

Before Queenstown Lakes District Council

In the matter of The Resource Management Act 1991

And The Queenstown Lakes District proposed District Plan Topic 12
Upper Clutha Mapping

SUMMARY OF EVIDENCE OF KELVIN LLOYD FOR

Allenby Farms Limited (#502 and #1254)

Dated ~~28~~ May 2017
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Qualifications and Experience

- 1 My name is Kelvin Michael Lloyd. My qualifications and experience are set out in my evidence in chief.
- 2 I have read the Code of Conduct for Expert Witnesses in the Environment Court Practice Note 2014. This evidence has been prepared in accordance with it and I agree to comply with it. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

Summary of Evidence

- 3 The Threatened Environment Classification is an abstract classification that does not directly show the vegetation, habitats, and species present at a particular site. As the classification is national in scope, local patterns of cover and legal protection may differ from the national pattern.
- 4 Detailed field work at the Mt Iron site has revealed that the highest ecological values occur in turf, grassland, rock outcrop, and coprosma shrubland habitats, rather than in the kānuka woodland.
- 5 Ecological values include four nationally Threatened and seven nationally At Risk taxa, a strong ecological gradient, diverse indigenous plant and invertebrate habitats, and good habitat for common indigenous birds. Many of these values are located outside the notified Mt Iron SNA C.
- 6 An alternate SNA is proposed, which would include all ecologically significant values, but exclude more modified kānuka woodland within the northern end of the notified Mt Iron SNA C. The alternate SNA would achieve significantly greater protection of ecological values than the notified Mt Iron SNA C.
- 7 Active management of the alternate SNA would enable maintenance of indigenous biodiversity values at the site, whereas passive management of the notified SNA would not. Ecological management actions - such as control of woody weeds, monitoring and if warranted, control of pest animals, planting of indigenous trees and shrubs which were formerly present, and encouragement of sensitive use of the site for recreation - would enhance the ecological values of the alternate SNA. This would represent a significant improvement and enhancement of ecological values compared to the management of SNAs required under the PDP.
- 8 Future management of the proposed 'discard area' at the northern end of the notified Mt Iron SNA C would be subject to the Chapter 33 indigenous vegetation clearance rules and to objectives, policies, and rules of the

proposed Mt Iron Park Rural Lifestyle Zone. Under the latter, native vegetation located within a lot outside building platform would not be allowed to be removed (except for vehicle access). This level of protection is stronger than provided by the PDP.

- 9 Kānuka woodland does not represent the original vegetation in this part of the site, which most likely comprised forest dominated by podocarps and broadleaved tree species.
- 10 Recent purchase of adjacent land at Little Mt Iron by Allenby Farms provides excellent potential for indigenous forest restoration. Holistic management of this land, together with the alternate SNA and Mt Iron Scenic Reserve, would enable Mt Iron to become a very important ecological area in the local landscape.

Response to the evidence of Mr Glenn Davis

- 11 Mr Davis states in paragraph 3.2 that he visited the Mt Iron site on 17 November 2011. In this case, my assumption that no site visit was undertaken is incorrect. However the reporting remains substandard and in my opinion does not represent best practice for the reasons I have outlined in my evidence in chief. The reporting, for example, did not confirm the composition of the vegetation present, as no information is provided on vegetation types or plant species other than 'kānuka woodland', and none of the Threatened or At Risk plant, and lizard species present at the site were documented.
- 12 Mr Davis (paragraph 3.9) quotes out of context from paragraph 22 of my evidence. In paragraph 22 of my evidence, I state that kānuka woodland does not represent the original vegetation in this part of the site [underlining added for clarity], which is the 'discard area' at the northern end of the notified Mt Iron SNA C. In my opinion, podocarp/broadleaved forest would have been the historic, and thus representative, vegetation on the deeper soils on the lower slopes of the Mt Iron site.
- 13 Mr Davis appears to believe that because kānuka was historically present in Central Otago, it is representative anywhere where it is currently present. This does not take account of the fact that kānuka has been able to persist and expand in Central Otago because of its resilience to grazing by stock and rabbits, and to burning, whereas a suite of browse- and fire-sensitive indigenous tree species were almost lost entirely after human settlement¹. The predictive models that Mr Davis relies on have the greatest uncertainty

¹ p 46, Rogers G, Walker S. and Lee W.G 2005: The role of disturbance in dryland New Zealand: past and present. *Science for Conservation* 258. Department of Conservation.

in Central Otago, and are biased towards species that better survive fire, such as kānuka, mānuka (*Leptospermum scoparium*), and kowhai². More recent research assessing preserved plant remains from dry rock shelters has shown that species such as ribbonwood, kowhai, kōhūhū, and fierce lancewood were also historically present in Central Otago³.

