



HAMILTON FIELD NATURALIST'S CLUB



PO Box 591
Hamilton
Victoria 3300

To
Project Director, Land and Biodiversity White Paper Team
Department of Sustainability and Environment
PO Box 500
East Melbourne, Victoria, 3002

Hamilton, 27 June 2008

Hamilton Field Naturalist's Club submission to: Land and Biodiversity at a Time of Climate Change Green Paper

Introduction

Thirty per cent of native fauna and 44% of native flora in Victoria are threatened with extinction (CSIRO, Environmental Sustainability issues Analysis of Victoria). The Green Paper is an excellent opportunity to turn around Victoria's biodiversity crisis, but to achieve this we believe much stronger government leadership and at least a ten-fold boost in government funding is needed to restore and protect fauna and flora habitat.

The Green Paper correctly identifies the pressing need for thinking and planning biodiversity conservation issues at a landscape scale and outlines some constructive suggestions. Despite some positive approaches, the Green Paper falls short in many areas. The Green Paper fails to properly address key issues such as in Section 6.8 where questions ask how the government, given its "finite resources", should prioritise efforts to save native species, and whether the community should accept that some species will not survive in a changing climate. This suggests that the Victorian Government has given up without having invested enough effort and funding into ensuring the survival of our precious native species. We must not give up.

The Green Paper has also failed to address key issues in Section 6.10 where questions ask are you willing to accept more prescribed burning and increased use of fire in the landscape? The suggested approaches appear to contradict core values of '*The vision for Victoria's land and biodiversity*' by accepting approaches based on hasty conclusions derived from flora models rather than scientific research into the ecological effects of increased fire regimes on native fauna. A recent paper by MF Clarke of La Trobe University entitled "*Catering for the needs of fauna in fire management: science or just wishful thinking?*" (in *Wildlife Research*, 2008) provides a good analysis of this problem: meeting the needs of plant species need not also mean that the needs of animal species are met. There is a critical dearth of research – especially long-term studies – on the habitat requirements for fauna, yet fire ecologists and land managers either assume that current data is adequate or they ignore impacts of fire on fauna.

At present about 50% of the State is less than 10 years since fire, the ecosystems are still under considerable stress by drought and further critical refuge habitat has been removed by prescribed burns that are of an intensity similar to summer wildfires. This is because of current political pressure to get much larger areas burned in late summer-early autumn to achieve targets rather than sound ecological management. We have seen the effects of this first hand in the Serra Range part of the Grampians in 2007 and 2008. How much habitat loss can be tolerated before there is an irreversible loss of more fauna species?

The Green Paper also suggests legislative changes in Section 7.6. It is unclear if the intent is to strengthen or erode existing legislations. We believe it is important to strengthen and enforce the current legislation – something that DSE seems reluctant to do – to protect the environment.

Main comments and concerns

Chapter 3; Challenges and opportunities

- The Hamilton Field Naturalist's Club disputes that "*We are world leaders in fire management*" as stated in text, particularly not with regard to fauna as there are large knowledge gaps especially the effects of large fires and increased prescribed burning regimes on fauna.
- There is virtually no mention of the significance of wetlands and the impact of drainage schemes in causing the catastrophic decline in wetlands extent and condition in Victoria.
- HFNC disputes "*that biodiversity is in good condition in the large areas of forests and parks*". Our observations are supported by the study *CSIRO Environmental Sustainability Issues Analysis of Victoria* that concludes that 30% of native fauna and 44% of flora are threatened with extinction.
Also, we can predict that the mooted expansion of large-area prescribed burns will have a significant adverse impact on endangered fauna species. We have observed the impact of intense prescribed burns in the Grampians and noted the impact of similar very large, hot burns in the Mallee and Big Desert country. At present there is little or no control of feral animals (deer, goats) and weeds (e.g. pines) in public land, which could have a profound impact in future.

Anomalies – Table numbers in this chapter do not match references in text.

Dr Kevin Love (Deputy Secretary, Department of Sustainability and Environment) acknowledged the submission by HFNC to White Paper, dated April 4, 2008 and wrote, in part:

"I look forward to hearing from you again and hope that you take advantage of this unique opportunity to contribute to the development of policy and program directions that will guide the Government's investment decisions in Victoria's biodiversity and land management for the next 20–50 years".

