

# Consolidated submission

Victoria's biodiversity  
Issues and recommendations on the  
Victorian Government Land and  
Biodiversity Green Paper

**July 2008**



## **Preface**

This is a consolidated submission to the Victorian Government's Land and Biodiversity at a Time of Climate Change Green Paper from; Victorian National Parks Association, The Wilderness Society, Environment Victoria, Greening Australia, Invasive Species Council, Trust for Nature and Bush Heritage Australia. A more condensed submission with the same key messages and recommendations has been submitted by the Victoria Naturally Alliance. Due to time constraints, one alliance member was unable to signoff on this larger consolidated submission, but fully endorses all the recommendations.

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## Overview

Victorian has a great opportunity to be a leader in the conservation of Australia's biodiversity, to contribute to global efforts to sustain all elements of our natural environment, and to commit to funding long-term protection programs for the ecological processes and all the species under Victoria's care.

Effective reforms through the White Paper are crucial, as the evidence shows that Victoria's biodiversity is in crisis:

- Fifty four percent of the state's native vegetation cleared.
- Victoria has the most stressed landscapes in the country (National Land and Water Resources 2002)
- According to the CSIRO (Dunlop *et al.* 2004), 44% of Victoria's native plants and 30% of our native animals are extinct or threatened.
- Victoria's land and biodiversity are subject to a range of threats including invasive plants and animals, extraction, urban and agricultural development, lack of environmental water flows for rivers and streams and inappropriate fire regimes.
- Climate change is adding to and magnifying these threats.
- The downward trend is continuing, with a range of studies revealing the ongoing decline of Victoria's land and water resources and biodiversity.

The White Paper process is an excellent opportunity to reverse these trends. Conservation efforts need to be carried out on much larger scales. This will require:

1. **Vision, leadership and investment:** Victoria's investment in biodiversity conservation does not yet match the scale and urgency of the task. If we are to solve the complex challenges facing our natural environment, an order of magnitude shift in resources and political will are needed.
2. **Strategy:** The evidence is clear; we know *why* Victoria should act, now we need a specific, measurable, ambitious, realistic and targeted strategy to show *how* we are going to turn Victoria's biodiversity crisis around. A state strategy should contribute to national goals.
3. **Policy Toolkit:** A mix of policy instruments are needed to deal with the state's environmental and social complexities. An over-emphasis on market-based instruments will not deliver flourishing biodiversity, and healthy and resilient ecosystems.
4. **Science:** Action must be based on good science, information and innovation. It is essential that our efforts take place in the light of the best scientific understanding.

### ***The Green Paper***

The Green Paper presents many good ideas and suggestions for reform, however it is disappointing because it is a vague document, lacking clear policy positions and detailed, comprehensive and integrated proposals. It does not address the issue of adequate funding.

Considerable work is clearly needed to develop the reform package that will be in the final White Paper. It would have been far preferable to provide much more definitive

proposals in the Green Paper so that the public are able to comment on and contribute to a draft agenda/framework.

The Green Paper makes it clear that the natural environment provides vital ecosystem services which our society, health and economy depend on. It is therefore disappointing that it starts with tradeoffs in the Minister's foreward on page i. The Green Paper mentions a number of times the inevitability of trade-offs (see pages 5 and 83). No discussion is provided on the *types* of trade-offs that will be made or on the methods that will be used to assess the necessity of these decisions. Victoria's natural environment is already highly stressed and decisions need to be made in this context.

When defining the problem for Victoria, the Green Paper starts with climate change (p3), with the next issue being "*Market failure*". The Green Paper states (p3) that "*markets for some environmental goods and services including land health and biodiversity have failed to evolve naturally*". However, markets haven't '*evolved naturally*' because the environment and the services it provides are not included in our national accounts and are discounted to zero in the pricing of goods. If markets are to develop for ecosystem services, they will require strong government regulation, investment and compliance measures.

The Green Paper focuses heavily on the potential of market based instruments (MBIs) to improve Victoria's land and biodiversity to the exclusion of other policy tools. The potential of MBIs is overemphasised. Markets alone will not be sufficient - a range of policy tools is required with different tools being relevant for different situations.

The Green Paper proposes in relation to threatened species the approach of securing "*targeted species and ecological communities*" (p31) "*Given the government's finite resources*" (p53). Likewise it suggests (p65) revising the objective of the *Flora and Fauna Guarantee Act 1998* "*to guarantee that all taxa of Victoria's flora and fauna...can survive, flourish and retain their potential for evolutionary development in the wild*" to a more realistic objective given the magnitude of the likely impacts of climate change. Victoria has never invested enough money and effort into ensuring the survival of threatened species. Rather than winding back the objective of guaranteeing a future for Victoria's species, more investment is clearly required.

The agenda for land and biodiversity management in the Green Paper starts with a section on working with the private sector to encourage investment. While this is important, the Victorian Government needs to be realistic about what can be achieved, Substantial government investment is required to leverage private investments, and reform is needed of taxation and other settings to facilitate private investment.

The Green Paper recognizes the important role the community plays, for example tree planting and mobilizing people to protect the environment. The Green Paper presents an estimate that volunteer members of delegated management bodies for public land contribute services valued at approximately \$136million per year (p73). However, the Green Paper seems to put more responsibility back on the community and volunteers to deliver without additional support or resources. Institutions for natural resource management, ecosystem services and biodiversity protection need to be regarded as fundamental to the state's future. They therefore should be seen in the same light as education and health, not as peripheral and left to the volunteer sector.

The Green Paper is short on innovation and fails to take into account the new science on the role of ecological process in maintaining the health of our ecosystems.

The Green Paper is very weak on Victoria's marine environment. It starts (piii) by stating that references to 'land' include 'coastal and marine systems' , but only provide maps of terrestrial species and habitats and lacks proposals for protecting marine biodiversity outside protected areas.

National parks and other protected areas remain one of the most successful and cost effective means for protecting nature and biodiversity. However the Green Paper does not adequately cover their role and potential management challenges in face of climate change.

The Green Paper does not address the level of government investment required. Government funding should be provided that is commensurate with the extent and scale of past losses and current threats, and sufficient to implement the recommended measures. Program funding should be guaranteed over a number of years rather than subject to annual budgetary negotiations and readjustments.

The roles of local government are recognized but no mention of the resources needed to deliver.

At least a 10 fold increase in government funding is needed for on-ground work to protect, maintain, restore and revegetate wildlife habitat in priority areas across Victoria.

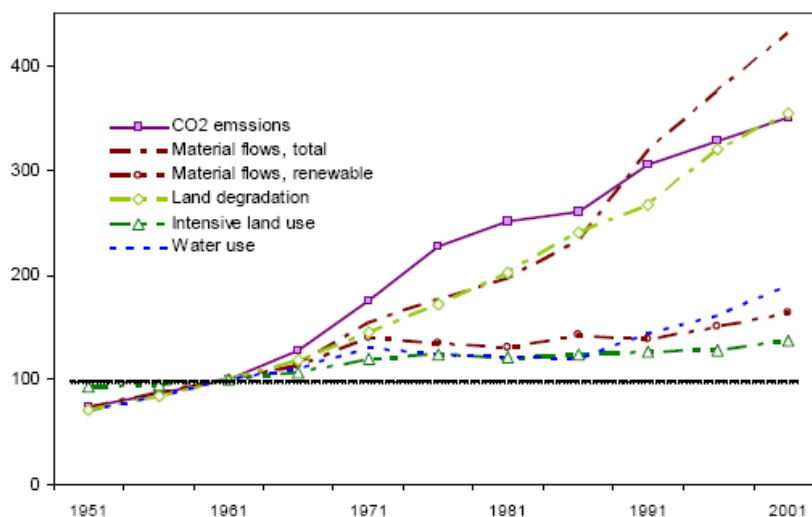
### ***Drivers of environmental decline***

Major sources of pressure on Australia's environment and natural resources - including mining, agriculture, transport, manufacturing and energy production and consumption continue to expand (OECD 2007). Figure 1. below shows that environmental pressures, particularly carbon dioxide emissions, land degradation, and material flows (of resources and energy) continue to trend upward.

There are many drivers of biodiversity decline, many of which are interrelated. It is essential to understand the underlying causes or drivers for ongoing loss of biodiversity and land health, as well as those for protection, regeneration and enhancement. The Green Paper's section on *Drivers of Change* (pp20) provides a useful discussion of drivers influencing management of land and natural resources and associated challenges and opportunities. The White Paper will need to provide options, plans and resources to address the drivers of loss and other causes of the problems facing Victoria's biodiversity and land.

Figure 1. Indicators of Australian environmental pressure, 1951-2001  
 Source: Hatfield-Dodds 2004

Index: 1961 = 100



Source: Calculated from ASFF data, CSIRO

## Issue 1. Vision framework and guiding principles

### Vision framework

The outcomes, long-term goals and sub-outcomes presented in the Green Paper are vague and broad, and are not commensurate with the scale of the problems that we are facing, which are described in some detail in Section 1 of the Green Paper. There is no sense of the bold new vision and strength of action that is needed to turn around Victoria's biodiversity crisis.

It is stated that a set of targets and headline indicators (with some suggested headline indicators provided on p 69) will be developed as part of the White Paper process to measure progress. It is useful to have a broad vision statement, but beneath this we need to have a clear description of what our future ecological and social landscapes will look like in order to sustain ecological processes and ensure that our species survive and thrive and a clear pathway to achieve this. Much more detailed goals (10, 20 and 30 year goals) and targets are needed – for example, how much and preferred locations of native vegetation cover, volumes of environmental flows for rivers, improved conservation status of threatened species, reversal of decline in species, control of invasive species. It is disappointing that draft targets were not provided in the Green Paper, as the current very general vision framework does not indicate what we are trying to achieve. Some of this detail may be provided in the renewed Victorian Biodiversity Strategy. (Targets are further discussed as Issue 2. in this submission).

The vague nature of the outcomes and underpinning goals presented in the Green Paper makes developing indicators and targets difficult. The goals and outcomes (p31-34) are generally lesser than Victorian Government objectives and directions in *Our Environment Our Future* (DSE 2005a), the *Flora and Fauna Guarantee Act 1988*

and the *Victorian Biodiversity Strategy* 1997. The Green Paper states (p30) that “*this vision encompasses the directions agreed to in the Victorian Government’s Environmental Sustainability Framework Our Environment Our Future*”. *Our Environment Our Future* has some quite specific interim targets. If the vision framework in the Green Paper sits underneath *Our Environment Our Future*, then these are already minimum objectives of the State Government.

The following outlines some of our concerns with the Vision Framework (pp31-34).

#### **Outcome 1 concerns:**

- It is widely recognised by ecologists, policy makers and NRM practitioners that to reverse Victoria’s biodiversity crisis, conservation efforts need to be carried out on much larger scales. The Green Paper does not give any sense that this is necessary.
- Very anthropocentric – there is no sense that the natural environment should be maintained for its own sake.
- Flourishing biodiversity is no longer an explicit part of this objective.
- The word ‘restore’ has been replaced by ‘enhance’ in the long-term goal. There is a need to restore native vegetation as well as enhancing existing vegetation,
- An objective of maintaining and restoring the ecological processes that underpin our biodiversity and ecosystems is lacking.
- It is important to reiterate the goal of Net Gain here, rather than just say “*Victoria has more and better quality native vegetation*” (p31) (p54 the Green Paper states “*net gain remains the goal today*”).
- The Green Paper recognises that the high degree of fragmentation means a reduction in ecosystems’ capacity to adapt to climate change (p3), but there is not a sub-outcome related to this. It is important that objectives include increasing connectivity between existing habitats.
- The sub-outcome that “*targeted species and ecological communities are secured*” is a major regression compared with objectives in the FFG Act, and *Our Environment Our Future* (DSE 2005a). The Victorian Biodiversity Strategy has the objective (p3) “*there is an increase in the viability of threatened species and in the extent and quality of threatened ecological communities*”. Likewise, the *National Objectives and Targets for Biodiversity Conservation 2001-2005* (2001), which Victoria signed on to, has the objective (p8) “*Protect threatened species and ecological communities*”.
- Sub-outcomes are not specific eg “Victoria’s environmental water needs are met” (compare with *Our Environment Our Future* 2005 which had specific interim targets (eg, “recover 500 GL of water over five years to improve the environmental flows at 6 icon sites along the Murray River”).
- It is very unclear what is meant by the statement “*Victoria’s reserve system is relevant to a changing climate*”.
- There is no sub-outcome referring to a comprehensive network of parks and reserves. It is important to reiterate the objective in *Our Environment Our Future* (DSE 2005a) that “all of the state’s major ecosystem types represented and protected in Victoria’s parks and reserves”, and that this is

comprehensive, adequate and representative as required by the National Biodiversity Strategy (1996 p9).

- The fundamentally important objective of ensuring that native species “can maintain their evolutionary potential over the long-term” in *Our Environment Our Future* (DSE 2005a), p25, is absent.

**Outcome 2 concerns:**

- On page 27, the Green Paper notes that “*Government can play a role in ensuring markets effectively include all production costs, particularly currently discounted environmental costs*”. However this is not included explicitly under this outcome and should be.
- The first sub-outcome fails to recognise that ecosystems already contribute very significant economic and social benefits.
- The contribution to the economy from private land is far more than that produced by primary producers. For example ‘tree and sea-changers’ are contributing environmentally, socially and economically, helping to keep many regional areas alive .
- Primary producers and many other land holders and managers also provide public goods outside the market framework and this must be acknowledged.
- The sub-outcome in relation to sustainable limits needs to go beyond understanding them, to state that action will be taken on this knowledge.

**Outcome 3 concerns:**

- The outcome suggests that Victorians respond and adapt to climate change. It is unclear what is meant by respond. Use of the word “mitigate” here would make it clear that Victorians actually intend to work to solve the human causes of climate change.
- A high priority sub-outcome should be stopping degradation and loss of existing native vegetation in order to reduce carbon emissions, encourage ongoing biosequestration of carbon, and to maintain the resilience of ecosystems in the face of climate change.
- The long-term goal needs to go beyond decision making, to actually acting to reduce our greenhouse gas emissions and increase the resilience of ecosystems.
- The sub-outcomes are vague and give no sense of any urgency to act. They need to go beyond knowing what is needed, to actually doing it.

**Outcome 4 concerns:**

- The long-term goal should be broadened to include all sectors, not just the community in active stewardship of Victoria’s natural environment.
- Too much focus on volunteerism and the private sector, and it is very unclear what the role of government is.
- There is no sense of how communities will be supported to develop and deliver “*innovative solutions to local problems*”.
- Suggested addition: governments actively support all sectors to improve our land health and biodiversity.

### Concerns relating to all outcomes:

- The outcomes fail to specify the role of government in achieving them.
- The role of science and systematic monitoring is not clearly articulated in the vision framework. It should be stated as part of the framework that solutions need to be underpinned by the best available science, systematic long-term monitoring and science- based adaptive management.
- The outcomes do not stress the need for very large scale change, that actually solves the problem. For example the long term goal “*to maintain and enhance natural capital*” is very vague. The vision statement needs to be clear about the scale of change we are aiming to achieve.

### Guiding principles

The guiding principles outlined in the Green Paper (Section 5.3, pp37-38) have some strengths and weaknesses. For example, it is important that we *restore* as well as maintain ecological processes as many have been degraded (for example flows of water through the landscape). It is unclear what is meant by “protect what currently exists and enhance its condition *before* restoring what has been lost”. While we must put strong emphasis on protecting and enhancing existing native vegetation,<sup>1</sup> the history of extensive clearing of many ecological vegetation classes means that extensive restoration is also required.

Science is again missing from the guiding ecological principles, which mention knowledge, but not science.

It is unclear what is meant by “*decisions should not be avoided solely due to lack of scientific certainty*”. This seems to be the opposite of the precautionary principle, which is ‘*Where there are 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*’. There is a significant risk that development actions will cause environmental damage because we do not know enough about the ecological impacts, whether direct or indirect, on- or off-site, immediate or in the future. Application of the precautionary principle is therefore very important.

The investment principles all relate to public investment, and should be designated as such.

The principle “*Optimise the return based on environmental, social and economic factors*” may still allow the environment to degrade over time due to cumulative impacts.

The natural resource management principles state that we should “*take actions that increase the sustainable use of natural resources*”. However, there is nothing here about reducing Victorians’ ecological footprint, despite the fact that if the entire world lived like Victorians we would need four planets to sustain us (DSE 2006a).

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<sup>1</sup> “*Retention and management of remnant native vegetation is the best way to conserve biodiversity*”. This is a guiding principle of the Native Vegetation Management Framework.

The Green Paper states “*These principles will be considered when planning actions to achieve the vision.*” There is a need for other principles, to guide Government decisions that affect land health and/or biodiversity, but are primarily about other matters. Examples include major infrastructure projects, strategic land use planning for urban growth, and timber industry policy. Consideration of the impacts of all government decisions on biodiversity and land should be part of routine environmental assessment procedures.

It is suggested that the wording of the guiding principles is changed (pp37-38):

- “*allow **ecological processes and functions** to continue*” to “maintain and restore ecological processes”.
- “***protect** what currently exists and **enhance** its condition before **restoring** what has been lost*” to “prioritise protection and enhancement of existing native vegetation and restore native vegetation”.
- “*be based on the best available **knowledge and models***” and “*decisions should not be avoided solely due to lack of scientific certainty*” to “be based on best available science (both western and Indigenous), the precautionary principle and the irreversibility of biodiversity loss”.
- “*optimise the return based on environmental, social and economic factors*” add “while ensuring ecological sustainability”.
- “*take actions that increase the **sustainable use** of natural resources*” to “take actions that reduce the ecological footprint of Victorians and achieve sustainable use of natural resources”.

#### **Key recommendations:**

- ❖ Under a broad vision statement, present a clear description of how Victoria’s future landscapes will look in order to sustain ecological processes and ensure that all our species survive and flourish. This should include large-scale habitat enhancement and restoration across the State to link existing habitat.
- ❖ Present detailed goals for the short-, medium- and long-term, and targets for key environmental components.
- ❖ Revise the outcomes and sub-outcomes to acknowledge the value of biodiversity for its own sake and to include: a much larger-scale conservation effort; maintaining all species; sustaining and restoring ecological processes; a comprehensive conservation reserve network; increased ecological connectivity between existing habitat; mitigation of climate change; stopping degradation and loss of native vegetation; science and ecological monitoring; more specifics on the role of government.
- ❖ Modify guiding principles to better reflect the need to maintain and restore ecological processes, the precautionary principle, and the need to reduce Victorian’s ecological footprint.
- ❖ Add a principle that applies to all government decisions, which should: “ – avoid or minimise and as a last resort offset negative impacts on biodiversity and land”.

## **Issue 2. Targets and indicators to drive on-ground outcomes**

As part of the vision framework, specific measurable targets are important to provide a clear indication of what Victoria is aiming to achieve and to drive improved performance. To be successful, targets need to be based in the real world, should provide links with current state of the environment reporting frameworks (state and national) and be accompanied by monitoring using scientifically sound indicators and measurement mechanisms. The further development of clear statewide targets (and indicators to measure progress towards reaching them) for biodiversity protection and restoration will provide an important sign of strong government leadership at the same time as providing clear priorities and guiding investment and activities.

By ensuring that targets are based on the overall environmental outcomes sought, government will create a driver for innovative projects and policy responses, without prescribing, and therefore limiting, the solutions themselves. Clear targets also ensure that programs can be designed to achieve the desired on-ground outcomes.

It is vital that the Victoria Government tracks our progress towards reaching these targets through comprehensive baseline data and systematic monitoring (discussed in the following section) coupled with transparent public reporting (annually for some indicators). The recent public release of the *Net Gain Accounting First Approximation Report* by DSE (DSE 2008a) was an important step by the Victorian Government, and should continue on an annual basis. The Native Vegetation Permit Tracking System, which is now apparently being implemented after many years delay, should also be publicly accessible.

Targets are an important driver for ecosystem market based approaches. For this to be truly effective, targets require a legislative basis. This has been demonstrated through the implementation of the Native Vegetation Management Framework (NVMF), which does not have a strong legislative base. It has consequently been given less weight than it should in VCAT. A stronger legislative basis for the NVMF would improve its effectiveness.

### ***The Green Paper***

Victoria is a signatory to the National Objectives and Targets for Biodiversity Conservation 2001–2005, which were developed following a progress report on the implementation of the 1996 National Strategy for the Conservation of Australia's Biological Diversity. However, these objectives and targets are not mentioned in the Green Paper.

The Green Paper states (p69) "*The Victorian and Australian Governments are developing a joint NRM monitoring framework that identifies longer term (20-30 year) and intermediate (5-7 year) outcomes that can be expected from investment. Intermediate outcomes, in particular will be used as the basis for establishing measurable targets for relevant headline indicators*". It is unclear in the Green Paper if an effort will be made to align Victoria's choice of indicators with the national framework. The National Land and Water Resources Audit has spent the last five years aligning data sets, indicators, thresholds and standards, and both the Victorian and the national framework should be based on this valuable work.

The White Paper process provides the opportunity to review existing targets and to establish systematic targets for Victoria's land and biodiversity, with local and bioregional (or CMA region) targets nested under statewide and national targets.

However, the Green Paper does not outline existing targets or present draft new targets. The Green Paper does state that it encompasses the directions agreed to in Our Environment Our Future 2005 (p 30), indicating that the objectives and interim targets in this document will be a basis for target development. There is also a range of targets included in Regional Catchment Strategies, and these require alignment with new overarching statewide targets. For example clear targets and timelines for large scale habitat restoration and revegetation are required, including target areas for restoration of each EVC.

The proposal for headline indicators in the Green Paper is welcomed, and clear and measurable targets are also required. The Green Paper states that “*a final set of headline indicators will assist in the development of measurable targets to focus investment and reporting on the effectiveness of our NRM strategies*” (p69).

The proposed headline indicators in the Green Paper are high level, vague, unstructured and not presented in a coherent framework. Of the list provided, we support the native vegetation and condition and extent indicator. Other indicators should be developed with input from relevant ecological monitoring experts. Careful attention needs to be paid to repeatability of assessments. There needs to be a shift away from arbitrarily scaled, subjective assessments of quality, towards measurable attributes of quality that can be easily replicated.

The Green Paper, with its repetition of words such as “*finite resources*”, “*redirect resources*” and “*prioritise*” raises the very real concern that targets may be set based on what can be achieved with available resources. However, if Victoria is to reverse the crisis facing Victoria’s biodiversity, it is vital that targets are based on what is required to:

- maintain and restore ecological processes,
- maintain and restore habitat,
- ensure long term sustainable populations of every species and community of flora and fauna in Victoria (including those currently under threat).
- ensure ongoing provision of ecosystem services.

### **Agenda for change**

It essential that targets are set for biodiversity and land health outcomes and that it is a fundamental requirement that the White Paper and Victorian Biodiversity Strategy renewal provide the roadmap to achieve these. They should be required by legislation (as the FFG Act currently requires a Biodiversity Strategy). This could be achieved for example through a consolidated Biodiversity and Ecological Processes Act (discussed in the section of this submission on legislative reform).

Targets must be science-based, and SMART (specific, measurable, attainable, realistic and timely). It is vital that targets should be achievable, and focused on outcomes rather than activities. While some targets will be generational, others must be achievable within ten years (there should be targets for a range of timeframes: 5, 10, 15, 30 and 50 years). They should be reviewed every five years.

Targets should:

- focus on outcomes including environmental condition and environmental pressures, rather than government responses.

- be evidence-based and underpinned by good science.
- be developed with broad community consultation, awareness raising and expert analysis, and
- be backed up with funding and institutional arrangements.

Clearly defined targets and associated indicators by which to measure progress towards reaching them are the first step to planning, monitoring and adaptive management. In general, the most useful indicators are quick, economical and easy to measure and operate over time frames and spatial scales that are useful for linking to land use patterns as well as linking back to adaptive conservation management and clearly stated goals. Indicators must also be SMART (specific, measurable, attainable, realistic and timely).

Indicators need to provide ‘early warning’ of undesirable trends rather than documenting losses before it is getting too late to deal with them. So, for example, instead of an indicator about the conservation status of native species, it is more useful to focus on population indices such as demographics, rates of reproduction, and extent of viable habitat, that will indicate likely species decline.

It is important that state indicators and targets align with the national framework, and that this is achieved through a Council of Australian Governments (COAG) style approach, otherwise we will continue with the problem of poor ability to integrate results from each state in national data collection, analysis and state of the environment reporting.

***Key recommendations:***

- ❖ Set clear, ambitious but achievable statewide targets for biodiversity and land health outcomes, applicable for a range of timeframes from 5 to 50 years.
- ❖ Setting of targets should be required by law and reviewed every 5 years. Bioregional or Catchment Management Authority targets should be nested as a minimum under the statewide targets.
- ❖ Targets should be based on what is required to maintain and restore ecological processes and habitat, ensure sustainable populations of every species and ecological community in Victoria, and ensure ongoing provision of ecosystem services<sup>2</sup>.
- ❖ A roadmap for achieving the targets should be presented in the White Paper and/or the renewed Biodiversity Strategy.
- ❖ Align Victorian biodiversity conservation and natural resource management targets and indicators with national objectives and targets.
- ❖ Establish a coherent framework for headline indicators that are SMART, transparent, with regular public reports and an effective communication strategy to engage with community, business, government agencies and decision-makers on progress.

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<sup>2</sup> Natural ecosystems provide a range of services, including soil fertility, nutrient cycling, erosion control, water quality, pest control and pollination.

### Issue 3. Science, data and monitoring

Australia's investment in science and knowledge is declining at the same time that the rate of environmental change is rapid and increasing, and the health of land and biodiversity is declining.

Knowledge of the status and trends of land health and biodiversity are essential for their effective conservation and management. The previous section discussed targets for achieving our objectives. Comprehensive baseline data and publicly reported systematic long term monitoring are essential if we are to know whether or not we are making progress towards our targets. Likewise, good information and knowledge sharing are required for systematic conservation planning and program implementation. Adaptive management loops (plan, do, monitor, review) are required to achieve iterative improvement and to capture valuable knowledge in the process.

Long-term ecological monitoring programs that systematically record changes through time are essential to understand the status of ecological processes and conservation assets. Baseline information, followed by monitoring and evaluation of the outcomes of management interventions is also necessary. Regular public reporting of the results is one aspect of sharing knowledge with resource managers to enable adaptive management. Also needed are good, up-to-date information systems that make spatial data and conservation management knowledge readily accessible to policy makers planners, landholders and other resource managers.

Victoria needs to foster strong ecological science so that we are able to better understand the nature of Victoria, the problems we face, the potential solutions, as well as learn from experiences, and improve/adapt management accordingly.

Victoria is fortunate to have some of the world's leading ecologists, and should build on the expertise that is already here.

The need for strong science is clearly articulated in the Green Paper, which states that *“accurate, appropriate and current knowledge is crucial to achieving our desired outcomes in land and biodiversity management”* (p66). The Green Paper also states that *“maps and data are often outdated and inconsistent, meaning the information needed for sound policy decisions does not always exist.”* (p4). And that *“data collection is currently project based rather than long-term and systematic. Maps are constructed using an amalgam of data from different temporal and spatial scales. In Victoria, we are unable to present a clear picture of what is happening to many important assets.”* (p28).

The Green Paper states that *“decisions must be based on good information (scientific and local) and decision making processes must be transparent.”*(p28). The Green Paper outlines a range of mechanisms to achieve this. However, it fails to discuss the level of investment needed, and while it is seen as important, there is not yet commitment to the level of investment that is required if Victoria is to base our natural resource management programs and activities on sound, systematic, long-term science and knowledge.

