuses on continual improvement and provides details what is expected to be in a management system.
It does not establish environmental performance standards, rather it specifies the steps required to manage impacts and achieve environmental outcomes.

The external audit and certification may form a basis for supporting claims of green production, which may be of importance when substantiating products in markets. ISO is the commonly, internationally recognised name for the 'International Organization for Standardization' (see www.iso.ch).

3. Native Vegetation Assessment by the Land Manager: Work Sheets 1 - 5

3.1. Native biodiversity self-assessment by the land manager

When undertaking any environmental management the land manager needs to assess native biodiversity assets located on a property. This will enable them to:

- incorporate existing native biodiversity information into any plans/system
- understand their obligations to protect native biodiversity
- be aware of the different ways current management effects native biodiversity.

A land manager will be required to have a basic understanding of the importance (or significance) of their properties biodiversity assets to help them to review their current management and to plan for future activities. An easy way to quickly understand the value of biodiversity assets is by using native vegetation as a focus for review. The presence and quality of native vegetation is a simple way that land managers can use to generalise the likely significance of more complex flora and fauna communities and ecosystems located on their property.

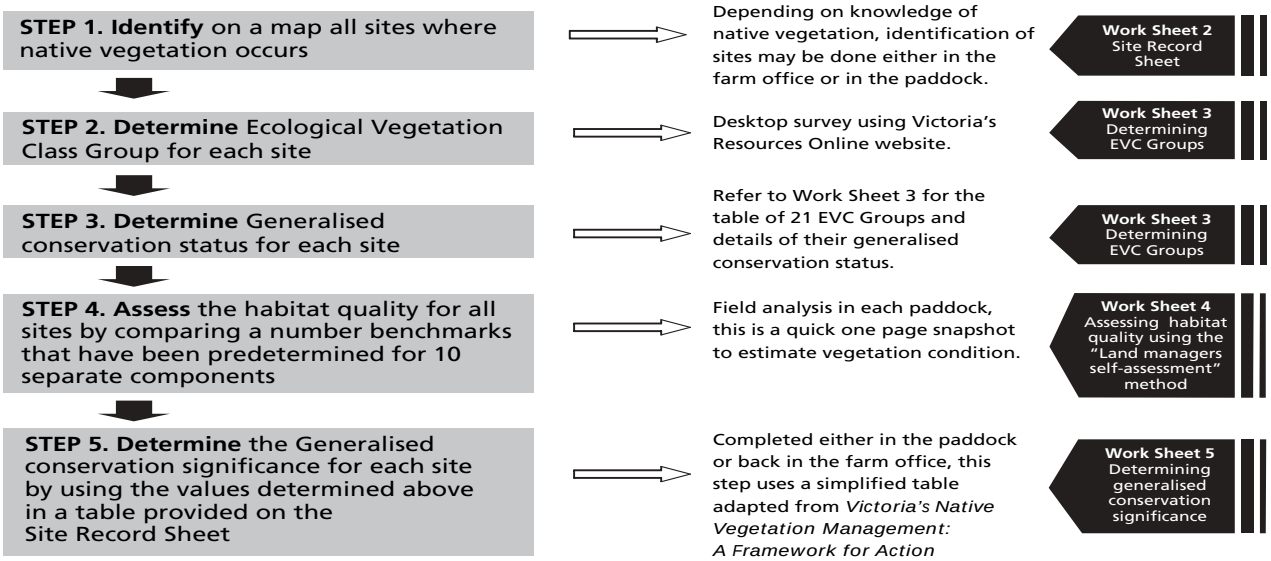
This Resource Kit has developed a number of Work Sheets that will enable a land manager to self-assess native vegetation. The key to the Work Sheets is easy implementation, using existing knowledge, observation skills and an understanding of current property management. They don't require extensive botanical knowledge. By following the Work Sheet series land managers will be able to self-assess the native vegetation located on their property using a basic desktop analysis combined with a farm walk (see Figure 5).

This easy method provides a simplified technique to determine the generalised conservation significance of native vegetation types and has condensed a large and technical data set to enable the land manager to refer to a set of generalised groups, scores or measurements. For most environmental management activities the 'generalised results' determined during a self-assessment will help to establish initial targets and actions, which land managers can use to begin their substantiation of 'green' credentials and achieve compliance with EMS requirements.

By undertaking this initial self-assessment of native vegetation a land manager will be able to prioritise management actions against a range of general targets and become aware of any obligations they may have to protect and manage the native vegetation present on the farm. The self-assessment process is more fully explained in Work Sheets 2-5 (refer to CD ROM). This process incorporates both simplified and generalised tables that have been adapted from the range of performance standards and targets established by government.

After gaining an understanding of the general conservation significance of native vegetation on their property a land manager may decide that they require more detailed information (including a fauna survey) to enable them to improve their environmental management. Because of the complexity of the survey methodology it is suggested that this more specific assessment be undertaken by a professional contractor (i.e. experienced ecologist etc). (Refer to Chapter 6 for background information and guidelines on undertaking a professional assessment.)

Figure 5: Flowchart to determine the generalised conservation significance



Work Sheet 1

SITE RECORD SHEET

Property Name

Paddock Name or Number

Vegetation Site Number (as per sketch map)

Assessor

Date

Sketch map of paddock (not to scale). Show and number all native 'vegetation sites' to be assessed. (**Note:** a separate site record sheet is to be prepared for each numbered site).

