

**BEFORE THE HEARINGS PANEL  
FOR THE QUEENSTOWN LAKES PROPOSED DISTRICT PLAN**

**IN THE MATTER** of the Resource  
Management Act 1991

**AND**

**IN THE MATTER** of Hearing Stream 13  
– Queenstown  
Mapping Annotations  
and Rezoning  
Requests

---

**REBUTTAL EVIDENCE OF KELVIN MICHAEL LLOYD  
ON BEHALF OF QUEENSTOWN LAKES DISTRICT COUNCIL**

**ECOLOGY**

**7 July 2017**

---

 **Simpson Grierson**  
Barristers & Solicitors

S J Scott / H L Baillie  
Telephone: +64-3-968 4018  
Facsimile: +64-3-379 5023  
Email: sarah.scott@simpsongrierson.com  
PO Box 874  
SOLICITORS  
CHRISTCHURCH 8140

## TABLE OF CONTENTS

|   |   |
|---|---|
| 1. INTRODUCTION.....  | 1 |
| 2. SCOPE.....   | 1 |
| 3. MR GLENN DAVIS FOR GRANT HYLTON HENSMAN, SHARYN HENSMAN<br>& BRUCE HERBERT ROBERTSON, SCOPE RESOURCES LTD, GRANT<br>HYLTON HENSMAN & NOEL THOMAS VAN WICHEN, AND TROJAN<br>HOLDINGS LTD (361) – GROUP 1A (Business and Industrial) ..... | 1 |

**1. INTRODUCTION**

**1.1** My name is Kelvin Michael Lloyd. I am a Principal Ecologist and have been employed by Wildland Consultants Ltd since 2004.

**1.2** My qualifications and experience are set out in my statement of evidence in chief dated 23 May 2017.

**1.3** I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2014 and that I agree to comply with it. I also confirm that I have considered all of the material facts that I am aware of that might alter or detract from the opinions that I express, and that this evidence is within my area of expertise except where I state that I am relying on the evidence of another person.

**2. SCOPE**

**2.1** My rebuttal evidence is provided in response to the evidence of Mr Glenn Davis, filed on behalf of Grant Hylton Hensman, Sharyn Hensman & Bruce Herbert Robertson, Scope Resources Ltd, Grant Hylton Hensman and Noel Thomas van Wichen, and Trojan Holdings Ltd (361).

**3. MR GLENN DAVIS FOR GRANT HYLTON HENSMAN, SHARYN HENSMAN & BRUCE HERBERT ROBERTSON, SCOPE RESOURCES LTD, GRANT HYLTON HENSMAN & NOEL THOMAS VAN WICHEN, AND TROJAN HOLDINGS LTD (361) – GROUP 1A (Business and Industrial)**

**3.1** Mr Davis has filed ecological evidence in relation to the rezoning of land at Coneburn at the base of the Remarkables Range from Rural to Industrial. Mr Davis states at his paragraph 12 that the original vegetation at the site was a mixture of native grassland and grey shrubland, and that indigenous forest would have been at higher elevations on the Remarkables Range. Consequently, Mr Davis suggests that the aim should be to restore ecologically appropriate indigenous plant species, rather than ecologically appropriate indigenous forest, as suggested in my evidence in chief.

- 3.2 Mr Davis relies on Leathwick *et al.* (2003), Leathwick (2001), and the LRIS Portal layer 'Potential Vegetation of New Zealand' to support his view that forest did not originally cover the Open Space landforms. He does not cite these references in full. I understand the reference to Leathwick *et al.* (2003) in his evidence to be to Leathwick J, Wilson G, Rutledge D, Wardle P, Morgan F, Johnson K, McLeod M, Kirkpatrick R. 2003: Land environments of New Zealand. David Bateman, Auckland. 160pp.
- 3.3 Alternatively Mr Davis may be referring to Leathwick J, Overton J. Mc and McLeod M. 2003: An environmental domain classification of New Zealand and its use as a tool for biodiversity management. *Conservation Biology* 17: 1612-1623.
- 3.4 I understand the reference to Leathwick (2001) in Mr Davis' evidence to be to Leathwick JR 2001: New Zealand's potential forest pattern as predicted from current species-environment relationships. *New Zealand Journal of Botany* 39: 447-464.
- 3.5 The LRIS portal (<https://lris.scinfo.org.nz>) is a public database that displays spatial depictions of land resource information. The proposed Coneburn industrial site is included in a 'Potential vegetation of New Zealand' unit described as 'Scrub, shrubland, and tussock-grassland **below** treeline' (my emphasis added in bold).
- 3.6 The consistent factor behind all of these information sources is that they are based on models of environmental variation and vegetation cover. As such, various deficiencies of these predictive models should always be borne in mind. In particular, they are not good at predicting indigenous vegetation cover at sites where the following is the case:
- (a) where the natural vegetation has been changed markedly, for example due to historic fires<sup>1</sup> and clearance for agriculture;
  - (b) where there has been less intensive sampling of vegetation plots that contribute data to these models;

---

1 Rogers GM, Walker S, Basher LM, and Lee WG. 2007: Frequency and impact of Holocene fire in eastern South Island, *New Zealand*. *New Zealand Journal of Ecology* 31: 129-142.