The Green Paper suggests *“ensuring natural resource management databases can be used across agencies will enable decisions that are based on the best possible information”* (p66), but does not demonstrate commitment to this, rather suggesting the approach *“assess the feasibility of a single natural resource management knowledge repository for Victoria”* and *“facilitate data access and mapping with land*

*use and natural resource planning that promotes collaboration, consistency and timely action” (p68).*

An additional problem to lack of integration/incompatibility of databases, is lack of data collection and lack of entry of existing data sets. There is a particular need for long term data sets and landscape scale monitoring. According to Bennett et al (2007, p3) data sets *“primarily represent a static view of assets. To understand the status of ecological processes, we need to have quantitative measures of change through time. There is an extraordinary scarcity of systematic long term data sets on the status of flora, fauna and natural resources in Victoria. There is a clear need for systematic, long-term monitoring of biodiversity across the state. Likewise, there is a clear need for systematic monitoring of the responses of biota to management programs and natural disturbance events (e.g. bushfire).”*

Submissions to the Consultation Paper recommended a detailed review of the current status of and gaps in Victoria’s research, data and monitoring systems and processes. The Green Paper states that this is being undertaken. The prioritisation of research and data collection efforts should be based on this. The Green Paper outlines some key research areas requiring further attention (p67). We look forward to seeing the detail of these research proposals. In particular, high priority should be given to undertaking comprehensive modelling/mapping of effects of climate change on land and biodiversity values on public and private land in order to determine and put in place strategies to mitigate and adapt to these impacts.

## **Agenda for change**

### **Monitoring and data collection**

A high priority is to greatly improve capacity for large scale and long term monitoring. Much can now be achieved through remote sensing, and by local sensors. For example, acoustic sensors can be used to monitor for frogs and birds, and data can be wirelessly transmitted to central data loggers.

There is a clear willingness and community capacity to respond to the need for long term monitoring if adequately resourced and supported by government. Some examples of international and Victorian community based monitoring are provided in Appendix 1. For example, community based field naturalists, ecologists and students could be provided with GPS capable PDAs from which they could send field data into central databases.

Effective monitoring requires effective data collection, storage and analysis. Andrew Campbell (former CEO of Land and Water Australia) in his submission<sup>3</sup> to the recent 2020 Summit proposed a comprehensive way to achieve this nationally (p3):

- *“A **clearinghouse/national innovation centre** for analytical tools, technologies and metrics — including tools such as carbon footprinting, lifecycle analyses, energy efficiency measures etc (especially those that can assist in integrating consideration of carbon, water and energy), and technologies such as sensing, metering and telemetry systems, linked to mapping systems such as GIS and GPS and user-friendly front ends like Google Earth — that would help schools, community groups, industries and governments at all levels to*

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<sup>3</sup> [http://www.triplehelix.com.au/documents/Thoughtsforthe2020summit\\_000.pdf](http://www.triplehelix.com.au/documents/Thoughtsforthe2020summit_000.pdf), accessed 3 July 2008

*develop their own ‘sustainability dashboards’, that would in turn link to;*

- *A complete overhaul across the federation to **create a single national system to monitor the status of and trends in the condition of natural resources** like biodiversity, soil, land and water (complementing and to a degree unifying work already underway in the Bureau of Meteorology on water and in the National Carbon Accounting System), that would in turn link to;*
- ***An Australian Ecosystem Observation Network** (drawing on the best elements of the Environmental Change Network in the UK, the National Ecological Observatory Network in the US, the Integrated Monitoring and Assessment Network in Canada and the international networks for long-term ecological research sites) that would establish core scientific infrastructure based on a network of sentinel sites for monitoring environmental change at a continental scale and supporting research. This could be complemented by a Farming Systems Research Network with the FFI CRC projects at its core, and pulling in any long term data sets from agriculture department research farms to establish for each agroecological zone an equivalent of the environmental sentinel sites, but with a greater emphasis on adaptation than just tracking key parameters of change. These would in turn link to;*
- *A **data and knowledge centre** (distributed network across existing super computers) that would work with States, Territories, R&D organisations and other data custodians and providers to consolidate both existing and new data into much more accessible and tractable forms (again with front ends like Google Earth), that would in turn link to;*
- ***An Australian Centre for Ecological Analysis and Synthesis** (learning from the US National Center for Ecological Analysis and Synthesis at UC Santa Barbara that has generated more than 120 papers in Science and Nature over the last decade on a budget of around US\$4m per annum) that would analyse and synthesise data generated through all of the above mechanisms to provide big-picture analyses of trends and options for policy and other audiences.”*

Victoria could play a key role in the establishment of this national system. Victoria would need to invest in the required data collection, and could for example host the proposed National Centre for Ecological Analysis and Synthesis. As an absolute minimum, the suggestion in the Green Paper of aligning Victorian databases should be implemented. It is important that a durable institutional home (with a culture of long run data sets) is provided for data storage.

Some examples of monitoring and data needs include:

1. *Finer scale monitoring of changes in native vegetation. Current technology allows for detection of changes in tree cover to approx. 0.25 ha using satellite (Landsat) data. While this is a significant advance on previous assessments of native vegetation, the detection of the loss (or gain) of individual trees is beyond the resolution of the satellite imagery. Arguably, this is where the*

greatest changes in native vegetation are occurring, but these are currently below the limits of detection. Trials indicate that the latest imagery from SPOT satellites have the ability to detect individual paddock trees. Purchase of these data would also begin to allow us to monitor changes in localised plantings (eg. through landcare). Biannual acquisition of statewide coverages would cost in the order of \$1million, but would allow this level of monitoring. The data of course are useful for a range of other purposes relevant to government (e.g. urban planning, forestry, water resources.).

2. High resolution modelling and mapping of the extent of Ecological Vegetation Classes (EVCs), scattered trees and vegetation quality should be extended statewide, using remotely sensed data (as discussed under point 1), with adequate ground-truthing and survey work. Preferably this should be done at a scale greater than 1:25 000, e.g. 1:10 000. Grasslands and other treeless vegetation types should be included, and there should be a short-term priority for Melbourne's growth corridors and other areas under immediate development pressure.<sup>4</sup>
3. There is generally have very limited knowledge of the ecology and distribution of threatened species. The flora and fauna of most remnant vegetation has not been surveyed. As a result, we have to predict what species are likely to/might occur.
4. There are substantial gaps in data coverage particularly on private land, as well as through time, and inadequate provision of data and data management capacity for local government planners and other implementers.
5. Long term monitoring is essential which shows trends in relation to both 'assets' and ecological processes.
6. There is a clear need for more scientific research to improve our understanding of the roles, functioning and condition of the ecological processes that sustain biodiversity and ecosystem services. The relatively intact environments are key places for learning about basic processes. *"There is enormous scope for cooperation between managers and scientists to integrate management actions with monitoring and research, in the form of management 'experiments'. Manipulative and observational experiments are powerful tools for gaining new insights into process..."* (Bennett *et al.*, in prep.).

### **Investment prioritisation tools**

The Green Paper focuses heavily on prioritisation of investment. A recently-published review of biodiversity investment prioritisation tools (Wintle 2008) concludes (p1) *"that there exists a sufficient array of tools to support biodiversity investment prioritisation and new tools are probably not required. However, there is a need for a careful examination and trialling of the existing tools in an NRM biodiversity investment prioritisation context to clarify which of the tools are most appropriate for resolving NRM prioritisation issues."*

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<sup>4</sup> To illustrate the importance of high resolution mapping: EVC mapping at 1:100 000 in the City of Manningham missed about half of the remnant vegetation in the municipality, compared with council's in-house mapping at 1:10 000.

### **Key recommendations**

- ❖ As a central component of an adaptive management framework, monitor the performance of conservation actions and management programs, using standardised, objectively measured data collection and storage protocols so data can be aggregated up to regional, and state and national levels for reporting purposes.
- ❖ Establish systematic, long-term ecological monitoring programs with a network of “sentinel sites” across the State to record changes in biodiversity assets, ecological processes and land health, including the responses of biota to management programs and disturbance events. Utilise remote sensing and automatic sensors, as well as professionally managed community-based monitoring as economical means of data collection.
- ❖ Provide adequate resourcing for baseline surveys and ongoing monitoring of threatened species on public and private land.
- ❖ Consolidate existing and new data, and maintain readily accessible, up to date information systems with spatial data and conservation management information for planners, landholders and other resource managers.
- ❖ Foster Victorian-oriented ecological research to support conservation management, eg through Arthur Rylah Institute and universities.
- ❖ Use a review of Victoria’s research, data and monitoring systems as a basis for prioritisation of future research and data collection.
- ❖ Develop institutional capability (in government and the research sector) for analysis and synthesis of ecological data to provide big picture analyses of trends and options for policy and public audiences.

### **Issue 4. Education and extension**

The success of biodiversity conservation in Victoria depends on the awareness, understanding, and valuing by Victorians of our unique and remarkable biodiversity and the vital ecological services it provides. It is clear that Victorians have a high concern for the environment. There is considerable celebration of the natural environment in Victoria including visits to National Parks and other natural areas, art and festivals that celebrate sense of place, and its appreciation as the backbone of the tourism industry.

There is growing interest in and desire to act to conserve water and tackle climate change and mega-fires. In regard to climate change, most Victorians accept the mounting evidence that climate change is real, is here and needs to be addressed. However, few Victorians are adequately aware of the very poor state of our biodiversity, and the threats it faces, including from climate change. Research undertaken in 2008 by the Victoria Naturally Alliance indicates very strong community concern and willingness to take action about the very high numbers of threatened species in Victoria. There is a clear need to educate the Victorian community about biodiversity – what it is, the ecosystem services it delivers, its status and threats, and what we as Victorians can do about it.

Concerted community awareness raising is required to ensure uptake of the tools and the behavioural change required and to engender support for the various programs, regulation and funding needed to achieve goals and targets.

## ***The Green Paper***

The Green Paper has a section on education and behaviour change which has some good suggestions that are lacking in detail. It lacks clear suggestions for improving extension, public education and achieving ecological literacy through schools, universities, professionals and government. There is a suggestion (p68) to “*make policy, planning and research outputs accessible to land managers and owners*” but no suggestion as to how this could be achieved. The section on *Farmers* (p81) does not mention extension or knowledge transfer. The section on *Landcare and volunteer organizations* (p73) also fails to suggest skills/knowledge transfer.

The Green Paper provides some high level suggestions about reviewing knowledge management systems and improving knowledge brokering. We look forward to seeing much more detailed approaches in the White Paper.

Given the scale of restoration and revegetation that needs to be undertaken in Victoria, there is a clear need in the White Paper to address how the individuals and organisations (public and private) involved in this work can communicate learnings in a way that is meaningful to others in the industry.

## ***Agenda for change***

The need to link awareness and behaviour change has been recognised in the State Government’s successful public interest campaigns including the black balloons, drink driving, water and energy. A similar high-profile, sustained education and behaviour change program is required for biodiversity. Such a program needs to be outcome focused, with defined target audiences and tested messaging. Important target audiences for such a campaign include metropolitan residents, rural and regional populations, tree/sea-changers.

We are living in a period of rapid environmental change, and our education system needs to evolve to deliver the skills and information economy required to respond to and mitigate these changes.

A schools and community based environmental education initiative is required. The development of this in Victoria could draw on the recently completed (but not launched) national environmental education strategy.

Leadership and ecological literacy are also required in the public and private sectors. A program to achieve this could involve teaching ecological principles and latest climate change science via:

- a *Leadership Retreat* targeted directly towards Departmental heads and deputy secretaries, Members of Parliament and ministerial advisers, heads of all statutory bodies (e.g. Port of Melbourne Corporation, water authorities, etc).
- an *Executive Retreat* targeted directly towards CEOs and senior managers of all major corporations operating within Victoria, particularly property developers, agribusiness and financial institutions. Attendance could be a requirement for receiving government contracts etc.
- a *Professional Development Course* targeted directly towards public servants with leadership potential– such a course could be offered through the public service training bodies (e.g. Australian & NZ School of Government), or by third party providers, and there could be targets established – e.g. 2% of all VPS and EO2 staff within 10 years.

- *Online professional education:* A curriculum development project to produce online modules about ecology and ecological processes at introductory, intermediate and detailed levels, for engineers, agronomists, planners and other relevant professionals. These modules would be in the public domain, and could be utilised by individuals or by staff teaching professional courses<sup>5</sup>.

It is also necessary to deliver readily-accessible training and ongoing technical support to all landholders (both agricultural and amenity), to enable them to prepare property management plans with a strong component of biodiversity, ecological processes and natural resource conservation. ‘eFARMER’ is a useful web-based mapping and planning tool that should be extended across Victoria to assist management planning at property and larger scales.

The section on knowledge and science above highlights the role of the community in ecological monitoring by. This also has an educational role. Programs such as Landcare, Waterwatch and Coastcare involve thousands of people and should be strengthened. These programs increase understanding of and engagement with the natural world.

Effective extension programs for conservation-oriented land management need to be developed/reinstated. For example, reform of the management of riparian Crown frontages will depend on comprehensive engagement and extension. Likewise, programs such as Land for Wildlife have been providing effective extension and should be fully reinstated.

Achieving the large scale revegetation required in Victoria will depend on considerable skill development and knowledge transfer. This could be in part achieved through the establishment of a virtual resource/knowledge centre for vegetation restoration. This centre would provide large and small scale projects and programs with a suite of information, tools and lessons learnt as well as advice on funding sources and potential avenues of institutional support and networking. Potential for a Cooperative Research Centre on biodiversity restoration should also be investigated.

### **Key recommendations:**

- ❖ Enhance awareness of the values and condition of Victoria’s biodiversity, and achieve behavioural changes through targeted public awareness and education campaigns, modelled on the road safety, water and energy campaigns.
- ❖ Implement a schools-based environmental education initiative, drawing on the recently-completed national environmental education strategy.
- ❖ Develop ecological literacy through specially designed courses for political and public sector leaders, corporate executives, and public servants, supported by online professional education modules.
- ❖ Deliver readily accessible training, web-based tools (such as ‘eFarmer’), and ongoing technical support to all landholders for property management planning with a strong component of biodiversity, ecological processes and natural resource conservation.

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<sup>5</sup> The idea is based on modules on energy efficiency produced by ANU, Natural Edge and CSIRO.

- ❖ Develop and deliver an effective extension program for conservation-oriented rural land management, including up to date tools and techniques for native vegetation management and restoration.

## **Issue 5. Ecological processes**

The importance of ecological processes is an emerging development in ecological theory which has major implications for the success of efforts to sustain biodiversity. The key insight is that ecological processes maintain our natural values/assets (species, vegetation communities, habitats or sites). Therefore if Victoria wants to maintain natural values, as well as ecosystem services for humans, the ecological processes which support them need to be sustained and restored.

However a focus on ecological processes does not automatically protect individual species and places: both ‘asset’ and ‘process’ based approaches are needed. There is a need to respond both to threats facing assets and threats facing processes.

Ecological processes that are fundamental to life include nutrient cycling, flows of water, dispersal of animals and seeds, local adaptations by species to changing climatic conditions, disturbance regimes associated with fires and flooding, and functional interactions between soils, plants and animals such as pollination, decomposition, predation and competition. If these processes are altered and degraded, then the species and habitats that depend on them may change or disappear.

Conservation in Victoria has had a fundamentally important focus on preserving large blocks of existing habitat. While this approach is very important for the conservation of many species, it does not on its own ensure the survival, for example, of species which move between different habitats (for which connectivity can be very important), or species which require a particular disturbance regime. For example conservation of Red Gum wetlands requires both protection of the trees themselves (‘assets’) and provision of floodwater (‘process’).

### ***The Green Paper***

The Green Paper does not adequately consider the role of ecological processes in land and biodiversity health and management. It lists as the first ecological principle (p37) “*allow ecological processes and functions to continue*”. This is an important recognition of the role of ecological processes, which fails to cascade through the rest of the document. This is understandable as this is a relatively new area, however ecological processes need to become a fundamental part of our approach to conservation. The Green Paper in relation to supporting species to adapt to a changing climate suggests “*Increase the resilience of critical habitats to restore broad ecosystem function, rather than focusing on conserving individual species populations*” (p 35). It is not a matter of one approach rather than the other – both increasing habitat resilience and focusing on individual species are required

### ***Agenda for change***

Victoria’s conservation framework needs to explicitly consider the ecological processes that keep our ‘assets’ functioning. The conservation approach needs to consider the significant processes as well as landscape context, including cumulative impacts, time lags, off-site effects, and connectivity requirements of species.

It is necessary to proactively and systematically build the full consideration of ecological processes into legislative and institutional frameworks, policy and planning processes, and on-ground management of land, environment and natural resources.

In broad terms, priorities for protecting ecological processes in Victoria are to:

- maintain extensive areas of natural or near-natural landscapes and seascapes with relatively intact ecological processes
- restore and reconnect terrestrial and aquatic ecosystems as far as is possible in production and settlement landscapes to sustain and repair functioning ecological processes
- manage human activities and human-caused impacts that threaten ecological processes, particularly water extraction, clearing and decline in vegetation condition, invasive species, fire.

The Victoria Naturally Alliance has commissioned a report on the policy priorities to sustain biodiversity in Victoria in relation to ecological processes. This report is nearing completion. It includes a range of policy change recommendations and will be made available to the White Paper team once it is complete. Key recommendations for the protection of ecological processes are presented under other sections of this submission, particularly public land, marine and coastal, very large scale restoration, native vegetation, fire, rivers and riparian.

### **Key recommendation**

- ❖ Apply an ecological process-oriented perspective to conservation planning, in addition to an asset-based approach.

## **Issue 6. Species and communities**

The approach proposed in the Green Paper of increasing the resilience of critical habitats and restoring broad ecosystem function and connectivity will be important to general biodiversity outcomes, but will not be sufficient to secure the future of threatened species. To ensure that Victoria is successful in conserving biodiversity, including rare and threatened species, the approach should be one of addressing conservation at multiple scales including both an ecosystem management and species management approach (Clark 1996).

The conservation and recovery of threatened species is a crucial element of achieving the protection of biodiversity in Victoria. More than 50% of Victoria has been cleared of native vegetation, (over 80% has been cleared on private land). The resultant highly fragmented landscapes, coupled with a range of threats including invasive species, has resulted in high numbers of threatened species. Thirty percent of all vertebrate fauna and 44% of all vascular plants in Victoria are extinct or threatened (Dunlop *et al.* 2004).

Victoria must act now to reverse this decline, and ensure the survival of our species. Approaches to conservation need to focus on threatened species and also provide security for more common species with a particular focus on preventing more species moving into the threatened categories.

Some species may become threatened if important elements of their habitat are lost. For example for hollow-dependent birds in largely agricultural landscapes, a key habitat component is provided by scattered hollow-bearing paddock trees. However, there has been little or no recruitment of new paddock trees, and many existing trees

are now senescing and dying, with no younger hollow bearing trees to replace them. Therefore while some species may appear to be safe now, they are may not be so in the future.

Many species are thought to be at risk due to extinction debt, with a time lag thought to be likely between habitat loss and loss of faunal communities. This is because populations and species may persist for some time but without remedial action, will gradually disappear as successive patch-level extinctions occur (Tilman *et al.* 1994).

Soon to be published scientific research is showing serious declines in bird abundance and species richness in north central Victoria. This includes more common species. A draft paper by Radford and Bennett states:

*“In 2002-03 we detected a threshold relationship between species richness of woodland birds and landscape-level tree cover: there was an abrupt decline in richness in landscapes with less than 10% tree cover. We hypothesized that landscapes with 10-20% tree cover were most likely to be carrying an extinction debt, and thus the threshold would shift towards higher levels of tree cover over time. That is, landscapes with intermediate levels of tree cover would lose proportionally more species. We detected dramatic changes in the terrestrial (non-waterbirds) bird community from 2002-03 to 2006-07. Of 114 terrestrial birds detected in 10 or more surveys in 2002-03, the incidence (reporting rate) of 70 (61%) of them decreased by over 30% in 2006-07... However, decreases in species richness were not related to extent of tree cover and the threshold remained at 10% tree cover. This suggests the losses are not the realization of an extinction debt but ‘across the board’ declines associated with poor climatic conditions and ongoing habitat degradation.”*

Experienced ecologists in western Victoria are also reporting consistent declines in abundance and species richness, including of previously common species. These across the board declines are thought to be the result of a combination of factors, including excessive fire, grazing pressure (and associated loss of understorey) and drought. The last 10 dry years are thought to have resulted in poor breeding success, resulting in observed crashes in abundance and species richness. However, given that with climate change, it is expected that Victoria will be drier and hotter, drier years could well be the ‘new normal’ for Victoria. Previous research by Deakin University showed that large blocks of habitat support more bird species and the new research shows that they continue to do so. Given that we are already seeing serious impacts from drought across our landscapes there is an increased imperative to protect and restore wildlife habitat.

Victoria needs to act to prevent more species becoming threatened. Victoria is recognised nationally for having high numbers of threatened species: with the National Land and Water Resources Audit (2002) identifying the subregions associated with the highly cleared areas of southern and south eastern Australia as having the highest numbers of threatened species. In Victoria, a total of 586 species are listed under the *Flora and Fauna Guarantee Act* 1988 as being threatened, along with 36 communities and 36 potentially threatening processes (DSE 2006). However, under the DSE Advisory lists for threatened flora and fauna in Victoria, a total of 204 vertebrates and 1667 plants are recognised as being threatened, taking the total number of threatened species in Victoria to over 1850 species (DSE 2003, DSE 2005).

Victoria also has a poor record in regard to threatened communities, with a number of bioregions in Victoria having greater than 50% of ecosystems threatened including the south-east Highlands, Victorian Volcanic Plain and Murray Darling Depression (National Land and Water Resources Audit 2002).

Despite the obvious and recognised need, Victorian investment in recovery actions specifically targeting threatened species and communities has been inadequate.

### ***The Green Paper***

Many of the statements in the Green Paper seem to be suggesting a fundamental winding back of threatened species policy in Victoria. The intent is explicit, with the Green Paper stating

- (p28) *“fundamental decisions need to be made about the level of resources that can be invested in this area and whether we want to continue to aim to protect all species”*;
- (p31) the goal under Outcome 1 that *“targeted species and ecological communities are secured”* which suggests that there will be no commitment to those species not selected .
- (p53) *“The scale and breadth of climate change impacts and Government’s finite resources means saving some plant and animal species once they become endangered may be beyond our means”*
- (p 65) that the principal objective of the Flora and Fauna Guarantee Act 1988 *“could be revised to a more realistic objective”*.

It appears that the Government is giving up on threatened species as too hard, before any significant attempt has been made in this area.

The Green Paper only addresses the issue of threatened species in relation to climate change, with the broad approach of the Green Paper being to increase the resilience of critical habitats and restoring broad ecosystem function. For example the Green Paper (p35) states *“Increase the resilience of critical habitats to restore broad ecosystem function, rather than focusing on conserving individual species populations”* (p 35). A broad ecosystem approach should be complementary to, but not at the expense of the specific and focussed actions required to recover species that are already threatened.

The Green Paper does not specifically address or provide an approach to dealing with the underlying causes of decline that have resulted in species being considered threatened in the first place. It appears to take the position that by dealing with ecosystem function and connectivity, threatened species will also be conserved. Whilst this approach may benefit some threatened species, it will not address the needs of all threatened species.

### ***Agenda for change***

#### **Specific policy/programs/legislative changes required**

Implementation of recovery actions will be required at multiple scales including site and species-specific management. This is required in order to minimise existing threats in the face of climate change. The stated focus in the Green Paper of increasing the resilience of critical habitat to restore broad ecosystem function may benefit species in the long term, however will occur too slowly for some threatened species. Therefore recovery actions need to be implemented to provide immediate

assistance for threatened species. It is clear that large scale restoration and biolinks projects are a priority, and should be implemented to assist with the long-term recovery of threatened species. All habitat restoration and large scale biolink proposals should be planned with a focus on threatened species recovery and should include an assessment of their likely impacts on threatened species recovery. In the meantime, threatened species require specific plans and resources for their recovery. Species that are in decline regionally but not yet considered sufficiently threatened to be listed also need to be indentified.

Targets must be set for threatened species recovery as well as persistence of all species in Victoria.

### **Resources**

Currently, the majority of funding for implementation of recovery actions has come through the now-replaced Natural Heritage Trust, which equates to only \$3000 of investment for each of the species recognised as threatened under the Department of Sustainability and Environment's Advisory Lists (based on figures from the Natural Heritage Trust Annual Report 2005-06). This is inadequate to address current threats, let alone increased threats in the face of climate change.

The Victorian Government has the opportunity through the White Paper to commit to and provide sustained funding for a threatened species recovery program.

### **Key recommendations:**

- ❖ Recommit to the goal of enabling all threatened species and communities to '*survive, flourish and retain their potential for evolutionary development in the wild*' consistent with the objectives under the Flora and Fauna Guarantee Act; Victoria's Environment Sustainability Framework; Victoria's Biodiversity Strategy; and the National Strategy for the Conservation of Australia's Biological Diversity.
- ❖ Set targets with timelines for the recovery of threatened species and ecosystems.
- ❖ Commit in the order of \$50 million per year for the next five years for a threatened species and communities recovery program specifically for implementation of recovery actions.
- ❖ Establish and fund a dedicated threatened species research and monitoring program that will focus on addressing the knowledge gaps in threatened species recovery, monitor trends in populations of threatened species and other species in decline, and support an adaptive management approach to implementation of recovery actions for threatened species.
- ❖ Factor climate change assessments into both the listing process for threatened species and the development and implementation of recovery actions; and establish a process for identifying and addressing emerging threats that may result from climate change.
- ❖ Strengthen the protection of threatened species and their habitats under the land use planning and development approvals system through greater consideration of threatened species in planning and approvals processes. Require consideration of the provisions of the Flora and Fauna Guarantee Act in planning decisions under the Planning and Environment Act 1987.

- ❖ Ensure planning for large scale restoration projects includes priorities for all threatened species and ecosystems in that region.

## **Issue 7. Native Vegetation**

### ***Implementing the Native Vegetation Management Framework***

The protection and enhancement of native vegetation is very important both for biodiversity conservation, and provision of ecosystem services (including reducing climate change). The historic excessive clearing of much of Victoria has had major impacts on biodiversity, and ecosystem services from the natural environment have also been greatly diminished or lost. Protecting and restoring remnant vegetation, particularly threatened EVCs and threatened species habitat, can help restore biodiversity and ecosystem services.

It is widely acknowledged that avoiding clearing is the first step to reversing the decline of biodiversity (SoE reports, VCMC 2002, DSE – many reports). It is not yet possible for humans to fully replace an ecosystem that has been cleared, hence clearing controls and protection of threatened ecosystems are vital components of biodiversity protection in Victoria.

The Native Vegetation Management Framework (NVMF) sets out the goal of reversing the decline in extent and quality of native vegetation, and of protecting existing remnant vegetation as a priority. The NVMF is valuable, but its implementation requires considerable improvement. Its key principle of ‘avoiding’ clearing of native vegetation needs to be rigorously implemented. However, there often continues to be inadequate emphasis on this priority, with over-reliance on ‘offsetting’. Likewise, the Exemptions under Section 52.17 in the Victoria Planning Provisions (VPPs) result in loss of native vegetation, and should be more tightly defined, with offsets required for exempt clearing. Illegal clearing continues, particularly in the case of native grasslands being ploughed for crops. Losses of grassy native vegetation in recent years averaged 3200 ha per year (DSE 2008a).

The NVMF was incorporated into all Victorian planning schemes by amendment VC19, which commenced on 24 July 2003. The amendment also introduced a requirement in the State Planning Policy Framework section of all planning schemes that planning and responsible authorities “should have regard to” the NVMF.

In the context of native vegetation removal, the key provision is clause 52.17 of the Victoria Planning Provisions which contains the requirement to obtain a permit for the removal, destruction and lopping of native vegetation. At the time of the introduction of the NVMF, clause 52.17 was basically in the same form as it was at the time of its initial introduction in 1989. The changes made in 2003 simply added the NVMF “and any operational guidelines” as one of a number of decision guidelines to be considered in a permit application for native vegetation removal.

A consequence of the chosen method of implementation of the NVMF under the *Planning and Environment Act* is that its legal status is that of a policy or guideline rather than a binding prescription. As such, it becomes one of a number of potentially competing or conflicting priorities that inform the exercise of discretion. The uncertainties generated as a result of the implementation of the NVMF as one policy amongst many under the VPPs are substantial, and in practice, greatly reduce its effectiveness. This is demonstrated, as in almost every instance that the preservation of very high conservation significance native vegetation has been considered at the

Victorian Civil and Administrative Tribunal (VCAT), the Tribunal has either granted a permit to clear native vegetation, or indicated that it would be prepared to do so, principally because of the need to “balance” the Framework against other competing planning policy objectives. The general failure to translate the strong policy outcomes promised by the NVMF into regulatory and on-ground outcomes undermines its objectives.