Work Sheet 2

EVC GROUP Refer to 'Interactive Maps' online www.dse.vic.gov.au

Work Sheet 3

GENERALISED CONSERVATION STATUS
Refer to EVC Group table. The Generalised Conservation Status is listed for each of the 21 EVC Groups

Endangered
Vulnerable
Rare
Depleted
Least concern

Work Sheet 4

ASSESSMENT OF HABITAT QUALITY (total)

Work Sheet 5

GENERALISED CONSERVATION SIGNIFICANCE

5B GENERALISED CONSERVATION STATUS	5A EVC GROUP TYPE: Forests, woodlands or mallee	Grasslands or wetlands	Scrub, shrublands or heathlands	5C MEASUREMENT OF HABITAT QUALITY	5D
Endangered	8 +	6 +	7 +	Very high	
	< 8	< 6	< 7	High	
Vulnerable	10 +	8 +	8.5 +	Very high	
	6 – 10	5 - 8	5 – 8.5	High	
	< 6	< 5	< 5	Medium	
Rare	12 +	9.5 +	10 +	Very high	
	6 – 12	5 – 9.5	5 - 10	High	
	< 6	< 5	< 5	Medium	
Depleted	12 +	9.5 +	10 +	High	
	6 - 12	5 – 9.5	5 - 10	Medium	
	< 6	< 5	< 5	Low	
Least concern	12 +	9.5 +	10 +	Medium	
	< 12	< 9.5	< 10	Low	

Work Sheet 6

PERFORMANCE STANDARDS

Current extent on farm

Future quality & quantity on farm

Work Sheet 7

TARGET AND MANAGEMENT ACTIONS

3.2. Assessing current management (Work Sheet 1)

A self-assessment questionnaire (refer to the CD ROM Work Sheet 1: Land Managers questionnaire) requires a land manager to answer 15 questions about their understanding of the native biodiversity assets located on their property.

The self-assessment questionnaire is simply about getting land managers to look at the way that native plants and animals are currently being managed, whilst the answers can identify where the management strengths and weaknesses are, and provide a guide for future actions for native biodiversity management.

It does not require a land manager to identify the different plant or animal species, and does not require any detailed scientific or botanical skills, just an understanding of how the property is currently being managed.
Refer to CD ROM *Fact Sheet 1: Frequently asked questions and Fact Sheet 2: Summary of native biodiversity benefits* for information to support land managers undertaking a self-assessment questionnaire.

3.3. Mapping vegetation (Work Sheet 2)

Work Sheet 2: Site record sheet (CD ROM) provides a convenient one page site record sheet that is used as a standard 'cover sheet' by a land manager to enter all relevant information collected during assessment of each site.

An individual cover sheet is required for each site containing native vegetation, with an expectation that each property will have between 5 – 15 sites to assess (this varies according to the property size and the complexity of vegetation types). It is recommended that, for convenience, property mapping is based on paddock boundaries and that each site is given a site number – indicated on a sketch map of the paddock on the site record 'cover sheet'.

Table 3: EVC Groups and Generalised Conservation Status

EVC GROUP		Generalised Conservation Status
1. Box Ironbark **FORESTS** or **WOODLANDS**		Vulnerable
2. Coastal **SCRUBS, GRASSLANDS** or **WOODLANDS**		Endangered
3. Dry **FORESTS**	exposed and/or lower altitude sheltered and/or higher altitude	Vulnerable Vulnerable
4. **GRASSLANDS**		Endangered
5. **HEATHLANDS**	not well-drained sandy and/or well-drained sub-alpine	Vulnerable Vulnerable Vulnerable
6. Heathy **WOODLANDS**	damp and/or less well-drained dry and/or better drained	Vulnerable Vulnerable
7. Herb-rich **WOODLANDS**	alluvial terraces and/or creeklines damp sands	Endangered Endangered
8. Lower Slopes or Hills **WOODLANDS**	grassy herb-rich seasonally inundated	Depleted Depleted Depleted
9. Lowland **FORESTS**		Least Concern
10. **MALLEE**	deep sands shallow sands or sandy clay loams or gravels	Least Concern Least Concern
11. Montane **SHRUBLANDS, GRASSLANDS** or **WOODLANDS**		Least Concern
12. Plains Grassy **FORESTS** or **WOODLANDS**	freely-draining lunettes or beach ridges or shallow sands poorly-draining	Endangered Endangered Endangered
13. **RAINFORESTS**		Endangered
14. Riparian **SCRUBS** or Swampy **SCRUBS** or **WOODLANDS**		Vulnerable
15. Riparian **FORESTS** or **WOODLANDS**		Vulnerable
16. Riverine Grassy **FORESTS** or **WOODLANDS**	broader plain creekline and/or swampy	Endangered Endangered
17. Rocky outcrop or escarpment **SCRUBS**		Least concern
18. Salt-tolerant and/or succulent **SHRUBLANDS**	coastal inland	Endangered Endangered
19. Sub-alpine **SHRUBLANDS, GRASSLANDS** or **WOODLANDS**		Least Concern
20. Wet or Damp **FORESTS**		Least Concern
21. **WETLANDS**	brackish / estuarine freshwater (permanent) freshwater (ephemeral)	Least Concern Least Concern Endangered

3.4. Classifying vegetation (Work Sheet 3)

Native vegetation types vary significantly across Victoria. This variation reflects the differences in geology, soil, climate, rainfall, elevation, drainage and aspect where these types are growing.

Plants suited to similar conditions are commonly associated with each other, and these associations are referred to as Ecological Vegetation Classes (EVCs).

A land manager may be required to identify the EVCs located on their property as:

- there may be legal obligations relating to the management of some EVCs
- EVCs respond in different ways to the same management practices
- EVCs have their own conservation status
- a means to assessing the current quality.