- 14 In my opinion, integrating recent research, observations from the site, and observations of exotic tree growth in Central Otago, the most likely natural, and thus representative, vegetation on deeper soils on the lower slopes would have been similar to the 'Dry hardwood forest' described by Rogers *et al.* (2005). This forest would have included species such as Hall's totara, matai, ribbonwood, kowhai, fierce lancewood, kōhūhū, and broadleaf⁴, which is consistent with my listing of these species as being ecologically appropriate for the 0.4 ha restoration site shown in Attachment 9 of my evidence.
- 15 I would agree that kānuka woodland is representative vegetation on thin soils on the upper part of the Mt Iron site, but on the lower slopes it does not clearly meet the criteria for representativeness, as Mr Davis states (paragraph 3.10). As Mr Cleugh notes in paragraph 21 of his evidence, there was very little kānuka cover on the steeper northern slopes when Allenby purchased their land on Mt Iron, whereas there has subsequently been significant regeneration of kānuka in these areas.
- 16 I also note that Mr Cleugh has devoted significant effort to controlling wilding conifers on the site (paragraph 20 of Mr Cleugh's evidence). Without this control effort, it is likely that most of the Allenby Farms land would now be heavily infested with wilding conifers, threatening the persistence of many of the significant ecological values of the site. If future control is not undertaken, the existing conifer saplings will continue to grow and produce seed, ultimately resulting in wilding conifer dominance across the site.
- 17 In my opinion Mr Davis overstates the effects of potential residential development of the 'discard area' on Kawarau gecko and brown creeper.
- 18 The Alternate SNA protects almost all of the known Kawarau gecko locations and the best gecko habitats that were recorded within the site. If residential development at platform 10 potentially disturbed or killed Kawarau geckos, this would have no effect on persistence of a large Kawarau gecko

² Walker S. Lee W.G., Rogers G.M. 2003: The woody vegetation of Central Otago, New Zealand: its present and past distribution and future restoration needs. *Science for Conservation* 226. Department of Conservation, Wellington.

³ Wood J.R. and Walker S. 2008: Macrofossil evidence for pre-settlement vegetation of Central Otago's basin floors and gorges. *New Zealand Journal of Botany* 46: 239-255.

⁴ p54, Rogers G, Walker S. and Lee W.G 2005: The role of disturbance in dryland New Zealand: past and present. *Science for Conservation* 258. Department of Conservation.

population at the site. The 'discard area' in which residential development is proposed was specifically delineated to avoid including all significant Kowarau gecko habitat.

- 19 There is extensive kānuka woodland habitat available on Mt Iron for brown creeper, and in my opinion the amount of clearance of kānuka woodland required for residential sites would have scarcely no effect on the long term persistence of brown creeper at Mt Iron. Considerable more kānuka woodland has been cleared and fragmented outside the Allenby Farms property, yet the brown creeper population persists at Mt Iron.
- 20 The significance that Mr Davis attaches to the modified kānuka woodland in the 'discard area' (paragraph 3.20) is misplaced, in my opinion. I do not consider the kānuka woodland in the discard area to be ecologically significant. A test is that if entire 'discard area' was cleared (which is not proposed), it would not result in loss of any of the known significant ecological values within the site. Nevertheless, the kānuka woodland does have ecological value, for example as habitat for indigenous forest birds and invertebrates. As such, I believe that any potentially adverse effects on this habitat type that cannot be avoided or remedied should be mitigated or offset, and I have suggested options for doing so in paragraph 63 of my evidence. I note that all but one of the conditions suggested by Mr Davis (paragraph 3.20) are being offered by the submitter.
- 21 With respect to the flammability of indigenous plant species planted within 'defensible space' (i.e. within 10 metres of residences; paragraph 3.22 of Mr Davis' evidence), only broadleaf is ranked as having 'low' flammability and thus is generally suitable for planting within 'defensible space'. Other practices, such as maintenance of lawns, paths, drives, and cultivated soils are all practical alternative methods for potentially helping to retard the spread of fire into defensible space⁵. Species such as fierce lancewood, ribbonwood, and narrow-leaved lacebark have low/moderate flammability, and are suitable for planting in defensible space so long as dead material and litter is removed, more than four metres is left between tree canopies, and trees are not planted within 10 metres of structures⁶.
- 22 While Mr Davis believes that broadleaf, pittosporum (kōhūhū), fierce lancewood, and matai may be difficult to establish, even with irrigation (paragraph 3.23), in my opinion all have good potential for establishment at the site, so long as they are protected from rabbit browse until sufficiently sized

⁵ National Rural Fire Authority 2004: Firesmart. Protecting our communities from interface fires. National Rural Fire Authority, Wellington.