To improve the retention of native vegetation, strategic planning needs to be undertaken at the outset of assigning planning zones and overlays, for example through precinct planning. Putting in place appropriate zones and planning controls that reflect biodiversity values will avoid conflicts between conservation and development. To be effective, this requires thorough survey and assessment of ecological values to ensure excellent ecological information from the outset, with rigorous spatial prioritisation to zone land appropriately to protect biodiversity. New planning tools are required to ensure that once the plan is in place, the full range of exemptions to clearing controls no longer apply. Strategic planning however is not a substitute for planning controls throughout the development process. Clearly there is still the need for the capacity to manage proposals to clear native vegetation.

In 2004, the Municipal Association of Victoria published a report on native vegetation. This report highlights a number of problems, that to our knowledge have not yet been addressed, for local government in the implementation of planning controls over native vegetation, including:

- confusion regarding roles and responsibilities between DSE, DPI and local government,
- resource and staffing constraints in many councils,
- the need to build skills and knowledge in local government, including access to high resolution native vegetation and habitat mapping across the state.

### **Offsets**

The key principle in the NVMF of ‘avoiding’ clearing of native vegetation needs to be rigorously implemented. This is particularly important for medium to very high conservation value native vegetation. Where clearing occurs, either by permit or exemptions, offsets are required. There should be a strong preference for local, ‘like for like’ offsets (tenure, EVC, security and condition), to maintain biodiversity and ecological function at a local level as well as regionally. Offsets by management and security gains alone result in further loss of biodiversity, therefore extent gains are also needed. Security, monitoring and enforcement of offset arrangements are required.

### **Net Gain accounting**

The recently published *Native Vegetation net gain accounting first approximation report* (DSE 2008a) reports a net loss of native vegetation of 4000ha per year between 1994 and 2004. While this period was largely prior to the implementation of the NVMF, the 3200ha of grassland loss per year is not yet adequately being addressed through the Framework, as most of this clearing has been without permits. The net gain accounting report (p18) states “*the rate of clearing of grassy vegetation is of concern, particularly given that much of this appears not to be considered in regulatory processes*” and that DSE is trialling a new ‘prior notification’ approach.

This is required, and needs to be combined with compliance measures to ensure its effectiveness.

The net gain accounting report does not include individual tree loss, therefore clearing of scattered trees under exemptions as well as illegal clearing are ignored in the data - clearly native vegetation loss is higher than that reported.

Of particular concern is the loss of native vegetation quality shown in the report. The report estimates that on public land there is a gain of 5900 habitat hectares (Hha) per year for the reporting period, while there is a loss of 9900 Hha/yr on private land. However, the assumptions used to produce these figures do not include some of the threats on public land, such as grazing by feral deer, horses and impacts from pigs, and environmental weeds. The assumption that fire and logging have neutral impacts on vegetation quality are not adequately backed up by research, and it is quite likely that they are resulting in long term declines in vegetation quality with consequent impacts on plant and animal diversity. Likewise the assumption that offsets for cleared vegetation deliver no net loss over time are not backed up by monitoring data, and at this stage are clearly assumptions. On the basis of this, it is likely that losses of vegetation quality in Victoria are even worse than reported.

### ***The Green Paper***

The Green Paper reiterates the commitment to Net Gain (p54), and states that the implementation of the Native Vegetation Management Framework is being reviewed as part of the White Paper process. We strongly support this. However, the approaches suggested are vague, and do not give a sense of how it is proposed that this is achieved. The suggestions of “*ensuring compliance with clearing controls*” and a priority focus on grasslands are important. Without compliance, monitoring and prosecution of those who clear illegally or do not adhere to permit conditions, government does not send a clear message that it is serious about its policy. The suggested approach (p54) “*investigate ways to reduce red tape without compromising the intent of the Native Vegetation Management Framework*” should not result in watering down of the Framework, while the reverse – its strengthening – is required. While there may be ways of making the Framework more efficient and user friendly, the principle of avoiding clearing of native vegetation is very important.

The Green Paper asks the question “*Are incentive programs such as BushTender the most appropriate means to achieve net gain in native vegetation*”. In response to this question, it is clear that a mixture of policy tools including regulation, strategic planning, use of varied incentives, proactive education, technical advice, resourcing of major community-based revegetation projects, monitoring and enforcement are needed. For example, the loosely worded exemptions and widespread illegal clearing are major causes of native vegetation loss. It is clear that incentives such as BushTender have a role to play, however to ensure that we achieve net gain, the NVMF needs to be given a stronger regulatory basis and enforced.

### ***Agenda for change***

#### **Regulation and planning tools**

- Provide a stronger legal basis for the NVMF, for example through a separate Native Vegetation Act, or as part of new consolidated biodiversity legislation.
- Emphasise avoiding clearing as per stated policy.
- Provide a clearer definition and best practice for ‘avoid’ and ‘minimise’.

- Undertake strategic enforcement action for illegal clearing (particularly grasslands).
- Put in place more tightly defined exemptions, with offsets required for exempt clearing.
- Review municipal planning schemes, including zones and overlays, to reflect up-to-date data on native vegetation, and to support local and regional biodiversity plans and catchment strategies.
- Undertake strategic conservation planning for example through precinct planning. Ensure excellent ecological information is included from the outset, with rigorous spatial prioritisation to zone land appropriately to protect biodiversity. Ensure that once the plan is in place, the full range of exemptions to clearing controls no longer apply.
- Ensure urban precinct plans provide an inclusive and viable reserve network, which protects all high quality native vegetation and habitat while providing additional space for recreational uses.
- Revise the NVMF to ensure that permits for timber harvesting do not result in a decline in native vegetation quality.

#### **Monitoring and transparency**

- Separate decision making for offsets and their administration, for example by making an independent agency responsible for administration of BushBroker.
- Operationalise and make publicly accessible the long-awaited Native Vegetation Permit Tracking System.
- Implement long term monitoring of all actual gains/losses (including exempt clearing, permitted clearing and offsets). This should include long term monitoring of offsets and regular high-resolution remote sensing of native vegetation cover.

#### **Implementation**

- Support the implementation of the NVMF with education, extension and adequate resourcing of implementation agencies, particularly local government.
- Develop best practice industry standards for ecological consultants undertaking native vegetation assessment.
- Reinstate the statewide Roadsides Conservation Committee and resource the implementation of municipal roadside conservation plans.

#### **Improve the approach to offsetting**

- Ensure offsets are local and like for like – in terms of tenure, EVC, security and condition.
- Require offsets for any clearing on public land and for clearing under exemptions.
- Implement compliance measures to ensure offset for promised vegetation become real and secure.

## **Resources**

- Substantially increase the number of staff with ecological training in local government and DSE to assess planning applications.
- Adequately resource the NVMF implementation agencies.
- State Government to fund the purchase of high quality native vegetation on private land through a range of mechanisms including the Trust for Nature Revolving Fund.

## **Grassland reservation**

- Plan for grasslands conservation across Victoria, including how to achieve a comprehensive, adequate and representative reserve network, and protect and manage remnants outside reserves for long-term viability (also see the section of this submission on urban and peri-urban biodiversity).

## **Key recommendations**

- ❖ Provide a stronger legal basis for the Native Vegetation Management Framework, for example through a separate Native Vegetation Act, or as part of new consolidated biodiversity legislation.
- ❖ Review municipal planning schemes, including zones and overlays, to reflect data on native vegetation, and to support local and regional biodiversity plans and catchment strategies.
- ❖ Support the implementation of the NVMF through more proactive communication with landholders with native vegetation, about vegetation values, clearing controls and penalties, and assistance available for vegetation management. Landholders with native grasslands are an urgent priority.
- ❖ Increase the area of native grassland permanently protected in conservation reserves and under covenants, including establishment of new grassland reserves in and around Melbourne.
- ❖ Utilise a mixture of policy tools including regulation, strategic planning, varied incentives including land tax and rate rebates, BushTender, education, technical advice, resourcing of major community-based revegetation projects, monitoring and enforcement to achieve the Victorian Government's policy goal of Net Gain in native vegetation.
- ❖ Reinstate the statewide Roadsides Conservation Committee and resource the implementation of municipal roadside conservation plans.
- ❖ Require native vegetation offsets for any clearing on public land; and for vegetation cleared under exemptions.
- ❖ Ensure a strong preference for local, 'like for like' offsets (tenure, and EVC, security and condition), and ensure there are gains in extent, condition and security. Provide security, monitoring and enforcement of offset arrangements.
- ❖ Publish annual native vegetation Net Gain accounting data.
- ❖ Operationalise and make publicly accessible the long-awaited Native Vegetation Permit Tracking System.
- ❖ Ensure that DSE adopts a greater role in monitoring and enforcement action in relation to illegal clearing.

- ❖ Increase the natural resource management (including native vegetation) content in tertiary training courses for land use planners and civil engineers.

## Issue 8. Fire

Fire in the Australian environment is complex, challenging, sometimes necessary, and sometimes downright dangerous. Along with our nation's aridity, it is probably the most difficult aspect of our environment to deal with and climate change adds to this problem.

We acknowledge the role of fire in the landscape. However, fire size, intensity, season, frequency and arrangement in the landscape need to be appropriate to the ecosystem and the requirements of fire sensitive and threatened fauna in particular. Knowledge and research/monitoring of desirable fire regimes for different vegetation types are inadequate, and knowledge of the needs of fauna is virtually non-existent (Clarke, in press).

The outstanding work of firefighters on the front line needs to be backed up with the best available knowledge, planning and resources to ensure operations are as effective as possible in protecting people, property and nature.

### ***The Green Paper***

The suggested approaches to fire in the Green Paper are extremely alarming because of their likely ecological impacts. The Green Paper states (p55) that *'research suggests a revised level of prescribed burning needed for protection may require between two and five percent of the landscape to be effectively treated in strategic locations each year, or four to ten percent if burns were more randomly located.'* However, the basis of this research, from the papers quoted in the reference paper on fire on the White Paper website, appears to be computer simulations of fire behaviour in Tasmania and America (involving button grass plains and pine forests) which appear to be mis-quoted<sup>6</sup>, and also the level of burning done in south-west Western Australia (7.5%)<sup>7</sup> with largely relatively uniform dry forests.

The Victorian National Parks Association (VNPA) in its May 2007 submission to the Inquiry into the Impact of Public Land Management Practices on Bushfires in Victoria<sup>8</sup> emphasised that fuel reduction burning is not a panacea for fire control. The submission states that *"in certain, strategic circumstances it can assist asset protection, but in others it can increase fuel loads and it had a limited effect on the 2002-3 and 2006-7 fires"* (p1).

There is still significant scientific debate about the effectiveness and appropriateness of much of the current fuel reduction burning program and far more knowledge is needed of post-fire responses of fuels and biodiversity (especially fauna) in a range of ecosystems. Any increase must have a strong scientific basis that proves its effectiveness and minimal impact on fauna and flora.

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<sup>6</sup> In fact the American research papers suggested a far lower level of burning; 1-2% year of strategic burning or 2-4% of random burning while the Tasmanian paper involved burning of 3%(strategic) – 10% (random) of only the button grass plains which occupy 23% of the landscape and leaving the remaining 77% with other ecosystems unburnt (ie burning of 0.9-3% of all vegetation) .

<sup>7</sup> The ecological effects of this level of burning in South-western WA is currently the subject of a research project by the Bushfire Cooperative Research Centre

<sup>8</sup> (see <http://www.vnpa.org.au/admin/pdf-pages/Submissions/Parliamentary%20Fire%20Inquiry%20-20VNPA%20Submission.pdf>)

Currently, the target for prescribed burns in Victoria is 130,000ha per year. This is 0.6% of the State or 1.7% of all public land. In practice, when areas that are unsuitable to be burnt (wet forest, rainforest, native pine and logging regrowth) are subtracted, this level of prescribed burning is already over 2% per year of public land and in the last 5 years is about 10% per year when wildfire and prescribed burns are combined. At present, with about half of all public land burnt in the last 5 years there is instead a need to wind back burning in many regions until fire regrowth matures sufficiently to support a wider range of fauna species.

The suggestion of up to 10% of the landscape, or even the 5% suggested by the recent Parliamentary Inquiry, being prescription-burned every year is extreme. Firstly, it is hard to believe that this could be achieved given the duration of suitable weather conditions and the resources required. Secondly, it would take Victoria's flora and fauna beyond its ecological tolerance of fire, especially those species requiring longer fire-free periods.

Of the 32 draft 'Ecological Vegetation Divisions' (EVDs) into which all Victoria's vegetation has been recently divided for the purpose of working out fire tolerances, 14 of these cannot tolerate repeat fires of less than 20 years, even if these are low intensity. Some fauna species, such as many of those in the Mallee have even longer fire-free requirements than the minimum required by the flora. Thus the proposed rate of prescribed burning is likely to detrimentally affect some ecosystems, even if it is in a mosaic.

While the role of fire in the landscape is acknowledged, we are strongly opposed to broad-scale burning that is likely to alter ecological functioning and which does not take into account the extent of similar vegetation types that have been recently burnt, either by wildfire or by other prescribed burning. It is essential to consider these areas when working out future targets for prescribed burning – something that does not seem to be happening at present. For instance the continued burning of the Grampians is potentially removing the last refuges for some fauna such as Heath Mouse before the 2006 areas recover sufficiently to support them.

Since January 2003, over 2.6 million hectares in Victoria have been burnt in wildfires or escaped burns to which there has been added 570,000ha of prescribed burning - a total of 3.17 million hectares. The level of prescribed burning undertaken in the last season (155,000+ha) already represents about 5% per year of public land that has not been recently burnt.

If current strategic fuel reduction burning is increased to broad-scale burning, there will be concomitant losses in biodiversity and ecological services, such as water quality.

The Green Paper suggests the approach '*Broaden the current approach of undertaking more prescribed burning across the landscape, including in Melbourne's water catchments. This carries some risks such as reduced water quality and yield but is recognised as important to reducing significant risk of a severe unplanned event.*' (p55). We have strong reservations about this. It is important to look at other methods, including rapid response and control of fires in Melbourne's water catchments.

Logging is an important consideration in relation to Melbourne's water catchments. Not only does logging reduce water quality and yield, dense regrowth post-logging also increases fuel loads because of the resulting elevated fuels including regrowing eucalypts and the stimulation of the shrub and undergrowth layers. Scientific research has also established that clearing and logging dry out landscapes, making them more

fire prone. Conversely as disturbance is reduced and forests and other natural systems recover they hold and store more moisture, making them more fire resistant. To be serious about protecting Melbourne's water catchments, logging of them should cease.

The Green Paper suggests "*Increase fire access and fuel breaks adjacent to high value areas at risk from inappropriate fire*" (p55). It has often been claimed during and after major fires that the existing road and track network is inadequate and that it needs to be extended and upgraded to improve and aid fire detection and suppression. As roads and road maintenance have severe detrimental effects on conservation values, in particular through facilitating the spread of weeds and pests, expansion of the track network is not to be taken lightly. Endlessly increasing the road and track network will not reduce fires. Victoria has an extensive track network already but improved maintenance and signage may assist.

Strategic fuel breaks, while they do little or nothing to stop a fierce fire because of spotting, may be useful if they are immediately adjacent to an asset being protected by firefighters. Their role is particularly debatable in wetter forest where backburning is difficult or impossible. Fuel breaks result in direct loss of native vegetation, fragmentation of flora and faunal populations and increase the likelihood of weed and feral animal invasion.

There are significant questions over the current strategic fuel break establishment program given;

- uncertain benefits in reducing the extent, frequency and severity of fire, and
- lack of impact assessment of these fire breaks on biodiversity.

We support the suggestion in the Green Paper to '*consider tighter assessment procedures for new and existing settlement growth in areas of high fire risk or biodiversity value*' (p55). Urban-rural subdivisions in bushland are undesirable on environmental grounds and are an increased fire risk. This type of subdivision should be specifically discouraged in planning controls.

The suggestion (p55) of "*allowing fires to run their course instead of actively suppressing them*" may be difficult in practice. However letting a fire burn may be desirable in fire-dependent ecosystems, in some closely-monitored situations. Making such a decision should consider the fire requirements of the ecosystem, fire behaviour and weather conditions and risks to people.

### ***Agenda for change***

We support the existing zonal approach, where areas adjacent to towns (and small, highly strategic corridors) are managed for both the protection of life/property and natural values – while in remote areas such as National Parks, State forest and areas away from human assets, the protection of environmental values is the primary objective. However, it is critical that the zonal approach is implemented through well resourced, scientifically based operations. As discussed below there are a number of critical steps to be undertaken to achieve this.

### **Science and monitoring**

The Victorian Government must invest heavily in the science required to underpin an effective prescription burn program and ecologically-based fire management including:

- A major program to fast-track the identification of the requirements of fauna in terms of fire size, frequency, intensity and patch arrangement in the landscape. In the interim, a precautionary approach should be taken to keep prescribed burn size and scale to a minimum.
- Long term monitoring of the effects of fire (both prescribed and wildfire) on biodiversity, including flora and fauna surveys in each EVC before and after conducting prescribed burning.
- Genuine adaptive management, ensuring “*our propensity for burning is matched with an equivalent fervour for learning*” (Clarke in press, p13).
- Long term research on the effectiveness of prescribed burns in reducing fire risk, including research over several fire cycles to assess to what degree vegetation communities may be drying out and becoming more fire-prone.
- Synthesis and compilation of the knowledge from a variety of sources (government, academic, community) in a form that is readily accessible to fire managers.

### **Fire protection planning**

Extensions to the road and fuel break networks must be subject to environmental assessment and mitigation of impacts:

- Breaks must demonstrably reduce fire risk and have minimal ecological impact to be considered.
- Statewide standards should prescribe a maximum width of strategic fuel breaks.
- No further construction of strategic fuel breaks should occur without a full environmental effects assessment.
- Full offsets consistent with the Native Vegetation Management Framework must be provided for any loss of native vegetation.

### **Risk reduction**

Two measures that would significantly reduce future fire risks are proposed:

- A review of Planning Schemes to prevent future residential subdivision and other unsuitable development in fire-prone areas. DSE, when acting as a referral authority should strongly oppose the development of rural-residential subdivisions within or adjacent to bushland.
- Changes to forest policy to make native forests more resistant to mega-fires by protecting old growth forests and water catchments from woodchipping and moving logging into existing plantations.

### **Prescribed burning**

- Defer any increase in the annual fuel reduction burning program until this can be justified scientifically with regard to its effectiveness and ecological impacts.
- Introduce a regulation requiring referral of any proposed prescribed burns affecting Reference Areas to the Reference Areas Advisory Committee for their approval.

- Refer any proposed burns in Wilderness Areas to the National Parks Advisory Council.
- In order to avoid too-frequent burns, areas affected by recent wildfires should not be reburnt outside of ecological tolerances unless there is a compelling, over-riding strategic need.

### **Prevention, surveillance and response**

Victoria needs to:

- Invest in remote sensing and remote area surveillance to detect bushfires as soon as they start.
- Ramp up hi-tech, quick response capability to fight bushfires as soon as they ignite.
- Improve the control and conduct of backburning so that it aids fire suppression and does not result in an expansion of the fire.

### **Resources**

There is an urgent need to increase investment in the scientific underpinning to fire management (including monitoring and genuine adaptive management), particularly for fauna.

Investment is required in decision support systems that

- integrate existing knowledge of fire history, ecological tolerances for flora/fauna and natural/built assets into a single location/system; and
- provide practical decision support to fire managers – particularly at the regional level.

Resources and training are required to improve 'first strike capability' to the point that it can deal with the extent of lightning strikes seen in recent years.

### **Key recommendations**

- ❖ Any expansion in the extent of prescribed burning must be scientifically based, both in terms of the effectiveness in reducing fire risk and impacts on flora and fauna
- ❖ The Victorian Government must invest heavily in scientific research for ecologically based fire management, including the requirements of fauna, monitoring of the effects of fire on biodiversity, and the effectiveness of fuel reduction burning in reducing fire risk. A decision support system should also be established to ensure this knowledge can practically support fire management decisions – particularly regionally.
- ❖ Enhance remote sensing and surveillance capability for early detection of wildfires, and rapid response capability to fight fires.
- ❖ Undertake full environmental assessments of any proposed extensions to strategic fire breaks and access networks, and offset any vegetation loss.
- ❖ Review Planning Schemes and utilise approvals processes to minimise future subdivisions and residential development in fire-prone areas.
- ❖ Increase the resistance of native forests to mega-fires by protecting old growth forests, rainforests and water catchments from wood chipping and logging.

## Issue 9. Invasive species

Invasive species have wrought havoc on biodiversity in Victoria, and despite collective regret about some introductions (e.g. foxes and gorse), harmful introductions continue to occur. There are currently 576 listed environmental weeds in Victoria (DSE 2008b).

At least two-thirds of Victoria is mostly or predominantly covered in exotic vegetation and about 28% (>1200) of the plant species listed in *Flora of Victoria* are exotic (Carr 1993). Weeds are a major threat to native species and ecosystems.<sup>9</sup> As the Green Paper notes, foxes and cats have already caused extinctions. Along with rabbits and trout they continue to threaten the survival of rare and threatened species: deer, carp and rabbits degrade habitats and displace native species; and exotic marine organisms dominate Port Phillip Bay. Climate change will exacerbate many of these threats.

Most introductions to Victoria have been deliberate - about two-thirds of plants for example (Carr 1993) and current policy continues to foster the interests of those who commercially benefit from invasive species at the expense of the environment and the management problems created. Nurseries have been the source of most of Victoria's environmental weeds, and continue to sell weeds without even being required to label them as such. Deer are a major threat to Victoria's forests and are spreading, but they seem to be managed for the benefit of hunters rather than for conservation. Tall Wheat Grass is invading wetlands, including Ramsar-listed wetlands, but because it is a pasture grass that tolerates salt it is being promoted for rehabilitation rather than banned as a weed. These are the sorts of problems that need a much more considered response in the development of the White Paper.

### ***The Green Paper***

In general, the Green Paper appropriately acknowledges that invasive species are a major threat to biodiversity, as well as agriculture. It introduces the section devoted to invasive species (p56) by saying that '*Invasive plants and animals are a major cause of animal extinctions, a threat to riparian zones and nationally important wetlands, and cause damage to already threatened ecosystems.*'

One gap in the Green Paper, however, is invasive pathogens, which are barely mentioned but are causing significant environmental harm. Dieback fungus (*Phytophthora cinnamomi*) kills native plants, and chytrid fungus threatens frogs. The invasive orange pore fungus has recently appeared in Melbourne reserves.

Another gap is exotic invertebrates. For example, a large number of exotic earthworms in Victoria are being actively spread, with unknown consequences. Insects, spiders, and crustaceans are becoming more popular as pets, with the inevitable consequence that they will be released into the wild when people tire of them. Invertebrates are also being spread through trade.

Specific focus is also needed on invasive species threats to marine and aquatic environments, as they are often ignored in invasive species policies.

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<sup>9</sup> A NSW assessment found that 419 listed threatened species were threatened by weed invasion, particularly by exotic grasses (Coutts-Smith and Downey 2006) - it is likely that the threat in Victoria is of a similar magnitude.

## **Impacts of climate change**

The Green Paper acknowledges that climate change will worsen weed and pest problems, in particular by influencing “*the ability of species that are not currently a problem to become established in Victoria.*” However, there is no mention of invasive species in the section devoted to proposed climate change responses. The harmful impacts on many native species of organisms favoured by climate change, many of which will be weeds, pests and pathogens, are likely to be even greater than the harm directly caused by climate change (Low 2008; Dunlop & Brown 2008).

The Victorian Department of Primary Industries has produced a report, *The Impacts of Climate Change on Plant Biosecurity*, that assesses the effects of climate change on pests and pathogens of agricultural plants. A similar review should be undertaken on pests that harm biodiversity. A start has been made with an assessment of the effects of predicted warming on the distribution of 25 agricultural or environmental weeds in *Climate change and potential distribution of weeds* (Steel *et al.* 2008) but there needs to be a much more comprehensive assessment of the threats to biodiversity from interactions between climate change and invasive species.

As well as ensuring that threats from invasive species are considered in plans to adapt to climate change, the Green Paper should consider the full suite of damaging interactions between global warming and invasive species. In particular, more frequent and/or severe weather events, such as droughts and floods, as well as fire, will promote weed invasion, as they have in the past. And invasive pathogens whose spread is facilitated by climate change could also cause great ecological harm, especially where their hosts may be under climate-related stress.

For example, the first documented climate change extinctions – of numerous frog species in South America – are attributed to disease (chytrid fungus) facilitated by climate change<sup>10</sup>. Dieback fungus (*Phytophthora cinnamomi*) is another pathogen that will increase in virulence if wet periods and warm temperatures increasingly coincide. According to Chakraborty *et al.* (1998), climate change models predict increases in summer rainfall for parts of Victoria. An increased rainfall during the warmest times will favour dieback fungus, even if overall Victoria is becoming drier.

The Green Paper recommends that climate change projections be used to “*inform risk assessments for new pest and weed incursions, as well as rates of spread of established invasive species.*” This is important and should be supported.

## **Pest plant and animal management**

Commendably, the Green Paper recognises that reactive approaches to pest and weed management are largely ineffective, and stresses the importance of prevention and early intervention.

However, the Green Paper fails to recommend approaches that will be effective in preventing future invasions. It proposes that communities be trained to recognise and deal with weeds and pests early and that legislation be reviewed. But there is no mention of the major role played by the nursery trade in introducing new weeds. The need for more controls over sale of weedy garden plants is recognised by government weed experts, but the Green Paper skirts around this issue.

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<sup>10</sup> by creating more favourable conditions for the disease (Pounds *et al.* 2006). Specific to Australia (but with evidence only for northern Australia) is a correlation between higher minimum temperatures and chytrid (Laurance 2008). Other potential links include that climate change is a stressor that compromises the immune capacity of frogs and they succumb more easily to chytrid or other diseases (Di Rosa *et al.* 2007; Blaustein & Bancroft 2007).

There is also no mention of the sensible approach to prevention, which is to regulate introduction of new exotic species to the State or to particular regions, by not allowing introductions unless they have been assessed as low risk and are placed on a permitted list. Currently, Victoria takes the opposite approach, which is to allow all species in unless they have been specifically prohibited. This means that invasive species management is inevitably reactive, resource-intensive and often ineffective. The Government can never keep up with the pace of new introductions, and by the time it gets around to assessing a species it is often too late for eradication, or politically difficult. WA adopted a permitted list approach in 1997, and Victoria should follow their lead.

The focus of the Green Paper is predominantly on education and cooperation – “*In some instances there may be the need to increase awareness and understanding across the community about the impacts of invasive species and actions needed to manage them.*” But unless there are also clear legislative and policy commitments to preventing new introductions of potentially harmful species and controlling established harmful species, especially garden and pasture plants, the information approach will be ineffectual.

The Green Paper proposes that risk assessments should be extended to include *'freshwater species, additional pest animals, diseases and pathogens that impact native biodiversity and other values.'* This is important. It also proposes to improve the management of invasive species in marine environments by improving surveillance and increasing awareness. However, it neglects prevention, which requires better practices with ballast water and hull fouling of boats (reforms here will require working with the Federal Government and quarantine services).

As well as more rigorous risk assessments and cost-benefit analyses which properly account for environmental risks and costs, there should be application of the polluter-pays principle for invasive species. Legislation should be amended to require that those who introduce and use invasive species take responsibility for resulting harm. One such approach used in Florida for some crops deemed risky is the payment of a bond by landholders/managers to cover clean-up costs should the plant escape cultivation.

### **Agenda for change**

As part of adaptation to climate change, accord high priority to reducing the risk of invasive species to indigenous species and ecosystems. This should include:

- Conduct a comprehensive review of the impacts of climate change on invasive species, to identify new and increased threats to biodiversity, and develop strategies to minimise the impacts.
- Develop climate change adaptation strategies for all harmful interactions between climate change and invasive pests (i.e. not just expansion in the range of pest species), including strategies to limit domination by invasive species after severe weather events and fire.
- Ensure weed risk assessments are conducted before permitting or supporting the development of new crops in a region (e.g. more drought-hardy pastures, biofuels or plants for rehabilitation). These assessments must be precautionary and rigorous, and account for the risks and uncertainties of invasive species under climate change conditions.

