



The Wilderness Society Victoria Submission  
To the Victorian Environmental Assessment Council  
Statewide Assessment of Public Land  
June 2015

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## Introduction

The Wilderness Society is a community-based environmental advocacy organisation supported by over 40,000 members. Established in 1976, we have been at the forefront of Australia's most historic environmental campaigns, including the Franklin River, Fraser Island, Wild Rivers, Marine Parks, Tasmanian forests, numerous World Heritage areas and James Price Point in the Kimberley. The Wilderness Society supports Indigenous people's land and sea rights, and is committed to working with traditional and historical owners before and during campaigns to protect wilderness and nature.

Our organisational purpose is to protect, promote and restore wilderness and natural processes across Australia for the survival and ongoing evolution of life on Earth.

Our organisational vision is to transform Australia into a society that protects, respects and connects with the natural world that sustains us.

We thank the Victorian Environmental Assessment Council (VEAC) for the opportunity to make comment on this State-wide Assessment of Public Land.

The Wilderness Society Victoria recognises, in the statements made within this submission, that the Indigenous peoples of Victoria as the original custodians of country and acknowledge the rights, interests and aspirations of Traditional Owners.

The values of public land to the general community are also many and wide ranging - from the primary purpose of conservation of biodiversity to health, from recreation to the preserving of cultural history, from places where human strength can be tested to places where wild and intricate beauty lifts the spirit beyond the day to day and, more and more, research is finding the place of nature in bringing about a sense of well-being to those who make contact. Well-managed and resourced public land is the core to a good conservation system.

## Term - of – Reference - One: land use categories

### Indigenous ownership and management of country

The Wilderness Society Victoria:

- recognises that Traditional Owners have a legitimate right to claim title over land and sea
- is supportive of joint-management and co-management arrangements
- acknowledges the ongoing interest of Traditional Owners in all aspects of land management and decision making in relation to their traditional lands, regardless of current land tenure. Accordingly, we support Aboriginal involvement in decision making, including where Native Title has been extinguished, as Traditional Owners have ongoing rights, interests and special knowledge of land and management practices across the landscape
- advocates for an ongoing process of consultation and negotiation between governments and Traditional Owners over the identification, declaration and management of land for nature conservation purposes. Such a consultation process should involve dialogue between Traditional Owners and the State to promote a clearer understanding of each others perspectives on land management issues and to develop cooperative agreements
- supports a comprehensive framework for indigenous rights and interests in protected areas covering new dedications of protected areas, previous dedications, and areas of previous extinguishment with a significant cultural interest.

In the context of this investigation, VEAC is encouraged to consider developments since previous investigations in regards to Indigenous rights and interests, ownership and management of land as they relate to tenure categories and the public land use regime, including:

- Traditional Owner Settlement Act 2010, and Aboriginal title
- Aboriginal Heritage Act 2006.

We also encourage VEAC to consider interstate and international developments in this area, and can provide additional detail about such developments if that is of use.

### Nature conservation

In any recommendation made by VEAC regarding simplification of public land categories, including for improving public understanding and /or more efficient management, the key fact that public land is core to Victoria's nature conservation must be upheld.

This means that:

- this inquiry must not lower the conservation status of any public land,
- IUCN categories must remain,
- if there are amalgamations of categories the amalgamated category must be the equivalent of the highest conservation category in that set of amalgamations,
- public land in IUCN categories I-V must not be subject to agriculture, mining, forestry, firewood and recreational activities or other uses that cause the destruction of or damage to native fauna, flora and general nature conservation, and
- public land in the IUCN categories I-V must be managed under the schedule National Parks Act.

In particular, the category of Special Protection Zone (SPZ) is inadequate to protect conservation values. While an SPZ designation recognises the presence of high-conservation values, the fact that SPZs can so readily be removed and the land swapped back into other tenures, rendering high-conservation values vulnerable to destruction by a range of threatening processes, means that the status of public land in SPZs is not secure and that this reservation status is inadequate. Any move to change or consolidate existing land categories should closely consider the purpose, function and effectiveness of SPZs.

