

Victoria's

biodiversity

SUSTAINING

OUR LIVING WEALTH

*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.*



Natural Resources
and Environment

AGRICULTURE
RESOURCES
CONSERVATION
LAND MANAGEMENT

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Foreword

Biodiversity conservation is an important part of the Victorian Government's policy agenda, and has been so for some time. The focus has widened over time to reflect our increasing knowledge of how ecosystems work, and how we can act to sustain them. Similarly, the scope of government, business and community actions and programs has broadened, driven by the increasing awareness of biodiversity challenges across a range of areas of activity, from forestry to coastal management. Biodiversity conservation is now recognised as an essential component of responsible environmental management, not just by governments but by the whole community.

Victoria has a rich and highly distinctive biological heritage. We share some of this diversity with the rest of Australia, but many of Victoria's plants and animals are found nowhere else in the world. Protecting our biodiversity is something we owe to other Australians and to the wider global community.

Conserving biodiversity is fundamental to our quality of life and our economic well-being, both now and in the future. We will greatly influence the quality of our children's lives, and the lives of generations to come, by the way we manage our natural wealth and preserve the options for future development or conservation.

Sustaining Our Living Wealth shows how we can integrate biodiversity conservation into actions and thinking throughout the community, how current actions are already making a major contribution, and what more can be done. Individuals, community organisations, businesses and governments all have a role in conserving, and sustainably using, our living wealth. This document recognises that some of our past actions may have been unwise, often because we have had little understanding of the nature of our impacts, and that we need more effective action, supported by good information and research, in order to sustain our biodiversity. In recent times Victoria has led the way in many aspects of environmental management that affect biodiversity. Our record is something to be proud of and to build upon.

A single document such as this cannot describe all the ways we can work towards sustaining our biodiversity. However, *Sustaining Our Living Wealth* does provide a framework and a context for the various actions which Victorians can take to sustain biodiversity. It suggests principles that can guide our decisions. It also shows how government policies and actions can be complemented by local actions of business and the community. Its companion documents, *Our Living Wealth* and *Directions in Management* define our biological heritage and describe the actions to be taken to ensure that Victoria's biodiversity is managed in an ecologically sound and sustainable manner.

We hope this document will be a stimulus for the continuation and expansion of positive actions, and the development of initiatives which work in real synergy with government programs. Together, our actions and initiatives will provide the impetus to better ensure that Victoria's native flora and fauna and natural ecosystems can survive, evolve, and flourish in the wild.

Jeff Kennett
Premier

Marie Tehan
Minister for Conservation
and Land Management

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Introduction

Sustaining Biodiversity

In 1996 the Victorian Government signed the *National Strategy for the Conservation of Australia's Biological Diversity*. In doing so it re-emphasised the importance of biodiversity to all Victorians. Conserving biodiversity is vital for maintaining our quality of life and our standard of living in the long term.

In the National Strategy, biodiversity is defined as:

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.

Biodiversity therefore encompasses a huge range of living things and ecosystems, which are constantly evolving and adapting to environmental changes.

Its importance to sustaining resource-based industries such as agriculture, fishing, forestry and tourism cannot be overestimated. But it is also vital in our everyday lives — for non-material needs such as recreation and a sense of place, and for basic needs such as helping to process waste. In the end, we have no choice: we must carefully sustain our biological resources if we are to prosper and to have a high quality of life. Conserving biodiversity is not just the responsibility of governments. Our daily lives provide opportunities for all of us to consider how our actions affect Victoria's environment and biodiversity.

To take some simple examples: individuals can separate and recycle their domestic garbage to reduce the need for raw materials and landfill, and industry can develop and implement 'cradle-to-grave' product stewardship and use natural resources such as water more sustainably.

Meanwhile, governments can also do practical things like ensuring that our use of the land and sea considers biodiversity, improving our knowledge of threatened flora and fauna, and ensuring that our shared natural resources are utilised sustainably.

By drawing together the threads of our various roles and responsibilities, this document shows how Victoria can fulfil its national and international obligations to sustain biodiversity.

Introduction

Background

Early in 1992, all three levels of Australian governments signed the Intergovernmental Agreement on the Environment. The Agreement commits governments to integrating economic and environmental considerations into decision-making to achieve ecologically sustainable development.

Later that same year, after discussions between industry groups, environmental groups and all levels of government, Australia committed itself to a *National Strategy for Ecologically Sustainable Development*. This type of development:

improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The protection of biological diversity is one of three core objectives of the National Strategy, and a cornerstone of the Intergovernmental Agreement. The latter stated that:

conservation of biological diversity and ecological integrity should be a fundamental consideration [of policy making and program implementation].

In 1996 the governments of all Australian states and territories agreed on the *National Strategy for the Conservation of Australia's Biological Diversity*.

These community debates and government commitments mirrored those in the international arena. The 1992 Rio Conference on Environment and Development produced *Agenda 21*, which in turn led to the 1994 International Convention on Biological Diversity.

Having already set forth on a path of sustainable development, the Australian Government readily became a party to this convention. Most other countries have also joined the cause. Here in Victoria, the effort to integrate environmental concerns with economic development began many years earlier. For more than 25 years we have had a vigorous community debate about how best to protect our environment. Throughout that time, Victorian Governments have actively reformed legislation and established programs to protect the environment. Grass-roots movements (such as Land for Wildlife, Landcare and the 'Friends' groups associated with national parks) have also actively contributed to environmental protection and the conservation of biodiversity.

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Building on Victoria's Integrated Strategic Approach

While the State Government is not the only sector of the Victorian community with an interest in biodiversity conservation, it does have a major strategic role. Biodiversity conservation is already integral to a number of Victorian Government strategies and policies, and its prominence will increase over time as familiarity with the concept of biodiversity conservation grows.

The Victorian Government actively works to ensure coordination and liaison across government programs and strategies which affect biodiversity. In practice, the integration of biodiversity conservation and management means:

- recognising the common long-term goal of biodiversity conservation across a range of areas and issues (for example, the catchment and land protection process, and the forest management process);
- recognising the ecological linkages between different parts of the biosphere (for example, streams, streamside vegetation, and the biodiversity they support);
- being aware of all the actions and strategies which influence the attainment of the goal of biodiversity conservation, and working positively with others across institutional boundaries to advance this goal;
- using a variety of complementary tools and approaches in a coordinated way to achieve the goal (for example, information, community participation, economic incentives, as well as more traditional tools such as regulation).