To make it easier for land managers to classify the EVCs located on their property this Resource Kit uses a condensed classification whereby the approximately 250 EVCs have been re-categorised into one of 21 EVC Groups (see Table 3). These EVC Groups have been mapped across Victoria and are accessible on www.dse.vic.gov.au

Department of Sustainability and Environment — Map created Thu Jan 20 10:24:16 EST

EVC Groups

EVC:	22
EVC_BCS:	D
EVC_BCS_DESC:	Depleted
EVC_GO:	C
EVC_GO_DESC:	Common
EVC_BCS_SRC:	5
AREASQM:	180475.4
HECTARES:	18.05
EVC_GP:	6
EVC_SUBGP:	6.1
X_EVCNAME:	Grassy Dry Forest
X_GROUPNAME:	Dry Forests
X_SUBGROUPNAME:	Exposed and/or lower altitude
SCALE:	100000
EVC_MUT:	EVC
BIOREG:	Goldfields
BR_NO:	6.1
BR_CODE:	Gold
VEG_CODE:	Gold0022
Coordinate Position	
Vicgrid94:	2415357, 2459832

Generated at http://nremap-sc.nre.vic.gov.au/MapShare.v2/ — Produced on Thu Jan 20 10:24:53 EST 2005

Map Scale 1:75,242
NOT FOR NAVIGATION

Map Server: nremap — Map Service: bnr_external_v1

To identify which EVC Group their vegetation belongs in, land managers will need to access the external DSE website www.dse.vic.gov.au (full access details provided in Work Sheet 3: Determining Ecological Vegetation Class Groups and generalised conservation status [CD ROM]). By following the prompts to 'Interactive Maps' and then 'Biodiversity Interactive Map' the interactive maps will enable a land manager to search under a number of different parameters, enabling them to:

- select the location of their property by either postcode, shire, town name)
- locate government, DSE, CMA, bioregional boundaries
- select a 'Vegetation' layer that will identify the appropriate EVC Group
- determine the area of the remnant.

The 'Zoom In' function enables detailed analysis of a property to a fine scale. After identifying individual vegetation sites in their paddocks, the land manager is able to record the appropriate EVC Group on the Site Record Sheet.

Ecological Vegetation Class (EVC)
The basic mapping units used for biodiversity planning and conservation assessment at landscape, regional and broader scales in Victoria. EVCs are derived from large-scale forest type and plant community mapping and are based on the following types of information:

- vegetation and forest types (including species and structural information)
- ecological information relevant to the species that comprise the vegetation types (including life-form and reproductive strategies)
- information that describes variation in the physical environment (including aspect, elevation, geology and soils, landform, rainfall, salinity and climatic zones).

DSE has identified approximately 250 separate EVCs located throughout Victoria, these have been mapped typically at 1:100,000 scale (but may also be 1:25,000 in very fragmented or diverse landscapes).

Note: A full list and description of all EVCs located in individual catchments can be found in the Native Vegetation Plans prepared by each of the Catchment Management Authorities. *(For downloads of your regional Native Vegetation Plan go to www.dse.vic.gov.au).*

3.5. Determining generalised conservation status (Work Sheet 3)

Conservation status
The extent to which ecosystems remain in their natural condition in relation to their pre-European distribution.

Assessment of the conservation status of vegetation types is based on the broad concepts of rarity, threat (including consideration of historic and on-going impacts) and importance for supporting other significant features (for example, as a drought refuge for native fauna).

Many of these criteria have been used as the basis for assessing conservation status of vegetation types in the Net Gain approach that has been developed in *Victoria's Native Vegetation Management – A Framework for Action* which support the CMA Native Vegetation Plans (See Table 4; also Fact Sheet 14 for more detailed descriptions of the criteria.).

The approach for determining conservation status under the Native Vegetation Framework has been adapted in *Work Sheet 3: Determining Ecological Vegetation Class Groups and generalised conservation status* (CD ROM) which lists generalised categories based on each of the 21 EVC Groups. Note that this whilst is an interim allocation, land managers are able to apply these generalised categories as part of an initial review of native vegetation sites. A land manager may also be required to determine the generalised conservation status as part of funding applications to the Natural Heritage Trust or National Action Plan for Salinity & Water Quality as this funding is increasingly being linked to the conservation status of vegetation types (usually prioritised within Regional Catchment Strategies and/ or Native Vegetation Plans developed by Catchment Management Authorities).

Table 4: Conservation status of Ecological Vegetation Classes (EVCs) at bioregional level

STATUS	CODE	CRITERIA
Endangered	**E1**	Contracted to less than 10%of former range; or less than 10% pre-European extent remains
Vulnerable	**V1**	10 to 30% pre-European extent remains
Depleted	**D1**	Greater than 30% and up to 50% pre-European extent remains
Rare	**R**	Rare (as defined by geographic occurrence) but neither depleted, degraded nor currently threatened to an extent that would qualify as Endangered, Vulnerable or Depleted
Least Concern	**LC**	Greater than 50% pre-European extent remains and subject to little to no degradation over a majority of this area

Source: Victoria's Native Vegetation Management – A Framework for Action (p 51)

3.6 Assessing habitat quality using the 'Land managers self-assessment method' (Work Sheet 4)

Habitat quality is determined by comparing the structure and types of native plant species present in a site against a 'benchmark' for these attributes.

The Department of Sustainability and Environment has developed a method to assess vegetation quality (habitat condition) uniformly across Victoria. This method, known as 'Habitat Hectares' (DSE [2004], *Vegetation Quality Assessment Manual: Guidelines for applying the Habitat Hectares scoring method.* Department of Sustainability and Environment, Melbourne www.dse.vic.gov.au), is a site-based measure of quality and quantity of native vegetation assessed in the context of the relevant vegetation type. In combination with assessments of conservation significance this is being increasingly applied as part of statutory planning processes and private land investment initiatives such as BushTender™. For more information on the Habitat Hectares method refer to www.dse.vic.gov.au/ or *Fact Sheet 14: Defining conservation status of species and ecosystems* (CD ROM).

This Resource Kit has developed a land manager self-assessment method (see CD ROM *Work Sheet 4: Assessing habitat quality using the 'Land managers self-assessment method')* to introduce land managers to vegetation quality assessments. It is based on the Habitat Hectare method. This self-assessment method enables land managers to undertake on-farm assessments by estimating the quality of their vegetation and subsequently using this information to determine a generalised conservation significance.