Implement prevention and early intervention approaches to prevent new weed, pest and disease problems arising. This should include:

- Replace the current Prohibited List system with a Permitted List system for non-indigenous species (i.e. those not indigenous to the State or region, including those native to elsewhere in Australia), which permits the entry into the State or region only those species assessed as low-risk.
- Ensure that weed risk assessments are sufficiently rigorous and precautionary to limit permitted species to those that represent a low risk to the environment and agriculture.
- Ensure that only those species assessed as low risk are approved and supported as new commercially cultivated species or used for rehabilitation.
- Require that nurseries sell only low-risk species, and that all products with potential for spread carry appropriate warnings.
- Develop strategies to minimise the risk of accidental introductions of invasive pest animals, plants and pathogens (including through introduction of pests in ballast water, on fouled boat hulls, contaminated seed, plant materials or machinery etc).

Manage existing invasive species assessed as a high environmental risk to reduce the risks to biodiversity. A highly precautionary approach is warranted. This would include:

- Appropriately declare and control populations of harmful invasive species to prevent spread into new areas.
- Control populations of harmful invasive species to minimise threats to threatened species or ecosystems and protected areas.
- Ensure that only non-invasive species are approved and promoted by the Government and related agencies for commercial use or rehabilitation.

Implement a 'polluter-pays' duty of care approach, which requires that those who cause harm are held responsible for it. This would include:

- Develop a legislated general duty of care to prevent the spread of invasive species.
- Provide for legal recourse (including third party rights) against those who cause environmental harm by their use of invasive species.
- Implement a system of bond payment for those who are permitted to introduce and/or use high-risk species for commercial reasons; the amount of the bond should reflect the risk of wide-scale outbreaks and potentially catastrophic impacts on the environment and biodiversity.

## **Resources**

Effective management of invasive species requires a sustained, ongoing commitment of resources; short-term 'initiative' funding is of limited benefit if there is little or no follow-up. Program funding should be guaranteed over a number of years rather than subject to annual budgetary negotiations and readjustments.

### **Key recommendations**

- ❖ Identify which invasive species are likely to benefit from climate change in Victoria, and develop strategies to minimise the harm this may cause.
- ❖ Require invasive species risk assessments before permitting or supporting the development of new crops in a region.
- ❖ Replace the current Prohibited List system with a Permitted List system which only permits the entry into the State or region those species assessed as low-risk.
- ❖ Require that nurseries and pet shops/aquariums sell only low-risk species, and that all products with potential to spread carry appropriate warnings.
- ❖ Develop strategies to minimise the risk of accidental introductions of invasive pest animals, plants and pathogens (including through introduction of pests in ballast water, on fouled boat hulls, contaminated seed, plant materials or machinery etc).
- ❖ Invest in dedicated rapid response capacity (personnel, resources) to control populations of harmful invasive species to minimise threats to threatened species or ecosystems and protected areas.
- ❖ Legislate for a general duty of care to prevent the spread of invasive species, with bonds to be paid for the introduction and/or commercial use of high risk species.

### **Issue 10. The role of ecosystems in combating climate change**

Climate change has profound implications for the natural environment. The CSIRO predicts that climate change will make Victoria warmer and drier, significantly increasing the threats to ecosystems and placing further pressures on water availability and the agricultural systems that underpin our way of life.

Over the last 650,000 years atmospheric concentrations of CO<sub>2</sub> have ranged from 180 to 300 parts per million (ppm) (Intergovernmental Panel on Climate Change (IPCC) 2007a). We can therefore assume that up to 300ppm is within the evolutionary tolerances of life on Earth. Atmospheric concentrations of CO<sub>2</sub> have already reached 385ppm (Hansen *et al.* in press), and will continue to rise unless international agreement is reached to ensure deep, rapid and early cuts to greenhouse emissions. According to Hansen *et al.* (in press), to avoid irreversible catastrophic effects, atmospheric CO<sub>2</sub> levels should be reduced to 350ppm or less.

According to the IPCC (2007b), to even stabilise atmospheric CO<sub>2</sub> levels between 350-400 ppm we have to reduce emissions by 50-85% of 2000 levels by 2050. The IPCC projects that even if we do this, there will be an increase in global temperature of 2-2.4°C and sea level rise of at least 0.4-1.4 metres. Our current trajectory however will see us reach 790ppm by 2100. The IPCC projects that this will result in an increase in global average temperatures by 4.9-6.1°C and sea level rise of 1-3.7metres. These figures are shown in Figure 2 below.

When considering the risks associated with these projections, it is important to recognise that recent climate observations for global temperature and sea level rise, when compared with modelled projections are both in the upper part of the range projected by the IPCC (Rahmstorf *et al.* 2007).

Figure 2. Atmospheric CO<sub>2</sub> stabilisation scenarios and resulting long term global average temperature and sea level rise. Source: IPCC 2007b

*Table SPM.6. Characteristics of post-TAR stabilisation scenarios and resulting long-term equilibrium global average temperature and the sea level rise component from thermal expansion only.<sup>a</sup> (Table 5.1)*

Category	CO <sub>2</sub> concentration at stabilisation (2005 = 379 ppm) <sup>b</sup>	CO <sub>2</sub> -equivalent concentration at stabilisation including GHGs and aerosols (2005 = 375 ppm) <sup>b</sup>	Peaking year for CO <sub>2</sub> emissions <sup>a,c</sup>	Change in global CO <sub>2</sub> emissions in 2050 (percent of 2000 emissions) <sup>a,d</sup>	Global average temperature increase above pre-industrial at equilibrium, using 'best estimate' climate sensitivity <sup>d,e</sup>	Global average sea level rise above pre-industrial at equilibrium from thermal expansion only <sup>f</sup>	Number of assessed scenarios
	ppm	ppm	year	percent	°C	metres	
I	350 – 400	445 – 490	2000 – 2015	-85 to -50	2.0 – 2.4	0.4 – 1.4	6
II	400 – 440	490 – 535	2000 – 2020	-60 to -30	2.4 – 2.8	0.5 – 1.7	18
III	440 – 485	535 – 590	2010 – 2030	-30 to +5	2.8 – 3.2	0.6 – 1.9	21
IV	485 – 570	590 – 710	2020 – 2060	+10 to +60	3.2 – 4.0	0.6 – 2.4	118
V	570 – 660	710 – 855	2050 – 2080	+25 to +85	4.0 – 4.9	0.8 – 2.9	9
VI	660 – 790	855 – 1130	2060 – 2090	+90 to +140	4.9 – 6.1	1.0 – 3.7	5

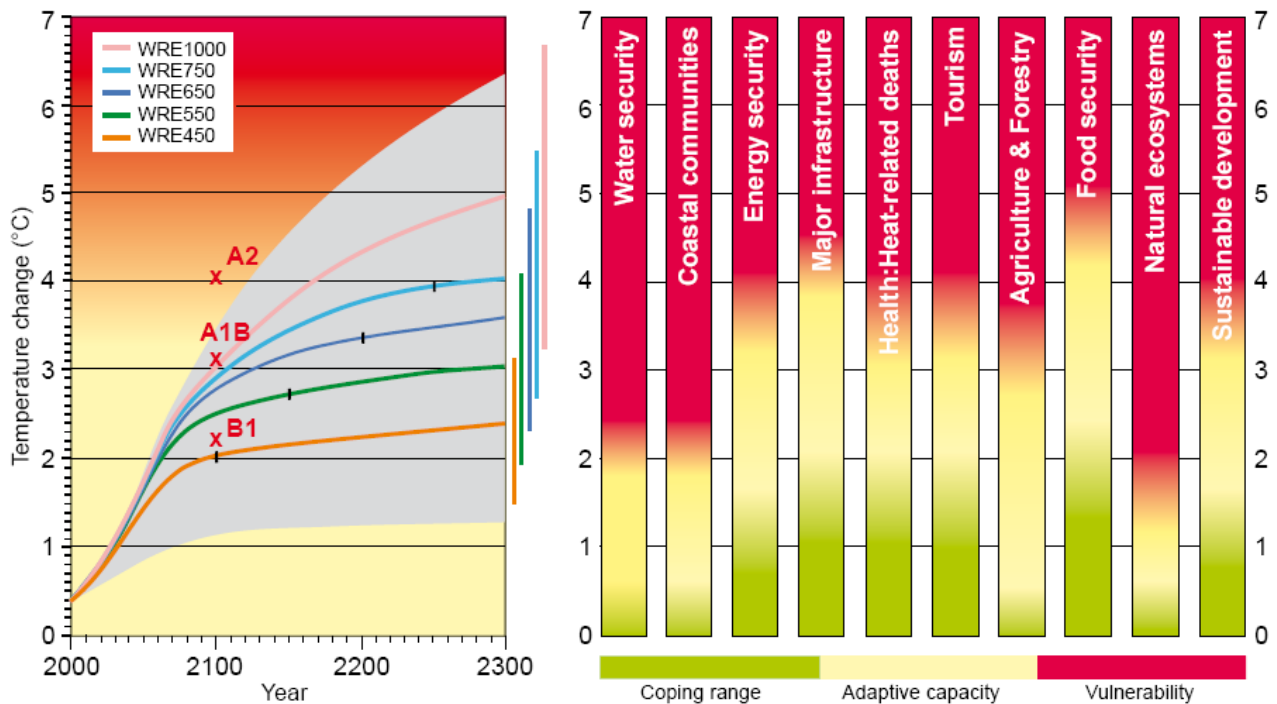
The IPCC's Fourth Assessment Report *Working Group II Report: Impacts, Adaptation and Vulnerability* (IPCC 2007c) shows that ecosystems are particularly vulnerable to climate change, and that with 2°C warming, natural ecosystems are beyond their coping range, and are vulnerable to climate change (see Figure 3 below from the report). The IPCC (2007c) reports that 20-30% of species are likely to be at increased risk of extinction if temperature rises exceed 1.5-2.5°C, along with major changes in ecosystem structure and function and species' geographic ranges. As discussed above, the IPCC reports that even with **50-85% cuts in emissions by 2050 we are still likely to see at least 2°C warming**. It is clear that strong action is needed now on climate change to reduce emissions at the state, national and international level to protect the natural and built environment from climate change from past and future emissions.

As well as being particularly vulnerable to climate change, ecosystems play a key role in the global carbon cycle. In terms of climate change, emissions from terrestrial ecosystems are very significant. The 2006 Stern Review estimated that emissions from deforestation account for over 18% of annual global greenhouse gas emissions. It concluded that curbing deforestation is a highly effective way of reducing greenhouse gas emissions and that action to preserve the remaining areas of natural forest is urgent.

However, 18% of annual global greenhouse gas emissions is an underestimate, as this does not include all land based emissions sources, including logging (M. Blakers, pers comm. 25 June 2008). It is now becoming clear that carbon stored in native vegetation has been greatly underestimated, because modelling used by the IPCC and the Australian Greenhouse Office's (AGO) National Carbon Accounting System (NCAS) is based on limited data, skewed against mature and old growth forest which store the highest densities of carbon. Soil carbon losses from logging are not counted, nor are emissions from clearing and degradation of non-forest ecosystems. The methodologies calculate carbon storage in commercial species only, in plantations and afforestation projects rather than native forest and woodland ecosystems. This means that woody living and dead biomass, charcoal, understorey and non-commercial species, and a percentage of soil carbon are not calculated by the IPCC or AGO. The

result is that emissions from and carbon stored in ecosystems, and especially forests in south-eastern Australia, are underestimated

Figure 3. Coping range, adaptive capacity and vulnerability of a range of sectors to warming. Source: IPCC 2007c



Research by the Australian National University (ANU) currently in peer review and soon to be released will show that the IPCC default position of 217 tonnes of carbon per hectare stored in temperate forests is a substantial underestimate. It appears that the forests in south-eastern Australia store over three times this amount and the wet Ash forests of Victoria and Tasmania store more than ten times this amount of carbon.

These new figures demonstrate the importance of native vegetation, and especially native forests, as part of the solution to climate change, and greatly enhance the case for native vegetation (especially native forest) protection to be part of any policy solution to climate change.

The new report by ANU will be published in July). The Wilderness Society will ensure that the Victorian Government receives this new data.

It is important that we put in place full carbon accounting for ‘green carbon’<sup>11</sup> as it is currently a large and significant source of emissions, uptake and storage, and full carbon accounting will allow us to know what is actually going on in terms of impacts on the atmosphere and climate change.

### ***Impacts of climate change on biodiversity***

It is important to recognise that biodiversity is particularly vulnerable to climate change, and that actions are needed to increase its resilience.

<sup>11</sup> ‘green’ carbon is the carbon associated with living systems in biomass (above and below ground), litter, dead wood, and soil organic matter.

According to the 2007 Proceedings of a WWF and IUCN World Commission on Protected Areas symposium, Enhancing resilience of natural systems requires the following key elements:

- *“Identify and protect climate refugia including high cost areas such as urban fringe and coastal areas;*
- *Conserve large-scale migration corridors;*
- *Maintain viable populations to enable adaptation;*
- *Reduce threatening processes at the landscape scale (within and outside protected areas);*
- *Conserve natural processes and connectivity at the landscape scale; and*
- *Special interventions to avert extinctions”.* (Taylor & Figgis 2007, p3)

In addition to this, in largely cleared landscapes, Victoria must make every effort to not only protect existing native vegetation, but also, to identify priority areas for restoration.

It is important to recognise that climate change will magnify existing threats to biodiversity, however there are many examples where one direct or a number of these direct threats will result in significant losses much more rapidly than climate change. For example, a recent study undertaken at RMIT University investigated the threats posed to a small frog species in the Merri Creek corridor in northern Melbourne. The results of this study showed that the threat from urbanization on this species was significantly greater than the projected impact of climate change (Wilson 2007).

### ***The Green Paper***

The Green Paper’s title acknowledges that climate change is here, and alludes to the unprecedented human induced rapid change threatening our ecosystems. In defining the problem (p3), the Green Paper puts *“rapid climate change”* first, however does not discuss the role ecosystems themselves play in carbon emissions, and only cursorily deals with their roles in carbon storage and uptake. It acknowledges that *“The capacity for Victorian ecosystems to adapt to a changing climate has been reduced because our landscapes are highly fragmented. The need to respond to the challenge is urgent”* (p3), and *“Climate change is a long-term threatening process that scientific modelling indicates will magnify land and biodiversity decline”* (p20). However there is no comprehensive program presented in the Green Paper in order to achieve this.

The Green Paper says *“the Australian Government is developing a national emissions trading scheme due to commence in 2010. Victoria is contributing to the discussion around the design of the scheme. A formal biosequestration market is likely to be one element of this response to climate change”* (p43) and that *“Climate change will provide opportunities for Victoria. For example, we can capitalise on the emerging global carbon market, particularly the market for carbon offsets.”* (p20). The Green Paper has a section (p43) on *“Using carbon markets for biodiversity and land health”*.

The Green Paper makes little acknowledgement of the role of existing native vegetation and soils as carbon stores, nor of the significant emissions from logging and clearing of native vegetation, although the section on public land (p52) does state that *“parks and forests...are significant carbon stores”*.

The focus on offsets through biodiverse plantings has value in terms of tackling climate change, and is very important for increasing the resilience of ecosystems. The role of biodiverse carbon offsets in the national Emissions Trading Scheme (ETS) should be investigated. Any system of carbon offsets through vegetation (mandatory or voluntary) needs to have a strong focus on biodiverse plantings with permanent legal protection.

However, Victoria also needs to focus on the carbon that is currently stored in native vegetation, firstly as logging, clearing of vegetation and degradation of native vegetation are significant emissions sources, and secondly because sequestration is slow, making existing carbon stores essentially irreplaceable in the timescales needed to tackle climate change.

Protecting native vegetation on a large scale is necessary to reduce greenhouse emissions. This is because: existing vegetation is storing large amounts of carbon; any new plantings will only accumulate carbon slowly; and native vegetation is far more resilient to climate change.

Logging, land clearing and soil disturbance from machinery all release vast amounts of CO<sub>2</sub> into the atmosphere. Recovering carbon debt by regrowth/restoration after logging takes over 100 years. Furthermore native forests on logging rotations have 40% - 60% less carbon capacity than undisturbed forests: logging reduces the size of the carbon bank

In a March 2008 Newspann, 93% of Victorians surveyed said that the '*protection of native forests and woodlands as carbon banks*' was either '*very important*' or '*important*' as a measure to tackle climate change (commissioned by The Wilderness Society).

The Green Paper section on "*supporting species and ecosystems to adapt to a changing climate*" (p53) is very weak. It lacks any detailed analysis of the likely impacts of climate change on ecosystems. The Victoria Naturally Alliance's submission to the consultation paper, recommended that as part of the White Paper process, the Victorian Government "*undertake comprehensive mapping/modelling of effects of climate change on land and biodiversity values*". This has not to our knowledge been done, and it is vital that we do this in order to be able to base our decisions on detailed scientific understanding of the problem. Instead, the Green Paper states (p53) "*the scale and breadth of climate change impacts and Government's finite resources means saving some plant and animal species once they become endangered may be beyond our means*". However, climate change should not be used as an excuse to give up on some species when the necessary resources and effort have never been invested. The Green Paper says "*Connectivity is an important contributor to maintaining and improving the resilience of biodiversity to climate change*" (p50). Strong science and knowledge will be also required to achieve the best outcomes from increasing connectivity. The suggestion on p53 of "*sustained and targeted research and the establishment of long term monitoring sites*" is clearly important.

### **Agenda for change**

The global community needs to massively reduce greenhouse emissions in order to avoid catastrophic climate change (Hansen *et al.* in press) At the same time, the resilience of ecosystems needs to be increased in the face of climate change that is

already occurring. This can be achieved by restoring habitat and creating biolinks (see section 8 on connectivity conservation.)

To reduce significant emissions from ‘green carbon’, Victoria needs to halt the loss and degradation of native vegetation.

An urgent assessment should be made of the appropriate means by which carbon stores in existing native vegetation and soils can be protected, whether through carbon pricing or regulation, and any structural adjustment needed as a consequence. As well as protecting existing native ecosystems, carbon sequestration needs to be increased by restoring degraded vegetation and replanting native vegetation. Carbon sequestered needs permanent protection.

To increase the resilience of ecosystems in the face of climate change, it is also very important to minimise direct threats to nature from invasive species, development, extraction, inappropriate fire regimes, lack of environmental flows, logging and clearing of remnant vegetation. (See specific sections in this submission on invasive species, fire, native vegetation, urban biodiversity and rivers.).

### ***Key recommendations***

- ❖ Halt the clearing, logging and degradation of native vegetation in order to reduce carbon emissions.
- ❖ Establish ongoing funding mechanisms for the long term management of carbon stores in existing native vegetation.
- ❖ Encourage additional carbon sequestration by 1) protecting remnant native vegetation from degrading processes such as grazing and encouraging regrowth, and 2) replanting biodiverse native vegetation in strategic locations that also enhance connectivity and ecological functioning.
- ❖ Develop robust full carbon accounting for ‘green carbon’, incorporating emissions as well as uptake from land use, agriculture, forestry and land use change.
- ❖ Ensure that any system of carbon offsets through vegetation (mandatory or voluntary) has a strong focus on biodiverse plantings with permanent legal protection.
- ❖ Undertake a major investigation, including modelling and mapping, into the likely impacts of climate change on ecological processes, ecosystems and species in Victoria, and recommend strategies to assist adaptation.
- ❖ Increase the resilience of our ecosystems by enhancing landscape connectivity, and by removing direct threats from: invasive species, development, extraction, inappropriate fire regimes, lack of environmental flows, logging and clearing of native vegetation.

## **Issue 11. National Parks and other protected public land**

### ***The role of national parks in the landscape***

National parks and other protected areas play a crucial role in the protection of biodiversity in Victoria and provide ecosystem services such as clean water, as well

as significant recreation and tourism opportunities across the state (Parks Victoria 2007).

There are 118 parks reserved under Victoria's National Parks Act, including a great range of terrestrial national, state and regional parks, as well as marine national parks and sanctuaries. In all the nature conservation reserve system covers some 3.2 million ha, or 16% of the State. (In addition, some 2,800 smaller reserves covering 0.5 million ha are given lesser protection under the Crown Lands Act).

Large areas with relatively intact ecological processes, where native species are able to maintain their long-established roles in a range of ecological communities, are the essential cornerstone of biodiversity conservation.

To be truly effective however, the reserve system must include viable areas of every vegetation type in the State. Some, such as Red Gum forests and wetlands, are still inadequately represented. And the once common native grasslands and grassy woodlands are now so rare that a viable comprehensive reserve system is very difficult to achieve, even with extensive purchase of private land.

Although the information is not publicly available, it appears that Victoria spends well under \$30 million per year (possibly only \$15 million per year) on the ecological management of Victoria's parks. This is less than \$5 per hectare, which is significantly less than NSW and far below what is required to maintain the natural values of the park system<sup>12</sup>.

Coupled with insufficient funds for management, Victoria spends only two million dollars per year expanding the park system; far less than other states, and far less than what is needed to incorporate threatened communities into the system before they disappear forever (Sattler & Taylor 2008).

### ***Park management and ecological integrity***

Although large natural areas may be given legal protection as national parks or other conservation reserves, that doesn't guarantee their security. They need more effective support against impacts that are already seriously eroding the ecological integrity of many of Victoria's parks, or have the potential to severely impact them in the future, such as weed, pest animal and pathogen invasions, visitor impacts and inappropriate fuel reduction burns.

### ***What will climate change do?***

Stresses brought about by climate change will greatly add to the impacts of these existing threats. Alpine areas, such as in much of Victoria's Alpine National Park or Mount Buffalo National Park, are among the most climate threatened ecosystems in Australia, and will suffer greatly from increased temperatures and reduced snowfalls and new pest invasions. Other climate-induced threats to parks include rising ocean temperatures and increased acidity (in marine parks), reduced rainfall, reduced river flows and seasonal wetland flooding, rising sea levels and storm surges (affecting coastal communities such as salt marshes) and increased fire frequency and severity throughout most of the State. New pest plant and animal species will also impact many parks (Dunlop and Brown 2008).

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<sup>12</sup> Estimate based on information in: Parks Victoria. *Annual Report 2006-2007* and other sources.

This adds up to a considerable series of impacts on Victoria's core biodiversity refuges. These areas need to be adequately protected and given the resources needed for their effective management, to ensure they are as resilient as possible.

### ***The Green Paper***

The Green Paper does not outline the threats climate change will bring to Victoria's prime natural areas, including:

- the internationally recognised threats to alpine ecosystems
- the flooding of coastal saltmarshes, and other impacts of rising sea levels (coasts have one short paragraph on p. 47)
- fire frequencies, particularly in regard to rainforest communities, but also in regard to most other communities
- the impacts of reduced rainfall on many ecosystems
- reduced flooding events in wetlands.

The Green Paper does not outline the extent of existing threats to Victoria's prime natural areas, particularly in relation to weed and feral animal invasion. It does not adequately highlight the degree to which those threats would be likely to increase under climate change.

Although the Green Paper acknowledges that public land is primarily the responsibility of Government, it does not outline exactly what those responsibilities are, particularly in relationship to the National Parks Act (1975). The Green Paper does not indicate what contribution the Government currently makes to public land management and to what degree, and in what areas, that contribution is insufficient.

### ***Agenda for change***

Most scientists agree that climate change will have profound effects on biodiversity and Australian ecosystems, which will ultimately flow through to affect the ecosystem services provided to humans (Dunlop and Brown 2008). Under changing climatic conditions, management activities become critical in building the resilience of parks. National and State Park management needs to achieve the prime purpose of their reservation, already stated in Victoria's National Parks Act (1975) as "the protection of nature". This means:

- a) minimising non climate-related pressures such as human disturbance, and acting on all manageable weeds and introduced pests, through increased management;
- b) reviewing existing management strategies, such as fire mitigation strategies, to ensure that they are appropriate
- c) expanding park boundaries to increase the core size of parks and improving connectivity through large scale wildlife corridors (Dunlop and Brown 2008).

In Victoria, primarily, greatly increased resources are needed to deal effectively with all manageable existing and predicted threats to the ecological integrity of our park system. To do that, both the number and expertise of park management staff need to be significantly increased (Biosis Research 2008).

Comprehensive monitoring of ecological communities needs to be established across the park system, to understand the impact of threats to natural areas, and the

effectiveness of management actions, allowing increasingly well-informed responses to climate change impacts.

The size, connectivity and comprehensiveness of parks need to be increased as large areas of intact ecosystems are the essential core element of any attempt to re-establish landscape connectivity. This would also involve complementary strategies on private land as discussed in other sections of this submission.

### **Resources**

Victoria must invest now so that our unique natural areas are resilient in the face of climate change. This requires secure recurrent funding that will lead to a situation where all manageable threats to our prime natural areas are being effectively managed. For example, effective environmental weed control requires reliable dedicated ongoing funding, rather than special initiative funding (Biosis Research 2008).

Initially, at least three times current funding is needed for the management of ecological systems in Victoria's national parks and reserves. This means a dedicated budget of around \$90 million per year over the next three years.

### **Key recommendations**

- ❖ At least triple the recurrent funding for ecological management of national parks and protected areas to build resilience in the face of climate change through:
  - identifying in management plans scientifically based on-ground outcomes for management of ecological systems
  - establishment of a dedicated 'ecological management' stream within Parks Victoria, with greatly increased capacity for management of ecological systems and threat abatement.
  - comprehensive, systematic monitoring of the ecological integrity of parks, climate-induced impacts and the effectiveness of management programs
  - an additional ongoing dedicated budget to control environmental weeds and pest animals.
- ❖ Provide dedicated funding to urgently improve the size, design and comprehensiveness of national parks, to strengthen the resilience of the existing reserves, and complete the representativeness of the reserve system as much as possible through tenure change for public land and marine areas, strategic acquisition of private land, and support and funding for private land contribution to the National Reserve System.

## **Issue 12. Very large scale restoration: Connectivity Conservation, biolinks and endangered ecosystems**

Two thirds of Victoria has been largely cleared and modified for settlement, agriculture and wood production, creating a fragmented landscape with disrupted ecological processes and high numbers of threatened species. In the face of this, it is now recognised that conservation reserves alone will not adequately protect biodiversity, and that successful integration of conservation and production has a key role to play. It is important to recognise that biodiversity in production landscapes is fundamental to functioning ecosystems – the basis of agriculture as well as biodiversity (Fischer *et al.* 2006).

The scale of restoration/revegetation that has been achieved to date in Victoria, while an important achievement, is too small to reverse the decline of biodiversity. This was demonstrated in the recently published *Net Gain Accounting First Approximation Report* (DSE 2008a) which shows ongoing decline in extent and condition of native vegetation across the state.

To reverse the decline, and provide resilience in the face of climate change, ecosystem restoration and revegetation are urgently needed on a very large scale. It is important that this is achieved at multiple-scales, with a focus on quality science based outcomes from the property to the regional scale. Priorities for restoration include large scale biolinks, reconnecting conservation reserves and large areas of remaining habitat. It is also important to protect and restore endangered ecosystems such as grasslands and grassy woodlands (ecosystems which largely lie outside the; indicative biolinks map of 1992 (Dept of Conservation and Environment), and current landscape scale initiatives such as Habitat 141 in the west of the state).