Given the high percentage of cleared land in the state, and the continued decline in biodiversity noted in many reports and research, the task before us is to determine how to improve ecological viability, not merely sustain or concede the status quo of declining ecosystem health.

## **Term-of-Reference-Two: appropriateness of current reservation status on public land**

For the Wilderness Society, the priorities for increasing the reserve status in Victoria are:

1. the forests of eastern Victoria
2. western Victoria.

It is the Wilderness Society's view that there is substantial scope for improving the reservation status of public land in both these regions. Doing so will prevent both species extinction and ecosystem collapse, and protect significant conservation values that deliver a range of benefits to Victorian society.

### *Eastern Victoria's forests*

Eastern Victoria's forests are well recognised for supporting an extraordinary range of important values including water, carbon, biodiversity, cultural, scientific and economic.

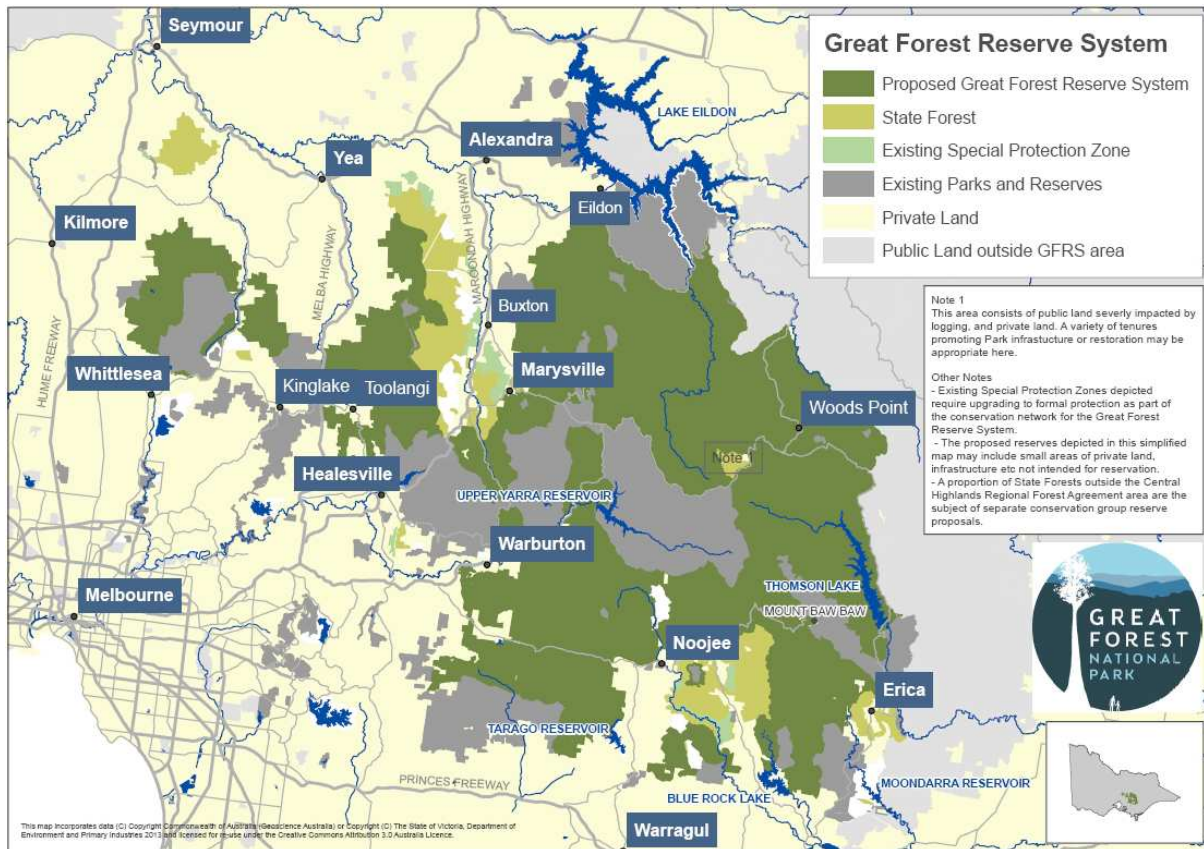
The Wilderness Society Victoria, along with other conservation groups, have long been advocating for the protection of eastern Victoria's forests. The need for increased protection, particularly against the threat of industrial logging operations, is strongly advocated.

