Planning Scheme Amendment C372 to the Greater Geelong Planning Scheme

Between Echin Pty Ltd and the Waurn Ponds Unit Trust and City of Greater Geelong

Land: 35 and 69-93 Hams Road, Waurn Ponds

Expert Witness Statement

Yasmin Kelsall, Senior Ecological Consultant and

Lincoln Kern, Managing Director and Senior Ecological Consultant

15 August 2019

Practical Ecology
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Instructions:

We have been engaged to complete the following tasks:

- review the letter provided as an attachment to email correspondence titled: *Greater Geelong Amendment C372 – Brief to ecology expert (4014673)[NRF-APAC.FID2550536]* and in hardcopy to our offices on 2nd August, 2019 and the enclosed documents provided in hardcopy including expert reports, public submissions (as relevant to our area of expertise);
- confer with instructing solicitors and counsel where necessary;
- prepare an expert statement considering ecological matters arising from the Amendment by reference to the two reports prepared by Practical Ecology that were exhibited as supporting documents to the Amendment. I should advise on any change to our opinion since these reports were prepared, particularly as a result of the client's adoption of the revised masterplan and the waterway construction/drainage proposal considered in the Flood Modelling Report prepared by Water Technology dated 30 October 2018; and
- if necessary, appear at the Panel hearing of this matter, which is scheduled for 22, 23, 26 and 27 August 2019, in Geelong.

Documents and other materials considered

We have prepared this expert witness statement according to the required format for the Planning Panel. In doing this I have reviewed the following:

1. All relevant work that Practical Ecology has completed for the subject site. This will include as a minimum our two reports:
   - *Growling Grass Frog, Natural Spring and Bird Habitat Surveys*, dated 2015;
   - *Updated addendum to Flora and Fauna Assessment and Native Vegetation Impact Analysis*, dated October 2018;
2. Review and preliminary analysis of ecological impacts based on the updated *Overall Subdivision Masterplan* dated 24/7/2019 and the waterway construction/drainage proposal considered in the *Flood Modelling Report* prepared by Water Technology dated 30 October 2018.
3. Review and consider the preliminary Draft Planning Permit documents and Design and Development Overlay Schedule, provided via email on 3 August, 2019.

Documents prepared in response to the updated Overall Subdivision Masterplan by myself include:

A draft *Native Vegetation Impact Assessment* letter report and *Native Vegetation Removal Report* from the Department of Environment, Land, Water and Planning dated 7/8/2019.

Ecological Expert Witness Statement

1. Appointment by project proponent and history of involvement

1.1 We were engaged in August 2019 by Echin Pty Ltd and the Waurn Ponds Unit Trust in our role as ecology experts to consider the ecological issues on the subject site in the context of Planning Scheme Amendment C372 to the Greater Geelong Planning Scheme; to prepare an Expert Witness Statement for the Planning Panel process and present my findings concerning impacts on flora, fauna and native vegetation.

Practical Ecology has completed a number of ecological investigations on the property associated with this application. This has included:

Nance, D (2012) *Due Diligence Flora and Fauna Survey at 35 Hams Road and 151-229 Anglesea Road, Waurn Ponds*, Practical Ecology, Preston

Kidman, J. (2014) *Flora and Fauna Assessment and No Net Loss Analysis Recommendations, 35 Hams Road and 151-229 Anglesea Road Waurn Ponds*, Practical Ecology, Preston

O'Malley, A. (2015) *Growling Grass Frog, Natural Spring, and Bird Habitat Surveys for 35 and 69-93 Hams Road*, Waurn Ponds, Practical Ecology, Preston;

Kelsall, Y. and Loboda, E. (2018) *Updated addendum to Flora and Fauna Assessment and Native Vegetation Impact Analysis,* Practical Ecology, Preston.

The 2015 report was requested by the City of Greater Geelong in response to community concerns regarding a variety of ecological values that the subject site may provide including habitat for frogs, in particular the Growling Grass Frog *Litoria raniformis*; two bird species – the Swift Parrot *Lathamus discolor* and Wedge-tailed Eagle *Aquila audax*; and the presence of a natural spring. This report was prepared by zoologist, Dr. Austin O'Malley, a colleague.