Targets for restoration and revegetation are required. The VCMC in its 2002 Catchment Report Card (p103) put forward a vision of Victoria: “by 2020 the mosaic landscape accommodates a 40% coverage of native vegetation”. Landscape-scale ecological research by Radford *et al* (2004) asked the question ‘How much habitat is enough?’ According to Radford *et al.*,

*“We have a choice about the types of rural landscapes we want in the future. How much habitat is enough? That depends on how much of our natural heritage we are willing to lose. Our research shows that the woodland bird community collapses below 10% cover – we must aim higher than this. In mosaics with 10-20% cover, many species are in decline but this is enough habitat to support sustainable populations of some species. However, to support most species present in woodland regions in southern Australia, an average of 30-35% native vegetation cover is necessary. It is not practical to have uniform cover of 30-35% on all farms and landscapes, but we need to ensure that areas with high vegetation cover are regularly interspersed among those where native vegetation has been heavily cleared.”*

Landscape restoration is integral to a number of strategic policies at both national and state level. In Victoria, restoration is a key component of the Victorian Greenhouse Strategy, Victorian River Health Strategy and Victorian Native Vegetation Management Framework. Clearly, there has been a shift in emphasis from reserve based biodiversity conservation to a whole of landscape approach (Radford *et al.* 2007).

The IUCN has stressed the importance of connectivity for maintaining ecological processes and supporting biodiversity, using the term ‘Connectivity Conservation’.

*“Connectivity Conservation is a 21<sup>st</sup> Century vision for the long term conservation of biodiversity and associated natural, cultural, economic and social assets. Connectivity Conservation advocates buffering and linking ‘islands’ of protected areas into connected large scale mosaics of lands or seas managed cooperatively by many owners – national, state and local governments, private land or water trusts, indigenous people, primary producers and corporations.”* (Worboys *et al.* draft, p1)

The IUCN recognises that protected areas form the core for effective large scale connectivity conservation, around which connectivity can be re-established, through both protection of remnant native vegetation and restoration. Corridors and stepping

stones need to be re-established to allow species to migrate, move and adapt. Connectivity conservation can assist in managing significant threats including climate change, habitat loss and fragmentation, the spread of feral pests and pathogens and changed fire regimes (Worboys *et al.* draft).

Connectivity can be considered as the maintenance or restoration of key large-scale ecological phenomena, flows and processes critical to the long-term conservation of biodiversity (Mackey 2007). Connectivity is required at multiple scales, and depending on the species can include contiguous habitat, stepping stones, resting points, networks of habitat patches, and refugia.

The WildCountry Science Council (Soule *et al.* 2004) has identified seven extensive ecological processes that are critical to the maintenance of biological diversity and ecological resilience in Australia. All these processes require connectivity at landscape, regional and continental scales to function effectively.

Landscape repair involves not only replacing components such as trees and animal species: ecological processes that sustain the system must also be reinvigorated or reinstated to achieve ecologically functional landscapes that are viable into the foreseeable future. Such restoration builds on natural remnants such as paddock trees by encouraging regeneration around them. Riparian zones along waterways provide important opportunities to improve connectivity. Coupled with this, riparian zones are naturally productive, making them rich areas for biodiversity. They also provide a range of ecosystem services including water purification making them a priority for rehabilitation. (see separate riparian section in this submission)

The paper recently-published by Radford *et al.*, *Effective Landscape Restoration for Native Biodiversity in Northern Victoria* (2007) provides a valuable ecological framework on which to base landscape restoration in Victoria. The paper provides ecologically based:

- Landscape restoration definition and objectives (pp6)
- Conceptual framework for landscape restoration (pp11)
- Planning approaches for restoration (pp12)
- Principles for restoring landscape resilience (pp25),
- Guidelines for landscape linkages (p26) and
- Future research directions (pp27).

(see <http://www.nwf.org.au/docs/Papers/biodiversity%20paper%20final.pdf>).

Large-scale restoration and connectivity projects have many social and economic benefits, providing a 'big picture' vision to which individual landholders and local groups, NGOs, corporations and government agencies contribute, creating regional employment and skills development in ecological restoration, enhancing tourist routes and attracting investment. Major connectivity projects underway include GondwanaLink in WA, Alps to Atherton (mainly NSW-Qld, extending into Victoria) and Naturelinks (SA). Victoria's first such project is the three-State Habitat 141 project from Broken Hill south to the sea (Victoria, NSW, SA) an NGO and government partnership led by Greening Australia Victoria. Other smaller-scale, community-based projects are successfully under way. It is time to embark on a major effort for connectivity conservation for the rest of Victoria.

## ***The Green Paper***

The Green Paper has a section on “*Building ecological connectivity*” (pp49-50). It states (p49) “*Victoria is interested in increasing ecological connectivity across the landscape, focusing on public land and existing remnant vegetation*”. We are concerned that the approach suggested is to focus on public land, whereas there are significant conservation and restoration needs on private land, as over 80% of it has been cleared in Victoria, and 60% of native vegetation remaining on private land is a threatened vegetation type (DSE 2007a).

Hence, any strategy to increase ecological connectivity must have a strong focus on private land. Achieving this will require a range of approaches including building on the landcare/conservation ethic that is already established in rural Victoria. However, this is not sufficient and the use of old and new tools and increased investment will be critical including tax incentives, market based instruments, regulation and extension. The new residents in rural Victoria – the tree and sea-changers – should be particularly targeted for programs that deliver biodiversity outcomes.

The Green Paper states that “*Public land outside the reserve system can provide a good starting point for building connectivity*”, including through “*improving vegetation on riparian land*”. This is very important, as is the suggestion in the Green Paper to “*improve riparian vegetation as a priority*” (p50). Likewise the approach of concentrating on areas with natural resilience and natural regeneration capacity, is important, however a focus on threatened ecosystems, threatened species habitat and key connectivity zones are also needed.

Roadsides, unmade roads, and old and current rail corridors are also vital reservoirs of native vegetation in the landscape which will contribute to building connectivity. The Green Paper states that they “*must be managed for public safety first*”. We agree that roads need to be safe. Authorities should be implementing environmentally appropriate safety solutions which can protect the great majority of our road and rail corridor vegetation and achieve public safety objectives. Solutions for roads include flexible wire rope and other safety barriers, a strategic site specific approach for assessing crash risk and safety treatments (involving ecological expertise and a consultative approach), speed reduction and public education.

The Green Paper states that (p50) “*buffering or improving existing patches of vegetation should be the starting point*”. This is to be supported. Restoration needs to be carried out on a very large scale to reconnect habitat areas through a mosaic of linkages. Endangered ecosystems/EVCs outside proposed biolink zones also need to be a focus of protection and restoration efforts.

The Green Paper proposes potential biolink zones (p50), and we broadly agree with these.

A logical next step is for the Biodiversity Strategy to develop a 2030 ‘vision’ for large scale restoration/revegetation and biolinks, across the state. This needs to be underpinned by good science, focus on protecting and enhancing existing native vegetation, and set priorities for large scale natural regeneration and revegetation .

Taking this broad vision for restoration and biolinks, we suggest that more detailed planning could be undertaken by VEAC, provided its role were expanded to include freehold land. The VEAC process of thorough investigations, consultation and preparation of recommendations on land use and management to Government is well-suited to the planning of biolinks and large-scale restoration programs.

Regional vegetation targets, detailed scientific analysis and community participation and partnerships will be needed. The process can build on existing consultation, eg with the Regional Catchment Strategies review, or via landscape scale projects currently underway such as Habitat 141 in western Victoria and Connecting Country in central Victoria.

This planning for restoration and biolinks should be informed by statewide mapping and modelling of climate change impact scenarios on land and biodiversity values, including ecological processes. Such models should include projections of likely longitudinal and altitudinal shifts in species' and communities' bioclimatic envelopes under different warming scenarios.

### ***Agenda for change***

- Create a '2030 vision' map and targets for protection of existing vegetation and large scale revegetation across the State.
- Set targets for 30% or more of each catchment to be covered in native vegetation by 2030 (short to medium term targets may be less than 30% for highly depleted EVCs to ensure that targets are realistic).
- Riparian corridors should be seen as key structural components of connectivity conservation projects. Refer to recommendations in our riparian section in relation to achieving this.
- Develop a strategic plan for connectivity conservation to assess and prioritise potential linkages across Victoria and into NSW and SA, based on core conservation reserves, other relatively intact environments, waterway corridors and movement pathways for organisms along longitudinal and altitudinal gradients. The plan should include actions, implementation mechanisms and responsibilities, sources of funding, restoration targets and timelines, and monitoring requirements.
- The Victorian Government should support a network of community-based, long term ecological restoration projects that link protected areas and patches of native vegetation, harness natural regeneration capacity, re-establish ecological processes such as nutrient cycling and biomass decay by soil biota, regeneration of understorey flora as well as trees, and development of structural diversity.
- Prepare a set of ecological and community development principles and guidelines for connectivity projects, applicable at a range of scales from local to continental.
- Provide more support for native vegetation management and habitat protection on private land, using a portfolio of approaches – financial assistance, technical advice, market based instruments/incentives for landowners to retain and improve the condition of native vegetation, streams and wetlands.

### ***Key recommendations***

- ❖ Create a '2030 vision' map of a 'restored and resilient' Victoria.
- ❖ Set targets for the protection and enhancement of remnant native vegetation, and for large-scale revegetation across the State. (For example, set long-term targets for 30% or more of each catchment to be covered in native vegetation.

Short- to medium-term targets may be less than 30% in areas with highly-depleted ecological vegetation classes.)

- ❖ Expand the role of Victorian Environmental Assessment Council (VEAC) to include freehold land, so that it can investigate and make recommendations about land-related issues that cut across tenures.
- ❖ Prepare a set of ecological and community development principles and guidelines for connectivity projects, applicable at a range of scales from local to continental.
- ❖ Support the establishment of a research centre for connectivity conservation and landscape restoration.
- ❖ Support and contribute to the resourcing<sup>13</sup> of a network of collaborative, long-term ecological restoration projects.

### **Issue 13. Marine and coastal conservation**

Victoria has remarkable marine biodiversity. Some 90 to 95 per cent of our marine plants and animals are found nowhere else in the world (Victorian Coastal Council 2007). However there is limited scientific understanding of these complex biological systems to guide marine planning and management. The VCMC's *Catchment Condition Report 2007* rates data quality in relation to estuaries, coastal and marine areas as very poor. Based on limited data, the VCMC's report assumes that there is a downward trend in estuarine, marine and coastal health, and that current condition is moderate to poor. The management response in this area is rated in the report as meeting few or none of the criteria: "*strong legislative and policy framework, statewide and regional strategies in place, and being implemented using an adaptive management response*" (inside cover).

It is evident from the VCMC (2007) report that many catchments are in poor condition, which in turn impacts on aquatic systems. Estuaries and bays are suffering from a multitude of threats including poor water quality, overfishing and invasion of pest species.

As well as having high biodiversity values, the Southern Ocean acts as an important carbon 'sink', containing about 40% of the total anthropogenic carbon dioxide stored in the global ocean (Newton 2007). The oceans are also important for oxygen production – phytoplankton provide half of the oxygen on the planet.

Commercial ports, shipping, commercial fishing, aquaculture and wind energy industries rely directly on coastal natural assets. Together with coastal tourism, these industries contribute over \$2.8 billion a year to Victoria's economy (Victorian Coastal Council 2007).

Bays and estuaries provide an important ecosystem service acting as fish nurseries (for example . snapper breeding in Port Phillip Bay). Bays around Victoria are already experiencing a large number of stresses as a consequence of human activity such as dredging, trampling, pollution from towns and cities and the introduction of pest species. Bays and inlets have already suffered from a major loss of species biodiversity.

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<sup>13</sup> Government funds are important in leveraging other funds from the private sector

### ***Climate change and sea level rise***

Plans need to be put in place now to cope with sea level rise. According to the 2007 IPCC Fourth Assessment Report (IPCC 2007b), global sea levels are projected to rise by between 0.18 and 0.59 metres by 2100 (allowing for different emissions scenarios and uncertainty ranges and excluding future rapid dynamic changes in ice flow).

Since 1990, the observed sea level has been rising faster than that projected by models. To date, the largest contribution has been through thermal expansion, however the contribution of ice sheet melting is rapidly increasing (Rahmstorf et al 2007) and according to the National Snow and Ice Data Center (2008) ice sheet melt is now accounting for about half of the observed sea level rise.

As sea levels rise, areas previously inhabited by mangroves and saltmarsh and other low lying areas will be flooded. As a result of a rise in sea level, coastal freshwater wetlands may also be inundated with saltwater, having significant impacts on species which have low salinity thresholds.

Changes in sea level have occurred many times in the geological past and many species have simply migrated inland. However, in many cases this is no longer possible as coastal development now acts as an impenetrable barrier.

### ***Marine and coastal pollution***

The Parliament of Australia *Senate Inquiry into Marine and Coastal Pollution* (1997) concluded that the most serious threat to Australia's marine environment stems from catchment activities. This is as a result of diffuse sources of sediments, nutrients and toxicants draining from catchments to the coast, posing a significant risk to the environmental quality of estuaries and shallow bays (Environment Conservation Council 2000). Uncontrolled runoff from catchments (urban or agricultural areas) has a negative impact on water quality and marine and coastal habitats, particularly on important bay and estuarine habitats such as seagrass. Impacts include: turbidity blocking of sunlight for photosynthesis of marine flora; uncontrolled epiphytic algae growth and eutrophication of water from nutrients; litter that can kill or injure wildlife.

### ***The Green Paper***

The Green Paper virtually ignores marine and coastal environments, perhaps demonstrating our lack of focus on, and understanding of them. This lack of focus is particularly demonstrated by the lack of a decision making and planning framework for the marine environment outside Marine National Parks and Sanctuaries.

The discussion both of aquatic ecosystems and climate change in the Green Paper very briefly mentions sea level rise and increased storm surges (p47). But there is no suggestion of what should be done or of the potential for very serious impacts on biodiversity. Within the next five years, increased storm surges will have increasingly big impacts and need to be adequately considered and factored into statewide planning.

The Green Paper does not adequately address the issue of nutrient and sediment pollution in aquatic environments. The Green Paper does suggest (p45) "*improved integration and collaboration between catchment, coastal and marine programs*", but does not adequately explain why this should be done or how it could be achieved.

## **Agenda for change**

The White Paper must contribute to the delivery of clear management strategies to address the impacts on marine and coastal biodiversity associated with the key drivers of change such as climate change, fishing practices, coastal development, pest species and pollution/catchment management.

The following long term aims should be included in the White Paper:

- Protect, enhance and restore the natural marine and coastal ecosystems of Victoria.
- Ensure that 20-30 per cent of each habitat type is protected in the marine and coastal environment.
- Minimise, and where possibly prevent the impact of exotic terrestrial and marine organisms.
- Maintain and improve coastal and marine water quality to meet the requirements of ecosystem health and human use.
- Facilitate the development of coordinated, integrated planning and management systems for the coastal and marine environment with links to terrestrial and freshwater management.
- Ensure adequate resources are available for coastal and marine planning and management.

## **Improve marine and coastal governance structures**

Victoria has no decision making and planning framework for the marine environment outside Marine National Parks and Sanctuaries. The default framework for management falls to Fisheries Victoria (Department of Primary Industries), which focuses on single species and commercial harvesting with little or no focus on ecosystem or habitat health.

The Victorian Coastal Strategy notes that strong consideration needs to be given to future governance arrangements for marine and coastal environments.

A marine governance structure needs to be put in place, including adequate legislation and appropriate policy to protect and manage marine areas, including Marine Protected Areas, and providing for stakeholder and community input.

An integrated catchment management system is needed across the State, with a strong catchment to coast perspective. Catchment management should address threats to marine and coastal systems from soil erosion, salinity, and urban and agricultural runoff. Regional Catchment Strategies (RCSs) should be expanded to include and drive this and each RCS should have input from dedicated marine and coastal staff.

There is a need for development and application at a statewide level of firmer legislatively based coastal planning schemes and appropriate planning controls. The overarching legislation, the Victorian *Coastal Management Act 1995*, requires a number of amendments, for example:

- a definition of ‘the coast’.
- clarification that it includes the marine environment within three nautical miles of the coast.
- a legislative basis for coastal action plans, and

- inclusion of Integrated Coastal Zone Management The Victorian Coastal Council should play a strong role ensuring all coastal action plans are implemented according to standardised criteria that focus on long term protection of biodiversity and ecological processes, catchment management, wetland and estuary management, coastal development, fisheries and tourism.

The *Fisheries Act 1995* and the *National Parks Act 1975* require amendment to include the protection of intertidal marine ecosystems.

### **Improve marine conservation**

A truly effective core of protected areas is vital to the maintenance of healthy and functioning ecosystems. At the World Summit on Sustainable Development in 2002 and the World Parks Congress in 2003, Australia signed onto the need to protect between 20-30 percent of each habitat in the marine and coastal environment by 2012. Victoria currently has 5.3% of its coastal waters in marine parks and sanctuaries. This is a valuable start on which to build.

Building coastal connectivity is vital if species are going to survive the changes associated with climate change. As sea levels rise, shoreline erosion and realignment is likely to occur. Rocky shores, estuaries and wetlands will be submerged along with coastal dune systems. Compounding this, coastal development will block the natural migration of these habitats inland as changes in sea level occur.

Ensuring there is a connection between where species are now and where they will need to migrate will be critical to their future survival. Developing such connections will help to build resilience including ensuring the present ecosystems are healthy and therefore able to adapt to future changes.

Alongside a world class system of protected areas, all threats to marine and coastal environments must be identified, with comprehensive, clear and well resourced management strategies developed to address them.

It is necessary to develop guidelines and plans for the protection of Victorian estuaries. The EPA and DSE should be lead agencies responsible for ensuring water quality and sediment monitoring, as well as undertaking audits of licensed point source discharges that should be reported on regularly in a form that is readily accessible to the public.

In terms of responding to sea level rise and storm surges, investigations need to be undertaken to identify where sea walls will be needed and what type of walls will be able to accommodate intertidal communities, where possible. The Victorian Government needs to implement Coastal Plans that enable the inland movement of intertidal and coastal species. Plans should be included in the Victorian Coastal Strategy and in local planning schemes, allowing for the acquisition of land where required.

Future fresh water allocations will need to take into account the amount of water needed to maintain wetlands and estuary health.

### **Improving scientific understanding of the marine environment**

In order to plan for change agencies need to have access to appropriate information. For example, marine conservation is hampered by poor habitat mapping and EVC mapping of the marine environment.

The State Government, in consultation with scientific, community and industry organisations, should establish a framework for acquiring data relating to Victoria's marine, estuarine and coastal resources and co-ordinating a program of integrated data collection. The research already in existence should be appropriately catalogued and archived, gap analysis undertaken and a future plan provided.

There is a clear need for the Victorian Government to prioritise and resource marine and coastal research. This may be achieved for example by funding and establishing a marine and coastal research centre.

### ***Resources***

Increased resources are needed to manage Victoria's marine and coastal environment. Victoria should be divided up into marine and coastal management regions and each region should have a dedicated, expert and well-resourced marine and coastal team whose job it is to provide input into: catchment management planning, EPA monitoring, DSE assessment and management, and local government planning. No plan, monitoring or assessment should be completed without their input.

The Victorian Coastal Council lacks adequate and secure funding and this needs to be addressed.

### ***Key recommendations***

- ❖ Increase the number, extent and connectivity between marine protected areas in Victoria to meet the international target of 20-30% of each habitat by 2012.
- ❖ Identify all threats to marine and coastal environments, and develop and implement comprehensive, clear and well-resourced management strategies to address them.
- ❖ Undertake investigations to identify how to accommodate intertidal communities as sea levels rise, and develop and implement Coastal Plans that enable the inland movement of intertidal and coastal species.
- ❖ Establish a marine governance framework, including legislation, policy and organisational capacity to plan for, protect and manage all marine areas.
- ❖ Integrate marine governance and terrestrial catchment management governance.
- ❖ Develop guidelines and plans for the protection of Victoria's estuaries, including pollution control and provision of environmental flows to maintain estuarine health.
- ❖ Provide appropriate funding to the Victorian Coastal Council and management agencies to ensure biodiversity protection in the marine and coastal environment.
- ❖ Prioritise and resource marine and coastal research, including publicly accessible EVC mapping of the marine environment.

## Issue 14. Rivers

### ***Why are healthy rivers important?***

Nearly every town in Victoria is situated on or close to a river. In addition to their intrinsic value as diverse and complex ecosystems, rivers have become inextricably entwined with the state's social and economic development.

Victoria's natural infrastructure depends on healthy river systems. They provide clean drinking water for millions of people and support billions of dollars worth of agricultural production. They provide recreation and transport, tourism opportunities and a sense of place.

Healthy rivers support a huge variety of flora and fauna, provide connectivity in the landscape and allow migration both on land and in water, are highly important in the cycling of nutrients and sediments through the landscape and are a significant interface between the aquatic and terrestrial environments. They provide a wide range of ecosystem services such as purification of water and waste removal.

### ***Victoria's rivers are in a desperate state***

One third of river reaches have been classified as in poor or very poor condition (Green Paper, p18) as shown on page 18 of the Green Paper. Poor condition means low flows, poor water quality, declining fish and bird populations and damaged vegetation. And the situation is getting worse: over the last 10 years flows have been reduced by up to 84% in the Campaspe River (DSE 2008c) and 85% in the upper Yarra (Melbourne Water website). This year (summer 2008) the lower Campaspe has 20 times less water in it than in the most severe natural drought, as a result of the combined impact of low inflows and extraction (DSE figures provided in NRSWS Environment Working Group).

The reasons for the decline in condition are many, but the major driver is the development of agriculture and extraction of water for human use. In 2005/06, approximately one third of the state's available surface water was diverted for human use. Seventy six percent of this water was used for irrigated agriculture (DSE 2007b).

Severe reductions in natural flooding frequencies have occurred on Victoria's regulated rivers. This has affected waterway morphology, nutrient availability, in-stream and floodplain habitats and riparian plant and animal communities.

CSIRO has identified six major risks to the future of shared water resources in the Murray Darling Basin, which are applicable to varying extents in all Victorian catchments. These risks are: climate change, farm dams, groundwater extraction, bushfires, reforestation and increased irrigation. The most significant of these risks is climate change with even moderate scenarios predicting up to 35% decline in inflows by 2050 (Jones & Durack 2005).

### **The Green Paper**

The Green Paper suggests that the impacts of land use change and climate change on river health can be dealt with through the development of regional Sustainable Water Strategies (SWSs), as envisaged in *Our Water, Our Future*. It acknowledges, however that the existing water allocation framework does not fully incorporate the impacts of climate change and some land use activities, particularly agroforestry (p46).

As inflows decline under climate change, the impact of all extractive use on river flows is increasing. In some catchments, up to 50% of inflows are captured by farm dams, which may be incompatible with providing environmental flows.

The assessment proposed in the Green Paper on the impacts of climate change, forestry, agroforestry, fire and catchment dams on water availability is clearly needed. Licensing issues need to be retrieved from the 'too hard' basket, with all users registered and sustainable diversion limits set for all surface and ground water systems.

The Green Paper poses the important question "*In a water constrained future, how can we make the best trade-off decisions to meet the water needs of communities, industries, farmers and the environment?*" (p46). In the last 10 years, reduced inflows have had a disproportionate impact on environmental flows across the state. The Northern Region SWS Discussion Paper shows that if the low inflows of the last 10 years continue in northern Victoria, overall water availability could be reduced by 27% in the Murray system to 70% in the Loddon. Water availability for consumptive use (diversions) could be reduced by 6% in the Broken to 67% in the Loddon, while water availability for the environment could be reduced by 44% in the Murray to 84% in the Campaspe<sup>14</sup>.

The recently released 2008-09 budget papers (Victorian Government 2008, p398) state that environmental entitlements for the Northern Region are dependent on a return to "*normal*" rainfall and implementation of the entitlement for the Central region has been delayed due to severe drought conditions, "*until Melbourne's water storages recover*". The environment's share of the water has already been traded off in favour of consumptive use by the current allocation framework. Future decisions need to increase the environment's share of the available water, particularly to reduce the disproportionate impact of climate change.

The approach being taken in the development of the Northern Region SWS is to break down the scientific environmental flow recommendations<sup>15</sup> into a series of categories to achieve specific objectives, from maintaining drought refuges to full environmental flow recommendations. Proposed increases to the Environmental Water Reserve (EWR) will be adequate to maintain most northern rivers at a Category 4 level (healthy instream environment but no overbank flows) under current (ie historic) conditions, but under all climate change scenarios the increased EWR will be sufficient only to manage drought refuges.

The focus on managing drought refuges only will lead to a 'continued and rapid deterioration' in river health in the long term under all climate change scenarios<sup>16</sup> and is unacceptable.

The only legislated addition to the EWR made through the Central Region SWS to date (17GL for the Yarra) has been qualified by the Water Minister until Melbourne returns to Stage 1 Water restrictions. The river health provisions of the Central Region SWS have thus been rendered inoperative. As the Green Paper sees the development of Sustainable Water Strategies as the key mechanism for improving river health, it is

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<sup>14</sup> NRSWS Discussion Paper, Table 3.7, p47.

<sup>15</sup> The FLOWS methodology produces recommendations which are the minimum flow regime required for a healthy river

<sup>16</sup> NRSWS Consultative Committee working paper

essential that any additions to the EWR made through these strategies are actually delivered and are not subject to Ministerial discretion.

The Commonwealth Government, with its \$3 billion commitment to buying water for the environment and reform of the Murray Darling Basin arrangements, will become an active player in the Victorian water market and a major holder of environmental entitlements. At present there are still significant differences between the Victorian and Commonwealth Governments in their approach to water management.

### **Agenda for change**

- Increase the Environmental Water Reserve (EWR) for each of Victoria's rivers to meet scientific flow recommendations for healthy instream and floodplain habitat under climate change scenarios.
  - Increases to the EWR can be made in many ways but to be effective must include a State Government commitment to buy water entitlements for environmental flows.
- Amend the Water Act 2005 to more clearly constrain Ministerial rights to qualify the environment's water entitlements.
  - any additions to the EWR made through these SWSs must be delivered and must not be subject to Ministerial discretion.
- Put in place licensing provisions for farm dams and small catchment dams, groundwater extraction and stock & domestic use, and set diversion limits for unregulated rivers.
- a targeted approach to buying water by both State and Commonwealth Governments is needed where structural adjustment can be achieved, and the most inefficient areas and marginal or salt affected land retired from irrigation, thus creating benefits for both the environment and farmers.

### **Resources**

The Government is investing heavily in infrastructure modernisation projects in northern Victoria to create water savings, which will be shared between irrigators, the environment and Melbourne's water supply. One billion dollars is being invested in the Food Bowl Modernisation project (\$600 million government, \$300 million Melbourne Water, \$100 million Goulburn Murray Water) to generate 225GL in savings. Other modernisation projects (Central Goulburn and Shepparton Irrigation systems) will in the long term contribute to the Living Murray and Snowy Initiatives and are being funded as part of the Government's commitment to those programs. The Government is also investing in the Macalister Irrigation Area to return water to the Macalister River

What is missing is a commitment by the Victorian Government to purchasing water to add to the EWR. This is both a more immediate and more cost effective way to provide water for the environment. At current prices, permanent water is available for purchase at around \$2,500/ML whereas water from infrastructure projects will cost over \$4,000/ML.

### **Timeframe**

The Northern Region SWS is currently being developed and the Eastern and Western Region SWSs are due to be developed over the next few months. In view of the

disproportionate impacts of climate change and the existing degradation of Victoria's river systems, a commitment to provide additions to the EWR sufficient for healthy instream habitat is very urgent. The next statutory review of water sharing arrangements, when climate change impacts could be assessed, is not due until 2019, at which point Victoria's rivers are likely to be in irreversible decline.

### **Key recommendations**

- ❖ Begin purchasing water as soon as possible, and use other mechanisms to increase the Environmental Water Reserve (EWR) for each of Victoria's rivers to meet scientific flow recommendations for healthy instream and floodplain habitat under climate change scenarios. To be effective this must include a State Government commitment to buy water entitlements for environmental flows.
- ❖ Put in place licensing provisions for farm dams and small catchment dams, groundwater extraction and stock & domestic use, and set sustainable diversion limits for unregulated rivers.
- ❖ Amend the Water Act 2005 to ensure that any additions to the EWR made through Sustainable Water Strategies are actually delivered and are not subject to Ministerial discretion.

## **Issue 15. Wetlands**

Lakes, inland and coastal wetlands are critical for water quality. They play a significant role in reducing nutrient, sediment and pollutant loads and provide breeding areas for animals, and feeding areas for both local and migratory birds. The impact of floods is mitigated by wetlands on a river floodplain. Coastal wetlands help stabilise shorelines and provide protection from storms.