Important values requiring conservation across these forests include:

- old growth and older age class forests,
- Rainforest sites of National, State or Regional Significance,
- other EVCs, including the Montane Ash ecosystem,
- rare and endangered species known to be impacted by logging such as the Leadbeater's Possum, Long-footed Potoroo, Smoky Mouse, Spot-tailed Quoll, Baw Baw Frog, Spotted Tree Frog, Giant Burrowing Frog, Sooty Owl, Masked Owl, Powerful Owl, Barred Galaxias and Orbost Spiny Crayfish,
- urban and rural water supply catchments,
- forest carbon stocks,
- areas with important tourism, nature-based recreation values, or importance to local communities for conservation, visual amenity or recreation purposes.

We support the reserve proposal for significantly expanded parks and reserves in the Central Highlands Regional Forest Agreement (RFA) region (see map below), and urge VEAC to carefully consider the multiple benefits of this proposal when assessing the current reservation status of public land in this region.

The Wilderness Society Victoria and other conservation groups are additionally proposing a significant expansion of parks and reserves on public land in the East Gippsland, Central Gippsland and North East RFA regions, however these reserve maps are still in development. Additional information about these proposals can be provided upon request.



For more information about the Great Forest National Park proposal please see <http://wilderness.org.au/articles/great-forest-national-park> and [www.greatforestnationalpark.com.au](http://www.greatforestnationalpark.com.au).

Significant changes in land use have occurred across eastern Victoria's forests since previous VEAC investigations.

There has been a significant reduction in the size of the sawlog industry, and in log volumes: in the ten years to 2012, log volumes from native forests reduced by two-thirds from more than 10 million cubic metres per annum to 3.8 million cubic metres per annum.

The export woodchip facility at Eden, South East Fibre Exports, has dramatically reduced the volume of residual logs taken from Victoria, and may cease operating in the near future.

The impacts of successive wildfire events across eastern Victoria (including 2003, 2006-7, 2009 and 2013-14) have been such that the current reservation status of public land is now far from adequate to protect a range of conservation, cultural and social values. As such, any review of the adequacy of reservation status must take the impacts of successive wildfires into account.

These are but some of the land use changes that have occurred since previous VEAC investigations. It could be that there are a range of tenures that are now out-of-date. As such the Wilderness Society's welcomes VEAC's assessment of the role and purpose of public land categories.

### Western Victoria

Here it is relevant to state the Wilderness Society's strong support for Recommendation 12 of *the Remnant Native Vegetation Investigation* (RNVI) Final Report 2011. We recommend this VEAC Investigation revisit the regional clusters prioritised in this recommendation - namely those in western Victoria, the Wimmera (south) Dundas Tablelands and Glenelg Plain, and the Central Victorian Uplands.

While on the one hand there is in these regions a history of high level clearing and fragmentation there is also, in each of the regions, substantial adjacent native vegetation, often of high quality for conservation or, given time and rehabilitation could be of high conservation value that, in a more appropriate conservation system, would be protected under IUCN categories I-V.

Even though the review of the Box-Ironbark public land has been comparatively recent there are some remaining **Box Ironbark Forests** ( e.g. Wellsford) that need to be added to National Parks management as do forests with important conservation values (e.g. Wombat Forest) in the **Central Victorian Uplands** bioregion.

