



Cardinia Planning Scheme

Planning Panels Victoria

Pakenham East Precinct Structure Plan

Planning Amendment C234

Cardinia Shire Council

Expert Witness Report

Lincoln Kern, Ecological Consultant

28 May 2018

Qualifications and Experience of Lincoln Kern

I am a trained ecologist with a Bachelor's Degree in Biology and Environmental Studies (completed in 1986 with field studies in Pacific Northwest USA, Southwest USA, India and Central America) from Antioch College in Yellow Springs, Ohio, USA, and a Graduate Diploma in Environmental Management (1998) from Deakin University, Victoria. In addition, I have been involved in environmental planning, ecological restoration and bushfire risk management for 27 years in Victoria through positions with the National Trust of Australia (Victoria) (1991–93), Greening Australia Victoria (1992 including organising a series of field days on reconciling fire risk and native vegetation management), as a supervisor for labour market programs (part-time 1993–94) and through Practical Ecology P/L, formed in 1993. I also worked in 1998 as Environmental Planner for Wellington Shire Council in Gippsland where I assessed many native vegetation clearing applications, developed the Shire's roadside vegetation management plan and participated in developing the municipal fire plan.

As owner and managing director of Practical Ecology P/L I manage and support the implementation of extensive contract works, ecological consulting and bushfire risk management projects. The work has included designing work programs and managing crews implementing ecological restoration works such as weed control projects in remnant vegetation, terrestrial and wetland revegetation projects. I have also written many management plans for bushland reserves across metropolitan Melbourne and dozens of flora and fauna assessments and land management plans for bush blocks in municipalities across Victoria. In addition, I have produced or coordinated many dozens of ecological and bushfire reports on a wide range of projects, from infrastructure projects to urban and rural subdivisions to houses on rural bush blocks. I have also coordinated the investigation of several incidents of illegal clearing for Councils and DSE.

As manager of Practical Ecology I have designed and implemented hundreds of restoration projects, flora and fauna surveys and planning assessments across Melbourne and Victoria. I have also developed particular experience in developing property management plans for bushland properties that reconcile development, bushfire risk and native vegetation protection through negotiating with many land owners over several years.

My experience with native vegetation offsets began before they were strictly required under Clause 52.17 and the Native Vegetation framework in 2003 as well as prior to that time when some Councils and authorities implemented mitigation work individually. I have helped search for and established many offsets and Practical Ecology is an accredited Site Assessor recognised by DELWP.

In summary, my expertise is in reconciling planning law and objectives and the assessment and management of native vegetation. Over time I have taken extensive knowledge of vegetation, ecology and bushfire and combined it with knowledge and experience of the planning system gained through training and experience. My detailed CV is attached at the end of the statement.

Instructions to Lincoln Kern

I was instructed to:

- Consider and investigate the availability of native vegetation offsets required under the Pakenham East Native Vegetation Precinct Plan within the Shire of Cardinia; and
- Prepare an Expert Witness Statement in accordance with the *Guide to Expert Evidence* provided by Planning Panels Victoria.

Documents and other materials considered

I also reviewed relevant documentation specifically relating to the proposed development as listed below.

Documents in relation to the planning amendment, which comprise:

- PSP 1210 Pakenham East Precinct Structure Plan; and
- PSP 1210 Pakenham East Native Vegetation Precinct Plan

Other references used include the following:

DEPI (January 2014). *Permitted clearing of Native Vegetation: Biodiversity assessment handbook*. Department of Environment and Primary Industry, East Melbourne.

DELWP (2017). *Guidelines for the removal, destruction or lopping of native vegetation*. Department of Environment, Land, Water and Planning, East Melbourne.

Statement of Expert Evidence

1. APPOINTMENT AND INTRODUCTION

- 1.1 I was engaged in May 2018 by Cardinia Shire Council to consider, investigate and document the availability of the native vegetation offsets required to satisfy the proposed native vegetation removal for the Pakenham East Precinct being considered as part of Planning Amendment C234.
- 1.2 I proposed the following approach to Cardinia Shire Council to consider the availability of offsets.

The potential availability of required offsets would be relatively straightforward to determine. There are approximately 3 General Habitat Units and almost 2 Species-specific Habitat Units for Tufted Club-Sedge required. The General units are always easy but the species-specific units could prove much more difficult.

Essentially, to consider the availability of suitable offsets in the Shire we would review and filter various corporate map layers from DELWP in the ArcGIS program and manually to some degree. The various layers and filtering processes would include the following:

- *The habitat mapping for Tufted Club-Sedge would be used to determine where this species-specific offset may occur. Although it is not strictly true as suitable alternative habitat that isn't mapped in the layer can be nominated the habitat mapping layer for the species is the first and most definitive source for this offset.*
- *The presence of native vegetation is essential because creating offsets is predominantly based on protecting and improving current habitat and there are at least two mapping layers to consider in this filter, tree cover and Extant EVCs 2005. Revegetation in cleared areas could be used to create offset credits but it would play a very minor role and would only be considered on larger properties.*
- *The size of the properties is the other critical factor as there is little room for retaining native vegetation and creating offsets after building dwellings (with infrastructure, defensible space etc) on small blocks. The cost of establishing offsets can also easily outpace the value of the created offset on small blocks as well. 8 ha blocks are the smallest blocks we would consider although even this size is not likely to offer opportunities for offsets in many cases as 20 or even 40 ha plus is the range where offsets are more definitively possible. The different size blocks may be used to offer nuance in the availability mapping; smaller blocks may be mapped as less likely with larger blocks mapped as more likely sources.*