INTEGRATION IN VICTORIA

The various strategies and management processes which the Victorian Government has adopted work together to promote biodiversity conservation. The common

long-term goal of biodiversity conservation and management is being advanced through strategic objectives, legislation and key integrating processes.

As an example, the Victorian Catchment and Land Protection Council brings together information on the condition of biodiversity as part of its brief to report on the condition and management of land and water resources.¹ Similarly, the Victorian Coastal Council, in its Victorian Coastal Strategy, explicitly identifies the goal of protection of coastal and marine biodiversity, through addressing threatening processes, as a key part of its overall vision for the Victorian coast.²

A major challenge for government is to continue to build on the solid framework provided by existing legislation and programs, and strive for better and more explicit integration of biodiversity into government policies, strategies and actions in the future.

Bioregions, which reflect the patterns of biodiversity in the landscape, provide a geographic framework for integration of priorities and outcomes across all tenures.

Priority setting

Sustaining Our Living Wealth provides a strategic framework and a context in which priorities can be determined. Because conserving biodiversity is an ongoing task, it cannot be reduced to a predetermined list of priorities. Proposing and resolving specific priorities is more appropriately the focus of detailed strategies such as the Victorian Coastal Strategy and regional Catchment Strategies.³

Related documents

Sustaining Our Living Wealth is a strategic document. Separate and complementary documents provide a description of Victoria's biodiversity

(Victoria's Biodiversity — Our Living Wealth) and the actions to be undertaken to achieve fully integrated biodiversity conservation throughout each bioregion of the state (Victoria's Biodiversity – Directions in Management).

These documents fulfil the requirements of the Flora and Fauna Guarantee Act 1988 for the preparation of a strategy that includes proposals for guaranteeing the survival, abundance and development in the wild of all taxa and communities of flora and fauna, ensuring the proper management of potentially threatening processes, providing an education program, and improving people's ability to meet flora and fauna conservation objectives.⁴

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Why Biodiversity Matters

Our Living Wealth

On a national scale, the land and sea area of Victoria is relatively small at 30 million hectares. But despite its size, Victoria embraces many different landscapes, from alpine peaks and rugged mountains to the dry semi-arid plains of the north-west, the shallow coastal bays and the ocean waters of Bass Strait. Each landscape has a range of habitats which support a particular suite of plants and animals (species diversity). The variety of landscapes and environments affects the way they interact with each other and the non-living parts of the environment (ecosystem diversity). Even within a particular species, there is genetic diversity.

Victoria owes its complex range of ecological communities to climatic and geological evolution over tens of millions of years. Even so, some of our ecological communities are relatively young. The marine communities of our bays and inlets, for example, have developed only over the last 6000 years.

We share many of our plant and animal species with neighbouring states and the rest of Australia (for example, the waters of Bass Strait). We also share species with other parts of the world. 5 But many species exist only in Victoria, and the large number of these 'endemic' species reinforces our responsibility to protect our biodiversity.

On land we know of 4000 species and subspecies of native vascular plants in Victoria. Our 260 orchid species and subspecies are just 10 fewer than the number found in North America and Europe combined. While much of our natural wealth is relatively well known through biological surveys, we can still expect more species diversity to be revealed in the decades to come. Surveys have shown that the coastal seafloor off eastern Victoria has the highest levels of species diversity and endemism known in the world.

Victoria also forms part of the habitat for species that range across the globe. For example, each spring Southern Right Whales visit Victorian waters to calve and suckle their young; and in summer tiny Red-necked Stints feed in our intertidal areas to gain weight before flying to northern Siberia to breed.

Having habitats for wide-ranging species, and having species found nowhere else, gives Victorians particular responsibilities and opportunities. Fortunately, in world terms, we have a high standard of living and a small human population, giving us the opportunity to look after our biodiversity.

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Our Quality of Life

Biodiversity underpins human well-being in many ways. We depend on the environment to supply clean air to breathe and clean water to drink, to produce and maintain fertile soils and to break down our wastes. Biological resources provide all of our foods, many of our medicines and many of our industrial products. Moreover, they provide us with recreation, inspiration and a cultural identity.

Our biological resources also create economic opportunities, and therefore create jobs. For example, tourism, of which eco-tourism is a growing component, earns around \$8 billion (and 140,000 jobs) for Victoria and is growing. Tourists coming to Victoria want to see our parks, our landscape and waterways, and our remarkable flora and fauna. For example, penguin, seal and whale watching attracts tourists from many parts of the world, and it is estimated that the Grampians National Park contributes more than \$200 million a year to the Victorian economy. Moreover, in future, we can expect people to value the environment at least as highly as at present. Maintaining our biodiversity keeps tourism, recreation and related options open for the future.⁶

Our biological diversity is also a source of pleasure.

Many Victorians simply wish to know such diversity exists and that it is protected. For others, our biodiversity offers more direct enjoyment. Bird-watching in the Mallee, snorkelling over sheltered reefs, walking in the ancient rainforests of East Gippsland, and recreation in national parks and state forests throughout Victoria are everyday examples of biodiversity enriching our lives.

In addition, many of our natural resources spring from biodiversity. For example, our forests generate about \$3000 million in commercial turnover each year.

Our seas and rivers support substantial recreational and commercial fisheries, with Victoria's commercial fisheries (including aquaculture) worth around \$100 million per year. Agriculture too depends on biodiversity – for watershed protection, climate regulation, soil fertility, nutrient storage and cycling, and so on. Without it, this \$5000 million per year sector would be threatened.

Beyond all this, the environment is something more than a commodity for our benefit. We share the Earth with many other life-forms that have their own intrinsic value. They warrant our respect, whether or not they are of immediate benefit to us.

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Our Past Achievements

For more than 25 years Victorian Governments have actively reformed legislation and established programs to protect the environment.