In addition, in giving secure appropriate conservation status to these public land areas the rehabilitation on adjacent private land would receive valuable enhancement as is evident in the practical and far reaching recommendations and case studies in VEAC (2010/2011) and where there is considerable overlap with this current investigation.

#### **Cessation of Logging - where land use has changed during the last 25 years:**

The cessation of logging in many western and central Victorian Forests is an example of a clear change in land use since previous public land investigations and recommendations. Slow growing and slow in regeneration, subject to increasingly low rainfall as climate change brings change and frequently surrounded by intensification of agriculture it is timely that VEAC relook at the 'state forest' category in these regions and also in others throughout Victoria. The Wilderness Society, for example, suggests the importance of the remaining forests in far western Victoria and in Central Victoria is now predominantly for nature conservation. There are very strong arguments for this VEAC Investigation to examine this public land, currently 'state forest', with a view to upgrading it to IUCN status to be managed under the National Parks Act.

An example would be the land between the Cobboboonee National Park, north towards the Little Desert, and currently designated "state forest" in far western Victoria, which should be placed under the National Parks Act. These public lands include both former hardwood forests and former uncommitted lands. Also in this context and in the interest of the consolidation of the unprotected public lands adjacent to the **Grampians National Park** we recommend review with a view to greater consolidation of the National Park as a whole.

For more detailed discussion on western Victorian reservation status, please see Appendix 1

### **Term-of-Reference-Three: types of values on public land**

#### **Cultural values**

There is a strong need to recognise and consider Aboriginal cultural values in all tenures, as well as in the land use regime.

Other cultural values should also be considered.

#### **Natural values**

In making any recommendations and decisions relating to public land status since past investigations the first task for VEAC in this investigation is to examine past recommendations. Their relevance needs to be reviewed in the light of some overarching factors and trends that should be taken into account. In particular, those that have emerged or deepened in the last 25 years such as

- climate change
- the unprecedented biodiversity consequences of a 40 year woodchip driven forest industry
- cessation of logging in some state forests
- the change from uncommitted land category to state forest
- increase in spread of feral animals into public land
- the intensification of agriculture
- development of a large plantation wood crop industry
- the findings of long-term studies of particular species for example the Leadbeater's Possum and Red-Tailed Black Cockatoo
- the growth of reconnecting and rehabilitation land actions such as Habitat 141
- conservation consequences of the implementation of the 5% burning (Royal Commission)
- water: worldwide loss of wetlands and mining threats to aquifers.

#### **Climate Change and identification and protection of climate change refugia**

Among the factors that the Wilderness Society suggests for inclusion in any investigation of the appropriateness of current system of public land use status is the identification and protection of climate change refugia on public land that might provide habitat for species displaced as the climate changes and to make sure that these refugia are placed within a highest IUCN category of protection. While specific changes to local climate, and subsequent species responses are difficult to predict, one approach to securing landscape resilience is to identify and protect areas that provide refugia in times of environmental stress, such as during past ice ages and in periods of drought and intense heat.

Studies undertaken by scientists at the James Cook University highlight the need for refugia to be in place as far as they can be identified: 'Here in Australia and abroad we've discovered that intact forests that offer a variety of complex structures can reduce the severity of extreme climate events. These structures are like small air-conditioning units in the rainforest that smaller species can use. Thus, intact and protected rainforests will be critical for species adaptation and safeguarding biodiversity as the Earth warms'. In Victoria we argue that one example would be the forests of Far East Gippsland, (cf appendix 3). These forest ecosystems, including all areas of the various rainforest types found there, should be a priority for a geographical increase and consolidation of protected areas of the high IUCN category if we are to seriously look at the possible roles of long term climate change refugia.

Likewise, in the far west of the state the north-south line of extant native vegetation near the South Australian border needs protection status raised in the face of climate change. For a west –east biodiversity link the parts of bioregions remaining unprotected in the Goldfields and Central Uplands should have a National Parks Act status.