Victoria has approximately 16,700 non-flowing wetlands covering 540,900 hectares, of which 12,800 (covering 432,800 hectares) are natural and the remaining 3,900 wetlands are artificial<sup>17</sup>. Worldwide, wetlands are among the most threatened ecosystems. In Victoria, almost 4000 natural wetlands have been lost since European settlement (191,000ha), mostly from drainage for agriculture. Many that remain have been affected by one or more degrading processes.

As is the case with other water resources, the prolonged 10-year dry period across much of Victoria has severely impacted many lakes and wetlands. Predicted higher temperatures and lower rainfall as a result of climate change have the potential to make lakes and wetlands dry out more frequently.

Currently, it is difficult to find good information and indicators on condition and trends for lakes and wetlands. The VCMC 2007 report assumes that they are overall in poor condition, declining over the past five years and likely to continue to decline.

A case study in the VCMC 2007 report (p37) with results from the annual Statewide Summer Waterfowl Count for 2007 shows a significant decline in waterbird numbers. In 2007, a total of 137,980 birds were counted, half the number recorded in 2006 from

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<sup>17</sup> Source: <http://www.dse.vic.gov.au/dse/nrence.nsf/childdocs/-8946409900BAC6344A256B260015D4AF-BC30FFF2D27FA86DCA25729E000419CD?open> accessed 18 June 2008.

a comparable number of wetlands. The reductions were considered to be largely due to drought. Breeding success has been low due to many years of drought. Sixty nine per cent of wetlands surveyed in 2007 were dry (compared with 31% in 2006). Few of the dry wetlands supported any birds. The majority of birds were found at sewage treatment plants and in coastal locations, highlighting their importance as drought refuges (VCMC 2007).

The statewide management response is generally poor for lakes and wetlands in all regions, with some exceptions such as Hattah Lakes which benefited from emergency watering in 2006 (VCMC 2007).

### ***The Green Paper***

The Green Paper suggests increasing the number of wetlands on private land managed for environmental values and identifying wetlands that are important habitat refuges and that could contribute to biolink zones. There is no suggestion as to how to improve the management of wetlands, nor for monitoring and assessment of wetlands.

### ***Agenda for change***

A statewide monitoring and assessment program to determine condition benchmarks and trends is needed. The Index of Wetland Condition is currently under development and being tested by DSE. This Index is a crucial step in monitoring and assessment and its development (which has been under way since 2005) should be prioritised and accelerated. The Victorian Government's Sustainability Action Statement (DSE 2006a) committed to the development of a new wetland strategy by July 2009; this is urgently needed to improve management.

Management of Ramsar listed wetlands in northern Vic which are Living Murray icon sites (Barmah, Gunbower and Hattah) is complex. The State Government can easily pass responsibility to the Commonwealth, as is happening with water supply for these wetlands. Other wetlands on public land which can be supplied through the irrigation system can have water supplied under the Murray Flora and Fauna Entitlement which is currently set at 27.6GL. While this entitlement has been invaluable for wetland conservation and protecting critically endangered species such as Murray hardyhead, it will become inadequate under climate change and low allocation scenarios, and needs to be increased.

Lakes and wetlands throughout Victoria are drying out and/or becoming increasingly saline and many systems are close to collapse. The Gippsland Lakes in particular are suffering from nutrient pollution, reduced through flows and salt water intrusion to the extent that a marine blue green algal outbreak has persisted for the last 8 months and is showing little sign of the expected winter decline. The best efforts of the Gippsland Lakes Action Plan have been unable to halt the decline and further efforts to halt the flow of nutrients and chemicals from the dairy industry into the lake system is urgently needed. 3,000ML have recently been added to the EWR for the Macalister River, which is welcome, but much larger additions to EWR are needed to halt the decline of the Lakes system and prevent it becoming an environmental disaster area like the Coorong and Lower Lakes.

Further commitment is required to the Living Murray and other MDB processes.

### **Resources**

Funding is needed for the Index of Wetland Condition and water purchase for wetland supply.

### **Key recommendations**

- ❖ Establish a statewide wetlands monitoring and assessment program to determine condition benchmarks and trends.
- ❖ Provide funding for the Index of Wetland Condition and water purchase for wetland supply.
- ❖ Increase the the provision of water for wetlands by increasing the Murray Flora and Fauna Entitlement.
- ❖ Add to EWR for rivers flowing into the Gippsland Lakes to halt the drastic decline of the Lakes ecosystem.

## **Issue 16. Riparian zones – high priority for conservation**

The high rates of primary productivity (fertility) in riparian zones make them biodiversity hotspots and refugia for wildlife especially at times of climate stress. They are also very important movement corridors. However, these areas are generally highly degraded. According to the VCMC (2007), riparian zones have been extensively cleared, and their condition is moderate to poor across much of Victoria.

There is a range of benefits from native vegetation in riparian zones including: better water quality and river health, erosion protection, carbon sequestration, improved habitat/connectivity for wildlife, and landscape amenity. In the North Central CMA, Jones *et al.* (2007) found that riparian landscape elements optimise water filtration, carbon sequestration and biodiversity. Riparian zones are therefore a high conservation priority for protection and restoration. It is also of note that highly productive/fertile areas are under-represented in the reserve system, and conservation management of riparian zones offers an important opportunity across the landscape to redress this. It is in agricultural landscapes where these areas are most under stress and degraded but perhaps also where the greatest opportunity lies. Crown river frontages occupy around 100,000 ha, or 1.1% of Crown land in the state (The Public Land Consultancy 2006). *“There are some 30,000 kilometres of Crown frontages alongside rivers in Victoria. Of this, some 22,000 km is abutted by freehold land, and a substantial proportion of this length is subject of Crown water frontage licences....mainly for grazing. There are almost 10,000 licences, nearly all issued for 5-year terms – the next renewal being due in October 2009”.* (The Public Land Consultancy 2008).

Victoria is unique in the world (and in Australia) in having such an extensive network of publicly owned stream frontages. Current legal requirements for their management are lacking in public interest criteria, and management is fragmented and overly complex, often contested and uncertain. Victorian Planning Provisions (15.01.2) encourage 30m vegetated buffer zones along waterways for a variety of public good outcomes, which appears to contradict licensing for agriculture.

It is also important to note that a high proportion – probably two-thirds of rural frontages in the Port Phillip and Westernport CMA region - are actually freehold land (Jan Smith, Melbourne Water, pers. comm.).

Riparian zones are highly significant assets that need to be managed in the long term public interest for river health and biodiversity outcomes, whether on public or private land.

## **The Green Paper**

The Green Paper states (p48) that “*the impending renewal of Crown frontage licences in 2009 will provide an important opportunity to review the management of a significant proportion of the State’s riparian zones and consider ways to improve their condition*”. It also suggests they may play a role in bio carbon sequestration, and that “*adjacent landholders and other managers could take a greater role in managing riparian areas for the range of services they provide*”. We strongly support this as long as biodiversity is a key focus.

The suggestion of identifying riparian areas that could contribute to ‘biolink’ zones is important, however, all riparian areas provide valuable opportunities for movement of animals and seeds, and therefore restoration should be a key management objective regardless of whether or not they are in ‘biolink’ zones. They are places in the landscape where ecosystem processes are highly active, but are also subject to threats and stresses associated with the legacy of past clearing/inappropriate land use and management.

We strongly support the suggested approaches in the Green Paper (p48)

- “*Improve the management of riparian areas and encourage the development of stewardship arrangements with adjacent landholders and other potential managers*”. The biodiversity outcomes from these arrangements need to be secure.
- “*Review the Crown frontage licensing process for the 2009 renewals to better reflect broader environmental outcomes*”.
- “*Improve statutory and administrative instruments for managers to improve riparian zone management.*”

It is timely that DSE has just released The Public Land Consultancy’s *Review of the Management of Riparian Land in Victoria* (2008). This report is very detailed and provides useful information and suggestions.

## **Agenda for change**

To reflect the vital role riparian zones play in providing ecosystem services and their high (potential) biodiversity values, they should be primarily managed in the public interest for conservation outcomes. It is important to recognise that the support and active involvement of local landholders is vital for the successful management and restoration of riparian land. Therefore a concerted community engagement strategy will be required to ensure the successful implementation of change, so that stakeholders and potential managers agree on a common conservation goal for Crown frontages.

Riparian zones should be continuous corridors of native vegetation that are fenced, with off-river water points provided for stock. The revegetated corridors should be wide enough to maintain relevant ecological processes such as dispersal and migration of native fauna. As riparian zones are areas of high productivity, there will need to be a focus on weed control, particularly after removal of stock. This is a potential source of conflict between landholders and government and needs to be well managed. It is crucial that weed management is integrated with appropriate restoration techniques. A major expansion in stream frontage fencing and revegetation is required, and clearly it will take time to achieve this. There is a need to determine which sites require immediate off-stream stock watering. To do this, it is useful to set

condition targets for river frontages, determining priority levels and the level of management that a given reach requires.

There is a need to be realistic about the cost of implementing riparian management projects for both public and private landholders, and what investment is needed. It is however worth considering that it is likely that the investment would provide a more efficient return if the riparian zone to be fenced off were wider than just the licence area. Wide ‘corridors’ are much easier to manage for invasive species, costs for fencing and watering points are similar for wide or narrow bands, and there is an increase in ecosystem services delivered (pest control etc).

While public land stream frontages are clearly a major opportunity for reflecting changing community values about the need for conservation, private land riparian zones still make up a very significant component of all riparian land. Clearly major investment is needed for these riparian areas from both public and private purses. The Melbourne Water Stream Frontage Management Program, funded from the drainage charge to Melbourne ratepayers, mainly pays for cash costs of restoration – fencing, seedlings, watering points for instance - with the landholders donating their time for implementation and ongoing management. The outcomes benefit the environment, the public and the landholders.

Such a program relies on the willingness of landholders to participate, and skilled extension services. The values of river health and riparian corridors are not well understood in the community or by landholders (Jan Smith, Melbourne Water, pers comm.). In the words of the economists, the ‘demand signals’ for the ‘product’ are not strong. This is an area that must be addressed if we are to change land management in riparian zones both on public and private land.

It is important to recognise that restoration of riparian zones is not a substitute for environmental flows, which clearly need to be provided to ensure river health. Periodic flooding is required to rejuvenate floodplains and wetlands.

Investment is needed into research to improve understanding of riparian restoration and revegetation as well as the dynamic ecosystem processes in relation for example to water quality, movement of organisms and flooding.

### **Institutional issues**

Current Crown Frontage management regimes and legal status are complex and need simplification. The Public Land Consultancy’s Review (2008) proposes a range of ways of achieving legislative reform. The suggestion of introducing all the “*recommended legislative changes through a single Riparian Land Reform Act which will amend six or eight existing Acts, and can then be repealed*” is worth exploring further.

The Review also recommends:

*“that all riparian Crown Land be reserved under the Crown Land (Reserves) Act 1978; that the gazetted purpose of the reservation be “Public Purposes (Protection of the Riparian Environment),” and that the legislative provisions relating to Crown frontage licences be transferred from the Land Act 1958 to the Crown Land (Reserves) Act 1978”* (Public Land Consultancy 2008, p7)

We support this important initiative.

There is a need to clarify riparian roles and responsibilities. The approach suggested by the Public Land Consultancy (2008, p20) is to:

*“retain, strengthen and expand the roles and responsibilities of all agencies with existing riparian roles”*

and (p21) the aim is:

*“to have a designated land manager appointed for all high-priority unlicensed riparian land – Parks Victoria, the relevant municipality, community-based Committees of Management or the CMAs themselves”*,

and to:

*“(a)llow the CMAs to evolve as regional ‘caretakers of riparian condition’ through an incremental program of role expansion”*.

CMAs already have responsibilities in riparian management and need to be supported to perform this role better.

Riparian land is often a mixture of Crown land (reserved and unreserved) and freehold land. For effective statewide management of riparian land, management tools and legislation that accommodate these tenure differences are needed.

The role of private land managers of public land needs to be re-defined with a shift to a conservation focus. Clearly there are excellent opportunities to support private land managers to manage Crown Frontages (for example by stewardship/ecosystem services payments). In lower priority reaches, licensing arrangements that establish an ongoing management relationship with a private land manager for conservation outcomes including fencing and revegetating riparian buffers may be a practical solution. For conservation priority reaches, adjoining landholders (previously licencees) may be involved in management for example with oversight through a committee of management.

The 5-yearly renewal of Crown licences, which is to occur in October 2009, is a not-to-be-missed opportunity to change the approach to riparian management to achieve environmental outcomes. As there are some 10,000 licensed frontages across the State, it may be necessary to have a stepped process, with highest conservation priority licences reviewed first. In the event that any licences are renewed, licence conditions must require a minimum standard of riparian conservation management, for example through a Code of Riparian Practice.

A Code of Riparian Practice under the Conservation, Forests and Lands Act 1987 is recommended by The Public Land Consultancy (2008) to improve the recognition of riparian land in regulatory regimes including Planning Schemes. In the interim period while the Code is being developed, conditions relating to fencing and other management priorities may be incorporated into licences.

### **Resources**

The on-ground changes required in riparian land management require effective community engagement and governance as discussed above. Once this is in place, effective management will depend on community support and particularly on government investment. Increased public funds will be required to support this, including for fencing and off-stream water points, and stewardship payments.

### **Key recommendations**

- ❖ Reform the existing arrangements with respect to the management of riparian land to ensure that all riparian land is managed for conservation outcomes.

- ❖ Encourage the management of riparian zones in the public interest for conservation and revegetation with indigenous species, especially through control of livestock access, natural regeneration and weed management.
- ❖ Utilise the 2009 licence renewal period to change the approach to riparian management from a primary focus on agriculture to conservation.
- ❖ Transfer legislative provisions relating to Crown frontage licences from the Land Act 1958 to the Crown Land (Reserves) Act 1978, and change their purpose to protection of the riparian environment.
- ❖ Review legislative requirements for management of riparian zones to deliver conservation outcomes, including preparation of a Code of Practice for Riparian Land Management under the Conservation, Forests and Lands Act 1987.
- ❖ Clarify roles and responsibilities in relation to riparian zones, and better support CMAs in performing their riparian responsibilities.
- ❖ For high conservation priority riparian zones, establish partnership and resourcing arrangements for their effective management. Set 5-year and long term targets for environmental condition of these areas.
- ❖ Significantly increase investment in riparian management for both public and private riparian zones via appropriate tools such as stewardship and ecosystem services payments, supported by education and extension services.
- ❖ Support the changes in riparian zone management with a community awareness campaign in rural areas about the benefits of, and assistance available for conservation-oriented management.

## **Issue 17. Urban and peri-urban biodiversity**

Many people around the world gain benefits from engaging with biodiversity in the places where they live and work (Miller & Hobbs 2002), including aesthetic and cultural inspiration, recreation, and air and water purification (Binning *et al.* 2001), as well as sense of place and identity. One of the main reasons for Melbourne's status as a 'liveable city' is the level of greenspace. Likewise in Bendigo, 'the city in the forest', the issue of integration of natural values and urban living are of great importance both to residents and the Council.

According to the Green Paper, over 40 per cent of Victoria's nationally-listed threatened ecological communities partly occur in urban and peri-urban areas (p21). In Australia, more than 50 per cent of threatened species occur in urban fringe areas (Yencken & Wilkinson 2000). Remnant vegetation at the urban-fringe and in existing urban areas in Victoria includes some of our most endangered ecosystems, such as native grasslands and grassy woodlands, and many sites are of very high conservation significance. Yet this remnant vegetation is under great development pressure.

Conserving biodiversity on the urban fringe is a significant challenge for policy makers and land planners, where there is a dynamic mix of urban and rural land uses and conflict over land use is common (Buxton *et al.*, 2007). Green Wedge zones in the Melbourne metropolitan area have delivered some valuable biodiversity protection, although they are still subject to inappropriate development. And many threatened ecosystems are not adequately protected in Green Wedge zones, particularly grasslands, and Melbourne continues to lose urban and peri-urban

biodiversity. Development consistently out-competes biodiversity concerns on a case-by-case basis. There is often little scientific input into the biodiversity aspects of the urban planning process and consideration of biodiversity values is typically ad-hoc (Bekessy & Gordon, 2007).

## **The Green Paper**

### ***Improvements to Planning Schemes***

A number of the topics covered in the Green Paper are relevant to urban and peri-urban biodiversity. Some of the approaches outlined may contribute to improved biodiversity conservation and management, such as the review of planning scheme overlays, zones and their effectiveness. However, for overlays there is currently little relationship between the protection of ecological communities under these overlays and their ecological significance (Bekessy *et al.* 2007), and for zones, the current set has too few options for councils seeking to integrate urban development and bushland protection (Budge 2008).

We support this review. Any changes should improve the capacity of vegetation significance overlays to protect biodiversity in urban and peri-urban regions.

Melbourne 2030 (Section 7, Policy 7.7) directs: “*Protect native habitat and areas of important biodiversity through appropriate land-use planning*”. The White Paper process should recommend the reforms needed to achieve this.

Another suggestion made in the Green Paper is that the Native Vegetation Precinct Planning approach be expanded across the state where there is pressure for urban development (p62). It is clear that a strategic approach to biodiversity conservation is essential, and may help to mitigate the effects of conflict in regions of multiple land use, such as the urban fringe (Pressey *et al.* 1993; Farrier and Whelan, 2004). It is vital that strategic planning for biodiversity is undertaken at the outset of altering planning zones, for example through precinct planning. However, the development of these plans should not be rushed to fast-track the re-zoning of areas for urban development.

Putting in place appropriate zones that reflect biodiversity values will avoid conflicts between conservation and development. To be effective, this requires thorough assessment/survey of ecological values to ensure excellent ecological information from the outset, with rigorous spatial prioritisation to zone land appropriately to protect biodiversity. New planning tools are required to ensure that once the plan is in place, the full range of exemptions to clearing controls no longer apply. Strategic planning however is not a substitute for planning controls – clearly there is still the need for the capacity to manage proposals to clear native vegetation.

### ***Market-based approaches***

There are a number of suggestions and approaches detailed in the Green Paper that are of concern from an urban biodiversity conservation perspective and warrant further investigation. The first is the emphasis on market-based approaches to biodiversity conservation. These approaches are valuable as methods that complement regulatory approaches and that incentive programs such as BushTender have been successful in some regions. The urban fringe, however, presents a number of challenges to the successful implementation of market-based approaches. In particular, land prices in and around the urban fringe are significantly higher than in other parts of the state,

and development pressure is considerable. In addition, there are large numbers of threatened species and communities in these regions and ever-fewer remnants.

It is important that the 'avoid' and 'minimise' principles in the NVMF are prioritised in urban and peri-urban areas, as too often there is a jump to 'offset', despite the often high conservation significance of the vegetation concerned. The high price of urban/peri-urban land and limited availability of suitable remnant vegetation often result in offsets not being 'like for like', with urban biodiversity the big loser. It cannot be assumed that offsets and market based approaches will solve this problem. It is clear that market-based approaches are greatly constrained in urban and peri-urban areas due to high land values, highlighting the need for a strong regulatory approach, land acquisition for reserves, coupled with long term strategic planning and effective policy tools.

### **Trade-offs**

The Green Paper states (p83) *"It is important to recognize that trade-offs are inevitable. It will be very difficult for expanding suburbs to remain within the urban growth boundary if the community also wishes to set aside tracts of land for biodiversity protection. In other words, the environmental objectives of containing the expansion of new urban settlements works against the environmental objective of protecting urban biodiversity."*

Many of the ecological communities located in Victoria's peri-urban regions are threatened. The obvious alternative to trading off biodiversity protection is urban consolidation and increased development densities.

### **Agenda for change**

Government should move to improve the capacity of policy tools and legislation and to increase resources to protect biodiversity in urban and peri-urban areas where there are significant development pressures. Important biodiversity remains in these areas and a regulatory presence and investment will be required to protect it.

It is appropriate that urban and peri-urban remnants are added to the public open space system as they provide urban dwellers with much needed local access to natural areas, and it is usually not feasible for private landholders to retain and manage them.

Current knowledge of location of threatened species and communities is inadequate to inform quality strategic planning. Planning should occur now to identify those areas of remnant native vegetation suitable for purchase, covenants and financial assistance for conservation management, and/or planning scheme protection. It is a high priority to undertake a comprehensive study of biodiversity in urban and peri-urban regions to ensure that precinct planning is informed by adequate knowledge and science. Particular areas of investigation should include:

- Issues of species detectability and appropriate survey effort (See Wintle *et al.* 2005; Garrard *et al.*, in press).
- Detailed investigation of the extent, relative significance and quality of remnant native vegetation in urban and urban fringe areas (including areas within the UGB).
- Improvement of the current threatened species and communities databases, including information on private land.

- Matching Environmental Significance and Vegetation Protection Overlays and the status of biodiversity on the ground.

### **Resources**

One mechanism to fund urban biodiversity conservation could be for developers in growth corridors to fund the purchase and initial management of a public reserve network in new suburbs and nearby green wedge land, which incorporates most remnant vegetation into an ecologically appropriate reserve design. This could be achieved through developer contributions at the time of subdivision and development.

State Government should negotiate with developers to jointly cover the costs of permanently reserving ecologically significant remnants on existing urban zoned land, especially high quality native grasslands and grassy woodlands.

Resources are required to fund and undertake a comprehensive study of biodiversity in urban and peri-urban regions, reserve options, and management needs.

### **Key recommendations**

- ❖ Undertake a comprehensive study of biodiversity in urban and peri-urban regions to inform the design of a conservation reserve network, precinct planning and public open space management.
- ❖ Prepare strategic plans for conservation reserve networks across the metropolitan regions including peri-urban areas, where land should be designated and rezoned for conservation well in advance of urban development.
- ❖ Ensure that growth area plans provide an inclusive and viable local reserve network, which protects all high quality native vegetation and habitat while providing additional space for recreational uses.
- ❖ Increase the funding for public acquisition of sites of high conservation significance in rural and peri-urban areas, and enlarge the Trust for Nature Revolving Fund for land purchase, covenanting and re-sale<sup>18</sup>.
- ❖ Increase urban consolidation and increase residential densities in new developments, while protecting tracts of land for biodiversity protection.
- ❖ Review planning controls, including zones and overlays, to ensure planning tools provide for strong biodiversity outcomes.

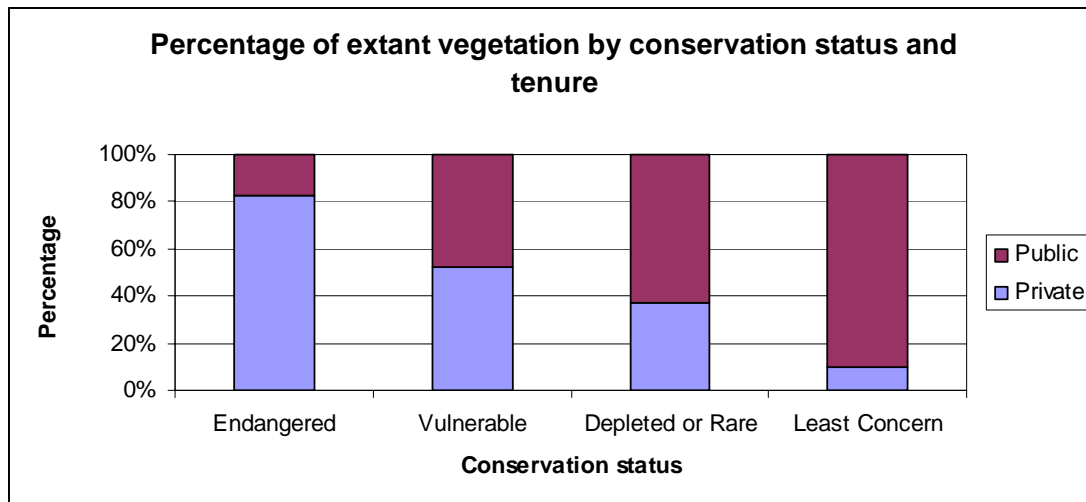
## **Issue 18. Private land conservation**

Two thirds of Victoria is private land and over 80% of this has been cleared of native vegetation (DSE 2008a). The remaining native vegetation on private land is highly fragmented, significantly degraded and subject to a range of threats. As a result of such widespread clearing, it is therefore not surprising that on private land 60% of remaining vegetation is a threatened vegetation type (DSE 2007a). This is demonstrated in Figure 4 below.

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<sup>18</sup> Refer also to funding recommendation for Trust for Nature's revolving fund – p85 of this document.

Figure 4. Percentage of existing native vegetation by conservation status and tenure. Source: DSE data 2005



The *Native Vegetation gain accounting first approximation report* (DSE 2008) found that both the quality and extent of native vegetation on private land are declining, with the extent losses being largely threatened native grasslands.

The continuing decline of the condition of native vegetation is a both a legacy of past clearing, i.e. an ‘extinction debt’, and lack of sufficient action to reverse this decline (a government policy goal). The result is that the rate of background decline in quality still overwhelms any gain. There is also ongoing decline from current threats such as invasive species, urban and infrastructure development, intensification of agriculture, all of which will be magnified by climate change.

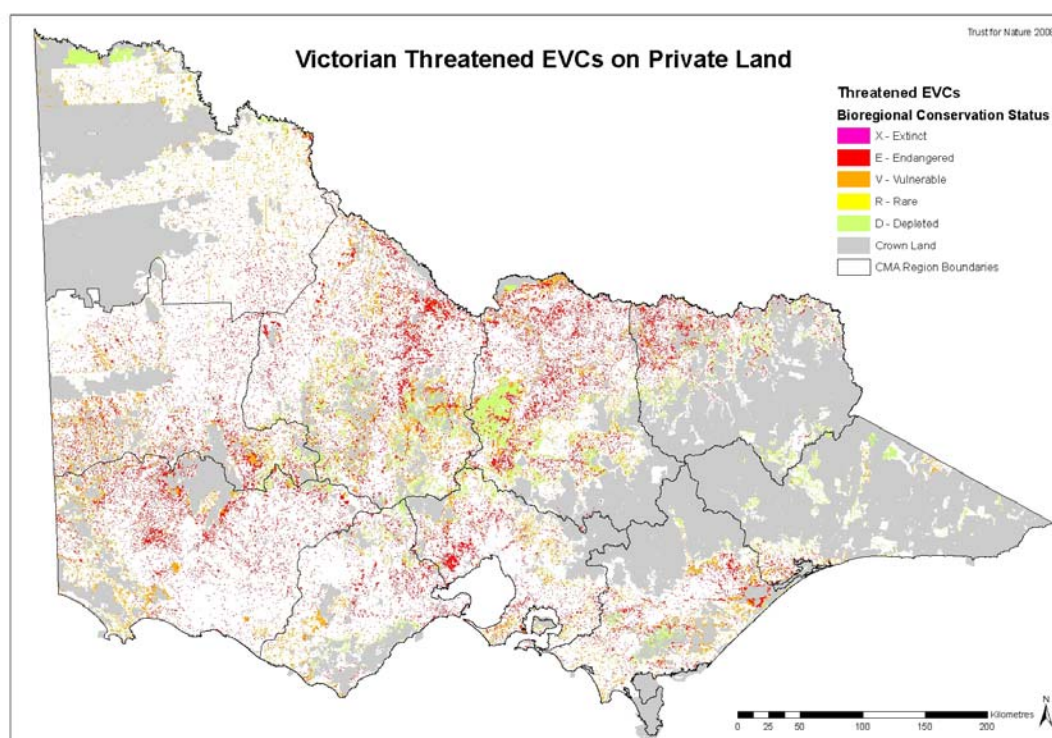
Fragmentation provides opportunities for invasion by weeds and pest animals, which further threaten native ecosystems. Fragmented habitats disrupt ecological processes resulting in dysfunctional ecosystems and populations that are geographically and genetically isolated.

Extensive removal of native vegetation has diminished and fragmented the habitats of flora and fauna unevenly across the State. Land tenure is an indicator of both protected status and fragmentation and has resulted in two distinct landscapes – the relatively unmodified and intact land and vegetation that comprises much of Victoria’s public estate, while most privately owned land has been extensively cleared and modified (by cultivation and grazing) resulting in highly fragmented ecosystems.