Note: this land manager self-assessment method does not replace the Habitat Hectare method which maybe required to fulfil certain statutory planning requirements, for instance, planning permit applications involving removal or clearing of native vegetation. In some instances a full flora survey maybe required to determine species distribution, quality and extent. It is suggested that this more thorough assessment be undertaken by an experienced professional contractor (see also Chapter 6: Native biodiversity survey by a professional contractor).

The single page 'land managers self-assessment method' requires a land manager to assess native vegetation against the following seven habitat components:

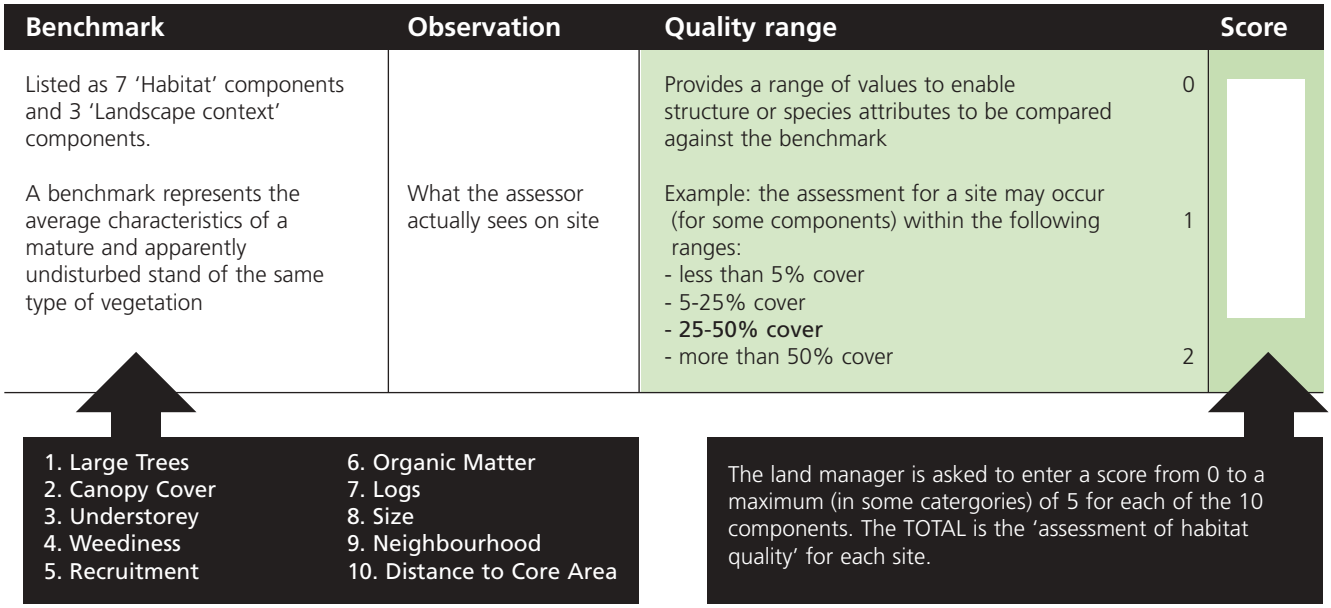
- presence of large old trees
- tree canopy cover
- understorey (determined by percentage cover and the number of perennial life forms)
- recruitment of woody species (or small herbs in grasslands)
- cover of weeds
- cover of organic litter
- logs (for forests and woodlands).

Habitat quality also assesses the site according to its size and location in the surrounding landscape (i.e. landscape context). This provides some indication of the viability of the vegetation and its ability to respond successfully to natural fluctuations or other disturbances. Landscape context is a measure of the following three components:

- size (defined by the area being assessed and any adjoining native vegetation)
- links to an amount of neighbouring vegetation (defined by the percentage area covered within 1km radius of the site)
- core area (defined by the distance from a block of native vegetation greater than 50ha).

Using the EVC Group information for the individual vegetation sites determined in Work Sheet 3, the land manager is required to select one of individual Site score sheets that correspond to the EVC Group for the site being assessed (see CD ROM *EVC Group Score sheets*).

Figure 6: Information required to use the EVC Group 'Score sheet'



Work Sheet 4 requires the land manager to assess each site against a set of known benchmarks. Each of the 21 EVC Group Score sheets have individual benchmarks embedded in the Score sheets for each of the seven habitat components, whilst the three landscape context benchmarks remain constant for each EVC Group. Reading from the left side of the Site score sheet (see Figure 6), the land manager is required to:

1. Note any specific definitions listed against any of the 10 components (e.g. the definition of a large tree is the trunk diameter or circumference at breast height). The definition may also be further explained using an individual benchmark (e.g. for large trees in a Box Ironbark Forest this is further defined as a tree with a diameter greater than 60cm, or circumference greater than 190 cm).

2. Observe what is located on each site and record the presence, number or percentage of each component in the 'observation' box provided (e.g. number of large trees per ha; or % weed cover).

3. Compare the site observations against the 'quality ranges' provided (e.g. is the number of large trees/ha in a Box Ironbark Forest less than 12).

4. Enter a score in the box provided.

5. The total assessment of habitat quality is recorded at the bottom of the EVC Group Score sheet, and this total figure is transferred to the Site Record Sheet.

Table 5: The range of values used to determine generalised conservation significance

GENERALISED CONSERVATION STATUS	EVC GROUP TYPE			GENERALISED CONSERVATION SIGNIFICANCE
	Woodlands, forests or mallee	Grasslands or wetlands	Scrub, shrublands or heathland	
	ASSESSMENT OF HABITAT QUALITY			
Endangered	8+ <8	6+ <6	7+ <7	Very high High
Vulnerable	10+ 6-10 <6	8+ 5-8 <5	8.5+ 5-8.5 <5	Very high High Medium
Rare	12+ 6-12 <6	9.5+ 5-9.5 <5	10 + 5-10 <5	Very high High Medium
Depleted	12+ 6-12 <6	9.5 + 5-9.5 <5	10 + 5-10 <5	High Medium Low
Least concern	12+ <12	9.5+ <9.5	10+ <10	Medium Low

3.7. Determining generalised conservation significance (Work Sheet 5)

Conservation significance for native vegetation is determined by the sites:

- *generalised conservation status (see Work Sheet 3: Determining Ecological Vegetation Class Groups and generalised conservation status [CD ROM])*
- *assessment of habitat condition (using the 'land managers self-assessment method" see Work Sheet 4: Assessing habitat quality using the' Land managers self-assessment method' [CD ROM]).*

This Resource Kit has developed *Work Sheet 5: Determining generalised conservation significance* (CD ROM) to explain how a land manager is able to assign a generalised conservation significance to sites of native vegetation located on their property.