Over that time, the community has contributed significantly to the debate about what governments can do to help. The creation in 1970 of the Land Conservation Council set an Australian precedent for public land-use planning. It provided a good example of effective, legislation-supported consultation between community, industry and government. The Council's advice to the State Government was strengthened by robust debate and by the exchange of information and ideas. By systematically evaluating the use of public land, in balance with the use of all land, a comprehensive land-use framework for more than one-third of Victoria was developed, and a progressive reserve system developed.

In recognition of the Council's work, and in order to meet the challenges of the future, the Government recently recast the Council's role with the establishment of the Environment Conservation Council. This new Council will have extended roles and functions in providing advice on natural resource matters from a different and independent perspective than currently available to the Government.

Victoria has led the way in many other areas. The Environment Protection Act 1970, which provided the basis for protecting the quality of our air, water and land through an integrated, outcome-oriented approach, has stood the test of time. The National Parks Act 1975

is regarded as a benchmark of its time, and the Flora and Fauna Guarantee Act 1988 established a precedent for the protection of biodiversity across Australia. Significantly, the Planning and Environment Act 1987 set the framework and policies for the use, development and protection of land throughout Victoria, and is a critical element in an integrated approach to biodiversity in the state.

More recently, the Catchment and Land Protection Act 1994 and the Coastal Management Act 1995 established an integrated approach to natural resource management, through bodies representing partnerships between the community, business and government. Recent local government amalgamations and the 1996 planning reforms further facilitated the incorporation of biodiversity considerations into land planning and use.

What has driven these innovations is grass-roots community initiative and energy. In some cases, these initiatives have developed into Government-funded programs such as Landcare, Waterwatch and Land for Wildlife, which have sought to support community activities.

The aim has always been for the Government to facilitate community efforts to actively contribute to our quality of life and the sustainable use of our natural resources.

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The Challenge Today

Human activity has changed Australia forever. Much irreversible damage has been done, and many of our environmental values are still in decline. While learning from the past, we must nevertheless look forward: there is a great deal at stake. Our challenge is to manage the environmental values that remain and rectify damage where possible. To do this we need to understand and manage the environmental risks arising from our economic and social development.

If we had known earlier what we know now, we may have been able to avoid a lot of damage to natural systems; for example, by not introducing certain destructive exotic plants and animals. Even so, our lifestyles and our habits, our desire for space and transport, and our demand for food, water, energy and manufactured products, would still have put pressure on the environment and on Victoria's biodiversity.

By the turn of the century Victoria's population will pass 4.5 million, and we will receive around 1.5 million visitors per year.⁷ The increase in the active and passive use of natural environments that is likely to result will mean that the wise management and sustainable use of our natural resources will become an increasingly complex and important issue in the years ahead.

Within the first few decades of European settlement, many of the species' extinctions in Australia occurred.

Of the 91 species of non-marine mammals known to have inhabited Victoria since European settlement, 19 are now extinct in the state, and five of these are now totally extinct. Many other species survive with much diminished populations. More than 900 species of Victorian plants are rare or threatened. Satellite maps graphically illustrate the loss of some ecological communities, with 30% of the State's broad vegetation types having been reduced by 80%. For example, the native grassland complexes of lowland Victoria are now among the most endangered ecological communities in Australia, there being less than 2% left of the pre-1750 area of thousands of square kilometres.

These modern remote sensing techniques show us not only what we have lost: they can also tell us where the surviving communities are located. For example, around two-thirds of the remaining lowland grassland complexes are on private land, and thus the assistance of these private landowners will be critical in preserving these ecosystems. A picture of our losses to date also provides us with a benchmark against which we can measure our effectiveness in halting and, wherever possible, reversing the decline.

Our response to key risks will continue to change as our understanding improves. For example, the recognition of the factors that cause the salinisation of rivers and wetlands and contribute to land salinisation has led to changes in the way water is managed. It has led to the establishment of catchment-based land-use planning, more efficient use of water resources and the reservation of water for environmental purposes in the allocation of water rights.

Meanwhile, protecting the quality of our bays and seas

is growing in importance. For example, the risk of introducing marine pests through ballast water rises with the increase in trade.

Similarly, we have to manage the risks of polluted stormwater run-off associated with our spreading urban areas. Our challenge is to manage the environmental risks associated with all our activities. Clearly, the best way to reduce these risks, wherever practicable, is to modify our behaviour and reduce the effect of threatening processes. It is equally clear that we need to allocate our scarce resources carefully, setting priorities and increasing community custodianship and action.

There is much we do not know. A central challenge is to recognise the uncertainty associated with our choices and to consciously manage the risks to biodiversity; by doing so we will have a better chance of avoiding further irreversible losses.

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Our Task

Our task is to ensure that Victoria's biodiversity is conserved by integrating the conservation of biodiversity into all relevant activities.

It is an achievable task, and it is a task to which all Victorians can be reasonably expected to contribute, whether at home or at work, in business, government or as part of other organisations.

To ensure biodiversity is valued as an essential part of Victoria's well-being, it is vital that all Victorians recognise that conserving biodiversity is a part of everyday life. Not all our actions will affect biodiversity, but many will.

Over the last few decades we have greatly improved our understanding of human impacts on ecosystems, and become more conscious of the responsibility of stewardship which goes with the use of our natural wealth. The consequence of deriving wealth and

enjoyment from our rich natural heritage is that we

have a responsibility to conserve it for future generations. Our goal is to ensure that the quality of their inheritance is not diminished.

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Approaching the task

Our Capability

Victorians are responsible for the well-being of one very small, but very rich, part of the world's biodiversity. We are well placed to live up to our responsibility. We have a vibrant economy, a well-educated population, and we are committed to the principles of ecologically sustainable development. We have the capability to protect biodiversity. Moreover, Victorians are sensitive to environmental issues. We have proven our commitment to protecting the environment.

In world terms, we have a unique blend of economic, environmental and social strengths. Accordingly, we are uniquely placed to manage our biodiversity responsibly and effectively, and show the world we are doing so.

Victoria is a leader in environmental protection, sustainable resource management, catchment management and the creation and management of parkland and open space. We can build on this strength. Already we are developing it into a competitive advantage in marketing our 'clean and green' foods and fibres, in attracting tourists, and in winning 'green business' export dollars for Victoria in the international environmental services market. To go further we will need to build on our tradition of balanced, consistent and transparent policy-making in a far-sighted manner. We need to aim to manage Victoria's natural resources in an ecologically sustainable manner for the benefit and enjoyment of this and future generations.