## **Looking long term**

Some of the areas of land conserved in the past may well prove inadequate on their own to protect biodiversity in the face of a rapidly changing climate. Studies that have been done since past Land Conservation Council Reports were published indicate that larger areas of remnant vegetation than previously thought are needed for fauna survival, just one example being '*How Much Habitat Is Enough?*' (Radford J, Bennett A, MacRaild L, 2004).

Therefore, in making recommendations on conservation in Victoria's public land, including possible refugia it will be necessary for VEAC to take into consideration that the Comprehensive Adequate Reserve System, Regional Forest Agreements and Janis Criteria, while a start, are very likely to be inadequate bases for long term, successful conservation in a fragmented landscape in this era of climate change. This is not to downplay the 'significant protected area estate', noted in the terms-of-reference document for this Investigation and which rightly point out the good in the protection system. It is, nevertheless a fact that the conservation system 'remains fragmented and incomplete', particularly in the face of new threats. Filling in gaps that have been identified in previous investigations (e.g. Remnant Native Vegetation Investigation Final Report 2011(RNVI)) is one way of helping to bring more strength to the conservation system as a whole.

In addition, scientific research reminds us of the need to make sure, in the present and in the long term, that common species remain common in the long term - for more information see Appendix 2. .

## **Movement of species across the landscape**

There is need for a conservation system that allows movement of species across the landscape in response to the changing conditions of climate change. An example is the substantial as yet unprotected remnants of the bioregions from the Little Desert National Park, south through the south west Wimmera bioregion, through the Glenelg Plain to the Lower Glenelg National Park make up the food sources and migratory path of the nationally endangered south eastern Red-Tailed Black Cockatoo which the Wilderness Society has detailed in previous submissions. Suffice to say here that the highest value of the native vegetation of these bioregions is now conservation of such species and with it many others. A lifting to IUCN National Parks protection of these lands would make a major contribution to Victoria's protected area estate and we urge VEAC to make recommendations to this effect- referred to in the Final Report RNVI 2011 p29 as 'opportunities to enhance the protected area system'.



## Conclusion

In conclusion, the Wilderness Society welcomes a review of the current system of public land categories, but strongly cautions against the weakening of any protections currently offered by these categories.

We suggest that the current reservation status of public land, particularly in the forests of eastern Victoria, and in western Victoria, has scope for improvement, and recommend the Great Forest National Park proposal as being of enormous benefit to improving the reservation status of public land in one region of the state.

An inventory of the types of values of public land ought to be accompanied by a thorough analysis of the relevance of land use changes since values were previously considered.

## References:

Australian Terrestrial Biodiversity Assessment 2002 National Land and Water Resources Audit

Australian Wildlife Conservancy *Autumn* 2012

S. Berry, S. Mackey, B and Brown, T (2007) *Potential applications of remotely sensed vegetation greenness to habitat analysis and the conservation of dispersive fauna*

Frood, D. (1982) A Survey of *E. baxteri* Communities in South-Western Victoria Land Conservation Council

Gibbons, P. Lindenmayer, D. (2002) Tree Hollows and Wildlife Conservation in Victoria CSIRO

Land Conservation Council *South Western Area, District 1 - Review* September 1981

Land Conservation Council *Proposed Recommendations South-Western Review Area District 1 – Review* October 1982

Land Conservation Council *Proposed Recommendations District 2 –* September 1981

Lindenmayer, D.B. Wood, J.T. McBurney, L. MacGregor, C. Youngentob, K. Banks S.C. *How to make a common species rare: A case against conservation complacency* 2011 Fenner School of Environment and Society, The Australian National University, Canberra, ACT 0200, Australia

Maron, M School of Geography, Planning and Architecture, University of Queensland, Brisbane *Potential impact of paddock Buloke tree removal on the South-eastern Red-tailed Black-Cockatoo*. Prepared for Iluka Resources Limited October 6, 2008

Parks Victoria, Gunditj Mirring Traditional Owners Aboriginal Corporation and Winda Mara Aboriginal Corporation *Ngootyoong Gunditj Ngootyoong Mara South West Draft Management Plan* August 2013

Parks Victoria, *Healthy Parks Healthy People –the Health Benefits of Contact with Nature in a Park Context* 2002

Radford J, Bennett A, MacRaid L, *How Much Habitat Is Enough?* 2004.