The conservation significance of a site containing native vegetation may range from very high to low. This range indicates the relative importance that a remnant may have within a landscape. Not all sites will receive the same rating, for example, if there are two sites of the same EVC group the site scoring the highest assessment of habitat quality will be the more significant, this is reflected in the 'range of values' provided in the assessment of habitat quality columns in Table 5 (which has been adapted from *Victoria's Native Vegetation Management: A Framework for Action* [NRE 2002]).

Note: Each of Victoria's Catchment Management Authorities (CMA's) has established targets for protection of native vegetation within their region based on priorities determined by conservation significance. When using Work Sheet 5 a land manager is required to determine the generalised conservation significance, which has been developed to simplify what is normally a complex process.

4. Targets: Work Sheet 6

Establishing targets that reflect a known biodiversity performance standard will enable a land manager to substantiate any environmental claims about biodiversity. ISO 14001 requires documentation of all targets against goals expressed in a property Environmental Policy.

ISO 14001 defines an environmental target as a 'detailed performance requirement, quantified where practicable, applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set in order to achieve those objectives'.

A native biodiversity target is based on applying the appropriate biodiversity performance standard (e.g. Net Gain goal) to the results of a native biodiversity assessment (refer to previous chapters). Targets are based on a sites conservation significance, which is established after undertaking a vegetation assessment to determine the:

- EVC classification - either an EVC Group as determined by the land manager or EVC determined during a professional survey
- Conservation status - either determined as a generalised status for an EVC Group as determined by the land manager or specific status of each EVC during a professional survey
- Vegetation quality - either as a 'land managers self-assessment method' to assess habitat quality determined by the land manager or as a Habitat Hectare quality score established by a professional ecologist.

Targets may comply with regional catchment targets (i.e. voluntary performance standards, see also Figure 8) or be required as a mandatory obligation established under legislation (see also Chapter 1.5: Government Legislation and Policies). *Work Sheet 6: Setting Targets* (see CD ROM) has been prepared to assist land managers to set targets based on government biodiversity performance standards.

Biodiversity performance standards (Net Gain goal)

Victoria's Native Vegetation Management - A Framework for Action (NRE 2002) establishes the strategic direction for the protection, enhancement and restoration of native vegetation across the State (see www.dse.vic.gov.au for a PDF version of the framework document). The framework addresses native vegetation management from a 'whole of catchment' perspective but necessarily focuses primarily on private land where the critical issues of past clearing and fragmentation exist.

This Resource Kit uses a biodiversity performance standard of a Net Gain of native vegetation as a minimum level for protecting biodiversity assets. Government established a Net Gain standard in Victoria's native vegetation management framework document. In short, the Net Gain approach has, as a priority, the avoidance of further permanent losses of existing native vegetation, i.e. no net loss wherever practicable.

At a Statewide level, Victoria's Native Vegetation Management – A Framework for Action (NRE 2002) identifies the contribution of the net outcome and considers both quality and quantity for gain and loss.

Losses in extent include:

- permanent clearing of native vegetation, both approved and illegal
- incremental reduction of plant survival.

Gains in extent will include:

- new areas of permanent revegetation primarily for biodiversity conservation
- new areas of permanent revegetation for land protection, greenhouse or other purposes which have predominantly included locally indigenous species.

Losses in quality include:

- on-going decline resulting from insufficient management of threatening processes
- impact of forest product harvesting or mining operations
- impact of bushfires or fuel reduction burns.

Gains in quality will include:

- improved management of threatening processes within existing native vegetation including both active improvement (e.g. weed control) and avoidance of further impacts by land managers agreeing to forego permitted uses (e.g. stock grazing, harvesting of timber for on-farm use)
- recovery from forest harvesting and mining operations
- recovery from bushfires
- supplementary plantings into depleted existing native vegetation.

The goal of Net Gain recognises that for native vegetation, although 'natural is best', it is possible to partially recover both extent and quality by active intervention, and thus to effect the net result. Net Gain goals enables targets to be set and performance to be measured on-ground. Table 6 highlights a hierarchy of action based on native vegetation management that:

- firstly looks at actions that protect remnants
- followed by actions that enhance remnants (the basis for actions developed in *Work Sheet 7: Determining management actions* [CD ROM])
- with restoration (e.g. revegetation) as the final action in the hierarchy.

It is suggested that land managers adopt this hierarchy when prioritising action plans developed for their properties.

The overall policy for native vegetation management is based on its conservation significance and is described in Victoria's native vegetation management framework document. This is summarised in Figure 7, which describes the native vegetation outcomes expected on a statewide basis. The Net Gain goal has been interpreted and applied to a regional context (and thereby can be extrapolated to a farm context) in each CMA Native Vegetation Plan. Outcomes are based on the conservation significance for the EVC or EVC Group on a region by region basis. Refer to the Native Vegetation Plan for the outcomes expected for vegetation types located in your region (i.e. for individual EVCs). Note: for the purposes of this Resource Kit a generalised conservation significance has been developed for each EVC Group, using the principles from the Net Gain goal as an approximate and preliminary indication of the significance of EVC Groups.