After filtering and reviewing the various map layers we would produce two maps:

- 1) *Potential sites for General Habitat Units*
- 2) *Potential sites for Tufted Club-sedge Units*

- 1.3 The general approach detailed above was generally followed although it was modified slightly in response to the available data in response to the issues that arose as the process of identifying where possible offsets were present was implemented.
- 1.4 The offset search was completed assuming that the required native vegetation offsets credits were the type of credits required under the 2013 *Biodiversity Assessment Guidelines* because the NVPP prepared by Ecological and Heritage Partners was done under those planning provisions. Having said that the fourth map attached below compares the different modelling for Tufted Club-sedge between the earlier 2013 version of the habitat mapping version the much more extensive habitat mapping of the species in the new data published when Clause 52.17 was changed in December 2017 to illustrate that the modelled may be more extensive in the new system.

2. METHODOLOGY OF OFFSET SEARCH

- 2.1 I delegated to the Practical Ecology GIS Coordinator, Karen McGregor, the task of accessing and filtering relevant data and then presenting it on maps, as attached below. The detailed methodology used to compile the maps included the following points.
- 2.2 Parcels within the Cardinia Shire municipality were selected if they were greater than 8 ha (excluding the very large parcels of Bunyip State Park but other parcels of public land could be in the identified parcels). These were then filtered to parcels which contained greater than 5 ha of modelled native vegetation (using the GIS layer NVR2017_Extent).
- 2.3 Parcels which were greater than 8 ha were also selected based on containing any modelled habitat for Tufted Club-sedge (using the 2013 habitat model for the species: vic-hdnt-v4-p501789_2013sep27_thm_bio_75m_vg94).
- 2.4 The maps show parcels greater than 8 ha which contain greater than 5 ha of modelled native vegetation only, modelled habitat for Tufted Club-sedge only and parcels which contain both modelled native vegetation habitat for the species-specific offset.
- 2.5 Another map was produced comparing the 2017 modelled habitat for Tufted Club-sedge (NVR2017_HIM501789_vg94) with the 2013 habitat model. Note that the 2017 extent may be much smaller (when using Ensym) but it was unclear what the threshold for habitat presence is in the GIS data layer provided to Practical Ecology by DELWP.