The Wilderness Society *Submission Ngootyoong Gunditj Ngootyoong Mara South West Draft Management Plan* August 2013

The Wilderness Society Victoria and Victoria National Parks Association *Submission to the Victorian Environmental Assessment Council Remnant Native Vegetation Investigation* May 2009

The Wilderness Society Victoria *Submission Ngootyoong Gunditj Ngootyoong Mara South West Draft Management Plan* August 2013

VEAC *Remnant Native Vegetation Investigation Discussion Paper* June 2010

VEAC *Remnant Native Vegetation Investigation Final Report* March 2011

Williams S, and Scheffers B, *As climate changes, animals move fast to escape the heat* media The Conversation October 2013 based on work out of James Cook University

## Appendix 1 - South West Victoria - additional conservation reserve requirements

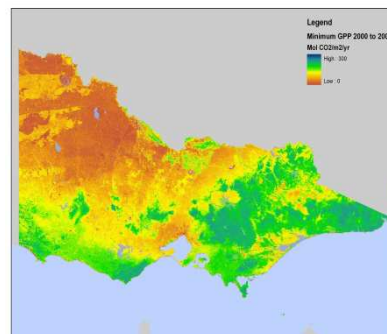
### Former hardwood production Forests in the South West Victoria

The state forests in question are those listed in previous Investigations for hardwood production in the southern section of the Far South West. Since the last study of this area in the 1980's the Cobboboonee Forest has changed to National Park and Forest Park. To the east, north and north east of the Cobboboonee current forests are no longer needed for the purpose of hardwood logging, (cf LCC 1982 p 21-22) but studies in the last twenty years have revealed they are absolutely essential for biodiversity in the region particularly fauna many of which reach their western most ranges of distribution. A change here (and in other parts of Victoria) to conservation status would reflect appropriately this situation and 'remove contemporary administrative arrangements which reflect an historical legacy from the native forest logging era rather than an ecological based conservation framework that is needed for the future' (Australian Terrestrial Biodiversity Assessment 2002 National Land and Water Resources Audit p188).

### Former uncommitted lands

Immediately north of the former hardwood production forests, from Hotspur to Dergholm State Park, the current state forests were mostly uncommitted lands until they were designated state forests cc 1994. Much of the public land has already been identified with high conservation values, namely Special Protection Zone (SPZ) and Special Management Zone (SMZ). This is the case not only in western Victoria but in many of the public lands throughout the state. Because of the high values SPZ and SMZ areas should be place in secure IUCN categories and managed under the National Parks Act.

It would now be more appropriate for forests that form a western 'sanctuary edge' to the highly cleared Dundas Tablelands and the Victorian Volcanic Plain to be added into the conservation system and managed in an IUCN category 1-V appropriate for nature conservation. Albeit, in a slightly different context, there is more detail on these western Victorian forest and gum woodland status in our previous submissions to VEAC Investigations and we can make them available if required.