Our response in the present submission to Dr Love's letter includes a re-statement of a comment that we made in the 2007 submission:

"The State Government should assume greater responsibility for looking after our remaining wild areas. PV should be run primarily for the conservation of all natural values within each park rather than as a manager of tourist assets. This could best be achieved if PV was integrated into the DSE bringing a wider influence of knowledge and expertise into looking after our remaining natural heritage".

Chapter 5; The vision for Victoria's land and biodiversity

The vision framework needs to address the main problem, namely:

HOW DO WE RESPOND TO THE DECLINE OF VICTORIA'S LAND AND AQUATIC ECOSYSTEMS AND THE BIODIVERSITY THAT SUPPORTS THEM?

Chapter 6; The agenda for land and biodiversity management

6.2 Using carbon markets for biodiversity and land health

Additional suggested approach:

To encourage greater investment into biodiversity outcomes, establish a star rating system for carbon plantings, e.g. One star for blue gum plantations, five stars for diverse indigenous plantings. That is, more carbon credits for plantings with multiple biodiversity benefits.

6.3 Improving catchment management

CMAs have a regional catchment strategies focus and are not proactive for strategic projects. Projects need to meet big picture needs.

6.4 Managing water for multiple objectives

There is a serious omission here in not addressing the need to keep water in the local environment. From many viewpoints, it is more valuable to keep water in landscape, not by building new dams but by restoring natural wetlands, rather than draining it away.

Suggested approach:

Government should re-evaluate drainage schemes, restoring large wetlands so water is retained in the regions where it falls. These wetlands function as environmental refuge areas, available to be locally used, and to Hamilton Field Naturalist's Club

recharge groundwater tables rather than being drained to sea. Wetlands are invaluable environmental assets in the region. Provision must be made for a long-term program of restoration of large wetlands, and that inevitably means land purchase and erection of weirs on drained swamps. A good example is that of the 3,000-ha Buckley Swamp in SW Victoria that was drained by a single outlet in 1895, and progressively "improved" from then until 1960 by further cuts in the swamp bed. The smaller, mostly shallow wetlands on farms continue to disappear and that will accelerate with global warming. The only realistic prospect of redressing the further loss of wetlands is to look at fewer but large-scale alternatives, as suggested here. In the long term that is bound to be cheaper and more effective than trying to "save" a host of small wetlands on farms. Over 50% of wetlands in the GHCMA have already been lost and 75% of the Shallow Freshwater Marsh category have been lost to drainage on the Volcanic Plains. Our waterbirds (including Brolga) have been the big losers.

6.5 Managing Aquatic ecosystems

In addition to 'promoting the sustainable use and conservation of wetlands on private land' serious considerations need to be given to restore drained wetlands on both private and public land.

Additional suggested approaches:

- 1) There is an urgent need to restore large wetlands rather than small wetlands which are more expensive to maintain and more susceptible to loss with climate change. The more cost effective long term approach to achieve restoration of large wetlands are strong financial incentives to block drains and for government to buy restore and manage large wetlands.
- 2) There is an urgent need to change planning schemes so a permit is required for earthworks installing drainage lines, to better monitor works affecting wetlands. An alternative may be to use zoning, e.g. *Rural Conservation* zoning controls, to accomplish this.

6.6 Building ecological connectivity

It is imperative to consider using native species adapted to a wide range of climatic variations. Some plants, e.g. Red Gum, Silver Banksia and Sweet Bursaria, have a very wide distribution range.

Suggested approaches:

- 1) There is a need for adequate funding in seed collection industry to obtain local provenance seed with wide genetic diversity, not just collection from a few isolated plants that may be self-fertilising. The CSIRO seed-collecting protocol must be adhered to for all revegetation projects, and provenance also needs to be documented. The seed collection rules are necessary to maintain genetic diversity, prevent inbreeding depression, and maintain high viability and vigour of seedlings. Currently, people are not prepared to pay extra to support good collection practices that will lead to successful outcomes and resilient long-term gains.
- 2) Biolinks should reflect pre 1750 EVC's – e.g. not creating forests where native grasslands were, to prevent inappropriate species movement into new areas that were not previously in their range. An example could be the expansion of the Bush Rat (*Rattus fuscipes*) from southern forests into the Grampians, where it is presently absent and the Heath Mouse (*Pseudomys shortridgei*) occurs.
- 3) Expanding existing remnants by adjacent plantings to increase connections. To accomplish this successfully there must be financial incentives, e.g. rate rebates for remnants on private land. Plantings to build "resilience" is pointless if recent trends of inappropriate prescribed burning and other destructive management practices continue, as this will lead to reduced quality of connections.
- 4) Use of rail reserves for linkages, e.g. Hamilton-Natimuk unused rail reserve that runs north south. Lineal reserves such as this occur throughout Victoria and offer excellent prospects as corridors for birds, at least. The single largest requirement is for fencing to allow regeneration of trees and shrubs. Most carry examples of the original vegetation, although groundcover species are absent or degraded in many areas as a result of past and present management.
- 5) Use of water frontages and creek lines also offer excellent opportunities, particularly as there is often access to some water or moist patches giving fauna extra refuge in a changing climate scenario.
- 6) Habitat 141 should be included in potential biolink zones planning.