For downloads of your current regional Native Vegetation Plan go to www.dse.vic.gov.au

Table 6: Hierarchy of actions for setting priorities

Hierarchy of Action	Examples of actions
1. Protect biodiversity remnants	e.g. Fencing, de-stocking etc to prevent further losses from threatening processes; management agreements / conservation covenants.
2. Enhance or manage existing remnants	e.g. Maintenance of hydrological regime; promoting/ enhancing natural species and/or structural and/or age class and/or size class diversity; weed or vermin control.
3. Restore or re-create biodiversity	e.g. Replanting of formally cleared areas with locally native plants (trees, shrubs, herbs and/or grasses).

Figure 7 includes separate columns that describe the 'extent of existing native vegetation' (which can also be applied as current extent on farm) and the 'gains in habitat quality/quantity' (which can also be applied as future quality and quantity on farm) that a land manager should use to achieve targets for native vegetation on their property. Refer to Work Sheet 6: Setting targets (CD ROM) for a description of the methodology that land managers can use to identify their catchment performance standards.

Figure 7: Reflecting conservation significance in overall outcomes for Net Gain

Determined in Work Sheet 5

CONSERVATION SIGNIFICANCE	EXTENT OF EXISTING NATIVE VEGETATION	GAINS IN HABITAT QUALITY-QUANTITY	NET OUTCOME
Very High	no losses	substantial gains	SUBSTANTIAL NET GAIN
High	losses minimised	moderate gains	NET GAIN
Medium	losses minimised	some gains in medium term	NO NET LOSS
Low	some losses	some gains in longer term	short term LOSS Longer term NO NET LOSS
TOTAL			**REVERSAL OF DECLINE** Change from net loss to net gain

Future quality and quantity on farm

Current extent on farm

Desirable net outcome for an entire catchment

5. Actions and Monitoring: Work Sheets 7-8

The previous chapters have explained how a land manager is able to determine not just how much native vegetation is present on a site (i.e. size or quantity), but how good it is (i.e. condition or quality). On-ground actions to improve management should look at increasing overall quality and quantity of habitats of native vegetation and habitats in local landscapes.

5.1 Determining management actions (Work Sheet 7)

Management actions for biodiversity need to address either the *cause* of decline or *what threatens* the continued existence of the native biodiversity. In many cases threats have their origin in inappropriate activities that may have occurred on the farm in the past or may currently be occurring. By adopting farming activities that are compatible with native biodiversity conservation, land managers can seek to integrate agricultural activities with native biodiversity, thereby working toward sustainable agriculture. Refer to *Work Sheet 7: Determining management actions* (CD ROM) for a list of management actions typically applied to native biodiversity. These actions have been:

- compiled from land managers experiences and research undertaken during the preparation of this Resource Kit
- based on typical landholder commitments that maintain or improve the extent/ quantity (i.e. size) of the remnant and the habitat quality assessment (i.e. condition) that a land manager may expect to achieve on a farm.

The actions listed in Work Sheet 7 are intended as a guide to land managers to indicate the type of potential management options they might adopt. As each farm is unique, actions should be considered as prompts with which to widen the search for solutions. Options for management are linked to improvements in one of the ten components that have previously been assessed to estimate 'habitat quality' (i.e. large trees, canopy cover, understorey, weediness, recruitment, organic litter, logs, size, neighbourhood and distance to core area). It is logical that to improve the overall quality of the vegetation a land manager would be required to increase the assessment score of individual components, and this is more easily achieved by concentrating on those areas (i.e. components) that are currently assessed as low.

Land managers are in the best position to understand their property, seasonal variations, personal skills and resources available. All these elements combine to develop an appropriate management approach. Generally management will be a combination of the suggested actions in Work Sheet 7 and the needs of:

- the specific native plant, animal or vegetation community, and
- agricultural production systems and practices.

For information on farming systems better suited to landscape conditions, native biodiversity management and other natural resource issues, contact the local office of the Department of Sustainability and Environment or Department of Primary Industries (Customer Service Centre 136 186) or your regional Catchment Management Authority. Industry based programs and other environmental organisations may also be able to assist. Adjoining land managers may also have practical experience that they can share regarding managing biodiversity issues that they have in common. A list of environmental contacts (both state and regional) can be found in *Fact Sheets 7 – 12* (CD ROM).

5.2 How to monitor native biodiversity (Work Sheet 8)

By undertaking to monitor the native biodiversity assets on their property, land managers will be able to gain a better understanding of the impacts of their management actions and identify how they are affecting native biodiversity.

Monitoring is the process of:

- undertaking periodical measurements, assessments or surveys
- recording results
- comparing and evaluating results to determine the effectiveness of management actions.

Monitoring of native biodiversity provides:

- information on whether the condition and extent of native biodiversity is being maintained, is improving or is declining
- evidence of whether management needs to be adjusted.

Table 7: An example of developing monitoring options

What's being monitored?	Target	Survey Method	Survey score or result	Monitoring options
EVC Group (e.g. Herb-rich woodland)	Manage remnants to maintain and improve habitat quantity and quality	**Land manager self-assessment**	10 (Assessment of habitat quality)	• Photo point of habitat condition • Undertake a reassessment of habitat quality
EVC (e.g. EVC 55 Plains Grassy Woodland)	Achieve a Net Gain (e.g. increase condition score to greater than 28%)	**Native vegetation survey** (e.g. undertaken by a professional ecologist / botanist)	28% (Habitat hectare score)	• Photo point of weed cover and recruitment • Review pest animal populations • Re-survey site to determine reductions in weed cover, improvements in native species recruitment
Rare or endangered species (e.g. Bush Stone-curlew)	Increase breeding population	**Species presence survey** (e.g. full professional native biodiversity survey)	2 breeding pairs (Observation)	• Survey to determine increase in breeding populations • Survey to determine improvements to habitat (e.g. increase in fallen timber, reduction of grass species >15 cm high)

It is desirable to monitor a site using the same method originally used to assess the site. Therefore monitoring of native biodiversity assets should be based on previous farm assessments, in particular *targets* and the resultant management actions established by the land manager. A land manager should monitor sites to identify how implementation of *management actions* is affecting native biodiversity assets (e.g. are the targets being met, are the assets being lost, are they improving in quality?). Table 7 provides an example of how targets have been used to establish survey methods, and the options for what and how to monitor is linked to reviewing actions.