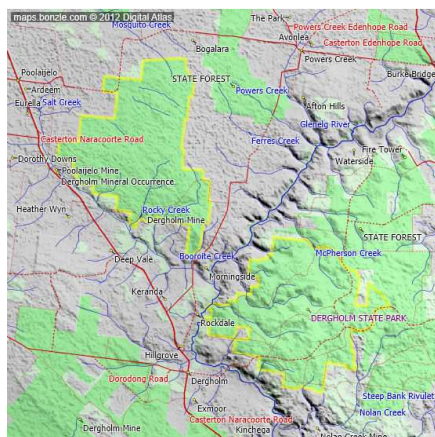


Mean minimum Gross Primary Productivity (GPP) for Victoria 2000-2005. Analysis of high resolution GPP maps as a time series can assist in identification of those remnants that may provide critical refugia in times of stress and have characteristics poorly represented within the formal reserve system. Map by courtesy of S. Berry, Australian National University. For data, sources and methods see Berry *et al* (2007). See reference below for further detail

The map above also demonstrates how the highly cleared, relatively fertile regions of the Dundas Tablelands and the Victorian Volcanic Plain, where very little remnant vegetation remains, are bordered on the west by largely extant native ecosystems on the largely sandy soils. These include the Glenelg Plain highlighted in Rec 12 of VEAC (2011). With the history of significant decline in the biodiversity of Victoria this north-south 'corridor' is now of ever increasing value to conservation and worthy of more appropriate conservation category. Although unable to replicate the richer soils of the crop and pastoral lands there are, nevertheless, particularly on the edges of the public land blocks, remnants of the richer ecosystems that are invaluable for conservation and survival of species. Scientific data in the last 25 years has confirmed earlier findings of the importance of these small remnants on the edges of larger blocks of public land. We note also depicted in this map the significant conservation importance of the bioregions east of Melbourne.

## Dergholm State Park

A very clear example of status needing revisiting is the eastern (Youpayang) block of the Dergholm State Park where a consolidation of the park by the addition of the rest of the block, currently categorized 'SPZ, SMZ and state forest' would both simplify management of the block as a whole and bring into appropriate conservation high conservation and endangered areas, such as the gum woodlands and wetlands. 'The Dergholm State Park, while making a major contribution to conservation in the south west landscape, is incomplete, and could make a far more sustainable and secure contribution to biodiversity if its relative intactness and ecological connections were recognized'. (Refer to The Wilderness Society and Victoria National Parks Association Submission May 2009).



Map of Dergholm State Park

Note: The park area in the Youpayang (eastern Block on the right), is smaller than the LCC recommendation in the South –Western area District1-- Review LCC October 1982. Refer to map in the Review. At that time the land outside the park area was designated "uncommitted land", later changed to State Forest, albeit mostly SPZ and SMZ, and it would now seem appropriate to consolidate the whole of the block under high IUCN National Park. It would be feasible, considering the multiple values including water, to add to the Dergholm State Park the Roseneath- Tooloy Mundi area much of which, together with the western Bogalara block of the Dergholm State Park is semi wilderness and semi remote.

## Habitat 141 and the growth of reconnecting and rehabilitation actions such as Habitat 141

The bioregions just discussed now form the north –south backbone of the linking the land initiative of Habitat 141. This development aiming to link desert to the sea and others like it throughout the state would not have been on the radar 25 years ago. The actual linking up of land and land rehabilitation of Habitat 141 landscape are more effective with secure conservation protection on public lands. In this context it is also important to keep as public land status are the **roadside/unmade road reserves** throughout Victoria which often contain native vegetation and act as fauna corridor links.

## Plantation estate – alternatives

The huge plantation estate in Victoria has developed markedly in the last 25 years and it is now a major industry and employer. This means it is time for a re-examination of 'state forest categories no longer appropriate in various parts of Victoria including in the Central and Far South West regions. We recommend it is time suitable arrangements were made to cater, from this wood crop source, not only for exports but domestic paper, timber and firewood. Firewood cutting and minor produce still taking place in threatened gum woodlands and which continue to cause ongoing incremental damage to these threatened ecosystems, including the habitat of birds and animals needs to cease. The Western Regional Forest Agreement *Biodiversity Assessment 2000* (p85) found the "direct impacts of firewood collection are similar to those for timber harvesting".

## Water and worldwide loss of wetlands

In the light of the changes and trends noted earlier in this submission it is important that previous recommendations made in reference to wetlands and aquifers should be revisited by this VEAC investigation. In our time water has become a critical issue. Surface water – streams, wetlands and aquifers – on public land need to be in IUCN category protection.