The most recent, 2018 report updated our 2014 report and was produced in response to a *Request for Further Information (RFI)* from the City of Greater Geelong. The RFI requested an updated assessment for reasons including that since the previous Flora and Fauna Assessment, there had been a change in native vegetation policy under Clause 52.17 of the Planning Scheme. Additionally, the council required greater consideration of ecological values along the waterway and wetlands as well as remnant vegetation along Hams Road. This report was produced by Yasmin Kelsall. It involved a site visit, reanalysis of our 2014 report and preparation of an updated report based on updated policy requirements and updated development plans.

Prior to the 2018 report Yasmin Kelsall had involvement in this project and property in the role of project manager from 2014 and by providing peer review for our 2012 report.

Various consultation phases in the planning and design process to date have seen adjustments to the subdivision plans for the two lots and we have adjusted our reporting accordingly.

Over and above the information supplied in previous iterations of the Subdivision Masterplan, we have sought further information with respect to the development proposal from Taylors Urban Development and Infrastructure staff. The information provided includes the following and generally aligns with our current understanding of the intended development:

- The majority of the property would likely be impacted by some level of construction work.
- Engineered outcomes will result in loss of some natural habitat:
    - Sections of the Creek Reserve areas including the majority of the length of the main waterway involving engineering work aiming to create new levels, and the introduction of rock and battering
    - Two Drainage Reserves (located in the north and north-west)
    - Two Retarding Basins (located centrally and in the eastern portion of the site)
    - A shared path within northern part of Creek Reserve & the western crossing of the Creek Reserve
    - Two road crossings of the Creek Reserve (central and west)
    - A Local Park (although aiming to retain native vegetation where possible in future design processes)
    - Two Tree Reserves (although aiming to retain where possible in future design processes)

- Natural habitat intended to be retained:
    - Balance of the Creek Reserve
    - The 'Overland Flow' site
    - Dams and Ponds (with the exception of where Council has requested perimeter fencing or bollards be applied for safety)
    - Attached pocket of unlabelled Creek Reserve

Since our 2018 report, the planning process has involved community review of Planning Scheme Amendment C372. A review of submissions received shows that there is strong community interest in key matters associated with increased traffic, lot sizes, flood risk, loss of amenity. A few submissions mention environmental issues.

Following the community submissions process, an updated *Overall Subdivision Masterplan*, 24/07/19, by Taylors Urban Development and Infrastructure was developed.

Subsequently we have produced an updated *Native Vegetation Impact Assessment (NVIA)* which updates Section 6 of our 2018 report. The NVIA has determined that under

the current subdivision plan 6.289 hectares of native vegetation will be removed or impacted. In response, the proponent aims to offset this impact via the purchase of the appropriate amount of native vegetation offsets offsite via a third-party broker. Our updated *Map 2, Ecological Impacts* is provided as an attachment to this statement.

2. Consideration of ecological reports

2.1 This section is in response to the instruction which required specific consideration and summary of Practical Ecology's two reports:

- *Growling Grass Frog, Natural Spring and Bird Habitat Surveys*, dated 2015; and
- *Updated addendum to Flora and Fauna Assessment and Native Vegetation Impact Analysis*, dated October 2018;

2.2 The subject site is approximately 23.8 ha in area and contains 6.77 hectares of native vegetation. This is present across the entire site but more prevalent in the north. The native vegetation is present as three Ecological Vegetation Classes (EVCs), the majority being depleted Grassy Woodland (EVC 175) now represented only by a few species of hardy remnant native grasses that often regenerate after disturbance and persist with typical grazing practices with the exception of a higher quality patch located within the Hams Road road reserve. Creekline Grassy Woodland (EVC 68) is present in small patches along the waterway and Sedge Wetland (EVC 136) is associated with wetland areas.

2.3 The waterway and its wetlands contain the most environmentally sensitive areas within the site. The 2015 assessment found that the three main wetlands along the waterway provided important habitat for frogs. Much of the diversity of vegetation that was seen within the wetlands in 2015 was not seen in 2018. This is not surprising, nor does it detract from the wetland values. It is natural for wetlands and waterways such as this to support floristic assemblages that respond to different seasonal conditions, i.e. they are temporal and change as water levels naturally fluctuate. This feature contributes to their habitat value for a wider variety of fauna.