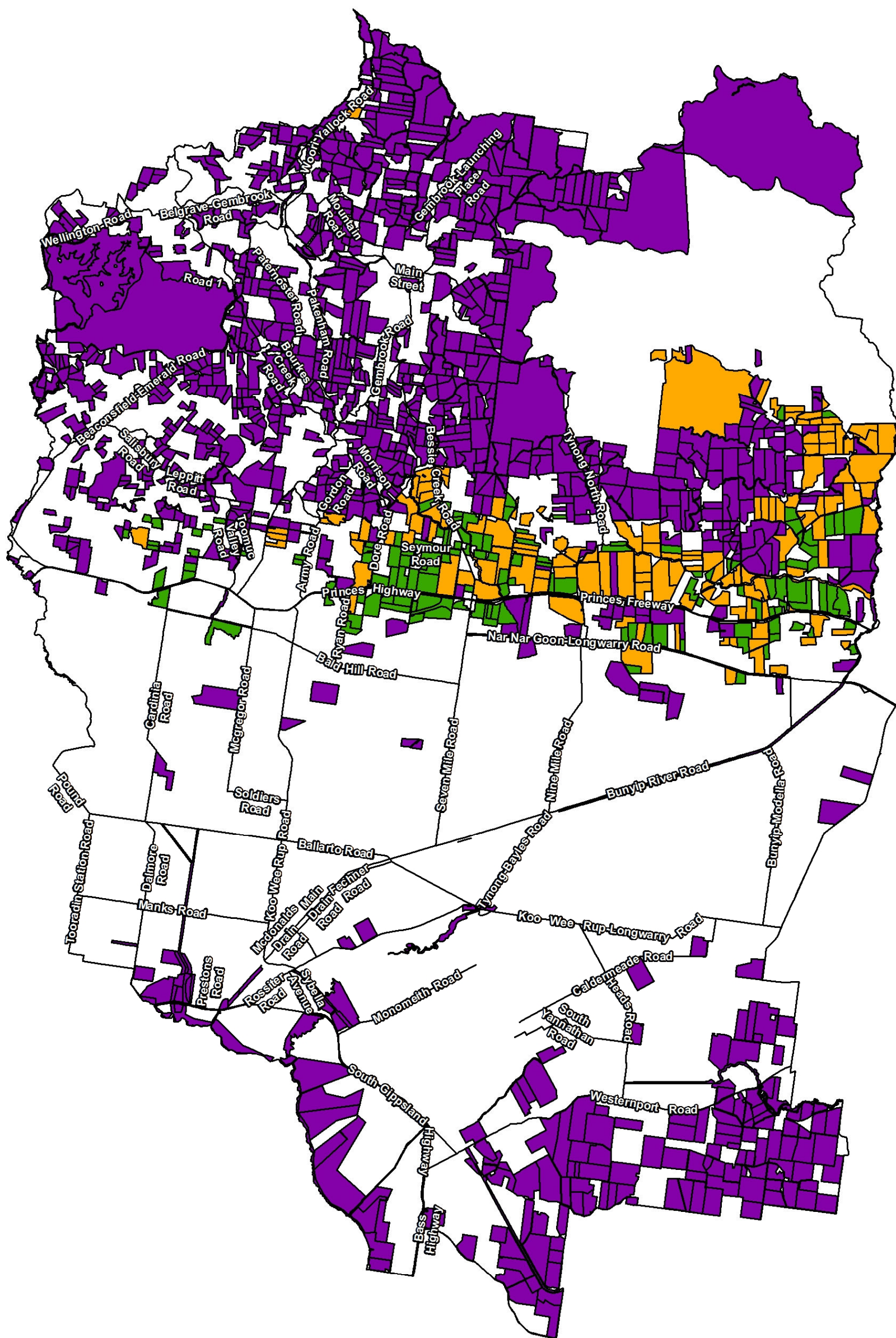
3. RESULTS OF OFFSET SEARCH

- 3.1 The plans attached below present the data compiled from the analysis of the relevant GIS layers for the Shire of Cardinia.
- 3.2 Map 1 shows all property parcels above 8 ha in size with specific indications of which of those parcels that have more than 5 ha of modelled native vegetation cover on each parcel, those parcels with any modelled Tufted Club-sedge habitat and those parcels that contain both values.

- 3.3 Map 2 is a close up of the northern half of Cardinia Shire with the same data as Map 1 as well clearer indications of the size of different parcels, either 8 ha, 9 to 20 ha or greater than 20 ha. This indication of size of parcel is important because the size of parcels is a key indicator of the quantity of offsets potentially available on any one parcel, which will be discussed in more detail below.
- 3.4 Map 3 includes the same data as Maps 2 and 3 but with the addition of the specific mapped habitat for Tufted Club-sedge. In the first instance under Clause 52.17 of the Cardinia Planning Scheme, only areas of native vegetation with modelled Tufted Club-sedge habitat can strictly be species-specific offsets for the species. However, the sparse polygons of the mapped Tufted Club-sedge habitat could be taken as indications of where the typical habitat occurs and if any more of that typical habitat occurs on the same parcel then the case for an alternative offset in other nearby areas of remnant native vegetation could be made.
- 3.5 Map 4 includes two layers of modelled Tufted Club-sedge habitat, i.e. the 2013 and the 2017 layers provided to Practical Ecology by DELWP. It is clear that the 2017 modelled layer is much more extensive than the 2013 layer but this should be taken with some significant uncertainty as it was difficult to interpret the meaning of the different values in this layer and we are not if the representation of the 2017 is necessarily accurate. At best I can assert that the later 2017 layer of modelled habitat of Tufted Club-sedge is likely to be more extensive than the 2013 layer of modelled habitat if that is useful.
- 3.6 The following table presents the actual number of sites of different sizes that are likely to have the two different required offsets. Smaller parcels will have smaller quantities of offsets available and less financial incentive to create because of the costs of creating them versus the value of any created offsets.

Vegetation present	Parcel size			Total number of parcels
	8 ha	9–20 ha	>20 ha	
> 5 ha Native vegetation	137	421	534	1092
Tufted Club-sedge	31	53	66	150
> 5 ha Native vegetation and Tufted Club-sedge	2	35	102	139

Table 1. Summary of parcels of varying sizes with presence of required conditions



Disclaimer

Practical Ecology bears no responsibility for the accuracy and completeness of this information and any decisions or actions taken on the basis of the map. While information appears accurate at publication, nature and circumstances are constantly changing.

Legend

Parcels >8ha

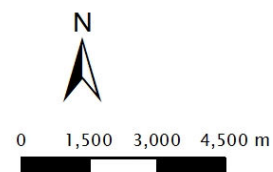
- Parcel contains >5ha modelled native vegetation only
- Parcel contains modelled Tufted Club-sedge only
- Parcel contains >5ha modelled native vegetation and modelled Tufted Club-sedge