- (c) where the remaining remnants are not representative of the full range of the former forests; and
- (d) where the former vegetation comprised beech forest.<sup>2</sup>

3.7 All of these factors apply to the Coneburn site.

3.8 For example, the 'Potential vegetation of New Zealand' layer also maps the 'Scrub, shrubland, and tussock-grassland **below** treeline' unit **above** 'silver beech forest' on the Remarkables Range (my emphasis added in bold). This in my view defies logical analysis based on a sound understanding of natural vegetation pattern, disturbance history, and ecological processes in these environments.

3.9 The obvious limitations of the above model outputs mean that these outputs should not be used in an uncritical fashion. In particular, evidence from the site and its context is needed to determine the historic vegetation composition at the site. The sources of information I have used to support my conclusion that indigenous forest is the appropriate restoration goal for the site are:

- (a) beech forest is currently present in post-fire refuges along the base of the Remarkables Range and on slopes on both sides of the Kingston Arm of Lake Wakatipu. These remnants clearly do not fully represent the historic more extensive distribution of beech forest in the area. The bulk of clearance may have happened during the peak of post-settlement fire frequency some 500-800 years ago;<sup>3</sup>
- (b) in some locations, beech forest remnants stretch from higher elevation down to near Lake Wakatipu, for example at Wye Creek and south of the Devils Staircase, along the Kingston Arm of Lake Wakatipu;
- (c) planted indigenous forest trees are growing successfully at the Coneburn site. For example, mountain beech (*Fuscopora cliffortiodes*), kōhūhū (*Pittosporum tenuifolium*),

---

<sup>2</sup> Leathwick JR. 2001: New Zealand's potential forest pattern as predicted from current species-environment relationships. *New Zealand Journal of Botany* 39: 447-464.

<sup>3</sup> Rogers GM, Walker S, Basher LM, and Lee WG. 2007: Frequency and impact of Holocene fire in eastern South Island, *New Zealand*. *New Zealand Journal of Ecology* 31: 129-142.

and ti kouka/cabbage tree (*Cordyline australis*) are present in the vicinity of the Wilson Contractors yard;<sup>4</sup>

- (d) planted mountain beech is growing elsewhere on the Coneburn site;
- (e) various exotic tree species are present within the proposed Coneburn Zone: Douglas fir (*Pseudotsuga menziesii*), *Eucalyptus* spp., chestnut (*Castanea* sp.) rowan (*Sorbus aucuparia*), pines (*Pinus* spp.), and hawthorn (*Crataegus monogyna*); and
- (f) additional exotic tree species are present on neighbouring land, including sycamore (*Acer pseudoplatanus*) and elder (*Sambucus nigra*).<sup>5</sup>

**3.10** The presence of a diverse range of trees that have established successfully within and adjacent to the site suggests that there are no significant limitations to tree growth, thus the site should not be considered to be 'below treeline'.

**3.11** If there are no significant environmental limitations to tree growth then, in the absence of disturbance, the former vegetation of the site would have comprised indigenous forest.

**3.12** I am confident that indigenous beech forest, most likely dominated by mountain beech, would have formerly been present within the proposed industrial zone at Coneburn. Of the three New Zealand beech species found in southern New Zealand, mountain beech is the most tolerant of the seasonally-dry soils that are present at the site. This former forest is likely to have included other indigenous trees such as kōhūhū, kapuka/broadleaf (*Griselinia littoralis*), and Hall's totara (*Podocarpus laetus*).

**3.13** In my opinion restoration to indigenous forest is a more practical goal than establishment of indigenous grassland and shrubland. Grassland and shrubland would be ecologically unstable at this site, and vulnerable to invasion of exotic shrubs and trees. Thus it would require ongoing resourcing to maintain the grassland and shrubland


---

4 Coneburn submission – ecological assessment for the Coneburn Group. *Unpublished Davis Consulting Group Report 15011c.*

5 Statement of evidence of Kelvin Michael Lloyd, ecologist – Remarkables and Coronet, hearing stream 11 (Ski Area Sub Zones).

state. Indigenous forest, on the other hand, is more resistant to invasion by exotic woody weeds, and would require significantly less resourcing once the planted trees have exceeded the height of competing exotic grasses and herbs.

- 3.14** In my opinion, the restoration goal for the 'Open Space' areas of the site should be restoration to ecologically-appropriate indigenous forest, as I state in my evidence in chief. I maintain my position that I do not oppose the request to create an Industrial B – Coneburn Zone from an ecological perspective, provided that policy and rules controlling use of the land promote retention and enhancement of existing ecological values, restoration of ecologically appropriate indigenous forest, and control of exotic woody weeds.



**Kelvin Michael Lloyd**

**7 July 2017**