Risks and gaps in our existing approach will need to be addressed.

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Tools

The guiding principles for this strategy can be summarised under three main categories: ecological principles, risk management principles, and development principles.

These are drawn from the Intergovernmental Agreement on the Environment (IGAE), the National Strategy for Ecologically Sustainable Development, and the National Strategy for the Conservation of Australia's Biological Diversity.

Ecological principles

- Biodiversity conservation is a central pillar of ecologically sustainable development.
- Biodiversity is best conserved in situ (within species' natural habitat).
- Central to the conservation of biodiversity is the need for a 'comprehensive, adequate and representative' system of ecologically viable protected areas, integrated with the sympathetic management of other areas, including urban, agricultural and industrial areas.
- Conservation is enhanced by knowledge and understanding of species, populations and ecosystems. We need to continue to develop our knowledge and understanding of Victoria's biological diversity.
- We share the earth with many other life forms that have intrinsic value and warrant our respect, whether or not they are of immediate benefit to us.

Applying ecological principles to ecological systems

Plants and animals depend on each other for survival. They are effectively connected to each other through a web of interactions which, at the larger level, form a series of ecosystems and help shape the landscape. Individual species are easiest to conserve when they are maintained within their natural habitats and landscapes. Therefore, to conserve biodiversity, we must consider landscapes and their management as a whole.

Size

Human activity in Victoria has fragmented many of our natural ecosystems and landscapes. Any area of native vegetation, whether mallee scrub, coastal heathland or mountain forest, is more susceptible to damage if it is small and isolated from other natural areas. In the long term, large, consolidated areas of native vegetation are more viable than smaller, more fragmented areas. Large, intact areas of some ecosystems, such as Victoria's grasslands and grassy woodlands, no longer exist. In future, some of these areas may be restored or re-aggregated in pastoral areas as part of drought preparedness arrangements.

Links and corridors

Fragmented ecosystems support less species and genetic diversity. Links between fragments can allow otherwise isolated populations of flora and fauna to remain connected to populations elsewhere.

Links therefore maintain larger gene pools, contributing to evolutionary development and long-term viability. For some animals, the ability to move between different parts of their habitat is a critical requirement of their life cycle. In urban and rural areas, corridors of native vegetation along rivers and roads are literally lifelines for these animals. On the other hand, roads and clearings through forests provide convenient corridors for the movement of introduced predatory animals like foxes and invasive pathways for weeds.

Many fish rely on free movement up and down rivers.

For them, structures such as weirs can become impregnable obstacles. At larger scales, the extensive coastal and inland freshwater wetlands linked by waterways enable waterbirds to survive droughts.

Boundaries

The boundaries between ecosystems are where change is most active. There the ebb and flow of seasons and environmental cycles have the most influence. Rapid, sometimes irreversible, change occurs especially at the boundary between natural ecosystems and altered ones. These so-called 'edge effects' include progressive invasion by pest plants and animals, changes to soil conditions and water flows, increased exposure to wind and sun, and changes to fire patterns.

Risk management principles

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Taking into account these ecological considerations, the following risk management principles can be identified from the IGAE and the National Strategies:

- The causes of a significant reduction or loss of biological diversity must be anticipated, attacked at the source, or prevented.
- Prevention is better than cure. Protecting ecosystems from damage is far more cost-effective than attempting rehabilitation once the damage is done. Besides, some ecosystem changes and losses of biodiversity (for example, extinctions) can never be rectified.
- The 'precautionary principle' (Principle 15 of the Rio Declaration on Environment and Development, to which Australia has agreed) provides a general guide to dealing with the uncertainty and risk involved in conserving biodiversity, in two main ways:
- When contemplating decisions that will affect the environment, the precautionary principle involves careful evaluation of management options 'to avoid, wherever practicable, serious or irreversible damage to the environment, and an assessment of the
- risk-weighted consequences of various options'.
- When dealing with 'threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'.⁹

Applying risk management principles to biodiversity conservation and management

Biodiversity conservation involves both risk and uncertainty. Risk refers to events of known probability.

By contrast, uncertainty refers to a situation where less is known, for example, about possible undesirable side-effects, and probabilities cannot be assessed. 'Risk' is often used loosely to cover uncertainty as well. It is important to remember that, when 'environmental risk assessment' is referred to, matters of uncertainty, such as the possibility of undesirable effects on genetic diversity, are often being identified as much as quantifiable risks.

The precautionary principle requires that there be caution in decision-making. However, the application of the principle does not by itself dictate whether or not a proposal will proceed: this requires a consideration of the issues outlined below.

Dealing with risk

In biodiversity management, unlike some other endeavours, there are as yet relatively few examples where we have adequate data to confidently and accurately assess risk – which is a first step in managing risk.

One encouraging example is the use of our climate records, coupled with our knowledge of aquatic systems, to calculate the approximate risk of riverine wetlands being exposed to inappropriate wetting and drying patterns resulting from changes to river regulation.

A risk management strategy involves assessing risks to biodiversity values, regularly recording the state of those values, and developing and implementing proactive risk-minimising responses where possible. An example of such a strategy is attention to threatening processes under the Flora and Fauna Guarantee Act.

Managing risk should also take into account its wider dimensions. People do not perceive risk solely in terms of measures of impact, such as loss of natural units (hectares of forests, individual animals, etc.).

They also rank risks based on how well the process is understood, how the impact is distributed, and factors such as whether the species or communities threatened are charismatic. Because of this complexity, even when we have good data, biodiversity risk management is as much a matter of judgement as it is a science.

Dealing with uncertainty

It is easy to overlook the importance of uncertainty.

With biological systems, there is an immense amount we simply do not yet know, especially as we move from the visible species to other smaller forms of life, and to ecosystems.¹⁰ Many subtler aspects of ecosystem functioning will probably never be understood.

By consciously recognising uncertainty, we are better able to be systematic in thinking through the likely consequences of our actions. This will help us to be more cautious about monitoring the actual outcome of our actions, and systematic in adapting our future actions to avoid bad environmental outcomes. The precautionary principle also reminds us to think early about the magnitude of any damage we might do, and to consider whether or not that damage

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might be irreversible and how it might be minimised. For example, with risks such as species extinction, early preventative measures are likely to be crucial.