6.7 Enhancing Public Land Values

Public- private partnerships need good management plans in place with supervision and accountability.

Suggested approach:

1st dot point – add “but not to the detriment of the environment”.

We object to market-based approach. Why suggest market-based approaches be applied to public land? We do not want to see our public assets exploited: private exploitive activities (including tourism) usually seem to result in a loss of biodiversity or degradation of the landscape.

Housing development and plantations should be prohibited within 500 m of the boundary of forests and conservation reserves. Under the Victorian Planning Provisions a special Planning Zone could be used to prevent development on private land within 500 m of the Crown land (forest or reserve). This would ensure that fire prevention works for asset protection are carried out on private land.

We note the hysterical clamour by some landholders to have buffers up to 500 m wide cleared within National Parks and forest boundaries, to act as barriers to fire entering private lands. That notion is utterly unacceptable. A major reason is that the areas that would be cleared are often the only Ecological Vegetation Class represented in the National Park or forest. A good example is the outwash slopes of the Grampians where heathland vegetation is the habitat for Long-nosed Potoroo, Brown Bandicoot and Heath Mouse, among other fauna species. This land adjoins agricultural property. Destroy that strip of vegetation within the forest and most of their refuge is gone, along with the species.

No equivalent suggestions are made to apply such draconian buffers on agricultural land to act as barriers to fire entering public land.

A better alternative is to insist on landholders installing at least one 3 m firebreak along their side of the boundary, with the option of a further break 20 m away. This was once common practice and occurs in other parts of Australia. Another approach is to improve the early-attack system for fighting fires. Everyone knows that is needed but nothing gets done – the disastrous Grampians fire of January 2006 would never have developed had a proper early attack been made.

6.8 Supporting species and ecosystems

HFNC strongly object to identifying species to let become extinct and the suggestion that it is beyond our means to protect them. Our focus should be to preserve and maintain habitat and that will go a long way to preserving the species.

Serious concerns are also expressed that a review of environmental protection legislation will result in watering down of the FFG Act. We believe that the provisions of this legislation is seldom used by DSE to protect target species and habitats, and that must be changed.

Suggested approaches:

- 1) Land management must focus on habitat structure and look at management practices such as fire and the deleterious effects it may have on fauna. Appropriate scientific approaches must be used.
- 2) To support species and ecosystems we must not be actively undermining them by habitat fragmentation, accelerated by current high intensity prescribed burning practices, etc.
- 3) In south west Victoria the CAR Reserve and JANIS criteria were not met in the West RFA and it all needs to be reviewed. For example, the endangered Plains Grassy Woodlands EVC of Woohlpooer State Forest was excluded from consideration and is still being logged.
- 4) Instead of reviewing FFG and Wildlife Acts “*for inconsistencies and inefficiencies*” let us actually apply it. A review of the legislations must not result in a reduction in protection but rather to strengthen and actually enforce legislation to protect the environment. Perhaps the DSE is not the appropriate department to act on such legislation? Their record of having used the legislation to protect habitat in country Victoria is very poor. What is the problem?
- 5) Each municipality should appoint at least one full-time, permanent, qualified environmental officer to ensure Shires don't contribute to loss of native vegetation, e.g. on roadsides. The lack of an

Environmental Officer has been a major impediment to conservation of flora on road reserves – the Shire staff and elected officials have no experience or interest in the matter and interaction with DSE and CMA is poor. Breaches of regulations concerning firebreaks and wide-area herbicide application have invariably not been followed up by Shires, to the detriment of roadside vegetation.

- 6) Shires must enforce their Planning Schemes. Currently the interchange between DSE, CMA and shires is impeded by a lack of commitment.