2.4 The property has been used for many decades as a farm and it appears there has been little effort made to conserve natural values. In accordance with the relevant EVC benchmarks, Grassy Woodland and Creekline Grassy Woodland would naturally have a representation of up to 15% cover of canopy trees and scattered shrubs but this property is devoid of these woody habitat components except for the small patch of Grassy Woodland within the Hams Road road reserve.

2.5 Practical Ecology's previous ecological reports have provided the following recommendations to guide the planning process. These recommendations align with Clauses 12 and 13 of the Victorian Planning Provisions, Clause 52.17 of the Geelong Planning Scheme as well as the Catchment and Land Protection Act, 1994.

- Attempt to incorporate existing patches of vegetation into areas of open space

- Avoid designing buildings or works that impact on the waterway or wetland areas
- Aim to incorporate/reintroduce locally native vegetation where possible in future designs and to enhance local habitat values where possible
- The site is within a Bushfire Prone Area (BPA); appropriate siting of dwellings and allotments in order to achieve appropriate setbacks from any unmanaged vegetation is required.
- Avoid placing lots and/or dwellings too close to vegetation that may need to be subsequently cleared to accommodate defendable space requirements under the BPA.
- Avoid excessive earthworks within and adjacent to the waterway.
- Avoid siting of any infrastructure that will see significant alteration to the waterway.
- Avoid creating situations that may increase erosion, i.e. minimise soil disturbance.
- It is recommended that ecological enhancement works be undertaken along the drainage line, but with consideration of the requirements of any bushfire risk requirements, i.e. the restoration work will not create areas of 'classifiable' vegetation as per AS 3959 (2009).
- Revegetation offsets, if intended to be created on site, may not account for the total offset required. Therefore, offsets for the loss of vegetation on site are recommended to be sourced off site, through native vegetation credit traders.
- Weed infestations should be controlled where areas of open space are to be created. A weed management program will need to be prepared to manage weeds across areas of open space and any areas where offsets are to be established. This should include areas along the drainage line.
- A suitable Construction Environment Management Plan (CEMP) is recommended to guide any future construction work.

2.6 Practical Ecology's 2015 report found that the property provides habitat for at least four frog species (Common Froglet *Crinia signifera*, Banjo Frog *Limnodynastes dumerilii* and Spotted Marsh Frog *Limnodynastes tasmaniensis* were recorded during our investigations) and contains some habitat of low to moderate quality that could support the Growling Grass Frog, which were not recorded during our investigations. It was recommended and we would indicate that they are still applicable:

- A series of habitat enhancement activities for the waterway and wetlands to enhance the likelihood that the property is able to support aquatic and amphibian species such as the Growling Grass Frog.
- Pre-clearance surveys: prior to any disturbance of the waterway and wetlands that pre-clearance surveys by suitably qualified zoologists are required, particularly for Growling Grass Frogs.
- Fauna salvage and translocation: appropriate fauna salvage and translocation be undertaken and overseen by a qualified zoologist.

3. Consideration of Floodplain Mitigation Plans

3.1 The *Water Technology Flood Modelling Report* (October, 2018) was reviewed but definitive detail regarding the detailed construction impacts on natural features within the property is not provided in the report. To date this information has been conveyed via Taylors and in seeking clarification to inform this Expert Witness Statement, we were directed to the report by Neil Craigie: *35 Hams Road and 151-229 Anglesea Road, Waurn Ponds, Surface Water Management Strategy for SMEC* (September 2013). Neil Craigie's report states that the piping of drainage throughout the site was not acceptable to the Corangamite Catchment Management Authority and that an open constructed waterway would have to be provided (p7.). Craigie provides a diagram that shows a preliminary surface water management 'development layout' that provides for a constructed waterway in combination with two integrated sediment basin/retarding basins (SBRB's) sited to reflect property ownership and likely staged development (Figure 2, p. 4). Craigie also provides descriptions and diagrams of the likely finished constructed waterway design. With the general approach taken by Neil Craigie in his report it is clear that there will be some loss as well as the possible retention of some habitats along the drainage line. The retained habitat along the drainage line can then be complemented with restored indigenous vegetation after careful construction of the drainage infrastructure. However, the detailed design for the drainage infrastructure has not been developed for this stage of the planning process. We have estimated the likely losses of habitat along the drainage line based on an arbitrary but adequate buffer only the drainage line, as detailed in paragraph 3.3 below.

