

**BEFORE THE DUNEDIN CITY COUNCIL**

**UNDER**

the Resource Management Act  
1991

**IN THE MATTER**

an application for resource consent  
of SUB-2016-90 and LUC-2016-  
459

**BY**

**DIANNE REID**

Applicant

---

**BRIEF OF EVIDENCE OF KELVIN MICHAEL LLOYD**

---

---

**GALLAWAY COOK ALLAN  
LAWYERS  
DUNEDIN**

Solicitor on record: B Irving  
Solicitor to contact: C F Hodgson  
P O Box 143, Dunedin 9054  
Ph: (03) 477 7312  
Fax: (03) 477 5564  
Email: [bridget.irving@gallawaycookallan.co.nz](mailto:bridget.irving@gallawaycookallan.co.nz)  
Email: [campbell.hodgson@gallawaycookallan.co.nz](mailto:campbell.hodgson@gallawaycookallan.co.nz)

## Introduction

1. My name is Kelvin Michael Lloyd. I am a Senior Ecologist with Wildland Consultants Ltd, based in Dunedin.
2. I hold the degrees of B.Sc.(hons) and Ph.D. from the University of Otago, where my studies were primarily undertaken in the Department of Botany. Subsequent to University study I was awarded a three year Post-Doctoral Fellowship from the Foundation for Research, Science and Technology, during which I was employed by Landcare Research Ltd in Dunedin. I have been employed as a senior ecologist and botanist by Wildland Consultants Ltd from 2004 to the present.
3. I am an author of 18 scientific papers published in peer-reviewed national and international scientific journals, as well as several popular articles. I have also presented aspects of my research at national and international scientific conferences. I have lectured in plant ecology at 3rd year level at the University of Otago. I remain an honorary research associate of Landcare Research Ltd and continue to publish research papers in collaboration with other scientists as time permits. I am a member of the New Zealand Ecological Society, the New Zealand Botanical Society, the Ornithological Society of New Zealand, the New Zealand Native Forest Restoration Trust, the New Zealand Plant Conservation Network, and the New Zealand Biosecurity Institute.
4. I am very familiar with indigenous vegetation and habitats in the Dunedin area, having undertaken numerous ecological assessments to assess the ecological significance of potential areas of significant conservation value in Dunedin City District, and many other assessments of the effects of land use activities on indigenous vegetation and habitats within the District. I am currently assisting the Dunedin City Council with expert evidence on ecological issues relevant to policy for the rural zones of the Proposed 2<sup>nd</sup> Generation District Plan (2GP).
5. I have been a Trustee of the Otago Natural History Trust, which governs the Orokonui Ecosanctuary development, since 2002. I recently helped design and implement a forest bird counting project

that determined the habitat relations of indigenous and exotic forest birds within the 55,000 ha 'Beyond Orokonui' project area.

6. I am very experienced in the analysis and interpretation of forest ecological processes. I recently re-measured 50 permanent vegetation plots and 20 additional control plots within and outside the Orokonui Ecosanctuary, and with a co-author, have recently submitted a scientific manuscript covering the results to a scientific journal. I developed indigenous forest monitoring protocols for plantation forest managers and for state of the environment monitoring. I have also monitored pest animals using tracking tunnels, wax tags, and traps.
7. My wife and I also operate a small family farm near Waitati which supports significant areas of indigenous forest, which we have progressively fenced to exclude stock. We have also legally protected some of these areas with QEII covenants. I have a good understanding of farming practices and constraints from my own farming experiences and also through many ecological assessments of farms and advice to farmers on management of indigenous biodiversity.
8. My work as an ecological consultant has covered a wide range of vegetation types, including wetlands, grasslands, shrublands, forests, and alpine vegetation. This work has included ecological investigations of areas of vegetation throughout New Zealand, including sites in Otago, Southland, Canterbury, Westland, Buller, Nelson, Marlborough, Chatham Islands, Wellington, Horowhenua, Wairarapa, Hawkes Bay, Auckland, and Northland. I am an author of over 210 contract reports covering these assessments and I have prepared expert evidence in 27 Environment Court (or equivalent) cases and 17 resource consent hearings in relation to these projects.
9. I undertook an ecological assessment of terrestrial indigenous vegetation and habitats at the 505 Saddle Hill Road site in February 2016 and prepared a report on my findings (Appendix 1). This evidence is based on those findings and the report attached.
10. I confirm I have read and agree to comply with the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. This evidence is within my area of expertise except where I state that I am

relying on facts or information provided by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