Monitor the change to the native biodiversity asset or the threat being managed to check the appropriateness of the action and if the target is being met. To do this, gather the following information:

- list which native biodiversity assets you need to measure and monitor
- note how the native biodiversity asset was initially surveyed or assessed and what the key threat is
- collate the scores and results from the initial assessment and survey of native biodiversity.

Monitoring should occur on a regular basis to check performance. However some methods of assessment are developed to show slow change and will therefore only be appropriate for longer term monitoring. However the changes to vegetation condition may also be checked upon on a more regular basis by using alternative monitoring methods, such as photo point monitoring. This could be used every year to record and monitor change.

Work Sheet 8: Monitoring (CD ROM) has been prepared to explain how a land manager will be able to record the monitoring methodology used to review management actions.

6. Native Biodiversity Survey by a Professional Contractor

The previous chapter discussed how to involve land managers in the self-assessment of native vegetation growing on their property and provides an initial overview quality and significance. This self-assessment helps the land manager to understand how the vegetation on their property links to any priorities that state government has established for native biodiversity conservation (eg reflected in a Net Gain goal). For most environmental management activities the 'generalised results' obtained using the land managers self-assessment method which could be used as part of a process to substantiate native biodiversity management.

In some instances it maybe necessary to engage a contractor to undertake a professional survey of the native vegetation growing on a property. A professional survey would identify:

- any native fauna or fauna habitat that may be located on their property
- any flora species or specific components of vegetation types
- a Habitat Hectare score relevant to the EVC on the property
- farm management practices that may impact on population viability or vegetation quality.

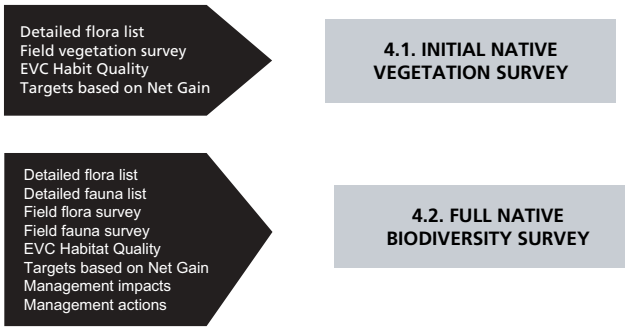
Either a 'initial native vegetation' or a 'full native biodiversity' survey (see Figure 8 for a range of expected outcomes) maybe required to enable a land manager to fulfil some of the stricter mandatory requirements established by government, for instance to:

- identify any management actions that are required to assist them to conform to relevant state legislation (refer to *Fact Sheet 6: Victoria's Legislation and Policies – native biodiversity* [CD ROM])
- conform to any requirements established within local government planning schemes, i.e. if a land manager anticipates that changes in farm management would require them to obtain a planning permit to clear vegetation, local government is required to consider any application to clear vegetation in accordance with performance standards outlined in the Native Vegetation Plan (see also DSE (2004), *Vegetation Quality Assessment Manual: Guidelines for applying the Habitat Hectares scoring method.* Department of Sustainability and Environment, Melbourne (www.dse.vic.gov.au).

The land managers self-assessment method developed for this Resource Kit does not provide an overview of the property at a landscape or regional scale, nor does it address questions of the native fauna that are present or likely to be present. Usually the expertise required to identify native fauna assets or to prepare a detailed native vegetation report is not part of most land managers skills, and it is suggested that a professional contractor be used to undertake an 'initial vegetation' or 'full native biodiversity' survey.

A professional survey of native vegetation on a property will provide more accurate details of the plant species and vegetation types present than a self-assessment undertaken by the land manager. The survey requires an independent consultant to undertake both a desktop review and a survey of the farm property. This will help to identify and locate individual plant species, and classify vegetation types into one of the approximately 250+ EVCs. Survey reports should be based on information provided in the DSE data sets and make use of appropriate benchmarks for the Habitat Hectare method (DSE 2004).

Figure 8: Expected outcomes from undertaking a professional survey of fauna and /or flora.



6.1 Preparing an initial survey of native vegetation

Fact Sheet 15: Professional Contract Brief- initial survey of native vegetation (CD ROM) has been prepared to enable land managers to provide a standard contract brief to a contractor. The brief:

- articulates the scope of work
- indicates the degree of detail required
- enables the land manager to assess different tenders against a standard.

The length of time required to complete the survey will vary depending on the number, size and complexity of native vegetation sites on a property. This survey is classified as 'initial', which means that it needs to be short and quick. It is suggested that timelines of 14 to 26 hours be used to indicate to the consultant the degree of detail required. Note: reports prepared during the pilot phase of this Resource Kit indicated that an 'initial' vegetation survey and report could be adequately completed within this timeframe.

Aerial photos or detailed satellite images indicating vegetation cover may provide a guide, on particularly large properties, to the extent of vegetation and should be reviewed prior to the first property visit. This preliminary review should provide some indication to the number and size of vegetation sites which will enable the consultant to scope the survey and plan work.

Note: as most private farmland has not been extensively surveyed for vegetation presence or status, DSE data sets should not be assumed to be complete. Refer to *Fact Sheet 4: Victoria's native biodiversity management resources* (CD ROM) for contact details, data sets or websites that may assist contractors to review vegetation presence or status.

The consultant will need to undertake interviews during the initial site visit to document any information relating to farm operations and land use history, and to discuss and identify areas of the property that may support native vegetation not identified in aerial photographs etc. Land managers should be encouraged to recall stories (or find old photos) to give a more complete understanding of the properties history and previous biodiversity values, even if those values have now changed or been lost. It is expected that this initial visit should take no more than 3 - 4 hours.