3.2 Craigie recommends a staged approach to construction of the surface water interventions and that Environment Management Plans be developed for each stage, including recommendations for what the EMPs should include. We would support Craigies' recommendations for EMPs be included as permit conditions.

3.3 On the basis of advice provided by Taylors staff, Practical Ecology's August 2019 Native Vegetation Impact Assessment has accounted for an impact area of 10 metres on either side of the centreline of the waterway. This buffer along the drainage line is calculated to include the likely required construction footprint of future drainage infrastructure.

4. Consideration of Draft Planning Permits and Design and Development Overlay

4.1 Draft Planning Permits: 35 Hams Road, Permit No.: 662/2017 and 69-93 Hams Road, Permit No.: 663/2017. With all native vegetation within residential and utility areas considered to be lost, the relevant sections of Draft Planning Permits to be considered are those that are related to the requirements around a Construction Management Plan and Landscaping.

4.2 The Construction Management Plan conditions (Condition 18 in both Planning Permit 662 and 663) are currently drafted with only high-level direction provided. Considering the extent of disturbance that is planned across the property, the low-lying nature of

the central portion of the site and importance of the waterway and wetland habitat, it is expected that the requirements associated with the CMP would be much more detailed and inclusive of specific environmental items than is currently proposed. It is recommended that the Construction Management Plan be renamed to Construction Environment Management Plan and include further detail regarding strict measures to conserve waterway values prior to works commencing, during the works and upon completion. We would recommend elements that are commonly required in Melbourne Water's Site Environment Management Plan be considered for inclusion and that all requirements for fauna pre-clearance survey, salvage and translocation be included. Additionally, other requirements including designing work practice to limit impacts on fauna such as working during drier times of the year, are recommended.

4.3 We note that currently Condition 18a requires that the CMP address the protection of all existing vegetation and waterways and would suggest that this condition requires rewording to reflect the intent that impacts on retained native vegetation and natural features such as the waterway and wetlands are minimised.

4.4 Landscape Masterplan (Condition 37 in Planning Permit 662 and Condition 30 in Planning Permit 663). This condition makes reference to a PSP and Native Vegetation Precinct Plan (NVPP) which appears to be an oversight as the proposed project is not being developed as a precinct. In any event, the fundamental purpose of our 2018 report serves the same function as a NVPP. The Landscape Masterplan condition is appropriately high-level and its contents are appropriate. In particular, the inclusion of native vegetation retention zones is supported. We also recommend:

- 'no-go' zones for important habitat features including waterway and wetland areas that are not planned as impact areas during construction be included in the proposed CEMP and Landscape Masterplan; and.

- a requirement for a waterway and wetland rehabilitation plan for retained native habitats be included in this condition.

4.5 Detailed Landscape Plan (Condition 38 in Planning Permit 662 and Condition 31 in Planning Permit 663). Our response, above, to the contents of the Landscape Masterplan condition are relevant to this condition as well. Additionally, we recommend that planting schedules for any areas along the waterway and wetlands must include plants that are consistent with the relevant Ecological Vegetation Classes, i.e. Creekline Grassy Woodland (EVC 68), Sedge Wetland (EVC 136) or similar for wetlands and further from the waterway, Grassy Woodland. We suggest that Grassy Woodland (EVC 175) species be encouraged for use in street tree and other open space plantings.

4.6 Design and Development Overlay: The following conditions of the draft DDO are supported:

- Subdivision design must incorporate the reinstatement of the creek system as a key drainage, environmental and open space feature.

- Open space and drainage reserves should be interfaced by roads on at least three sides.

5. Overall Conclusions

5.1 The current subdivision proposal is the result of lengthy consultation with the City of Greater Geelong and various other representative organisations and authorities and aims to meet the multiple objectives of the Planning and Environment Act, 1987.

5.2 From an environmental perspective, this site poses a challenge to the dual purposes of the Planning and Environment Act in that there are natural values that extend across the site, the majority of which will be impacted by the development. Clauses 12 and 13 of the Victorian Planning Provisions support the conservation of these values. Clause 52.17 requires that clearing be avoided and minimised. In this case, the majority of the native vegetation will be cleared therefore an offset will be required.