⁶ National Rural Fire Authority 2004: Firesmart. Protecting our communities from interface fires. National Rural Fire Authority, Wellington.

to resist rabbit browse effects. Broadleaf and kōhūhū have both established without assistance elsewhere on the Allenby Farms site.

Response to the evidence of Ms Mellsop

- 23 I have been requested to comment, from an ecological viewpoint, on paragraph 3.30 of Ms Helen Mellsop's rebuttal evidence where she comments on the predominately bright or light green foliage of the proposed revegetation species which she considers would contrast with the dark khaki of the kānuka and would likely result in "distinct islands of contrasting vegetation".
- 24 Based upon my statements above about flammability, indigenous tree species within 10 metres of any boundary should be limited to broadleaf, and the other recommended tree species should be planted at least 10 metres from any building. I agree with Ms Mellsop that the greener foliage of the recommended species would be different from the darker brown colour of the kānuka, just as the greener foliage of wilding conifer trees would similarly contrast. However from an ecological point of view I believe that planting of ecologically appropriate indigenous tree species other than kānuka would provide a superior outcome.
- 25 I have seen a copy of the proposed rule which requires retention of native vegetation outside building platforms and vehicle access ways, and would prohibit steps being taken to prevent natural native revegetation. I note that the rule does not require or refer to planting of kānuka and I support that.
- 26 In my opinion the future lot owners should be encouraged to plant different native species (beyond the 10 metre limit) along the edge of, and within, the surrounding kānuka woodland. Over time that would result in other indigenous species becoming established within and further spreading through the existing kānuka woodland and, after several decades would result in a mixed kānuka-broadleaved forest. In the long term (100 years or more) the existing kānuka woodland may be largely converted to indigenous forest.
- 27 The approach I have recommended above would have the following advantages:
- (a) The introduction of indigenous tree species into the kanuka would reduce the overall flammability of the vegetation surrounding the building platforms;

- (b) The gradual spread of a range of indigenous trees of different colour, texture, and shape, would offset any tendency towards the 'contrasting islands of vegetation' of concern to Ms Mellsop;
- (c) Over time, a more representative indigenous forest would develop on the lower slopes, as I have explained above, and provide seed sources for natural colonisation by these tree species of other suitable habitats on Mt Iron.
- (d) A more diverse forest would create more habitat diversity than the kanuka woodland, and increase the habitat value of the site for indigenous forest birds and invertebrates.
- (e) As a member of the Myrtaceae plant family, kanuka is susceptible to myrtle rust (*Austropuccinia psidii*), which has recently invaded New Zealand. The Ministry of Primary Industries is currently advising people to avoid planting species within the Myrtaceae family. As the tree species I have recommended for planting at Mt Iron are not members of the Myrtaceae, they will not be affected by myrtle rust, and provide greater resilience to indigenous tree cover at the site.

Ecological management plan

- 28 I have been requested to provide brief evidence about the Ecological Management Plan approved for the Little Mt Iron property under RM 130177 which I understand must be implemented if the house approved under RM 130177 is constructed. I was the author of that plan⁷.
- 29 The plan includes woody weed control, rabbit and hare control, grassland management, planting to increase biodiversity over the wider site, planting of low flammability species around the proposed building site, and planting guidelines. An implementation strategy and work programme was developed for the first five years.
- 30 As the Ecological Management Plan for the Little Mt Iron property contains very similar elements to what is required for the Mt Iron property owned by Allenby Farms, it would be less cumbersome for ecological management of both properties to be managed under a single, integrated plan.

⁷ Wildland Consultants 2016: Environmental management plan for Little Mt Iron, Aubrey Road, Central Otago. *Wildland Consultants Contract Report No. 3722*. Prepared for Kate and Peter Martin.