6.9 Working towards a net gain in native vegetation

We are pushing extinctions with current prescribed fire regimes; mistakes are not confined to the land clearing of the early 1900s.

We question the validity of the notion of “*net gain*” of native vegetation. What gain has accrued? Are we really talking about reducing losses?

Suggested approaches:

Exemptions for clearing native vegetation also means losses are not being counted. If exemptions were removed, land holder would need to apply for a permit for clearing and losses would be recorded.

Bush Tender Scheme process: land holder applies/is inspected and assessed/puts in tender. Shortcoming of scheme is its short term – only 3-5 yrs (long term tender is only 10 yrs). Biodiversity policy is for 20-50 yrs so Bush Tender is too short term to contribute to “*net gain*”. Will land holder keep vegetation when no longer being paid for it or when property changes hands? Need to ensure permanent retention of vegetation by including arrangement in property title, covenanting, etc.

6.10 Using and managing fire

The Victorian Parliament’s cross-party Environment & Natural Resources Committee has just reported on the fires of 2003 & 2006 and recommend a trebling of prescribed burning, to an annual target of 385,000 ha. Unfortunately, the committee’s report appears to have been written by members who had no expertise in ecology and, consequently, their report is flawed. If their recommendation is applied, without consideration of fire ecology, then it may have 2 serious outcomes:

- A drastic impact on vulnerable fauna species (and perhaps flora, too), in contravention of Victoria’s Biodiversity Strategy of 1997 and the Fauna & Flora Guarantee Act of 1988.
- An extremely expensive annual operation that does not reduce the incidence and extent of catastrophic summer wildfires when conditions are extreme (the burning may only be effective in moderate conditions)

The reason why this may be so was comprehensively reviewed by C Meredith in 1988 (“*Fire in the Victorian Environment – a discussion paper*”), funded by the then Department of Conservation, Forests and Lands. The review was wide-ranging, presenting all the information known to that time, and acknowledged contributions from 45 scientists, including DCF&L. Key conclusions at that time were:

- “*Failure to accept and understand the real level of risk meant that, in these cases [Ash Wednesday and preceding disaster fires], too much management effort was directed to fruitlessly attempting to reduce fire risk to zero and not enough to developing procedures to cope with the inevitable disaster fire*”.
- Fuel reduction burning “*is effective in helping control fires for three years after a burn*”. This is partly because there is increased litter fall after a fire and decay organisms are reduced for several years. “*For fire on less severe days, fuel reduction burning is likely to aid suppression for longer than three years*”.
- “*Due to the initial rapid rate of fuel accumulation, many forests reach high fuel levels in 3-6 years*”
- “*As the plateau phase is usually reached 8-10 years post-fire, the fuel loads at 8 years may not be much different from those at 20 years or more after fire in most drier forests*”.
- “*It has been suggested that some burning practices may increase flammability by promoting a dense shrub layer*”.
- “*All studies found an immediate reduction in soil and litter invertebrates after fire*”- i.e. the decay organisms were affected.
- “*Very frequent burns would lower small mammal diversity further, and affect some of the species restricted to dry forests and heaths*”.

- *“More frequent and complete broad-scale fuel reduction burning will have significant environmental consequences”.*
- *“Patch burning is the technique of burning a carefully planned mosaic of relatively small patches...designed to be effective, not just an unplanned and uncontrolled patchiness...have the environmentally desirable consequences of maximizing diversity of fire ages in an area, restricting the areas affected by any unplanned fires, and reducing the need to burn any one area too frequently”*

We propose that what is needed now is a current review of the research conducted in the 20 years that have elapsed since Meredith’s review. Until that is done, DSE should hold off any broad-scale prescribed burning, Hysteria should not be driving our actions. We need to be sure that effective measures are applied that will not drive our vulnerable fauna to extinction, yet can prevent disastrous summer wildfires. What we do now will have grave consequences in the long term.