Details

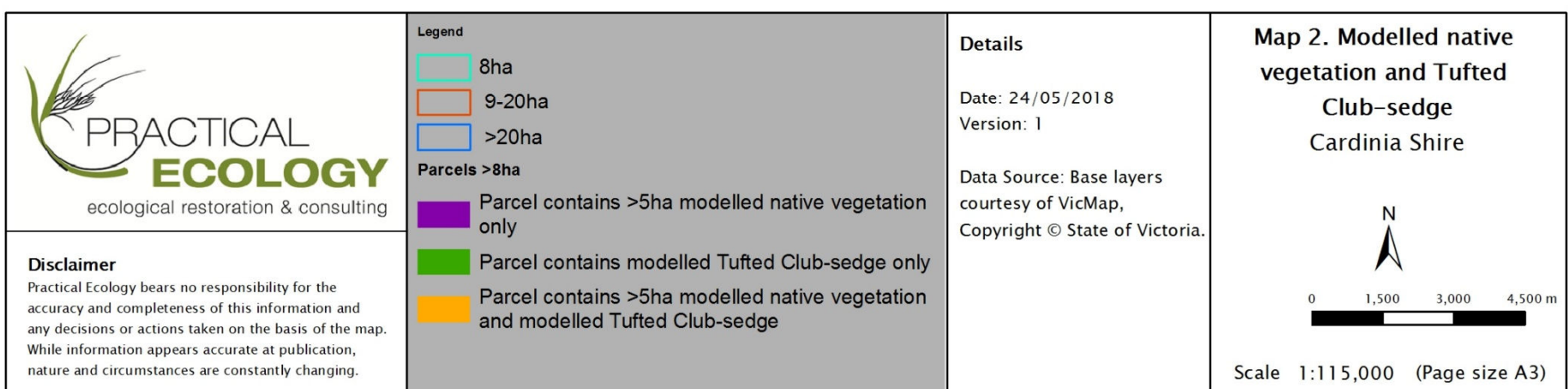
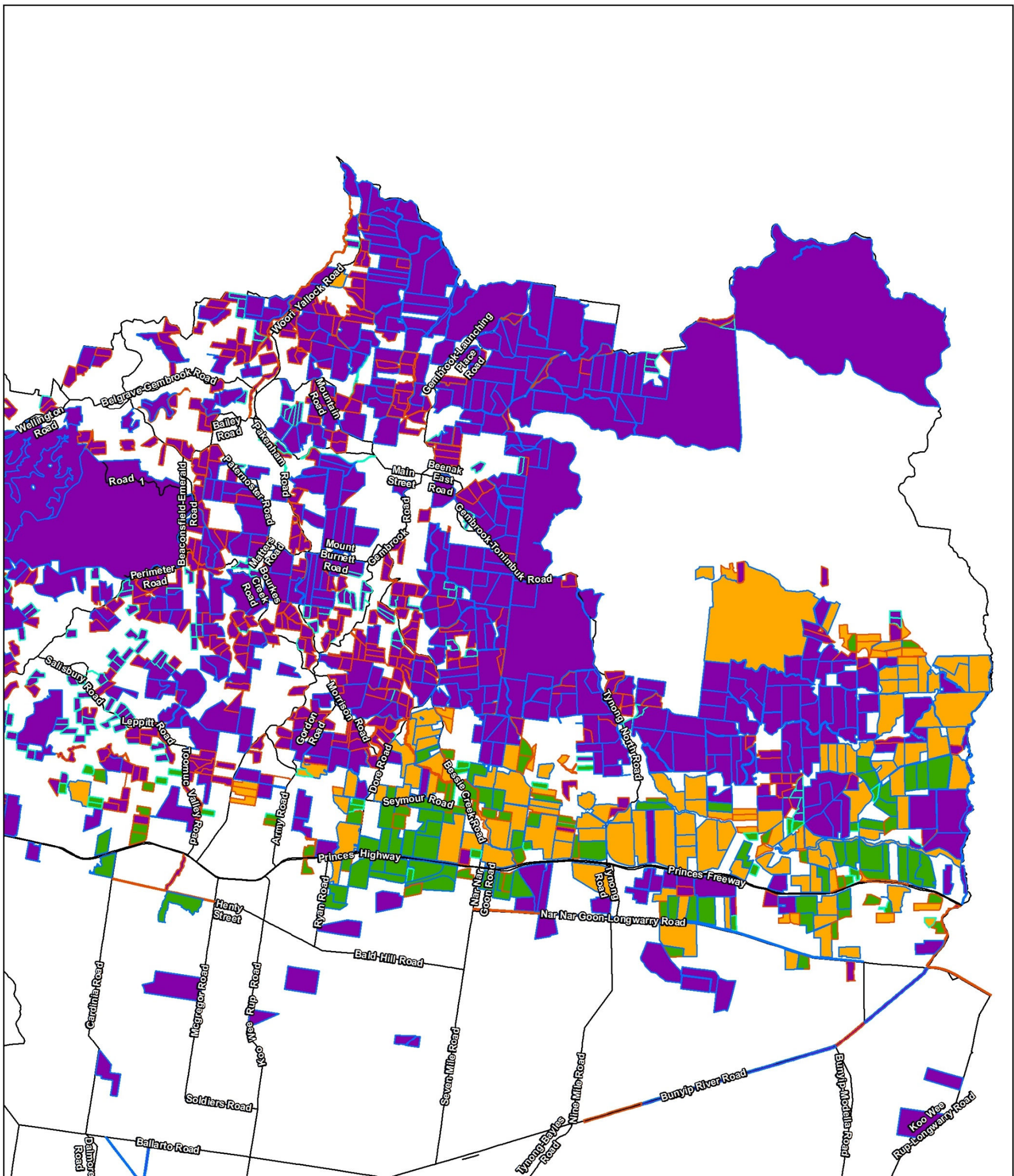
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