- For example, The Wilderness Society strongly urges this VEAC Investigation to revisit the special features notes under the heading uncommitted land p64-65 LCC Recommendations in the South –Western area District1-- Review LCC October 1982 with a view to the upgrading to IUCN/parks Act conservation levels all of the public lands in the north-south corridor in the vicinity of Weecurra, through Drajurk, Roseneath and north. The 1982 recommendation notes are even more relevant today than when written with such foresight (cf see above climate change, loss of wetlands and in addition and mining threats to aquifers) hence we quote these notes, page 65, in full:

- 1. Weecurra Land in the eastern portion of the Weecurra area contains an interconnected network of perched swamps and wet heath that should be protected. The fauna of this area is also significant, as it includes the swamp antechinus, which reaches the northern limits of its distribution in this area, and the heath rat, a species that has restricted distribution in western Victoria.
- 2. Roseneath – Drajurk A chain of heavily vegetated fresh-water swamps runs along the base of the Kanawinka escarpment through these blocks. These swamps provide habitat for many species of water birds and are also important recharge areas for groundwater supplies.
- 3. Aquifers Shallow unconfined aquifers underlie much of the uncommitted land. Management of the uncommitted lands should aim at safeguarding the quality and quantity of the groundwater, particularly the intake areas for the aquifers used to supply groundwater to Casterton and Merino....”

- In addition, we request this VEAC Investigation put in place the important **designated water protection area** recommendation (see D2 blue shading shown on the LCC Map of Proposed Recommendations South western area 1 Review) west of Merino and south of Casterton that is shown on current maps as “other”.

**Douglas Lakes ...World Heritage:** As the scientific studies have already been done we recommend that the Natimuk-Douglas line of lakes be recommended by this VEAC Investigation for World Heritage status. In addition, stronger protection for wetlands and better action plans for Ramsar wetlands be also recommended by this VEAC Investigation.

Further, it may be worth exploring the option of fencing off some areas in Victoria where feral predators are excluded and breeding of threatened species can take place. Indigenous communities and Australian Wildlife Conservancy methods being used in the Kimberley region are of interest in this regard (Australian Wildlife Conservancy Autumn 2012).

## **Appendix 2 - how to make a common species rare**

A traditional focus in conservation biology has been on rare species as they are often those most at risk of decline or extinction. However, we argue in this paper that some kinds of currently common species also can be susceptible to decline. Those at particular risk are species that are specialized on widespread environmental conditions. Such specialization may make such species vulnerable to a range of drivers of environmental change, placing them at risk of significant decline or even local extinction. We illustrate this with a case study of the arboreal marsupial the Greater Glider (*Petauroides volans*) in south-eastern Australia. Lindenmayer, D.B. Wood, J.T. McBurney, L. MacGregor, C. Youngentob, K. Banks S.C. *How to make a common species rare: A case against conservation complacency* 2011 Fenner School of Environment and Society, The Australian National University, Canberra, ACT 0200, Australia

### **Appendix 3 - Forests and Water**

#### **The 4th International Conference on Forests and Water in a Changing Environment, Kelowna, BC, Canada, July 6-9, 2015**

Forests play a vital role in sustaining water resources and aquatic ecosystems. Forest disturbance, both natural (e.g., wildfire, insects, disease, windstorms, drought) and human (e.g., timber harvesting, land conversion) caused, can have a profound effect on hydrologic, geomorphic and ecologic processes. With climate change, natural disturbances are becoming more frequent and catastrophic. This, together with growing human disturbance, will undoubtedly affect water resources and consequently have significant implications for land managers and policy makers. Our understanding of hydrologic and ecologic response to accelerated environmental and land use change is key to the development of adaptive and mitigating strategies ensuring the continued security of water supplies and ecological values. (source Abstract)