The preferred time to undertake a vegetation assessment is spring when most species are in flower and easier to identify (especially smaller groundcovers which can be easily overlooked during a quick survey of the property).

It is anticipated that the total cost for an initial survey may, at the time of publication of this Resource Kit, be about $1,000 (this depends on the complexity and size of remnant vegetation types). This is based on a contractors hourly rate of $50/ hour and the survey and report taking no more than 20 hours to complete. Note that contracting rates may vary between $45 - $80. It is suggested that a number of different contractors submit tenders and the final selection be made according to the contractors expertise, reputation, project timelines and total funds available.

6.2. Preparing a full survey of native biodiversity

A full survey of native biodiversity on a property will include not just details of the native vegetation present but will also include information on the fauna species (vertebrate and if possible invertebrate) present or likely to be present, and details of any habitat. An example of an invertebrate species that should be surveyed in South Gippsland is the threatened Giant Gippsland Earthworm. A full survey will be more detailed than those previously discussed and is usually undertaken by a professional ecologist (or similar). This full survey requires a high degree of expertise on behalf of the contractor.

It is anticipated that the full survey report will provide definitive guidelines for how major native biodiversity assets will be managed. *Fact Sheet 16: Professional contract brief-full survey of native biodiversity* (CD ROM) has been prepared to enable land managers to provide a standard contract brief to a contractor.

The objectives for undertaking a full survey of native biodiversity assets are to:

- assess a sites biodiversity value, with emphasis on remnant vegetation and sites that may provide habitat for native fauna
- compare the quality of remnant native vegetation against relevant Ecological Vegetation Class benchmarks (refer to www.dse.vic.gov.au) and to quantify the vegetation quality in terms of site condition and landscape context
- establish the conservation significance of each biodiversity asset, taking into consideration: the presence of significant species; the bioregional conservation status; international / national or state agreements / plan; and quality of the vegetation remnant. See also *Victoria's Native Vegetation Management – A Framework for Action* (NRE 2002), Appendix 3, p 53
- identify farm management issues that impact, or that may potentially impact, on biodiversity assets that are currently present on the farm, and to recommend management options directed at maintaining or enhancing those biodiversity values across the property.

Fact Sheet 17: Professional report on native biodiversity (template) (CD ROM) provides information and layout guidelines for preparing a full native biodiversity report. Fact Sheet 17 promotes a consistent way to prepare reports that are easy to follow and encourage use of plain English.

The template establishes a framework that enables a reader to:

- locate the most relevant information (e.g. priorities, actions and threats to biodiversity)
- review survey and assessment results
- define methodology of assessment.

Fauna surveys should employ a number of different techniques to identify the presence of species, including trapping, rock/log rolling, visual observations (spotlighting, tracks and markings), vocalisations and scat analyses. Surveys should be undertaken in areas that are likely to support native fauna (this may not necessarily only be in sites containing native vegetation remnants). All trapping should be undertaken with any permits necessary, as required under applicable legislation, with the trapping or handling of any material undertaken also in accordance with any relevant permit conditions, contact DSE.

The final report should provide recommended options for management based on the conservation significance of the biodiversity assets and the observed and potential threats that are, or might be, impacting on these assets. It will be important that contractors talk to the land manager about the survey findings and involve them in decisions or options for future management. It is recommended that the final report is no more than 100 pages and contains information, maps, photos and/or diagrams. Authors are encouraged to:

- use dot points and tables
- use plain English for species (in preference to scientific language)
- incorporate supporting information as appendices.

The level of work conducted during the development of Fact Sheet 17 averaged $2,000 to $3,000/survey, for 35-60 hours work. These figures provide a current indication of the extent of work expected.

CD ROM Contents

WORK SHEETS

Self-assessment
1. Land managers questionnaire
2. Site record sheet
3. Determining Ecological Vegetation Class Groups and generalised conservation status
4. Assessing habitat quality using the 'Land managers self-assessment method'
5. Determining generalised conservation significance

Targets
6. Setting targets

Actions
7. Determining management actions
8. Monitoring

EVC GROUP SCORE SHEETS (including benchmarks for individual EVC Groups)

1. Box Ironbark Forests or Woodlands
2. Coastal Scrubs, Grasslands or Woodlands
3. Dry Forests
4. Grasslands
5. Heathlands
6. Heathy Woodlands
7. Herb-rich Woodlands
8. Lower Slopes or Hills Woodlands
9. Lowland Forests
10. Mallee
11. Montane Shrublands, Grasslands or Woodlands
12. Plains Grassy Forests or Woodlands
13. Rainforests
14. Riparian Forests or Woodlands
15. Riparian Scrubs or Swampy Scrubs or Woodlands
16. Riverine Grassy Forests or Woodlands
17. Rocky outcrop or escarpment Scrubs
18. Salt-tolerant and/or succulent Shrublands
19. Sub-alpine Shrublands, Grasslands or Woodlands
20. Wet or Damp Forests
21. Wetlands

FACT SHEETS

General
1. Frequently asked questions
2. Summary of native biodiversity benefits
3. Definitions: biodiversity and agriculture related
4. Victoria's native biodiversity management resources
5. Key references and websites
6. Victoria's Legislation and Policies: native biodiversity

Environmental contacts
7. Statewide
8. Gippsland
9. North east
10. North west
11. Port Phillip
12. South west
13. Emergency incidents

Native Biodiversity Assessment
14. Defining conservation status of species and ecosystems
15. Professional contract brief: initial survey of native vegetation
16. Professional contract brief: full survey of native biodiversity
17. Professional report on biodiversity (template)

Native Biodiversity Targets
18. Setting targets

Native Biodiversity Actions
19. Determining management actions
20. Record keeping for monitoring

www.dse.vic.gov.au