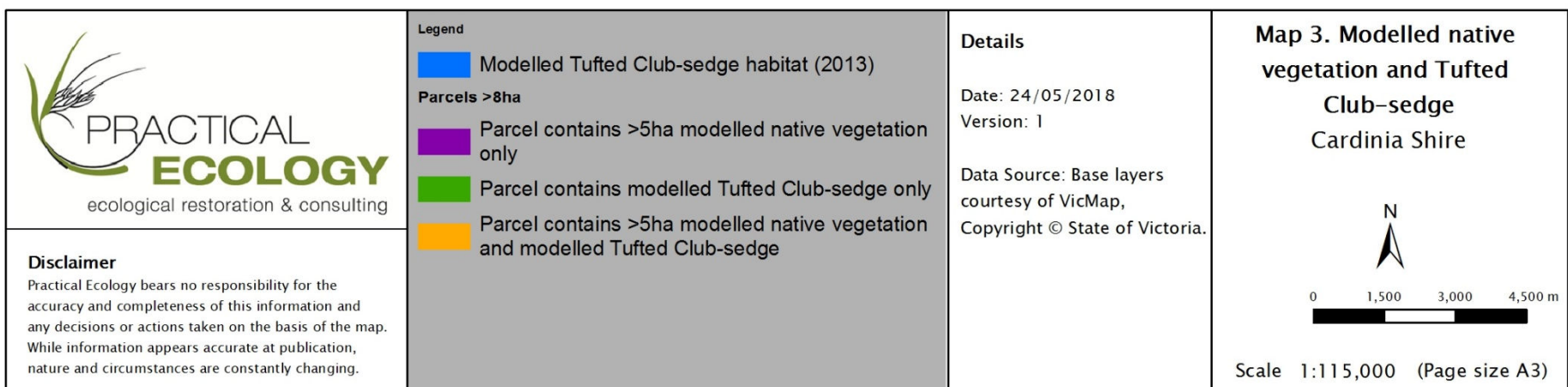
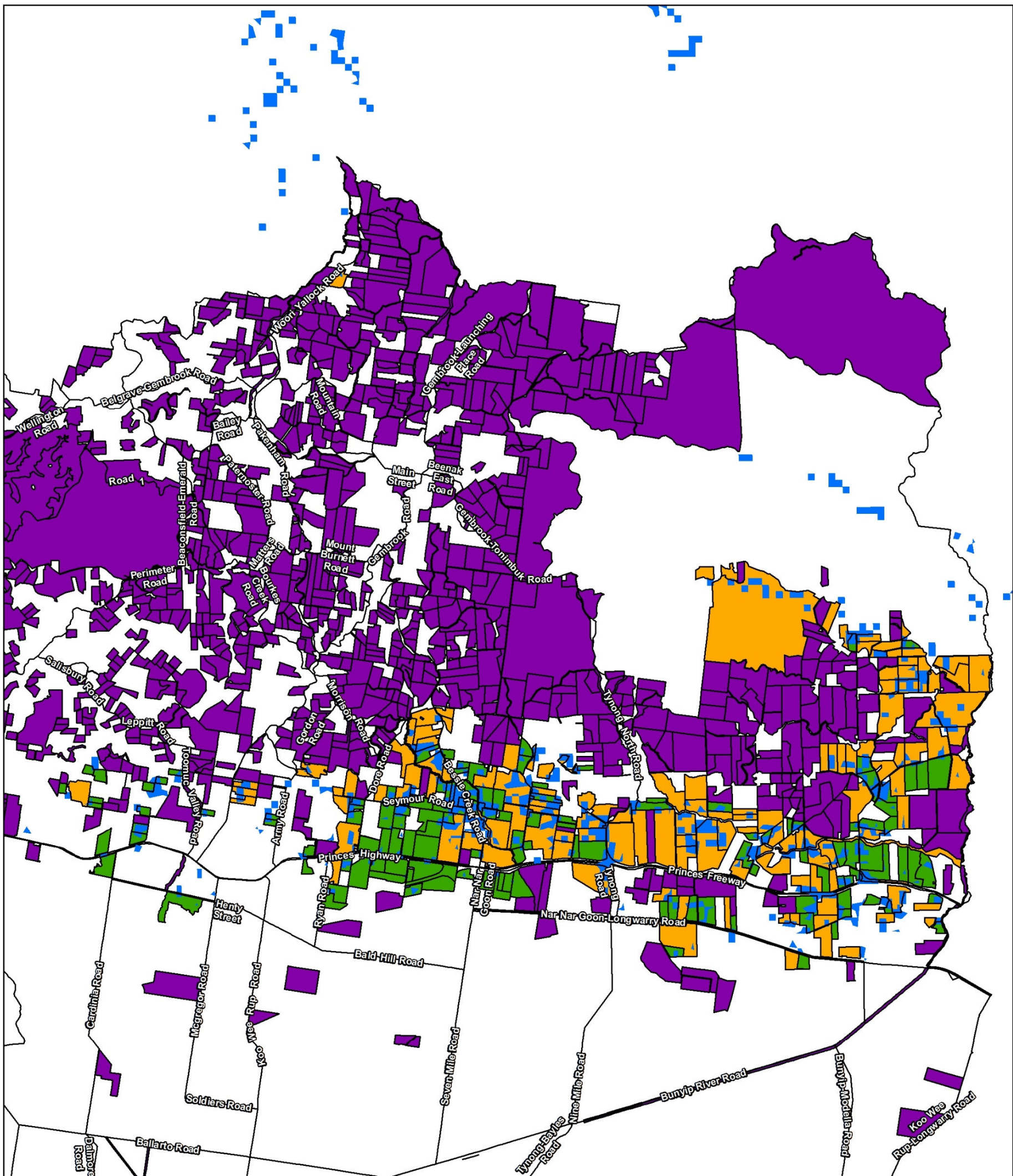
Data Source: Base layers courtesy of VicMap, Copyright © State of Victoria.