### **Ecological context and values**

11. The site lies within the Tokomairiro Ecological District, on dissected coastal hills which typically retain indigenous forest in deeply-incised gullies.
12. A number of areas of protected indigenous vegetation and habitat are located in the vicinity of the site, including the Hope Hill Scenic Reserve four kilometres to the southwest, and several QEII covenants to the north and east of the site.
13. Indigenous vegetation at the site is mostly located on land environments that have less than 20% of their original vegetation cover remaining.
14. Most of the indigenous forest (c.56 ha) on the site is secondary kānuka (*Kunzea robusta*) forest (c.50 ha), which is in a relatively advanced stage of succession to broadleaved forest, but retains kānuka dominance in the canopy in most places.
15. A key ecological feature of dry ridges within the kānuka forest is the presence of seven indigenous grass species, including one species, *Agrostis petriei*, which has a threat classification of At Risk-Naturally Uncommon, and is mainly found in inland basins. To put this assemblage of indigenous grasses in context, I have rarely recorded this number of indigenous grass species within a forested site before.
16. Another significant value of the site is approximately three hectares of representative podocarp/broadleaved forest, featuring five emergent podocarp species (matai - *Prumnopitys taxifolia*; miro - *P. ferruginea*; Hall's tōtara - *Podocarpus laetus*; rimu - *Dacrydium cupressinum*; and kahikatea - *Dacrycarpus dacrydioides*), and pōkākā (*Elaeocarpus hookerianus*), an additional emergent tree. All of these emergent tree species are listed as 'important native tree species' in Appendix B of the Dunedin City District Plan and in Table 10A.2 of the 2GP. Matai and kahikatea are locally uncommon within Dunedin City.

17. Eight indigenous forest birds were observed during the site visit, which is a moderately rich assemblage of indigenous forest bird species, indicative of good quality forest bird habitat.
18. Overall, indigenous forest at the site stands out for its moderately high diversity of plant and bird species, the distinctive assemblage of indigenous grasses, the small but representative example of podocarp/broadleaved forest, its presence on land environments with less than 20% of their original vegetation cover remaining, and its value as part of a wider network of indigenous forest habitats in the local area. The site would be assessed as being significant under Schedule A1.2 of the 2GP.

### **Risks under current management**

19. Under current management, significant ecological weeds such as radiata pine (*Pinus radiata*), hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), and holly (*Ilex aquifolium*) will continue to displace indigenous vegetation. Stock are limiting recruitment of indigenous forest tree species on forest margins adjacent to pasture. Woody weeds and stock will continue to affect indigenous forest regeneration. While significant stock browse effects were limited to forest margins at the time of the site visit, cattle could potentially access and affect most of the forest vegetation on the site if it is farmed at higher intensity.
20. While the effects of pest animals have not been assessed at the site, a typical range of pest animals is likely to be present, including possums (*Trichosurus vulpecula*), feral cats (*Felis catus*), mustelids (*Mustela* spp.), hedgehogs (*Erinaceus europaeus*), rats (*Rattus* spp.), and mice (*Mus musculus*), and will be adversely affecting indigenous vegetation and indigenous fauna. As far as I am aware, no control of pest animals is currently being undertaken at the site.

### **Benefits of forest protection and management**

21. Protection of the areas of indigenous forest on the site, and management of the threats to ecological values, would be highly desirable.
22. While the effects of stock browse on ecological values are not currently significant, under different land management with a higher intensity of

cattle browse they could easily be. Fencing the areas of indigenous forest to exclude stock would therefore be important to safeguard the ecological values of the indigenous vegetation and habitat in the longer term. Legal protection of these areas, for example using a QEII covenant, would further safeguard site values into the future, although I understand that the Applicant is not offering legal protection.

23. An important management action required to protect and enhance indigenous forest vegetation and habitat is control of significant woody weeds, including radiata pine, hawthorn, elder, and holly. Radiata pine in particular is dominant in places and excluding indigenous vegetation and habitat. The other three species are at lower abundance and thus would benefit from control now as each of them could become much more abundant over time.

### **Proposed conditions**

24. A key condition to help reduce further invasion of ecological weeds into indigenous vegetation and habitats is to restrict the species which can be planted within the proposed residential sites. The list of pest plant species in Appendix 10B of the 2GP would form a practical basis for such a condition, but the condition would also need to address Chilean flame creeper (*Tropaeolum speciosum*), which is a significant pest plant in dry forest habitats.
25. Conditions should also relate to stock-proof fencing around areas of indigenous forest habitat, and control of woody weeds currently present within areas of indigenous forest.
26. The S42A report provides a draft set of conditions relating to the above. In my opinion these conditions are generally appropriate but would benefit from some small changes:
  - (a) Proposed condition 3.f.ix should ideally make it clear what 'prohibited' means, by inserting "...and shall not be grown on sites,...";
  - (b) Proposed condition 3.i specifies that a pest and indigenous vegetation management strategy is to be prepared. The proposed condition indicates that a timeframe shall be specified for radiata pine control, but not for other woody weed control.

In addition, the proposed condition does not require targets for control of the other species. In my opinion, the indigenous vegetation management strategy should contain measurable, time-bound, objectives so that compliance with plan objectives - such as woody weed control - is able to be practically assessed.



.....  
**Kelvin Michael Lloyd**

**Date: 27 January 2017**