Uncertainty means that successful biodiversity management is an iterative process. As we learn more, we can improve our approaches, reassess how we allocate resources, and change priorities. Biodiversity management has to be an open-ended, adaptive process which develops continuously as further information and experience is gained.¹¹

Development principles

To the principles of ecological management and risk management can be added a third and more general set of development principles derived from the National Strategy for Ecologically Sustainable Development, to which Victoria is committed:

Look forward

- The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

Share responsibility

- Along with the community, all levels of government have a clear interest and responsibility in conserving biodiversity. Furthermore, the shared responsibility of conservation groups, resource users, indigenous peoples, and the general community (including industry and other natural resource users) is vital for successful conservation.

Take wise, balanced and fair decisions

- The close, traditional association of Australia's indigenous peoples with land and ecosystems should be recognised.
- Processes for and decisions about the allocation and use of Victoria's resources should be efficient, equitable and transparent.
- Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equity considerations.
- Decisions should recognise the need to develop a strong, growing, diversified and competitive economy.

Use smart tools

- Cost-effective and flexible policy instruments should be adopted, including improved valuation, pricing and incentive mechanisms.

These principles together constitute a powerful basis within which we can undertake actions to conserve and use our biodiversity. They do not apply only to government. Aspects are relevant to all decision makers, whether in business, part of community groups or individuals.

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Acting to conserve our biodiversity

Spheres of Action

Victoria has extensive policy, legislative and regulatory mechanisms for conserving biodiversity. This section summarises the actions we can take to encourage and inform individuals and organisations so that we can all contribute positively to conserving biodiversity whenever we encounter or make use of it.

Our interactions with the natural environment help shape the future of our biodiversity, either directly or indirectly. All sorts of opportunities arise to provide leadership and direction – as individuals or as members of organisations.

If we make smart use of increasingly accessible information, if market signals better incorporate environmental costs, and if we pay conscious attention to sustaining ecosystems, we can assure a richer future.

We will know we are heading in the right direction when we see the following outcomes.

- Everyday action by individuals to conserve biodiversity.
- Action and awareness by organisations to sustain biodiversity.
- Well-informed choices by Victorians.
- Markets better accounting for biodiversity.
- A deliberate focus on ecosystems.
- A secure future.

More details on each of these outcomes are provided on the following pages.

Sustaining our natural wealth is an ongoing job. It is not a task which can be adequately defined by a set list of actions, or a fixed set of priorities. Consequently, this strategy does not prescribe detailed actions or priorities for government, industry or the community. Rather, it outlines in general terms – as a set of desired actions – what we could expect to see, as people become more aware of the need to conserve biodiversity. This includes obligations for government as well as actions desired of other parts of the community.

Ecosystems are dynamic, forever adjusting and readjusting to change. Likewise, ecosystem management needs to have a dynamic, continuously adapting base.

We will have to regularly revisit and review our actions to ensure that the biodiversity outcomes we want really are being achieved.

We will have to learn continuously about the best way to conserve biodiversity, and flexibility in achieving the suggested outcomes is the corollary.

Flexibility has to be allied with greater accountability so that we can be sure that the outcomes we are seeking are attained.

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Everyday Action by Individuals

At the end of the day, people, not governments, protect the environment. However, people are more willing to do the right thing, more willing to help, if they know what to do and if they are given opportunities to become involved. They are also more willing to stay involved if they get feedback on progress. The Government will ensure that information to facilitate effective action is readily available in practical ways.

Action at home

At home we can plant native gardens, minimise water use, control domestic pets, and volunteer for work on native revegetation or weeding programs. We can install insulation, and use energy-efficient appliances.

All of us can reduce, reuse and recycle. Victoria's Clean and Green program illustrates some of the many possible actions.

Action at work

Reducing, reusing and recycling continues at work. And at work we can encourage our employers and colleagues to incorporate biodiversity considerations into product design and business planning, particularly as part of environmental management planning (for example, landscaping or commercial/industrial plant siting). Greener purchasing policies will support other environmentally sensitive businesses. Farmers and landholders have a huge range of opportunities to contribute to conserving biodiversity, from planting shelter belts to protecting waterside areas, fencing valuable patches of native vegetation, and protecting valuable areas from weeds and pest animals.

Action in the market

Every time we shop, we make choices. Over time, more biodiversity-friendly products are becoming available. All else being equal, if we choose products from organisations which have a demonstrated commitment to biodiversity conservation and good environmental practice, we help indirectly to conserve biodiversity.

Action at play

Most Victorians spend some of their leisure time enjoying our natural wealth. Minimising the impacts of camping and four-wheel-driving, are practical ways to help. There is also plenty of scope to develop new ideas. For example, catch-and-release fish tagging programs combine recreation with conservation. Voluntary codes of practice are becoming more widely available for different recreational pursuits.

Contributions to community-based action

Victorians increasingly participate in community-based action programs such as Landcare, Coast Action, FishCare, Land for Wildlife, and the conservation work of groups like Botanic Guardians and 'Friends' groups. Other programs may, for example, aim to improve recreation by restoring fish habitat in inland streams, or to increase the economic and productive value of rural land by planting trees. Whatever the motives, the actions also help us meet our responsibilities to biodiversity and to future generations. Collecting information about biodiversity or helping to monitor the environment are also valuable ways to contribute – a great deal, in fact, is gathered by enthusiastic people from cities, towns and farms.

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Action and Awareness by Organisations

Almost all organisations, including businesses, non-government organisations, government agencies, and local municipalities have a role to play in helping to conserve biodiversity. For many organisations, it may not be obvious that their activities do have an impact. But because so many of our actions have a number of indirect impacts on systems, habitats and species, most organisations will, one way or another, have an effect.

Any business that erodes our natural wealth — for example, by wasteful use of water or careless land use — is, in effect, being subsidised by the rest of society. In the long run, only businesses that use inputs wisely, minimise waste and are sensitive to their local environment are sustainable businesses. Businesses can become more sustainable by building concern for biodiversity into their business ethos.