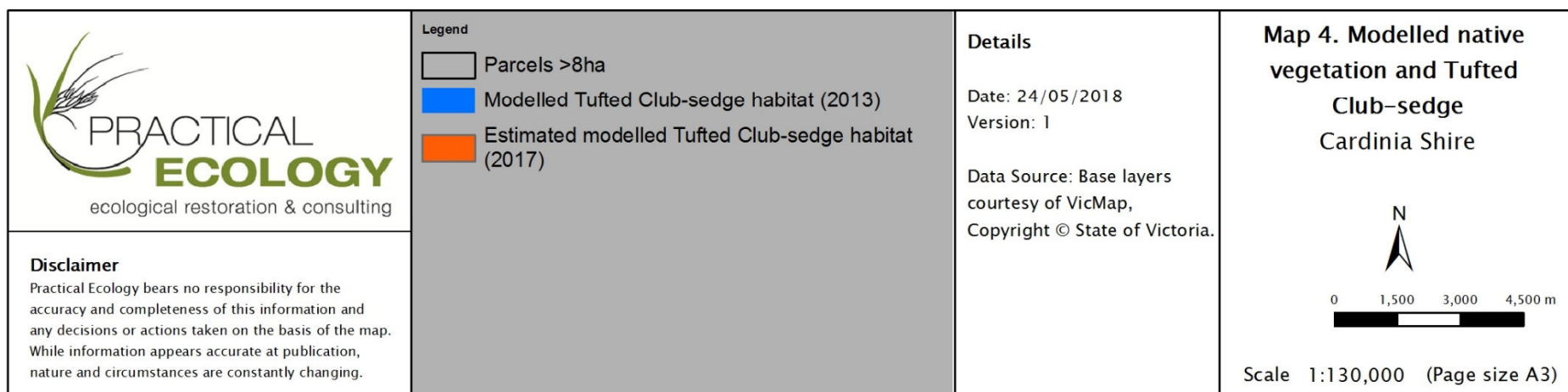
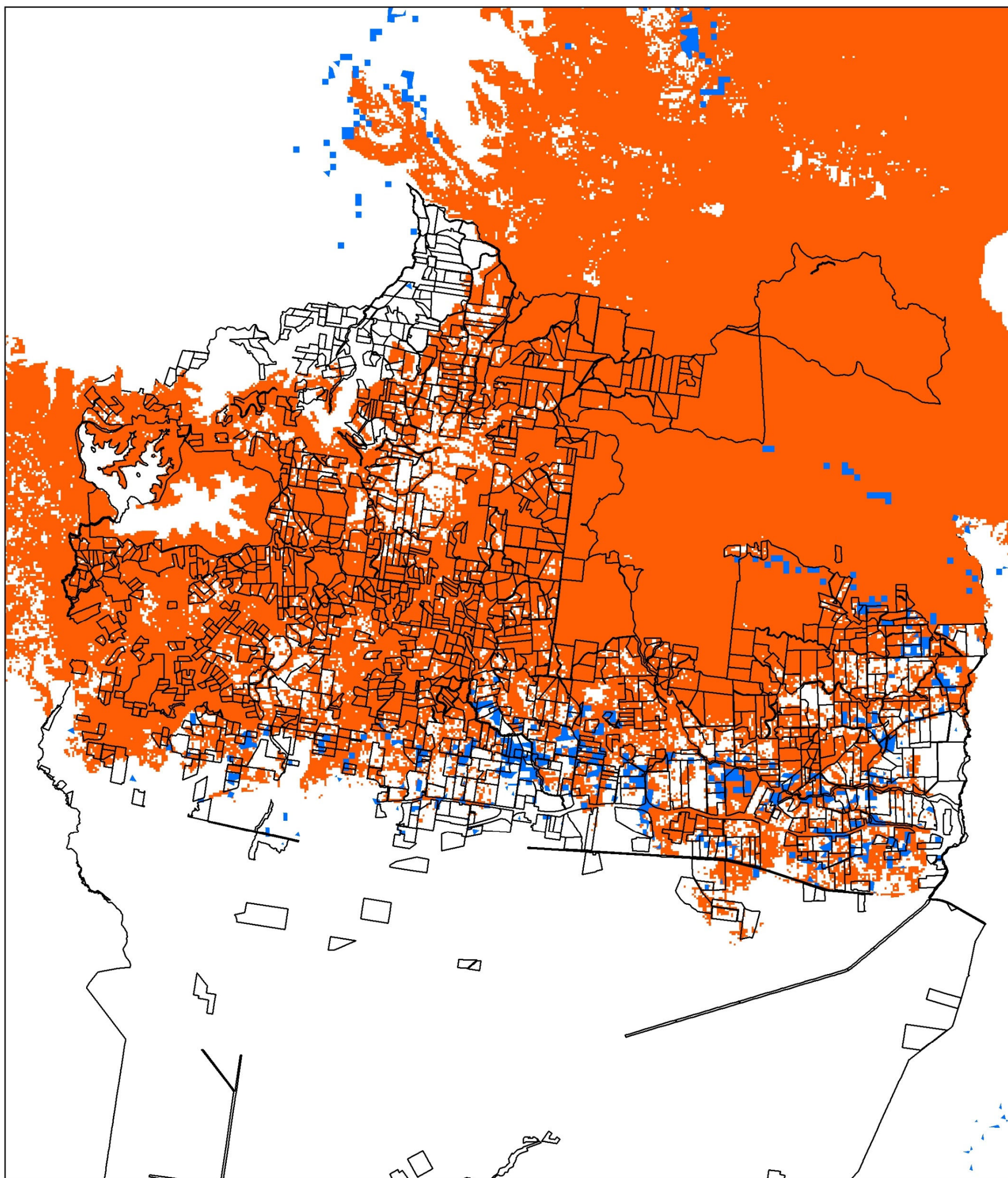
Map 1. Modelled native vegetation and Tufted Club-sedge Cardinia Shire