We note that DSE has not dealt with inappropriate statements made by others in regard to fire. DSE should have a role in providing correct information. We saw, at the parliamentary enquiry into the fires of 2006 and in many articles subsequently, reference to 2 matters:

- The notion that “fuel” builds up continuously over many decades in a linear fashion – that is simply not true. A plateau is reached within 10-30 years, depending on the vegetation type, where fuel accumulation is matched by fuel decay. Hysterical claims by ill-informed people have ostensibly influenced the committee that recently reported to Parliament. Our observations at the Dunkeld meeting in 2007 suggested that the committee members did not understand basic biology. The Emergency Services Commissioner, Bruce Esplin, has also made the same statement on many occasions, most recently on ABC 774 on Thursday 26 June 2008.
- Bruce Esplin (and some within DSE) also do not appear to understand how a “mosaic” burn should work. Mr Esplin suggested (e.g. on 26 June 2008) that one could burn very large areas and there would be retained a few unburned spots in the wet gullies, and that would serve as refuge for animals. That vision is a complete corruption of the mosaic ideal. A true mosaic burn must leave unburned sections within each EVC unit that exists in the planned burn area. How can any thinking person believe that a Potoroo, Brown Bandicoot or Heath Mouse that must have dense understorey to shelter in, can suddenly survive in a wet gully or dry, stony ridge where they would not normally ever go? Local extinction lies ahead for many species if that is the best we can expect from our “leaders”.

But why does DSE or Parks Victoria not counter such ill-informed statements? Why allow Mr Esplin, and others, to remain in ignorance and thereby mislead the public on matters of fact? There appears to be a lack of accountability within senior levels of DSE/Parks Victoria.

We have not seen any evidence in SW Victoria for adaptation to prescribed burning conduct – instead, all that we (HFNC) have experienced, in trying to get a better outcome for endangered fauna, is an orchestrated and almost hysterical attack from Fire Managers at Horsham and a local activist group, defending the objective of prescribed burning (to reduce fuel loads and so reduce severity of summer wildfire – something that we do not dispute). However, they ignored the whole question of fauna conservation (i.e. how, when and where the burns are conducted). It is simply not good enough.

Suggested approaches:

Fire management:

- must be scientifically based with respect to fauna
- need more pre- and post-fire fauna assessments and predator controls
- need fire ecology plans and age assessments for all parcels of forest and conservation reserves
- need 500 m buffer in private land adjacent to public lands where buildings are excluded
- Introduce the use of less destructive burning techniques such as “candling” to protect significant trees and removing debris from beneath such trees before fire is applied. There is also a need to review the procedures used by the Fire Section of DSE when applying prescribed burning.
- on a local aspect, remove Billywing pine plantation in Grampians which is getting additional protection at expense of surrounding bush. We believe the last pines are due for removal there in about 2015 and we strongly advise that no further pines be planted there. This plantation is a danger

to the values of the National Park, from too-frequent fires in the wet heathland (Glenisla Flats) near the Henty Highway and feral pines infesting the park.

First sentence: Fire may be a natural part of the environment but the amount of fragmentation we now have is not. Circumstances now are very different. There are fewer opportunities for re-colonisation, etc. Need buffer zones on already cleared private land adjacent to public land. In other parts of Australia fire breaks are placed on private land.

Paragraph 1 p.55:

"All members of the community need to play their part in minimizing the risks of severe and damaging fire." Victoria should introduce the use of fuel stoves only/no camp fires in all Parks and Forests for at least the duration of the fire season to reduce fire risk and protect fallen habitat. We strongly advocate such a ban – it applies in most other States, yet Victoria, with perhaps the greatest hazards, is strangely reluctant to apply it. However, we complain about the fires that escape from such campfires! The last damaging fire, started by a campfire, that we have noted in SW Victoria was that at Fulham Streamside Reserve on the Glenelg River, and that swept through the Black Range State Park too, creating much damage in both reserves, particularly from bulldozers that were used to push over scores of large, hollow-bearing trees that are becoming a scarce natural habitat resource.

Paragraph 5 p.55:

Misleading text as this is a blanket statement that applies to flora not fauna.

- Need to look at effect of burning regimes (e.g. on nesting material) for species such as Malleefowl.
- Omission: mosaic burning is not mentioned.
- Omission: assistance is being given to farmers to deal with drought conditions. What assistance are we giving wildlife? Need to reduce adverse affects of current management practices on habitat.
- Suggested approach for dot point 5: *"Introduce"* - not *"Consider"* – *"...tighter assessment processes ..."*
- Suggested approach dot point 6: We agree to *"Integrate fire management into planning processes for landscape rehabilitation"*, but also integrate feral pine and pest (fox) control operations at the same time. The fire team have the tools, ability and opportunity to cull pines following burns.