Building biodiversity conservation into organisational policy and practice

Organisations whose activities significantly affect biodiversity can build support for biodiversity conservation into their statements of business objectives. Such commitments would demonstrate that biodiversity conservation is viewed as a serious business issue. From the organisation's point of view, it indicates a belief that customer awareness of the organisation's approach to the issue will matter. A statement of commitment would also provide the basis for Victorians to compare and evaluate each organisation's performance against stated intentions.

It is however, important to go beyond broad statements of good intentions and look at design, production processes, market developments, and so on. One approach, which some larger organisations are adopting, is to introduce an environmental management system (EMS). An EMS can conform to an international standard. ISO 14001 is a particular type that is increasingly used.¹²

Where an organisation's actions do make a direct difference to biodiversity - for example, in the way the organisation uses its site, and the effects on the surrounding land and habitat - its environmental management practices and processes.

Other desirable steps are for the organisation to provide training and investment to shape organisational practice and culture, and to undertake a biodiversity life-cycle assessment (covering both direct and indirect impacts) of its activities and products.

Within an organisation, the actions of individual workers and contractors can materially affect the environment.

One way to ensure that they act consistently within the spirit of the organisation's objectives is to establish and maintain organisation-wide environmental standards.

These can cover everything from purchasing to production and waste disposal.

Monitoring performance

Large organisations which have, or potentially have, a significant impact on biodiversity can conduct environmental audits and produce annual reports in which efforts to reduce impacts on biodiversity or any efforts to conserve it are noted. These are more helpful if they contain relevant targets for improvement. Any reasonably large organisation could afford to report on how its actions have contributed to sustaining biodiversity.

Using other business tools

Examples of other means through which organisations can sustain biodiversity include adopting business codes of practice, and developing environmental improvement plans. For example, the Victorian forestry sector's Code of Forest Practices for Timber Production lays down state-wide principles that apply to timber harvesting and related activities, to ensure that operations are compatible with the conservation of a wide range of environmental, including biodiversity, values.¹³ Organisations can also participate in business networks that promote ecological sustainability.

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Well-informed Choices by Victorians

Victorians, both individuals and organisations, need accurate, timely and accessible information about biodiversity if they are to make informed choices and thereby help conserve our living wealth. Our information base is improving but we have a way to go. Community groups and governments at state and local levels can assist in ensuring information is readily available in practical ways.

Building up our picture of biodiversity

While there are substantial gaps in our knowledge of biodiversity, we do already know a lot about the distribution of Victoria's terrestrial and freshwater vascular flora and vertebrate fauna. Many areas of significance are well described and mapped. Better equipped with maps and survey information, individuals and organisations will more easily be able to recognise our natural wealth. They can then more easily avoid damaging it, or design positive actions to sustain it, as they plan their activities.

Monitoring trends and issues

To ensure that we are conserving biodiversity in the most effective way, we must continually seek out, and make use of, new information. Monitoring is an integral part of conserving biodiversity. Good monitoring of trends can assist in checking and reviewing earlier management decisions.

Monitoring should be approached in a number of ways. For individual species management, indicators identified in Action Statements under the Flora and Fauna Guarantee Act are an important set of base data. Much of Victoria's data in this area is excellent. In addition, there is a need for better indicators of

community/ecosystem biodiversity, and genetic biodiversity. This is beginning to be tackled by monitoring the processes which pose potential risks to natural systems.

An important aim is for Victorian and local government agencies, in conjunction with scientists, to ensure that indicators in these areas are consistently and robustly framed, and regularly updated and made available to the whole community. This will be an ongoing process.

Incorporating information about biodiversity into decision making

Decision makers such as industry managers, farmers and local government managers can make more sustainable investment decisions if they can use relevant biodiversity information, such as indicators of local ecosystem health. An example of this is the development of Regional Vegetation Plans by Catchment Management Authorities in partnership with the community to link biodiversity with productivity and land protection. This provides a basis for vegetation management into the future. Programs such as Frogwatch and Streamwatch have generated a huge amount of community involvement in collecting information and providing it to decision-makers. State and local governments can reinforce this by recording and using the results, and providing feedback and encouragement to participants.

Sometimes, formal environmental modelling can help in carefully evaluating the risks associated with development proposals, and thus contribute to more balanced decisions about the type of development that should be undertaken or the conditions under which it should operate.

Using information technology and multimedia

In recent years, as our collection of essential information about biodiversity has expanded, information technology has also exploded. We can now link data on water quality and farming environments, for example, and make such data easily accessible — it can be placed directly in the hands of users wherever they are. This too can assist decision-making. Because of its commitment to information technology and the communication of information, Victoria is well-placed to reap the benefit of these continuing advances.

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Better Accounting for Biodiversity in Markets

Market forces — operating through prices, property rights and other mechanisms — can provide strong incentives for individuals and organisations to conserve the resources they use, including natural resources. Mechanisms such as water pricing and covenants on property can strengthen these incentives, encouraging ecologically wiser choices and thereby assisting biodiversity conservation.

The objective is to require consumers and businesses to face the costs of the pollution they cause and the natural

resources they use (for example, the waste assimilation services of water). This is known internationally as the ‘user pays’ (or ‘polluter pays’) principle. It involves accounting for the environmental costs of production and resource use and, through charges or other means, ensuring that these costs are passed on to the user wherever feasible.

Price incentives are not always practicable. High administration costs, for example, may rule it out. However, other mechanisms which work with the grain of the market, such as placing covenants on property, and encouraging the use of codes of practice, can also act to ensure that environmental costs are taken into account in decisions. In this way, markets can still work to encourage innovative responses to environmental problems such as loss of biodiversity.

Better recognising the cost of our actions

If resource users and consumers are to pay prices based on the full life-cycle costs of providing goods and services, these costs have to be estimated. For example, with some forms of agriculture and mining, the full costs of environmental management can incorporate the protection of biodiversity as well as the disposal of wastes. Where activities generate pollution or disturb local ecosystems, the costs of avoiding, remedying or mitigating the disruption, such as the costs of containment or abatement, should be included.