Scale 1:165,000 (Page size A3)







4. DISCUSSION AND QUALIFICATIONS

- 4.1 To a significant degree the table and maps above are self-explanatory. It is possible to consider how many parcels of land are present in Cardinia Shire in different size classes that potentially contain the required general and species-specific offsets. There is certainly the potential for many suitable offset sites but of course there will be a variety of limiting factors to actually creating offsets so that they are available.
- 4.2 The potential for offset availability and creation on small sites, i.e. any parcel up to 8 ha, because of a variety of factors. One key factor is that offsets cannot generally be within 150 m under the Bushfire Management Overlay (BMO) or within 50 m under Bushfire Prone Area mapping of any dwellings. The key difference this factor makes is that it means that upwards of 2 ha under the BMO and up to 1 ha of land under Bushfire Prone Mapping is unavailable for offsets even if native vegetation and modelled habitat is present.
- 4.3 The buffers between dwellings and offsets generally required when a parcel is covered by the BMO and BFA mapping are not typically a limiting factor beyond the assumptions discussed in paragraph 4.2. First, the areas of impact required for a dwelling and required defensible space are accounted for within our analysis of 8 ha blocks with only up to 5 ha of such blocks assumed to be available for offsets and there is much flexibility on larger blocks. Secondly, in some circumstances smaller buffers between dwellings and native vegetation offsets are acceptable if fuel loads and risks are not increased above previous conditions. The factor of dwellings with required defensible space limiting the availability of native vegetation offsets has been taken into account with the assumptions of the analysis and any mapping is not necessary to illustrate limitations.
- 4.4 It is possible that some 8 ha blocks could have enough good quality native vegetation that is modelled habitat of Tufted Club-sedge to provide both general and specific offsets but the quantity available be small, possibly up to 1 or 2 units at best, so it should be kept in mind that any one 8 ha block will likely not produce enough offsets to satisfy the requirements for the NVPP and several might be required to achieve the required level. To illustrate how many offset credits might be available on an 8 ha block the following table summarises an example of how much offset credits could be created using a real-life example from DELWP's Native Vegetation Information Management website. This example generally applies to general and species-specific offsets but is only indicative and some positive factors drive a greater level of offset credit creation, no calculation of possible restrictions for offsets because of nearby dwellings and a relatively high strategic biodiversity score, out of 1.000. Table 2 below summarises the example of a block in the southern Dandenong Ranges near Gembrook.

Area of parcel	Area of potential offset	Strategic Biodiversity value of site	Potential credits available
Approximately 9 ha	6.449 ha	0.635	1.423

Table 2. Summary of example of potential native vegetation offset creation on small Green Wedge block near Gembrook

- 4.5 It is larger blocks that would be most likely to have the required offset credits available from the one parcel. As illustrated by the above example one 8 ha block might only provide approximately a fifth of the credits available. In order to conveniently create the required block of credits from one parcel it would have to have upwards of 30 ha of native vegetation.
- 4.6 Another key factor in regards to parcel size is the difference between the cost of offset establishment and the value of offset sales. The establishment cost of an offset is easily \$10–20,000 compared with the possible value of 1 general or species-specific unit being between \$100,000 and \$180,000. On any one 8 ha block it may be possible to only create around 1 or possibly 2 general or species-specific offset credits, depending on various factors of modelled data. When the opportunity cost of losing perceived land development potential and the uncertainty of selling offset credits is taken into account these potential returns are easily not attractive to a land holder.
- 4.7 One key factor in the availability of offsets in peri-urban Melbourne is the perception of land holders that they may have further opportunities for development or subdivision despite the constraints of native vegetation that requires a planning permit for removal and Green Wedge zoning that limits subdivision and development. This factor means that many land holders will not consider offsets because they strictly limit further development or subdivision. I know from my experience of working with hundreds of peri-urban land holders over decades that they hesitate to protect land for offsets because of the “opportunity cost” of possible further development and capital gains that such protection represents.
- 4.8 The other limiting factor for local offsets is the lack of the awareness of the potential to create them on the part of local landholders. One possible solution to this issue could be the implementation of a local tender for offsets. Such a tender could generally be based on the NSW approach to large road projects where there is a process of advertising to land holders in the region around the project to obtain the offset. The tender process could involve direct mail outs or advertising in local papers with the provision of information about the process and obligations of creating offsets and the type and amount required shared with interested parties.
- 4.9 There would be little opportunity to create native vegetation in the Pakenham East Precinct itself because of the limited native vegetation proposed for retention and the future land tenure where the native vegetation occurs. The native vegetation in the precinct mostly occurs along waterways and roads where it can be effectively retained but only in small patches in among uses that make offset creation legally difficult such

as stream corridors and road reserves. The limited area of native vegetation, scattered small patches and difficulty in creating offsets on public land mean that it will be difficult to have offsets available in the precinct itself.

5. CONCLUSION

- 5.1 The required offsets, both general species-specific credits, for the Pakenham East Native Vegetation Precinct Plan are potentially available in Cardinia Shire, although there are possibly barriers to creating them depending on the motivations of land holders who own land with native vegetation and mapped Tufted Club-sedge habitat.
- 5.2 This information could be important to informing the offset strategy for the Pakenham East Precinct. If there is a preference for local offsets from within Cardinia Shire this investigation indicates that there is significant potential for creating the required offsets within the Shire. This information could then be included in the Native Vegetation Precinct Plan to indicate the potential availability of offsets within the Cardinia Shire. Having said all that specific strategies to encourage the creation of such offsets by local land holders may be required given the unique circumstances of peri-urban land.