Land tenure presents a conundrum for conservation planning and management with largely intact areas well represented in the reserve system, while highly fragmented and endangered ecosystems are predominantly unprotected on privately-owned land.

A quick look at a map of Victoria shows that is those areas most easily grazed and cropped are also most heavily cleared. For example, less than 20% of the original vegetation of the Victorian Volcanic Plain, Warrnambool Plain and Wimmera bioregions now remains. Similarly the Victorian Riverina, Murray Mallee, Dundas Tablelands and Gippsland Plain retain only 20 – 30% of their original vegetation cover. This is demonstrated in the following map provided by Trust for Nature.

Figure 5. Victorian Threatened EVCs on Private Land. Source: Trust for Nature



Agricultural production is Victoria's predominant land use and occurs mainly on what were previously grasslands and woodlands in western and northern Victoria. Agriculture contributes \$8.4 billion to the Victorian economy (Australian Bureau of Statistics (ABS) 2007a), but the successes of modern industrial food and fibre systems fail to reflect their substantial environmental costs (ABS 2007b). Systems under major threat from changing agriculture include already-threatened native grasslands. Urbanisation is also a driver of loss of threatened species and ecosystems in some parts of the state.

### ***Conservation is needed on private land***

There is clearly a strong need for improved conservation and restoration of biodiversity on private land. And it is mostly on private land where the greatest part of Victoria's ecological restoration effort needs to be undertaken. Private land managers, then, clearly have a very important role to play. The Victorian government needs to step up its effort to engage private land managers and to increase public and private investment in biodiversity conservation on private land.

Notwithstanding many impressive public and private initiatives, the total conservation effort to date pales in comparison to the scale and urgency of the conservation problem. Meeting the challenge will require a quantum leap in effort. There is a need to focus both across the landscape and on highly threatened ecosystems and species. Native grasslands and grassy woodlands are a particular conservation priority given the extensive loss and damage they have suffered.

Existing areas of remnant native vegetation must be protected from intentional and indiscriminate clearing and other unsustainable practices, such as mismanaged grazing.

Equally, restoration of both quality and extent of native vegetation and re-building the ecological connectivity are essential if we are to build the resilience of our ecological

systems (and ecosystem services) and address the needs of threatened species and ecosystems.

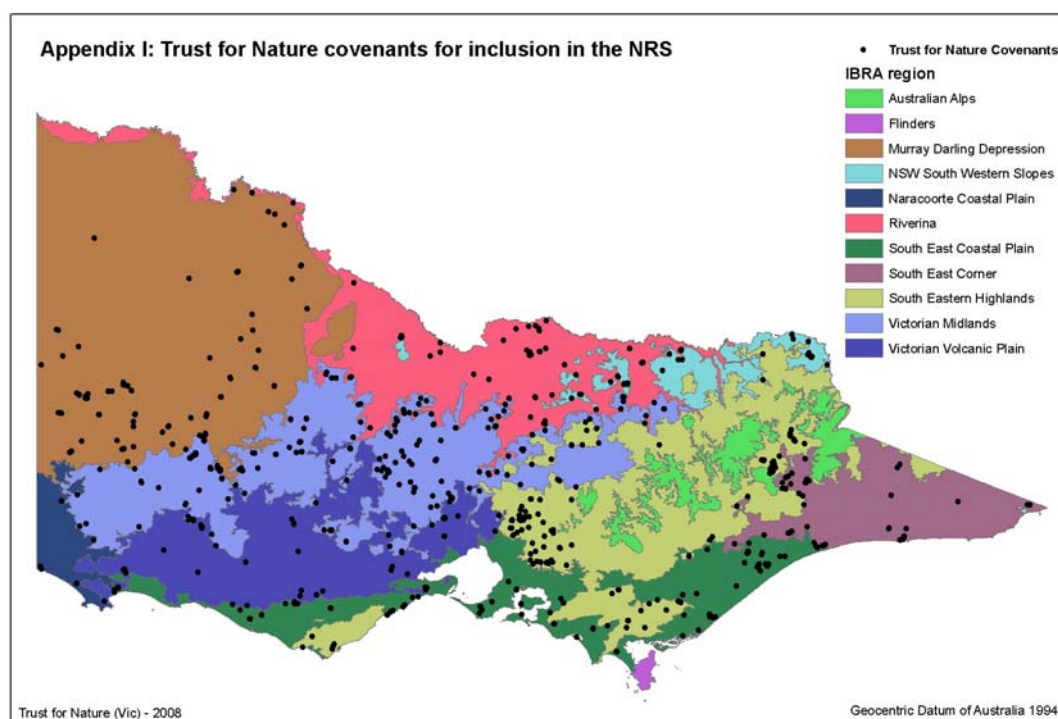
It is important to recognize that private land conservation plays a key role in the National Reserve System, through permanent protection of habitat through conservation covenants.

Recent assessment by Trust for Nature demonstrates the contribution of private land to the National Reserve System through Conservation Covenants (Table 1 and Figure 6). This is in addition to the eight NRS reserves owned and managed by Trust for Nature and Bush Heritage Australia's Wychitella Reserve. The private land contribution is highest in the most endangered bioregions.

Table 1. Public and private land contribution to the National Reserve System .  
Source: Department of the Environment, Heritage and the Arts (2006) CAPAD 2006 Victoria summary and Trust for Nature (2008) unpublished data.

IBRA region	Private protected area (ha)	Public protected area (ha)	Total protected area (ha)	% Public protected area	% Private protected area
Victorian Volcanic Plains	1357.86	30892	32250	95.79	4.4
NSW South Western Slopes	1259.98	58803	60063	97.90	2.1
Victorian Midlands	7479.01	378372	385851	98.06	2.0
South East Coastal Plain	2290.5	162252	164542	98.61	1.4
Riverina	1411.73	163316	164728	99.14	0.9
Murray Darling Depression	9649.82	1457650	1467300	99.34	0.7
South East Corner	2216.25	378877	381093	99.42	0.6
South Eastern Highlands	3301.17	692307	695609	99.53	0.5
Naracoorte Coastal Plain	207.13	60842	61050	99.66	0.3
Australian Alps	199.59	356592	356791	99.94	0.1
	<b>29373.04</b>	<b>3739904</b>	<b>3769277</b>	<b>99.22</b>	<b>0.79</b>

Figure 6. Location by IBRA region of Trust for Nature Covenants in Victoria.



Conservation organisations like Bush Heritage Australia, The Nature Conservancy and Trust for Nature, have a proven record of protecting and restoring ecologically important properties for the long-term.

Greening Australia, landcare networks, community groups and many other land restoration initiatives play an important role in private land restoration and revegetation. These groups are leading the way in restoration and regeneration on private land.

Adequate resources are needed for the purchase and protection of existing habitat, as well as for strategic restoration activities. In the case of habitat protection, a high priority is significant additional public funding to enable expansion of Trust for Nature's Revolving Fund.

The task of restoring ecological connectivity across the landscape implies a significant and strategic land use change. The full portfolio of policy tools and support measures will be required to enable and encourage landholders to improve conservation outcomes across Victoria.

The portfolio includes public regulation, volunteerism, education and extension, research and development, new environmental markets, payments for environmental services, statutory and community-based planning, voluntary binding agreements (i.e. covenants), environmental assurance schemes, voluntary non-binding agreements (for example Land for Wildlife), and so on. This range of tools needs to be used within an overarching investment framework that supports and leverages private investment. To get the mix of tools right, the White Paper process needs to explore the effectiveness of a range of different approaches and combinations of approaches.

### ***Trust for Nature covenants and Revolving Fund – an example of successful private land conservation***

Trust for Nature has several mechanisms for achieving conservation:

- Conservation Covenants - voluntary and legally-binding agreements between landholders and Trust for Nature to permanently protect the conservation values of a property.
- Stewardship - Trust for Nature provides support to covenantors to achieve best land management practice through expert advice, assistance to source works and fencing and possible rate and tax rebates. The stewardship program also provides management advice, support and monitoring.
- Revolving Fund - In 1989, Trust for Nature established its highly successful Revolving Fund. Trust for Nature uses the fund to buy environmentally significant land, which it then on-sells with the condition of a Conservation Covenant. All proceeds from the sale of Revolving Fund properties are wholly returned to the Revolving Fund to replenish its reserves and allow for future purchases.
- Land Acquisition - purchasing and receiving land as gifts or bequests; and managing its 51 reserves for conservation and biodiversity.
- Ecosystem services broking – facilitating the trade and establishment of native vegetation credits, carbon credits and water trading for conservation and biodiversity management outcomes.
- Projects, activities and fundraising that advance nature conservation.

Trust for Nature covenants provide permanent protection for high conservation priority remnant native vegetation. Relative to the high cost of revegetation and the risks to long-term ecological success of planted vegetation, Trust for Nature's focus on existing native vegetation represents high value for money.

By 'donating' land through covenants for nature conservation, managed largely at their own expense, covenantors provide:

- 37,560ha of permanently protected private land (via 902 covenants). This is the current area, and is rapidly growing (there were 800 covenants in mid 2007).
- Approximately \$1,000,000 worth of in-kind management of habitat across Victoria per annum.
- An approximate 'donation' of \$175,000,000 worth of property (if purchased on the open market rather than protected through covenants).

There are many advantages to covenanting as a conservation instrument:

- Covenants provide access to nature conservation outcomes not possible in the public estate;
- Covenants help keep people living and working in rural and regional communities; and
- Covenanting provides permanent protection and complements the range of policy approaches from market-based instruments (eg Bush Tender) to community-based programs such as Landcare.

However, by itself the covenanting program relies on the voluntary involvement of landholders, and hence can secure only a small proportion of ecologically significant properties. That said, the Trust's revolving fund has the potential to secure, at a relatively low cost, a large proportion of ecologically significant properties on the market, by purchasing and re-selling them to a conservation-minded buyer with covenant in place.

To date 47 properties have been sold through the Revolving Fund, protecting more than 4000 hectares at a value of \$5 million. The current size of the Revolving Fund is approximately \$2.4 million. The success of the Revolving Fund is hampered by lack of funds. A substantial investment by the State Government in the revolving fund would result in significant conservation outcomes.

Despite Trust for Nature's success, it is now in the invidious position of having the longest running, nationally lauded program, but with one of the smallest revolving funds as demonstrated in the following table.

Table 2. Conservation revolving funds within Australia.  
Source: Trust for Nature Revolving Fund case study.

	RF established	Total RF start up	Contribution to revolving fund corpus		
			Org	State	Cwth
National Trust WA	2001	\$2M	\$1M	-	\$1M
Nature Foundation SA	2003	\$1.4M	-	\$0.7M	\$0.7M
Nature Conservation Trust NSW	2006	\$13M	-	\$12M	\$1M
Queensland Trust for Nature	2006	\$13M	-	\$12M*	\$1M
Tasmanian Land Conservancy	2007	\$5M	-	-	\$5M
Trust for Nature (Victoria)	1989	\$2.2M	1.2M	-	\$1M

\*Queensland State Government is increasing the State contribution by \$3M to bring the total state contribution to \$15M in the next 18 months.

### **Contemporary rural landscapes**

Victoria should be orienting research and policy work towards the development of multifunctional landscapes that might include intensive and extensive agriculture, farm forestry and other traditional as well as novel commercial products, and ecosystem services, nature conservation, rural lifestyles, recreation and tourism.

The role of nature conservation, environmental works and ‘clean & green’ industries in regional development should be actively explored.

Two major transitions in rural Victoria present opportunities to reinvigorate biodiversity conservation: Firstly, the conversion of farmland near the coast and urban centres and much of the hilly Victorian countryside to ‘lifestyle’ properties, and, secondly, structural adjustment associated with climate and socio-economic change in production landscapes. (For a more detailed analysis of trends in rural social landscapes, see Appendix 2.)

The first point suggests that the current suite of tools to engage landholders is inadequately narrow given its focus on those whose priority or main income generator is industrial agriculture. The social landscape of rural Victoria is changing rapidly and the Victorian Government needs to be more proactive in its attempts to reach a new community of landholders exhibiting a wider variety of motivations. Lifestyle landowners who earn their income elsewhere should be assisted to enhance and restore native vegetation and associated ecological processes on their properties.

Changing social landscapes require a range of different approaches. For areas experiencing agricultural intensification and corporatisation, solutions include the development of a suitable policy framework for investment and mechanisms for certification of ‘clean and green’ products. Amenity landscapes will require a key focus on extension and incentives. To reduce the loss of people from rural landscapes (for a whole range of social reasons as well as to ensure that there are environmental managers in the landscape), it is important that new rural industries emerge to invigorate rural communities.

Drought demands a compassionate response, as well as a good dose of long-term thinking, and real vision for healthy landscapes in a changing climate. A scientific consensus now seems to be emerging that anthropogenic climate change is exacerbating the current drought and is likely to increase both the severity and frequency of extreme conditions. This will put added pressure on primary production

and on conservation assets in production landscapes, particularly those in marginal areas.

While many producers are adept at weathering extremes, many are looking for new options and assistance to help them out of unsustainable situations or wipe off debt. In marginal areas with high conservation values or where current land-uses are leading to environmental degradation, landholders should be given the option of voluntarily retiring part or all of their land from production with public assistance. Thoughtfully done, this approach can deliver benefits for the landholder and other farmers, our native wildlife, and the taxpayer.

Research in the pastoral zone, in the Western Division of New South Wales, and in Victoria's Upper Wimmera catchment shows land retirement can render a net gain to affected industries and to Australia as a whole (Hone 2006). Where current land-uses are causing environmental degradation, retiring them from production can also help save the public money that would otherwise be spent trying to meet spiralling costs of environmental degradation. One study by Latrobe University estimated an \$880 million net benefit from retiring only 5% of production land in the pastoral zone nationally for conservation purposes (Waschik & Fraser 2005).

Current approaches to drought assistance, and indeed industry assistance generally, should be scrutinised to better understand to what extent the public purse is subsidising unsustainable land management in a changing climate; and to identify where programs might be modified to meet conservation and other social goals.

### ***Production systems***

It is important to recognise that native biodiversity in production landscapes is fundamental to ecosystem function – the basis of agriculture as well as biodiversity (Fischer *et al.* 2006). Victoria's native ecosystems provide producers with a range of critical services and there is considerable and growing expectation that agricultural producers should act as good custodians of land and biodiversity.

### **Conservation activities and volunteerism**

Many landholders are already actively involved in conservation activities through a range of voluntary (such as landcare) and incentive schemes (such as BushTender). And they may be spending more time on conservation activities than is generally thought. For example in 2007, a PhD student interviewed 100 farmers in productive farming landscapes in Victoria, and found that 30% were spending more than 28 days per year on nature conservation. It had been expected that they are spending a day or two a year on conservation activities (Geoff Park, pers. comm. 12 November 2007).

Thousands of private landholders work for the betterment of biodiversity on their land, and hence for the community good, paying for the necessary work without support from government. This work is often done in conjunction with neighbours.

Community landcare, 'friends of parks' organisations and many other voluntary groups contribute many thousands of hours to conservation activities. In some areas community landcare has developed effective businesses that provide excellent on ground service, face to face liaison with landholders, and capacity to access new tools for funding. They are an excellent model (eg Bass Coast Landcare) and should be supported.

There is evidence that some landcare and friends groups, have 'given up' because they have seen their good work undone either directly on site, or through lack of

protection by subsequent owners. Clearly ongoing security is required for the outcomes of their work. Likewise some groups are questioning why they bother in the face of decisions to clear existing native vegetation.

Community landcare is growing in the urban fringe of Melbourne and provincial cities and, to some extent, in tree- and sea-change areas; it is declining in commercial farming areas just where it is needed. This is partly a result of ageing of the farming population and partly because land ownership in commercial farming areas is shifting to corporations who do not respond to the landcare volunteer engagement model (regulation, tax incentives, and MBIs provides a much clearer framework for business).

All this work should be supported by government with ongoing funding, facilitation and technical assistance. However it is very important to realise that it cannot be expanded sufficiently to achieve the necessary resilience and protection of threatened species that is required in the face of climate change.

### **Benefits to farmers and other private land holders**

The conservation activities being undertaken on private land reflect the many benefits to landholders including:

- The satisfaction of contributing to nature conservation.
- Improved amenity values (and therefore land values, at least in social landscapes that are shifting to amenity landscapes).
- Provision of ecosystem services (eg pest control, controlling salinity, water purification).
- Shade and shelter for stock.
- Windbreaks for homes and crops.
- Community engagement (for example through landcare).

### **Grassroots conservation planning**

Much more effort needs to be put into grassroots conservation planning, helping local communities to develop conservation plans at a very local scale. It is important that this is done at a small scale (though within a regional, statewide and national context). Community members need to be resourced with skills and knowledge so that they are able to increase their effectiveness in delivering conservation benefits. They need long time spans for local community-driven outcomes. In contrast to this, bioregional planning was largely a top down process, driven by CMAs and DSE.

### **Investment options and models**

Sustainable production systems require the marriage of profitability with environmental benefits. Victoria ought to be actively leveraging large-scale private finance for new, conservation-friendly industries and encouraging the development of a national enabling framework to achieve this – both to augment public investment in the landscape and as a catalyst for innovation.

The ‘leveraging’ approach would take account of the three broad layers in the investment chain: capital, land, and technical expertise. Importantly, the scheme would add a powerful new tool to the kit of regional communities; enabling CMAs, landcare and other groups to put land management on track to meet conservation and other environmental goals. Any scheme should employ policy instruments and

investment vehicles that have been tried and tested in other policy areas, such as business innovation, health care and built infrastructure.

The Allen Consulting Group (2001) proposed a policy and institutional framework to leverage private investment for the environment with the following essentials:

- Independent accreditation and administration;
- Tax-preferred investment vehicles (e.g. pooled development funds) to raise access to private capital for accredited commercial-environmental ventures;
- An integrated package of taxation offsets and concessions tailored to make environmental investments more attractive, with the aim of revenue neutrality;
- Seed funding for innovative commercial ventures with verifiable conservation benefits;
- Robust accreditation criteria for environmental ventures (e.g. biodiversity plantings). Proponents would have to show sufficient experience and expertise – commercial and environmental – in managing the new enterprise. Proposed ventures would be accredited if they demonstrated commercial viability, and involved significant land-use change or new approaches to land management that yield long-term conservation benefits.

More recently, Paul Martin and colleagues at the University of New England have suggested a similar ‘business model’ that employs adjustments to the taxation arrangements to Managed Investment Schemes to attract investment and philanthropy for conservation-friendly enterprises.<sup>19</sup>

Greening Australia and CSIRO tested the ‘leveraging’ approach as part of a national program of market-based instruments pilots<sup>20</sup>. Their approach emphasised:

- low-interest public finance issued within a co-investment model – a significant departure from the traditional ‘purchaser-provider’ model,
- ‘near commercial’ projects with an environmental benefit, rather than only public good environmental benefits,
- Enterprise (i.e. land-use) change, rather than environmental changes at the margins of existing land-uses,
- larger, landscape-scale change than would normally be provided for under alternative approaches.

An assessment of the GA-CSIRO project concluded that - even in the absence of an enabling policy framework - the ‘leveraging’ approach can:

- deliver some significant environmental benefits that other policy mechanisms are unable to deliver
- target innovative landscape-level change and sustainable land use options
- potentially generate financial returns for future reinvestment in natural resource management.

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<sup>19</sup> See <http://products.lwa.gov.au/files/PR071389.pdf>

<sup>20</sup> See

<http://marketbasedinstruments.gov.au/MBIsinaction/MBItypesinaction/Usingexistingmarkets/Leveragingprivateinvestment/tabid/229/Default.aspx>

The assessors believed that the approach is best suited to very large scale projects. This suggests that the model lends itself to landscape restoration endeavours with the potential to contribute significantly to regional development.

It should be noted that the general approach is one that continues to receive broad cross-sectoral support<sup>21</sup>.

The establishment of ecosystem services markets – including appropriate public regulation and support – would further enable private investment in conservation. (To this end, it is essential that the nascent carbon market be wedded to biodiversity benefits at the outset.)

Other compatible approaches to securing investment or co-investment from the private sector include payments for land stewardship (e.g. BushTender and EcoTender), changes to taxes and duties in recognition of the benefits to the public good arising from conservation endeavours (e.g. exemption of covenanted land from land tax, stamp duty and GST, etc.), municipal rate rebates (e.g. uniform government rates should be in place for covenanted land), revolving funds (e.g. Trust for Nature)..

These mechanisms, once in place will serve to leverage further private investment. There is now starting to be more private sector investment, for example super funds purchasing land with a long term goal of selling environmental services. More investors will follow this lead if it is shown to be profitable.

### **Land stewardship**

The success stories of landcare and other initiatives demonstrate how important it is to encourage voluntary conservation. However, these have not occurred at the scale required to adequately tackle the extinction crisis.

A program of payments and support for provision of stewardship/environmental services on private land is required. Landholders cannot be expected to bear the full cost of undoing the mistakes of the past. And because all Australians benefit from strengthened biodiversity, the effort needs to be shared. On the other hand, taxpayers need to be confident they're getting value for money, that they're not paying anyone to do what should be done anyway and that the best science is being used to target environmental action where it's most needed.

The Australian Conservation Foundation, WWF Australia and The Wilderness Society have outlined the foundations required for a good stewardship scheme. This is included in appendix 3. The principles include emphasis on proactive conservation, value for money, maintain strong environmental regulations, work towards conservation priorities and strategies, encourage scientists and landholders to work in partnership, enable the involvement of diverse landholders, provide long term guaranteed funding, and combine flexibility for landholders with environmental security.

Education and extension are discussed in a separate section of this submission.

### **Market based instruments**

This submission has repeatedly made the point that developing markets for the provision of land and ecosystem services would require a regulatory basis, and is not

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<sup>21</sup> See, for example, [http://www.lwa.gov.au/News\\_and\\_Events/News/News\\_2008/Climate\\_action\\_needs\\_rethink\\_on\\_funding/indexdl\\_8542.aspx](http://www.lwa.gov.au/News_and_Events/News/News_2008/Climate_action_needs_rethink_on_funding/indexdl_8542.aspx)

a substitute for direct regulation and enforcement of land use. Likewise market based instruments (MBIs) are one of a range of policy tools that should be used.

At this stage, the government is really the only buyer for ecosystem services in Victoria. The emerging carbon market and markets for water quality improvement (paid for by water authorities) have promise. It is clear that if markets are to emerge for ecosystem services, then government has a key role in regulating and contributing to funding these markets.

The current market-like, auction based approaches (BushTender and EcoTender) have good potential and should be encouraged. A benefit they have is the capacity to focus on clearly articulated outcomes and accountability for investment. There are also some concerns about these approaches. The 'economic' focus aims to select 'cheaper' bids. However cheaper bids are not necessarily the best in environmental terms. And there may also be negative effects from landholders competing with each other. Despite these concerns, it seems likely that a tender based approach will over time set a price for a given project type.

BushTender and EcoTender need to be properly targeted to achieve multi-scale outcomes – from the site to the regional scale, and need to be able to include local knowledge in design and implementation. To be effective, these programs now need to be scaled up with much greater funding from government.

### **Ecosystem Services**

'Ecosystem services' may be defined as the benefits that people derive from the environment. They include services essential to agriculture such as pollination, pest control and the provision of shade and shelter and services of value to the whole community such as water purification, regulation of river flows and groundwater, and waste removal.

They also give us a sense of place and provide many tangible and intangible environmental and social benefits.

One mechanism to increase the protection of an ecosystem service is to create a market for it, whereby it gains an economic value. The potential for ecosystem service markets has been explored by CSIRO. Such markets would increase the range of income streams for landowners and reward them for improving the way they manage the natural environment on their land.

Markets bring together buyers and sellers so that they can trade commodities. To create a market, there has to be a definition of what is to be sold, and there has to be someone willing to buy the particular commodity. Through the exchange of the buyer and seller, a price or value will emerge. This simple definition of a market can be applied to a market for ecosystem services. The Victorian Government could do this by setting up a trading system that puts a true commercial value on the benefits we get from environmental works that help control salinity, improve water quality, maintain soil health and bolster biodiversity.

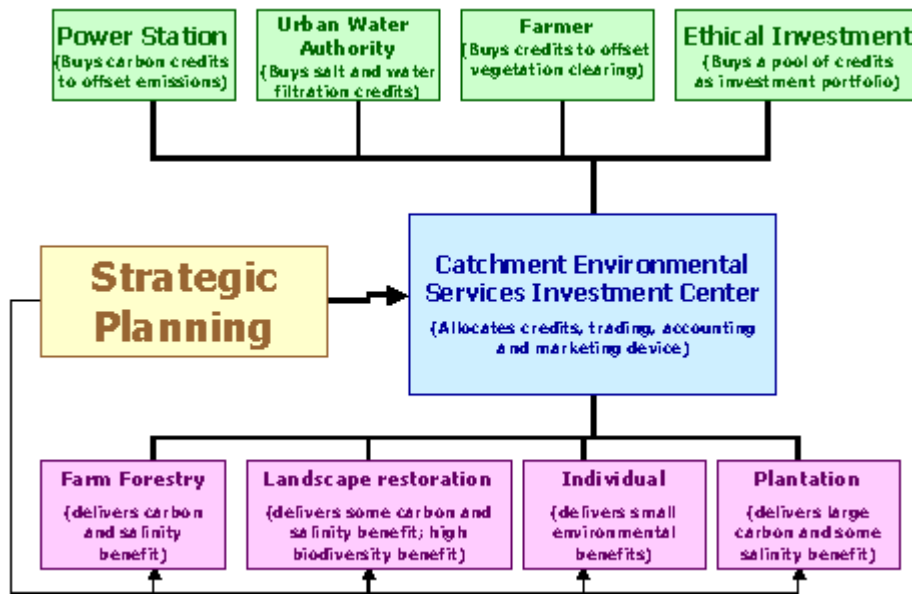
The result could be a marketplace that openly trades not just carbon credits, but salinity credits, water quality credits and even biodiversity credits, ensuring positive spin-offs for the farming community and the natural environment on which we so heavily rely.

It needs to be recognised that ecosystem services can also be delivered to human society by largely exotic vegetation and animals and by systems that are very depleted of their indigenous biodiversity. While there is some correlation between the value of

ecosystem services and that of indigenous biodiversity, reliance on payments for ecosystem services as a means of protecting and valuing biodiversity has to be carefully assessed for just how much indigenous biodiversity and land health values the payments can actually deliver compared to what is needed. And it needs to be recognised that not all biodiversity needs can be met by payments for ecosystem services.

Figure 6: Flow diagram of the framework of exchanges needed to create and maintain a market for ecosystem services.

Source: <http://www.ecosystemsproject.org/html/markets/overview/markets.html>



## The Green Paper

### Private land, land stewardship and ecosystem services

The Green Paper’s section on private land suggest that (p26) *“Tools that involve less red tape and foster individual innovation should generally be encouraged over more interventionist approaches. Options for correcting market failures by reassigning property rights and improving pricing should be considered first. Where this is not possible, or will adversely affect markets, regulation should be considered”*.

This is concerning, as regulation has a key role as part of a suite of policy tools. While current approaches to regulation could and should be made more efficient and effective, to suggest that regulation is simply ‘red tape’ or a tool of last resort is inappropriate and neglects the demonstrated importance of the law in behavioural change. The political will to enforce regulation, and community understanding of the need for it, are key to its success.

The Green Paper (p81) asks the question *“As a farmer, what motivates you to undertake environmental improvements to your land?”*

Considerable research has already been done on understanding what motivates farmers to do environmental improvements and it is now time to invest in appropriate programs.

The Green Paper acknowledges the vital role played by volunteers (p73), including landcare networks, and NGOs (p79) such as Greening Australia and Bush Heritage Australia, as well as the important role of Trust for Nature’s revolving fund (p79).

The Green Paper suggests “*Continue to encourage voluntary covenanting of private land*”, but does not suggest that the revolving fund needs to be expanded.

The Green Paper also states (p54), “*As a priority, focus on protecting and managing endangered grasslands*” which is clearly important, and as much of this is on private land, will require a range of responses around compliance as discussed in our native vegetation section, and funding for land purchase. Extension of the PlainsTender project would be valuable.