When publicly owned natural resources are harvested, the cost of conserving biodiversity and maintaining healthy ecosystems and communities should be taken into account. An example is including the cost of keeping forest ecosystems healthy. The Victorian Government, like other governments in Australia, is committed to the full-cost principle,¹⁴ which implies moving towards pricing that reflects full costs.

Informing markets and clarifying rights

Often, undertaking a valuation of the services provided by nature can provide a useful basis for costing our actions – or for placing conditions on development. There will always be uncertainties about economic valuations of the services provided by biological resources, since factors such as options for future generations are involved, but the values can nevertheless be used for guidance, taking into account the uncertainties involved.

Clearly specified property rights can assist biodiversity objectives. Throughout Victoria, existing property rights to take water are being better defined. As this is done, previously ‘unallocated’ water will be recognised as the environmental allocation. If this allocation is insufficient

to maintain environmental and biodiversity values, a

clear option exists to reallocate water from other uses, whether through a public agency buying rights in the market, or otherwise.

Using financial support incentives

Given the ‘public good’ nature of biodiversity conservation, there is a case for governments providing financial incentives to speed the adoption of practices that help conserve biodiversity. Where incentives are judged to be appropriate, they can be linked with other preferred practices. For example, under the Sunraysia Salinity Plan, participation in an irrigation management course is a prerequisite for a range of financial incentives for improved irrigation systems. Increasingly, support is delivered directly to community groups where joint action is required to overcome a common problem.

Where there are compelling reasons, such as social factors, for maintaining subsidies on the use of natural resources, those subsidies should be clearly stated. However, any disincentives for biodiversity conservation need to be carefully examined. Natural resource allocation arrangements such as the tender process for resource access, bulk water entitlement specifications, and accounting for resource harvesting activities should be open to scrutiny.

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A Deliberate Focus on Ecosystems

Plants and animals are intimately linked to their habitat. So in general, biodiversity conservation is best undertaken in situ, and is best achieved by maintaining viable ecosystems. Because we wish to harvest many of our natural resources, it is likely that most ecosystems will require continuing adaptive management practices to help ensure their viability.

Bioregional planning

Planning at a 'bioregion' level can help to integrate ecological, social and economic factors in regional planning and management. (A bioregion is an area defined primarily by biological and geographical criteria.)

Bioregions are big enough for us to take into account the complex relationships between species and landscapes, as a basis for maintaining the integrity of plant and animal communities. Yet they are small enough for us to group issues together and concentrate on achievable tasks. Naturally defined units like local water catchments are good starting points in conceiving bioregions.

The Interim Biogeographic Regionalisation for Australia (IBRA) provides a national framework that Victoria will use to monitor and report on biodiversity (see Victoria's Biodiversity – Directions in Management).

Completing Victoria's reserve system

A reserve system which fulfils the criteria set down in the national biodiversity strategy — of being comprehensive, adequate and representative — is one which also gives conscious attention to ecosystem management.

In Victoria, this system has been established over the past 20 years and forms the basis of our national and state park network. Some areas such as the marine environment still need to be addressed. The management of ecologically viable protected areas is integrated with the sympathetic management of other areas, as provided for under the Regional Catchment Strategies. For example, sensitive areas of land will be protected to provide corridors between public reserves.

Parks cover over 10% of Victoria, and park management plans, which are being progressively developed and implemented, provide management directions tailored to the specific circumstances of each park, and its visitors and neighbours. Management arrangements address the needs of individual species and ecological communities, taking into account the landscape of which each park forms a part.

Ecosystem-conscious management planning outside parks and reserves

A secure and well-managed reserve system is very important for biodiversity conservation. Nonetheless, it is not enough. Much of environmental value is in fragmented ecosystems outside reserves. Sympathetic management of these values, with a focus on maintaining ecosystem integrity, is needed.

Increasing attention to ecosystem management has characterised the recent development of specific management plans for Victoria's forests and fisheries,

in addition to those for parks just mentioned. For example, under the National Forest Policy Statement, to which Victoria is a party, protection of the full range of forest ecosystems and biodiversity are explicitly identified as objectives.¹⁵

Regional Forest Agreements, which are currently being established, come within this policy framework and aim to integrate development objectives, such as developing an efficient, internationally competitive timber industry, with biodiversity conservation objectives.

'Complementary management' has the aim of managing parts of ecosystems outside reserves in a way which complements the management within reserves.

As landowners are given more opportunities to develop their awareness and understanding of these issues, their interest in complementary management is growing.

The increasingly popular Landcare and Land for Wildlife programs are important examples of complementary management. They require continued support, as do landholders using covenants to secure the maintenance of environmental values on private land.

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A Secure Future

Our natural wealth is too precious for us to assume that individuals and organisations will always do the right thing. Market mechanisms are good at encouraging many efficient practices. However, markets do not necessarily account for biodiversity values. Given these limitations, governments have a responsibility to protect the public good and secure our future by making sure there is a biodiversity 'safety net' in place.

However, regulation is generally best seen as a last resort. If effective voluntary action is taken to conserve biodiversity, governments will be able to assume a less prominent safety net role.

The regulation safety net

For over 100 years, Victorians have demanded that their governments regulate undesirable practices. Consequently, Victoria has a range of legislative tools, described earlier in this document, that directly or indirectly help to conserve biodiversity. These now form a vital part of the biodiversity safety net by regulating:

- access to, and management of, natural resources,
- pollution,
- the way we use land,
- the taking of flora and fauna, and
- the protection of heritage values.

Even with this safety net, a major area to tackle is the legacy of practices that have already endangered, and sometimes continue to endanger, a number of species. We have a strong legislative mechanism to protect threatened species and ecological communities. Victoria's Flora and Fauna Guarantee Act 1988 is both a proactive Act working to abate threatening processes and to assist the recovery of threatened species, and our fail-safe mechanism. It contains powerful procedures, such as:

- listing,
- determination of critical habitats,
- action statements, recovery plans, and controls over disturbing protected flora and threatened fish, and
- cooperative agreements with public authorities and landholders.

These have been used since 1988 to list over 300 species, communities and 'potentially threatening processes', for example. The Flora and Fauna Guarantee legislation gives the strength to our safety net. It is our bottom line.