Suggested approaches:

Prescription burning practices will need to change as a result of climate change, e.g.:

- burning later in the day
- candling
- effectively protect and managing old habitat trees during burns
- more effective strike force for wildfires - rapid response teams, water bombing aircraft, etc.
- guarantee a mosaic, extinguish parts as per wildfire management. Could use 'Phoschek' fire retardant substance, although this has inherent risks.
- multiple burns/staged timing of burns, e.g. preliminary preparation – burn around edges at low risk time (?winter) and burn rest at a later time.
- Use of portable long-length sprinkler systems has been trialled at Wilson Promontory and has the advantage of allowing back-burning from the wetted line, thus enabling unburned sections to be left within the larger burn area. This allows the creation of a true mosaic which, to be effective for fauna, must lie within that particular Ecological Vegetation Unit.

Post script: fire management

There was an interesting interview on Saturday 14 June on Country Breakfast (Radio National, 6-7 am) with Prof. David Lindenmeyer (wildlife ecologist, ANU) about Eastern Bristlebird recovery after hot fires in the Booderee NP near Jervis Bay.

The Eastern Bristlebird is a highly endangered, ground dwelling species which was thought to be very fire sensitive. Grave fears were held for the survival of the Park population after the fires (in 2003). However, investigators found that the Bristlebirds survived the fires, persisting at all unburnt sites and ½ the burnt sites in the Park. Within 1-2 years of the fires, all the burnt sites had been reoccupied.

Prof. Lindenmeyer said the reasons for these unexpected findings were the very patchy nature of the fire and the well-organized fox baiting immediately after the fire to stop the predation of survivors. He said there was an inherent patchiness in lots of wildfires, very important for leaving wildlife refuge.

He also said that ecosystems are not designed to recover from two disturbances and can't deal with a second disturbance such as salvage logging after a fire. He said we should leave systems alone to repair themselves after a wildfire, as our interventions to help recovery can actually significantly impede it.

Another very important factor in the recovery after hot fires is management during the fire. A key thing is the way we do back-burning, which can give a very uniform (i.e. not patchy) result which has enormous negative consequences for biodiversity.

We need to conduct back-burns to leave patchiness, not wipe it out. He also said that, with the expected increase in the number and intensity of fires, we need to be very adaptive in our fire management practices.

6.11 Improving management of pests and weeds

Suggested approaches:

- No adequate communication between DSE, CMA and Shires – the weak link is the Shire. As noted earlier, there is an urgent need for competent, trained Environmental Officers to be appointed by each Shire. Until recently, many Shires did not have a trained staff member appointed solely in this role. The consequence was that nothing got done and infringements were let go.
- Collaboration with plant nurseries to prevent sale of current and future weed species.
- Encourage land holders not to sow weed species (Phalaris, Tall Wheat Grass, etc) adjacent to waterways, roadsides and significant remnant native bush areas.
- Educate and prevent inappropriate non-indigenous native plantings
- Classify goats, deer and brumbies as vermin and implement eradication programs.
- Have a permitted list for introducing new species. If it is not on list then it should not be allowed in until proved to be non-invasive. The opposite situation applies now.
- There may be a correlation between fire frequency and Phytophthora. Needs to be researched now – fire is the single largest agent that will affect our landscapes and we need to be sure about consequences of burning more frequently and possible effects of spring-burning (and increased movement of vehicles during damp periods when spores can be transmitted to new areas) on dieback. Dieback was major problem in the late 1970s in Victoria, and is certainly a major problem in WA now.

Chapter 7; Applying modern tools

The suggested approaches in chapter 7 are of little use if basic needs to retain and protect land and biodiversity values are not met.

7.6 Towards best practice legislation and regulation

It is unclear if the intent to change legislations made in the Green Paper is to strengthen or erode existing legislations. We believe it is important to strengthen and enforce the current legislation – something that DSE seems reluctant to do – to protect the environment

Suggested approach:

Strengthen and enforce existing legislation to protect the environment.

Chapter 8; Meeting our knowledge needs

Strong leadership and true government investment into research that will help understand the complex environmental implication of changing management practises are needed, not just basing decisions purely on modelling assumptions.

Land and biodiversity cannot cope with another wave of species extinction by adopting management approaches such as current and proposed prescribed fire regimes, we must learn from the mistakes of land clearing in the early 1900s.

8.3 Understanding the impact of our actions

Suggested approach:

We strongly recommend adopting precautionary principles to allow proper scientific research to help us understand the ecological impact of our actions on native fauna and flora before accepting management decisions based on hasty conclusions derived from deficient models.