5.3 The proposed subdivision will conserve some elements of the natural waterway including some wetland values and will aim to recreate some habitat and an integrated natural habitat corridor along the drainage line but much of the detail for this is yet to be determined, largely via the Landscaping Masterplan and Detailed Landscape Plans.

5.4 Because there is a risk that earthworks and the waterway engineering works would be detrimental to the ecological and habitat values of the waterway and wetlands, both within the property and downstream. We recommend that the Construction Management Plan be renamed to Construction Environment Management Plan and include further detail with definitive measures that will be included to conserve waterway values prior to works commencing, during the works and upon completion, as detailed on paragraph 4.2 above.

5.5 We further recommend that the Landscape Masterplan and subsequent Detailed Landscape Plans be required to focus more on restoration of natural waterway habitats; reinstatement of the former Ecological Vegetation Classes along the waterway, wetlands, retarding basins and within the 'Tree Reserves'. Furthermore, the landscaping should incorporate other native habitat features where possible such as locally indigenous trees for streetscaping, as detailed paragraphs 4.4 and 4.5 above.

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

Yasmin Kelsall, Senior Ecological Consultant Date: 15 August 2019

Lincoln Kern, Ecological Consultant and Managing Director Date:

Curriculum Vitae: Yasmin Kelsall

EDUCATION

Master of Environmental Science, Monash University. 2001

Focus: An appraisal of current catchment management practice and community involvement, considering the use of scientific information for the purposes of community management.

Bachelor of Science (Aquatic Science) (Honours), Deakin University. 1999

Focus: Analytical chemistry techniques applied to investigate the adsorption potential for copper, chromium and arsenic within a Western Victorian soil profile.

Bachelor of Applied Science (Environmental Management of Hazardous Materials) Deakin University. 1998

Majors: Environmental management, earth science and chemistry.

MAIN AREAS OF EXPERTISE

- Written and verbal communication including provision of training.
- Vegetation assessment and monitoring.
- Project management, including team coordination, budgeting, implementation and reporting.
- Vegetation enhancement and restoration techniques.
- Catchment and waterway management.
- Community engagement.

EMPLOYMENT HISTORY

Ecological Consultant – Practical Ecology, November 2011 – present

- Vegetation assessment including habitat hectare assessments, flora and fauna survey and weed mapping.
- Development and implementation of reserve management plans.
- Development of strategies related to ecological or land management issues.
- Report writing.
- Community engagement.
- Client liaison and advice.

Habitat Campaigner – Victorian National Parks Association, November 2011 – April 2014

- Run programs to promote habitat conservation within Victoria.
- Understand current environmental policy.
- Develop and maintain relationships.
- Undertake promotional and awareness raising activities.
- Respond to government processes as required.

Community Engagement Officer, Victoria Naturally Alliance, Sept 2009 – Nov 2010

- Scope, design, implement and evaluate a community engagement project designed to encourage more people to become involved in nature-based activities.
- Establish relationships with environment groups in three study areas across Victoria.
- Co-ordinate a study into the capacity of the environment groups to attract, host and retain new people.
- Co-ordinate the development of a social marketing plan based on market research to determine 'what would attract more people to spend more time in nature?'
- Organise and run three community events based on the principles determined through the study. Evaluate the success of the approach and the events.

Project Officer, Victorian National Parks Association (VNPA), May 2009 – Sept 2009

- Scope, design, implement and evaluate a pilot project aimed at identifying important areas of public land for protection in Central Victoria.
- Build relationships and engage with stakeholders including regional environment groups, individuals, and government staff. Manage expectations and relationships.
- Research, prioritise and assess areas of public land, nominated by stakeholders.
- Coordinate the development of a website to house information on the project.
- Undertake research and develop campaign materials in response to the planned expansion of Melbourne's urban growth boundary. Coordinate VNPA's response to government processes associated with the urban growth boundary expansion.
- Coordinate the VNPA's response to VEAC's Remnant Vegetation Investigation.