Finally, I have made all the inquiries that I believe are desirable and appropriate and that no matters of significance that I regard as relevant have to my knowledge been withheld from the Panel.



Lincoln Kern, Ecological Consultant and Managing Director Date: 28 May 2018

Curriculum Vitae: Lincoln Kern

Date of Birth 1 February 1963

Lincoln was trained in botany and environmental science in the United States and has been working in the environmental field in Victoria on a full-time basis since 1991 including time with the Merri Creek Management Committee, the National Trust Save the Bush Program and Greening Australia Victoria. Lincoln has run Practical Ecology Pty. Ltd. since November 1993, offering an integrated service for managers of native vegetation and developers as required.

Lincoln has provided relevant and realistic management advice because he has extensive experience with costing, planning and doing the required physical works and sharing the whys and hows of reconciling development and nature conservation objectives with staff and the public. He also specialises in devising vegetation management systems that are clear and useful to every person involved and interested in managing vegetation, whether amateur or professional.

Education

- | | |
|----------------------|---|
| April 2014 | Suppressing Wildfire and Planning Prescribed Burns
Training required to work on a fire crew and implement prescribed burns accredited by Timber Training Creswick Pty Ltd – since this time I have participated in several prescribed burns |
| November 2013 | Design and Building Bushfire Prone Areas Course
Week-long course run by University of Technology Sydney on preparing Bushfire Attack Level Assessments and Bushfire Management Statements and designing development and building in response to AS3959 and the relevant Victorian Planning Scheme provisions. |
| November 2005 | Wildfire Management Overlay Implementation Course
Week-long course sponsored by the Country Fire Authority to train people in designing developments to meet the requirements of the Wildfire Management Overlay in Victoria |
| 1998 | Graduate Diploma of Applied Science (Environmental Management).
Deakin University, Rusden Campus. Part-time: Begun February 1995 and completed in April 1998. |
| 1992 | Bush Regeneration Supervisors Course
Organised by National Trust, Victoria A course exploring management skills, the role of management plans and monitoring programs in bush regeneration. |
| 1990 | Bush Regeneration Techniques Course
Organised by National Trust, Victoria. A course emphasising plant identification and ecology and technical skills needed to manage bushland. |
| Winter 1988 | Rainforest Field Studies
Semester-long field course in Guatemala and Belize organised by University of California at Santa Cruz |

February Permaculture Design Course

1987 Organised by Aprovecho Institute, Cottage Grove, Oregon USA and presented at Solala Agriculture College, Guatemala

1986 B.A. Antioch College, Yellow Springs, Ohio, USA

Major in Biology with course work in Botany, Environmental Studies, Anthropology and Education

Employment History

2007 to 2011	Governor-in Council Appointee on the Alpine Resorts Coordinating Council Responsible for contributing to general business, chairing the Sustainability Committee of the Council and attending Environmental Officer Forums
1993 to present – part-time from June 1998 to May 1999	Practical Ecology Pty. Ltd. – Ecological Consultant and Managing Director Consulting and contracting business specialising in native vegetation management. Services include: <ul style="list-style-type: none"> • vegetation management ecological restoration project designs • flora and fauna surveys & management plans • preparing bushfire management plans and wildfire management statements • coordinating planning processes requiring reconciliation of conservation and development objectives • expert witness representation at VCAT and Planning Panels • education services including plant ID, land management planning, net gain and planning policy etc • community group coordination and/or support • coordination of contract works including revegetation, wetland planting and remnant vegetation management
June 1998 to May 1999	Wellington Shire Council – Environmental Planner Provided environmental advice to Council and officers with roles in commenting on planning permits and developing a wide variety of environmental programs.
1993/94	Victoria University of Technology, Melton LEAP PROGRAM – Part time supervisor based at Taylor's Creek, Keilor. Supervision and formal training of program participants students in regeneration work in a suburban creek valley.
June 1991 – Nov 1993	National Trust 'Save the Bush' – Part time Technical Supervisor <ul style="list-style-type: none"> • Development of works programs for and supervision of bush regeneration crews • vegetation surveys • developing and presenting bushland management courses • working with community groups.
June 1992 – June 1993	Greening Australia Victoria – Part time Project Officer, Urban Program <ul style="list-style-type: none"> • Assessments for Parks and Waterways community grants • Conservation project advice to community groups

	<ul style="list-style-type: none"> • Coordination of education programs and community information days
May 1991 – June 2003	Council of Adult Education – Casual Tutor Self developed and run short courses in: <ul style="list-style-type: none"> • Natural history • Field botany • Organic gardening and permaculture
1991–92	Merri Creek Management Committee – Revegetation Crew Member <ul style="list-style-type: none"> • Site preparation and maintenance, • Direct seeding and tubestock planting • Remnant vegetation management.
1986 – 1989	Biologist/Inspector – Foreign Fisheries Observer Program, National Marine Fisheries Service, Seattle, Washington USA. Monitoring the species, catch size and adherence to fishing regulations of foreign fishing vessels in American waters off of Oregon, Washington and Alaska
1984	Coordinator – Environmental Field Program Antioch College Science Institute, Yellow Springs, Ohio USA. As one of three coordinators, developed and implemented the curriculum and itinerary of a 3 month field program for adults in Arizona and New Mexico.