Best practice in regulating

The power vested in regulators must be wielded responsibly. Regulators must endeavour to act with transparency, certainty and efficiency.¹⁶

In accordance with the development principles outlined earlier in this document, we should ensure that the cost to individuals and organisations of complying with regulations is not disproportionate to the biodiversity values being protected. We need to keep monitoring and reviewing compliance costs, with the aim of reducing compliance burdens where organisations, for example, are making significant voluntary efforts to report on their activities which affect biodiversity and are acting to enhance biodiversity outcomes.

In a number of environmental spheres, regulators and their clients in the community are already developing a practice of partnership.

This can extend to partnerships in working towards biodiversity conservation outcomes. Regulators should be flexible in allowing their clients to determine the most efficient ways to achieve outcomes. In return, their clients should be willing to accept greater accountability for their actions. As is the case with the Nyah to South Australian Border Salinity Plan, and the EPA's Accredited Licensee concept, clients should have opportunities to reduce compliance costs by adopting preferred practices.

This strategy has indicated some types of preferred practices that will assist in conserving biodiversity.

The underlying themes are prevention rather than cure, and cooperation rather than compulsion.

An effective approach to maintaining viable ecosystems and communities of flora and fauna requires the use of a judicious mix of information, education and regulation to reduce the harmful side-effects of our activities and take positive steps to sustain and enhance our biodiversity.

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Conclusion

This document shows how we can integrate biodiversity conservation into actions and thinking right across the community, how current actions are already making a major contribution, and what more can be done. Individuals, community organisations, business and government can all play a role in conserving, and sustainably using, our living wealth — our ecosystem, species and genetic diversity.

Biodiversity conservation is an important part of the State Government's policy agenda, and has been so for some time. The language in which this commitment has been expressed has changed, broadening from a focus on wildlife to flora and fauna conservation, and now to addressing the whole range of biodiversity, including ecosystems. Similarly, the scope of government, business and community actions and programs has broadened.

This is being driven by the increasing awareness of biodiversity challenges across a range of areas of activity, from forestry to coastal management. It is being accompanied by increasing knowledge of how ecosystems work, and how we can act to sustain them. This document confirms that biodiversity conservation is a central and essential part of responsible environmental management, not just by the Government, but by the whole community.

The strategic framework of principles and mechanisms that have been described provides pointers to guide a wide range of activities. It indicates how people can get on with the job, in areas from parks management to water rights allocation, while sustaining biodiversity. Their actions must be based on accepted principles of ecological management, risk management, and sustainable development.

Shared responsibility: the involvement of the community

Although there is still much we do not know about Victoria's biodiversity, knowledge of our living wealth is improving. The gains in our knowledge, and our ability to access and use it, are accelerating with the impact of the 'information revolution'. This is helping to empower a range of people, from local groups to businesses and landholders, in making use of information about biodiversity. In turn, individuals, business organisations and local action groups are contributing, and can further contribute, to building our knowledge base. Only a few of these efforts have been mentioned in this document. They are becoming increasingly important over time, as a part of the effective sharing of responsibility for conserving Victoria's biodiversity.

Federal, State and local governments are reinforcing this by recording, using and sharing the results, and providing feedback and encouragement to participants. This constitutes a critical element in achieving ecologically sustainable development in Victoria.

Outlook

Improving our knowledge of biodiversity and developing more robust approaches to sustaining it will be a long but rewarding process. Meanwhile, risks to vulnerable species and ecosystems, and risks from potentially damaging processes where there may be irreversible losses involved, are priorities. Victoria has robust legislation and processes for addressing such risks, particularly in the Flora and Fauna Guarantee Act.

Victorians are placing increasing value on their landscape and sense of place, and their biological heritage is integral to this. Ultimately, the best outcomes for biodiversity will be achieved if all members of the community are proactive in building the goal of sustaining our living wealth into their thinking, planning, actions and lifestyles.

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Endnotes

- 1 Victorian Catchment and Land Protection Council (1996) p. 24 and elsewhere.
- 2 Victorian Coastal Council (1997) p. 12.
- 3 See for example Victorian Catchment and Land Protection Council (1996) p. 39 for a discussion of priorities assessment.
- 4 Flora and Fauna Guarantee Act 1988, s.17(2).
- 5 Australia is classed as one of the 12 'megadiverse' nations of the world, which together harbour between 60 and 70 percent of all known species (Beattie, 1995, Preface).
- 6 'Capitalising on Victoria's natural assets while protecting the environment' is stated as one of 12 key issues in Tourism Victoria's Strategic Business Plan 1997–2001 (Tourism Victoria, 1997, p. 28).
- 7 Tourism Victoria (1997) p. 114.
- 8 The National Strategy on biodiversity identifies key criteria for protected area systems as 'comprehensive, adequate and representative' (Commonwealth of Australia, 1996, p. 9).
- 9 Intergovernmental Agreement on the Environment (1992) pp. 13–14.
- 10 Beattie (1995)
- 11 World Resources Institute et al. (1995) p. xii.
- 12 ISO 14001 is the International Organisation for Standardisation (ISO) environmental management specification, part of the ISO 14000 series of standards and guidance documents. ISO 14000 was finalised in November 1996.
- 13 The Code specifically requires, for public land native forests, that Forest Management Plans consider how to enhance conservation values and biodiversity: see Department of Natural Resources and Environment (1996) p. 23. Note that the Code is consistent with the National Forest Policy Statement to which Victoria is a signatory. In the National Forest Policy Statement, conservation of biodiversity is specifically mentioned as one of the goals. See Commonwealth of Australia (1992a) pp. 5 and 8.
- 14 Intergovernmental Agreement on the Environment (1992) p. 14.
- 15 Commonwealth of Australia (1992a), pp. 5 and 8.
- 16 Office of Regulation Reform (1996).

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Laughing Kookaburra *Dacelo novaeguineae*: McCann/NRE. Western Pigmy-possum *Cercartetus concinnus*: McCann/NRE. Southern Freetail Bat *Mormopterus* sp. (eastern form): McCann/NRE. Sugar Glider *Petaurus breviceps*: McCann/NRE. Bottlenose Dolphin *Tursiops truncatus*: William Boyle. Macleay's Swallowtail *Graphium macleayanus*: Otto Rogge. Ironbark forest, Goldfields Bioregion: David Tatnall.

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