Native Vegetation Information Officer, Department of Sustainability and Environment, Aug 2008 – May 2009

- Management and maintenance of native vegetation datasets for Victoria, namely ecological vegetation class (EVC) mapping and EVC benchmarks.
- Provision of technical and strategic advice about native vegetation to a variety of stakeholders, colleagues and the public.
- Undertake stakeholder engagement to improve native vegetation information services.
- Training for field staff, consultants and other stakeholders to assist in the assessment and management of native vegetation.
- Development of education materials and information sheets for the public on issues related to native vegetation information and its use.
- Maintenance of the native vegetation information pages on the DSE website.

Biodiversity Officer, West Gippsland Catchment Management Authority, June 2006 –July 2008

- Coordination of programs to implement the West Gippsland Native Vegetation Plan.
- Development of new programs and projects to meet regional, national and State objectives for biodiversity and native vegetation management.
- Consultation and collaboration with colleagues and external stakeholders.
- Project management including planning, implementation, managing budgets, evaluation and reporting.

- Development of regional biodiversity-related plans and strategies.
- Participation in regional and statewide forums relating to biodiversity and native vegetation.
- Provision of advice on matters of biodiversity and native vegetation for internal and external processes, planning referrals and for the public.

Senior Project Officer, Greening Australia Victoria-West Gippsland Wetland Inventory Project, Dec 2005-June 2006

- Coordination of the West Gippsland Wetland Inventory Project.
- Development of project methodology and setting the project plan.
- Staff and resource management.
- Project implementation involving assessments of the physical and ecological parameters for each wetland and land manager interviews.
- Data collation, interpretation and reporting.

Senior Project Officer, Greening Australia Victoria – South East Region (Gippsland) Oct 2003- Sept 2005

- Coordination of the Greening Gippsland Biodiversity Project of approximately 80 individual landholder projects per year.
- Extension and project implementation involving: site visits, project planning, vegetation assessment, provision of vegetation and land management advice and coordination and support for on-ground vegetation management and restoration works.
- Community capacity building involving provision of training, coordination of field days, presentations at community events, development of information/fact sheets, media articles, displays at community events and providing technical advice.

Project Manager, Yarram Yarram Catchments (Landcare) Network Jan 2002-Oct 2003

- Planning, implementing and managing native vegetation management projects on behalf of a network of eleven Landcare groups, comprising approximately 300 member families.
- Providing technical support, education and extension to landholders and the Landcare community. This also involved establishing a local indigenous plant seedbank and coordinating seed collection.
- Working to build community capacity in order to support best land management practices.

Environmental Consultant, Egis Consulting Australia Feb 1999 – Dec 2000

- Project and budget management.
- Environmental site assessment; investigation and monitoring of soil, groundwater and surface waters.

RELEVANT TRAINING AND CERTIFICATES

- Habitat hectare assessment – competent status.
- Index of Stream Condition assessment.
- Index of Wetland Condition assessment.

- Community Engagement Fundamentals – DSE training program, 2006.
- Community Engagement Learning Group – DSE, 2008.
- Completion of defensive driving course.
- Completion of 4WD driving course.
- Environmental Ambassadors Program, Environment Victoria, June 2005.
- Alberton Project Community Leadership Program, 2003.

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 implementing the processes 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 1987 **Permaculture Design Course**
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: • 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 • 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 • Assessments for Parks and Waterways community grants • Conservation project advice to community groups

	• 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: • Natural history • Field botany • Organic gardening and permaculture
1991-92	**Merri Creek Management Committee** – Revegetation Crew Member • 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.

Map 2. Ecological impact

35 Hams Rod, Waurn Ponds

Legend

- Study site
- Contours (10m)
- Railways
- Watercourse
- Wetland
- Habitat zones

Proposed development

- Creek Reserve
- Drainage Link
- Park
- Tree Reserve
- Overland Flow Site
- Pump Station
- Residential
- Retarding Basin
- Road
- Proposed paths (2m wide)
- Path construction zone (1m buffer on either side)
- Waterway engineering work
- Waterway engineering work construction zone (10m buffer on each side)

Vegetation impacts

- Retained
- Impacted

Details

Date: 7/08/2019
Version: 1
Aerial photography from Nearmap (Dec 2017).
Base map data Copyright © The State of Victoria.
Scale 1:3,250 (Page size A3)

0 25 50 75 100 m

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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.

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