In terms of community involvement, the Green Paper says (p87) “*Strengthening obligations on CMAs to involve local communities and landholders in land and water planning will ensure community priorities are considered*”. This is important and should be encouraged.

### **Investment options and models**

The agenda for land and biodiversity management starts with a section on working with the private sector to encourage investment. While this is important, the Victorian Government may be unrealistic about what can be achieved in this regard, without substantial government investment to leverage private investments, as well as reforming taxation and other settings to facilitate investment.

In relation to enabling investment, the Green Paper suggests (p41) “*Remove regulatory barriers that hinder private investment in the environment*” (p60), “*Negotiate with the Australian Government to improving tax treatment for landholders introducing ecosystem services*”, and (p65) “*Consider: whether current legislation unnecessarily prohibits desirable private sector initiatives*”. It also suggests (p60) “*Support consumer choice for sustainable products by improving certification of farm management systems*”, and (p41), “*Encourage corporate scale farming organisations and food industry supply chains to build environmental outcomes into operations*”. We look forward to seeing the details of these proposals. It is worth noting that agri-business management of farming land in Victoria is increasing while that of farming families is decreasing, and a different set of tools to deliver biodiversity and land health outcomes is necessary. There are strong arguments that clear regulations requiring a measurable duty of care to deliver community good such as biodiversity outcomes, plus market mechanisms, are easier for business and that mechanisms that have worked for family farming such as Landcare are not useful.

### **Market Based Instruments**

Payments for the provision of ecosystem services are suggested in the Green Paper, which states (p60) “*Progress markets for new services in biodiversity and ecosystem services, including expanding BushTender and EcoTender approaches to address natural resource management priorities*” and (p60) “*Continue to develop market-based mechanisms to purchase activities that enhance ecosystem services*”. However if the focus is only on BushTender and EcoTender, this will mean that there is still only one buyer for ecosystems services in the market place – the government – and a true market which brings other players, such as electricity generators, steel manufacturers, water companies and private investors, will not be brought into existence.

A key question is how MBIs can work in urban and peri-urban settings where high land prices make conservation outcomes expensive. The Green Paper does not have a solution for this, simply suggesting (p60) “*Investigating opportunities for market like*

*approaches to secure public good values in other landscapes such as coasts and Green Wedges”.*

The Green Paper raises the concern that MBIs will reduce voluntary inputs (p73) *“Monitor the impact of economic policy instruments on volunteer mechanisms”*. As the value of ecosystem services from private land to Victoria is billions of dollars per year it is clearly impossible to pay landholders for all of these services. A critical role of the White Paper is determining how to integrate private and public funding for ecosystem services including: voluntary contributions by landholders and others, which services need to/should be paid for, and which ones can't be paid for and should be protected and restored using other mechanisms.

### **Soil health**

Soil health is key to land health. In a recent article published in the *Australian Financial Review* (5 March 2008, p 79), Andrew Campbell wrote *“Australia will be unable to maintain its food exports, achieve water security or meet its greenhouse targets without a major improvement in soil management”* and that *“improving soil management delivers win-wins all round”*. However, according to the VCMC (2007), *“There are currently insufficient data to report on the health of the soil resource across Victoria at a statewide level”* (p80), and *“The future of our soils does not look optimistic and this needs to be addressed at a statewide level”* (p25). Given that the Green Paper is about land health, it is disappointing that it gives almost no consideration to soil health and management. It acknowledges soil degradation and salinity as threats (p19) and in response, simply states (p28), *“Government and industry are considering actions that achieve positive environmental outcomes while allowing flexibility to adapt to various drivers of change”*.

### **Agenda for change**

Many of the required changes are discussed in the above section. This section focuses on the creation of ecosystem services markets and expansion of Trust for Nature's revolving fund, and substantial investment in BushTender and EcoTender.

### **Ecosystem services markets**

The Victorian Government needs to create a price for selected ecosystem services by setting scientifically determined legislated targets for landscape and river protection and restoration. A ranking system needs to be created to guide the development and application of different types of ecosystem service markets within Victoria. Specific markets should be promoted in regions and areas where conservation of a particular service, is needed.

Additional research is needed to explore the potential of ecosystem service markets to provide alternative and transitional income streams for landholders on marginal land and increase biodiversity protection.

As carbon trading expands, the potentially perverse impact of predominately monoculture tree plantings on water inflows and biodiversity needs to be considered and managed as part of an ecosystem services market integrated with land-use and catchment planning.

### **Revolving Fund**

Trust for Nature's Revolving Fund should be substantially expanded, with injection of government funding to make it possible to target the most depleted ecosystems in rural areas and increase protection of remnant native vegetation at urban fringes. An

innovation would be the addition of a land use change and ecosystem services revolving fund which would allow TfN to on-sell land with a covenant, but without a development right (eg sell water rights to be used for environmental flows, or use private land for carbon storage/sequestration.)

Funds required are:

- \$10 million for rural conservation priorities,
- \$20 million for peri-urban conservation priorities,
- \$20 million for land use change and ecosystem services.

### **BushTender and EcoTender**

The current level of investment in BushTender and EcoTender is \$14 million over 4 years. This must be significantly expanded.

### ***Key recommendations***

- ❖ Significantly scale up the effort to engage private land managers in conservation and restoration of biodiversity, and the level of public and private investment in this. Assign a high priority for conservation efforts to improve connectivity and to conserve native grasslands and grassy woodlands.
- ❖ Utilise the full portfolio of policy tools and support measures to enable, encourage and require landholders to improve conservation outcomes, and avoid an over-reliance on market-based instruments. The portfolio should include regulation, volunteerism, education and extension, research and development, new ecosystem services markets, payments for environmental stewardship, statutory and community-based planning, voluntary binding agreements (i.e. covenants), environmental assurance schemes, and voluntary non-binding agreements (for example Land for Wildlife). Use different approaches that are appropriate to different types of landholders, including lifestyle, corporate agri-business and farming families.
- ❖ Assist landholders to voluntarily retire part or all of their land from production in marginal areas with high conservation values or where current land uses are leading to environmental degradation.
- ❖ Provide \$50 million in additional public funding to expand the Trust for Nature Revolving Fund for purchase of environmentally significant land, which is on-sold with a Conservation Covenant.
- ❖ Actively leverage large-scale private finance for conservation-friendly rural industries and environmental ventures, and – through the Council of Australian Governments - encourage the development of a national enabling framework to this end.
- ❖ Significantly increase resourcing for BushTender and EcoTender and implement them across Victoria.
- ❖ Encourage the Commonwealth Government to expand its Environmental Stewardship Programme.
- ❖ Support local communities and local government to prepare and implement local biodiversity action plans.
- ❖ Encourage, legislate and set targets for, and invest in the development of ecosystem services markets.

## Issue 19. Institutional reform

### **Key issues**

1. Good institutional arrangements are critical for meeting biodiversity and land management objectives. Institutional arrangements should be understood to include policies and laws as well as agencies and organisations responsible for their implementation.
2. A good legislative framework is the foundation for effective institutional arrangements. Amongst other things, a legislative framework should:
  - a. Form a clear public statement as to the importance of biodiversity and land management as a government priority, and confirm the commitment to properly resource this priority.
  - b. Provide clear overarching principles and a framework for developing, implementing and evaluating strategies and plans at appropriate temporal and spatial scales;
  - c. Ensure that different agencies and organisations are clear about their roles and responsibilities so as to avoid unnecessary duplication or gaps in functions.
  - d. Guarantee evaluation and monitoring, accountability and public participation.
  - e. Establish appropriate instruments and tools for implementation and enforcement of strategies and plans.
3. The current legislative framework for land and biodiversity in Victoria is fragmented and out of date and does not meet the objectives listed above. The framework represents the incremental accumulation of different legislative regimes rather than any attempt to consider how it should all fit together and work effectively. Important legislation such as the *Conservation Forests and Lands Act 1987* and the *Flora and Fauna Guarantee Act 1988* is now more than 20 years old. This and other legislation do not reflect contemporary thinking and policy on ecologically sustainable development, let alone provide a basis for dealing with the threat posed to land and biodiversity by climate change.
4. The Green Paper identifies many problems with the current institutional arrangements that need to be addressed. While the identification of specific issues (eg the need for better coordination between Regional Catchment Strategies and the planning functions of local government) is welcome, these issues should not be considered in a piecemeal fashion. It is important that the issues identified be addressed in a manner that promotes a comprehensive and integrated approach. A piecemeal approach risks reinforcing rather than solving existing problems, such as confused lines of responsibility and lack of accountability.
5. Rather than simply foreshadowing the possibility of legislative review, the White Paper should set out some clear objectives for legislative reform in a manner similar to *Our Water, Our Future*. This must include a commitment to establish a legislative framework that both consolidates some of the existing fragmented legislative framework and also introduces new principles and

mechanisms necessary to properly account for and manage biodiversity, ecosystem services and ecological processes in the face of climate change.

6. The Green Paper focuses strongly on market based initiatives. The White Paper should focus on a strategic mix of instruments that emphasises not only economic efficiency but also the need for certainty in the face of irreversible biodiversity loss.
7. A good legislative framework is a necessary but not sufficient condition for meeting biodiversity and land management objectives. Political will and financial resources are essential. The *Flora and Fauna Guarantee Act 1988* was rightly acclaimed as a ground breaking piece of legislation when it was introduced. If it has been a disappointment, it is not because its objectives are unrealistic, as the Green Paper claims, but because the political will and the resources to implement it have not been forthcoming.

### **Institutional reform**

It is necessary to comprehensively review and reform the institutional, policy and legislative settings and instruments – assessing what is and isn't working, and why – in order to develop and implement a bold new vision and framework that delivers 'flourishing biodiversity in healthy ecosystems'. This demands a strategic approach to planning and delivery at a landscape scale.

The White Paper should include a broad appraisal of the present institutional arrangements and should detail a comprehensive platform and options for reform and improvement of these arrangements. The Green Paper is far too piecemeal, and does not lay out a comprehensive and integrated approach.

A strategic approach requires determining what vision, goals and objectives we want to achieve, with specific and measurable targets at a range of scales and timeframes, which in turn can be used to develop a suitable mix of organisational, policy, legislative and funding options and tools.

There are a number of principles that should guide review and reform of institutional arrangements, including:

1. Adequate resources to deliver desired outcomes.
2. Clearly defined roles and responsibilities.
3. Integration of environmental objectives into all decisions and actions with implications for the natural environment (horizontal integration) and alignment of legislation, policy, governance, investment and delivery (vertical integration).
4. A strategic approach to planning to provide outcomes at a landscape scale (rather than decision making mainly on a permit-by-permit basis).
5. Integrated biodiversity conservation and land management across tenures of both public and private land.
6. A clear statement of long term goals with measurable targets (see section on targets) with comprehensive monitoring and publicly reporting of achievements (see section on monitoring).
7. Publicly accessible and independent auditing of program implementation and outcomes, to demonstrate a commitment to monitoring and enforcement.

8. Strong emphasis on protecting and restoring habitat and maintaining and restoring ecological processes.
9. Utilisation of a mixture of policy tools, without over reliance on any one tool, recognising that different tools are applicable to different circumstances.
10. Greater emphasis on enforcement, particularly of native vegetation retention controls and weed management responsibilities.
11. Equitable distribution of public and private costs and benefits of land management and biodiversity conservation.
12. Public participation in planning and decision making.
13. That state government as the main land manager in the state should lead by example.
14. That state government, as the main agent with responsibility for long term protection of biodiversity in Victoria, implement international obligations as required by the Convention on Biological Diversity and as agreed at COAG in the Directions Plan.
15. That national targets are reflected at state, regional and local government levels.
16. Incorporation of best available science in setting of targets, monitoring, and adaptive management.

As discussed in the Green Paper, the disjunct between CMAs and Councils is a key area for improvement. This works both ways, with a need for local government to contribute to the development of Regional Catchment Strategies and likewise, for councils to be required when planning/reviewing planning schemes/Municipal Strategic Statements (MSSs)/developing Biodiversity Action Plans to align with Regional Catchment Strategies. This is discussed further in the section on legislative reform below.

An overarching strategy is important. Functions of such a strategy include guiding the development of planning and strategies at the regional and local level, coordinating the delivery of large scale long term actions such as biolinks and providing framework for investment through market based mechanisms. Such a strategy is also an important mechanism for ensuring consistency between planning and implementation in Victoria and Commonwealth and international obligations.

To be effective such a plan needs a legislative basis, that both requires the development of such a strategy but also that specifies what the strategy should contain. Legal frameworks for long term natural resource planning have been part of water reforms at in Victoria (reforms introduced by the Water (Resource Management) Act 2005, and more recently at the Commonwealth level (the "Basin Plan" under the Water Act 2008 (Cth).

The Flora and Fauna Guarantee Act provides for the development of a Flora and Fauna Guarantee Strategy. A draft Strategy was prepared in 1992 and abandoned. The present strategy, *Victoria's Biodiversity, Directions in Management*, (the Biodiversity Strategy) was released without consultation or public involvement in 1997 and has only recently and belatedly been reviewed. The absence of any requirement to prepare this Strategy within a specified time frame, and the absence of any requirement to review the strategy or review its implementation is unsatisfactory. The renewal of the Biodiversity Strategy concurrently with the

development of the White Paper presents an ideal opportunity to establish a legislative foundation for the Strategy to ensure that it is developed and reviewed in a timely manner, that its contents and coverage are appropriate and that it contains clear targets and timelines.

## **Resources**

The successful implementation of biodiversity strategies, policies and programs in Victoria fundamentally depend on adequate funding. This is currently seriously constrained by the inadequacy of funding levels, leading to repeated references in the Green Paper to “*finite resources*” (p53), “*redirecting resources*”, (p56), and “*prioritisation*” (pp53, 58). While there is a place for prioritisation, it is not acceptable to prioritise based on current funding levels, as it is clear that there is ongoing decline of biodiversity at the current level of investment. And it is clear that very large scale action is needed to reverse the decline. At least a ten fold increase in resources for the protection, enhancement and restoration of habitat across Victoria is required. The state government should use its increased investment to leverage further federal and private sector investment as well as advocating at a federal level for tax regimes that lead to biodiversity outcomes.

In relation to institutional reform, initial funding will be required to improve coordination of catchment management and land use planning. Councils require additional resources in order to fulfil their land use planning obligations, and require funding in order to develop Biodiversity Action Plans.

## **Legislative reform**

The Environment Defenders Office (EDO) made a detailed submission to the Consultation Paper which detailed the complexity and some of the deficiencies of the existing regulatory framework.

Specific problems with the legislative framework identified in the EDO’s submission to the Consultation Paper that should be addressed as part of the White Paper process include (p14):

- *“The lack of consistent, clear and overarching objectives to inform the administration of biodiversity and land management legislation in Victoria.*
- *A clear statement as to the principles to be applied in the administration of land and biodiversity legislation.*
- *Overlap or gaps between different legislative regimes.*
- *Areas where integration and coordination between different legislative regimes is lacking.*
- *A general lack of accountability mechanisms, particularly the absence of standing provisions that allow for appeals or review of administrative decision making.”*

Through this White Paper, the Victorian Government should commit to reforming and simplifying the legislative framework and should set a realistic timeline for implementation. It should contain a specific outline for legislative reform to address some of the key deficiencies in Victoria’s complex array of laws that relate to biodiversity. It must establish a framework within which it is possible to achieve specified goals and transparent auditing of their achievement.

## ***The Green Paper***

It is disappointing, that the Green Paper does little more than provide an ad hoc list of possible legislative reforms. This is far too piecemeal. What is needed is a comprehensive and integrated look at how to reform the current system.

As identified in the Green Paper, there are myriad overlaps, gaps, contradictions and inconsistencies in the current regulatory framework, as well as potential to better use existing provisions. These problems arise as a result of a lack of communication, engagement and coordination between the various government agencies and key players. This leads to considerable uncertainty within these particular roles and responsibilities and unpredictable interaction between legislation, policy and strategy 'on the ground'. Reforming legislation allows for clarification of these relationships. The Green Paper refers to this need to modernize the legislative framework for protection of biodiversity. Specifically, it states that, *“our understanding of the environment has grown and our objectives for natural resource management have become more holistic and outcome focussed. It is important that legislation recognises and enables this.”* (p65)

The section on legislation and regulation (p65) has a number of criteria to consider when reviewing legislation/regulation. It is interesting that the effectiveness of legislation is not listed as a criterion – although clearly it should be.

The Green Paper highlights a significant number of policy and legislative areas that are in need of reform and we support these. Examples include:

Working with the private sector to encourage investment in our natural assets (p41)

- *“Remove regulatory barriers that hinder private investment in the environment.”*

Managing aquatic ecosystems (p48)

- *“Improve statutory and administrative instruments for managers to improve the riparian zone .”*

Improving catchment management (p45)

- *“Investigate applicability of Special areas provisions in the CALP Act 1994”*
- *“Clarify the relationship between Regional Catchment Strategies, sub-strategies and other planning frameworks”*
- *“Better integrate catchment and statutory planning”*

Supporting species and ecosystems to adapt to a changing climate (p53)

- *“Review the Flora and Fauna Guarantee Act 1988 and the Wildlife Act 1975 for inconsistencies and efficiencies and for adequacy given climate change scenarios. Review the process for listing species.”*

Working towards a net gain in native vegetation (p54)

- *“Investigate ways to further reduce red tape without compromising the intent of the Native Vegetation Management Framework.”*
- *“Improve the linkages between Vegetation Protection Overlays and biodiversity conservation priorities as outlined in Regional Vegetation Plans.”*

## **Market Based Instruments**

Market Based Initiatives (MBIs) are consistently mentioned in the Green Paper. In response to this, we emphasise that it is vital that direct regulation retains an important role as part of a mix of policy instruments. It has a key role to play in the context of the threat of irreversible biodiversity loss. It is therefore worrying that the Green Paper states in the context of using MBIs (p60) “*regulation used in isolation will not protect or enhance land health and biodiversity. It needs to be in people’s interest to take action, either because it makes economic sense or because of their personal values*”. There is clearly a place for regulation and enforcement, as there are some situations where ‘stick’ rather than ‘carrot’ is required, for example vegetation retention controls.

Likewise, market based approaches themselves require regulation to establish markets in the first place and to provide for transparency and accountability.

### **The potential for specific legislative changes**

Suggestions regarding the FFG Act are particularly concerning. The Green Paper suggests (p65) that the goal “*to guarantee that all taxa of Victoria’s flora and fauna ... can survive, flourish and retain their potential for evolutionary development in the wild*” will need to be “*revised to a more realistic objective*” due to “*the magnitude of likely impacts of climate change*”. That is, the Green Paper flags an intention to water down the guarantee.

We believe that to do so would be a mistake. Using the threat of climate change as an excuse to water down a guarantee that was already being undermined by a lack of commitment and resources will effectively render the Act impotent. Explicit or tacit acceptance at a policy level that climate change will result in loss of species implying that there is no need to make no increase in effort is totally unacceptable. It is very demotivating for the thousands who contribute to the health of our biodiversity for the good of the all of us and will make it impossible to effectively object to any future development or activity that may have a detrimental impact on threatened fauna or flora. The proponents of such an activity or development may point to the watering down of expectations and claim that a given species is one that is likely to be lost anyway due to climate change.

Additionally, it sends a clear message to the judiciary that the legislature does not value biodiversity. Without impugning the independence of the judiciary, such a message provides for interpreting legislation in such a way as to place minimal value on biodiversity.

Likewise reducing red tape in relation to the NVMF could send the wrong signals. Strengthening the regulatory basis of the Framework is required as well as implementing its ‘avoid’ principle and compliance.

The government’s social marketing of drink driving, water, safe sex etc. are all excellent examples of the mix of regulation, awareness and compliance that lead to change in values and behaviour. Such a program is needed for biodiversity and land health.

Potential regulatory reforms to improve riparian zone management are discussed in the riparian zones section of this submission.

## **Agenda for Change**

Victoria was once at the forefront of conservation legislation. However, legislation concerned with biodiversity conservation and land management is now out of date. For example, modern concepts such as the principles of Ecologically Sustainable Development (ESD) are evident in recent legislation such as the *Pipelines Act 2005* but they are not included in the *Catchment and Land Protection Act 1994*. Incorporation of these principles ensures that legislation is responsive to evolving environmental concerns, such as climate change.

There are a range of ways to reduce the complexity and deficiencies of the current legislative framework.

### **Principles for legislative reform**

We recommend that biodiversity law in Victoria be reformed to include the following:

1. **Environmental legislation will be informed by modern principles and science**, such as:
  - Ecological processes.
  - Ecologically Sustainable Development (ESD).
2. **Accountability mechanisms**, including:
  - Providing public standing to review and challenge administrative decision making, to secure compliance with legislation.
  - The role and responsibility of auditor (e.g. Commissioner for Sustainability)
  - Public reporting of the auditing process, and assessment of program and auditing outcomes.
  - Legislatively prescribed timetables for review of strategies, goals and targets required.

### **Specific legislative changes required**

We recommend the consolidation of key land management and biodiversity conservation laws to achieve better biodiversity outcomes, reduce complexity, overlaps and gaps, clarify roles and responsibilities and lessen the administrative burden of state regulation.

A consolidated Act may include aspects of the Flora and Fauna Guarantee Act 1988, Wildlife Act 1975 Conservation Forests and Lands Act 1987 and the Catchment and Land Protection Act 1994 and other relevant Acts. A suggested working title for consolidated legislation is the *Biodiversity and Ecological Processes Act*.

#### **1. Reform of the Flora and Fauna Guarantee Act 1988 (FFG)**

The EDO described in detail a range of problems with the Act in their submission to the Consultation Paper (pp20).

Legislative reform, either through consolidating legislation, or through reform of the FFG Act itself should:

- Incorporate ESD principles into the Act;

- Create improved and specific mechanisms for enforcement, accountability, and integration with other legislation. These are necessary to decrease delays, and to invest the FFG with certainty and authority;
  - Expand the role of interim conservation orders (ICOs) and Critical Habitat declarations;
  - Expand the protection afforded to all flora and fauna, including invertebrates and non-vascular plants;
  - Ensure that Victorian legislation is consistent with the IUCN Red List Categories and Criteria for classifying species at risk of extinction;
  - Inform the operation of other legislation, and the processes of other government departments and non-governmental bodies;
  - Provide for third parties to bring actions in relation to breaches of the offence provisions; and
  - Express to the public an explicit intent to seriously, directly and effectively manage biodiversity conservation and land management.
2. **Better communication and coordination** is required between government and non-government bodies, including Catchment Management Authorities and local government, particularly in respect of local government responsibilities under the Planning and Environment Act 1987. This will require aligning planning schemes with biodiversity values and building upon existing initiatives such as the Municipal Association of Victoria’s project Integrating Local Land Use Planning and Integrated Catchment Planning.

Legislative reform could work to achieve this by:

- Clearly delineating the role of each relevant agency;
  - Aligning land use planning with Regional Catchment Management Strategies;
  - Aligning national, state and local goals in state, regional and local government planning;
  - Clarifying rights and responsibilities of landholders in natural resources management and biodiversity conservation.
3. **The management of aquatic ecosystems**, through:
- Creation of more appropriate marine and wetlands legislation.
4. An **improved legislative framework** for responding to the threat posed by **invasive species**, through the adoption of the WA permitted list system, whereby permissible species are explicitly listed, and all others are presumed to be invasive.
5. **Stronger regulatory basis for the NVMF**, for example by incorporating it into the new consolidated *Biodiversity and Ecological Processes Act*, strengthening the ‘avoid principle’ and providing significant fines for non-compliance.

### **Key recommendations**

- ❖ Ensure conservation funding commensurate with the extent and scale of past losses and current threats, and sufficient to implement the necessary measures.

- ❖ To give greater certainty in long-term conservation endeavours, guarantee program funding over a number of years rather than subjecting it to annual budgetary negotiations and readjustments.
- ❖ Provide at least a 10-fold increase in government funding for the on-ground work needed to protect, restore, and revegetate wildlife habitat across the state.
- ❖ Undertake a comprehensive review of the existing land and biodiversity legislation with a view to consolidating the existing fragmented legislative framework and also introduce new principles and mechanisms necessary to properly account for and manage biodiversity, ecosystem services and ecological processes in the face of climate change.
- ❖ Ensure that all legislation applying to land and biodiversity in Victoria includes ecologically sustainable development principles.
- ❖ Establish a new overarching legislative framework for developing a state-wide strategy. The framework should include a requirement for public involvement in the development and implementation of the strategy and a legislative requirement for the strategy to include a targets and a program for evaluation and monitoring.
- ❖ Pursue the legislative reviews and reforms identified in the Green Paper in a manner consistent with the recommendations outlined above rather than in a piecemeal or ad hoc fashion.
- ❖ Ensure that organisational and agency roles, functions and responsibilities are clearly specified in legislation.
- ❖ Do not dilute the objectives of contained in the *Flora and Fauna Guarantee Act 1988*.

## **Issue 20. Indigenous communities' involvement in management of biodiversity**

It goes without saying that Victoria's Aboriginal communities have long had a significant interest in Victoria's natural heritage, and that that interest and knowledge has, in more recent times, been largely ignored or given token recognition.

### ***The Green Paper***

Acknowledgement of indigenous connection to Victoria's land and waters over thousands of years is made briefly in the *Biodiversity and land-use in time* section (p14), as well as the Yorta Yorta Co-operative Management Agreement in 2004. There is recognition (p9) that one of the 'services' provided by 'healthy ecosystems' includes 'indigenous cultural heritage' (as well as the more general 'spiritual and cultural values').

It could be argued that under *Changing paradigms* (p27) there should have been more recognition of the growing impact of indigenous cultures and their relationship with land and waters on the non-indigenous community.

There is a welcome recognition of the knowledge, skills and perspectives of indigenous communities and the need for this to inform biodiversity management decisions in the "*Vision and outcomes*" section (p34), and again in the *Guiding principles* (p37). However this is not mentioned under "*Achieving the vision*" (p35) and should have been. And there is no mention of indigenous involvement in Chapter

6, *The agenda for land and biodiversity management*, nor is there mention of indigenous knowledge in 8.1 *Expanding our knowledge base* or 8.2 *Better systems to share knowledge*.

In the section on *Effective Partnerships* a welcome two pages (p77) are devoted to Indigenous communities, the suggested approach, and the Lake Condah case study. There is an acknowledgement that “[indigenous communities] have generally not been adequately involved in Victoria’s broader contemporary natural resource management, with some government agencies failing to take advantage of their expertise and knowledge of the natural environment.” This makes the absence of reference to how to involve indigenous communities in the earlier sections of the Green Paper all the more surprising.

### **Agenda for change**

Victoria’s Aboriginal communities have legitimate, strong and enduring interest in Victoria’s natural heritage, and that that interest and knowledge has, in more recent times, been largely ignored or given token recognition.

We leave it to the indigenous communities to comment on the suggested approaches on page 77 but we endorse the need for the White Paper process to seriously engage with Victoria’s Aboriginal community.

There is a clear obligation here in regard to Native Title holders, but energetic consultation should also take place with Traditional Owners across the State, regardless of their current level of recognition. We suggest that the White Paper should look seriously at Parks Victoria’s program for engaging with local Indigenous communities, not just as a way to conduct its own consultation, but as a model for future dialogue on land management issues.

The White Paper should also look seriously at the considerable opportunities to employ the broader Indigenous community in projects related to biodiversity enhancement. One good option would be to expand Parks Victoria’s successful model for increasing employment and training opportunities for Aboriginal people, and extend it throughout DSE and the CMAs.

It important to note here that Victoria’s Indigenous communities are required to consult regularly over a large range of issues, at considerable cost to them both time-wise and financially, but that effort generally yields few results. Indigenous communities should be appropriately funded during consultation periods, and those consultations should be directed towards achievable ends and utilised.

### **Key recommendations**

- ❖ The White Paper process should respectfully and meaningfully engage with Victoria’s Aboriginal community, and allocate adequate resources to support their involvement.
- ❖ Investigate models for future dialogue on land management issues, and opportunities to train and employ Indigenous people in projects and programs relating to biodiversity conservation and enhancement.

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