

UNDER

The Resource Management Act 1991

IN THE MATTER

of the Proposed Otago Regional Policy
Statement 2021

STATEMENT OF EVIDENCE OF KELVIN MICHAEL LLOYD

Dated 29 September 2022

ROSS DOWLING MARQUET GRIFFIN
SOLICITORS
DUNEDIN

Telephone: (03) 477 8046
Facsimile: (03) 477 6998
PO Box 1144, DX YP80015

Solicitor: A J Logan

STATEMENT OF EVIDENCE OF KELVIN MICHAEL LLOYD

Qualifications and Experience

1. I hold the degrees of Bachelor of Science with First Class Honours (1996), and Doctorate of Philosophy (2000), both obtained from the University of Otago, where my studies were undertaken at 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 by Wildland Consultants Ltd from 2004 to the present, based in Dunedin, and my current position is Senior Principal Ecologist.
2. I am an author of 22 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 Biosecurity Institute, the New Zealand Native Forest Restoration Trust and the New Zealand Plant Conservation Network.
3. I have considerable experience in biodiversity offsetting, having led several Wildlands projects, contracted by the Department of Conservation, to assess the utility of biodiversity offsetting in New Zealand. This included investigation of options for generation of biodiversity credits¹, developing a case study biodiversity offsetting approach for the proposed Escarpment Mine², assessing the selection

¹ Wildland Consultants 2011: Options for calculation and use of biodiversity credits generated by Yellow-eyed Penguin Trust conservation activities. *Wildland Consultants Contract Report No 2554b*. Prepared for the Department of Conservation. 29 pp.

² Wildland Consultants 2011: Biodiversity offsetting models for the Escarpment Mine project, Denniston Plateau, Westland. *Wildland Consultants Contract Report No. 2653*. Prepared for the Department of Conservation. 38 pp.

and weighting of biodiversity offsetting attributes³, and comparing and contrasting the results of three offsetting pilot projects⁴. I routinely provide technical advice to other Wildlands staff on the design of robust biodiversity offsetting approaches.

4. In 2017 in my Environment Court evidence on the application by Bathurst Resources for the proposed Escarpment Mine near Westport, I provided a detailed critique of the Applicant's biodiversity offsetting approach. That offsetting approach was subsequently withdrawn from evidence by the Applicant. In 2019 I provided evidence on biodiversity offsetting and compensation on behalf of the Director-General of Conservation at the Notices of Requirement (NOR) Environment Court hearing for the proposed Manawatu Gorge highway realignment. In 2020 I reviewed an offsetting approach for a wetland affected by roading in Invercargill.
5. In 2006 I compiled a vegetation rehabilitation plan for Oceana Gold (New Zealand) Limited ("OGL") to address rehabilitation of post-mining landforms for the Macraes gold mine in Otago, but to the best of my knowledge this was not implemented. I have also assisted Waitaki District Council with the processing of resource consent applications from Oceana Gold Ltd for the Macraes Phase III, Coronation North, Coronation North extension, and Deepdell North extension mining applications.
6. 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 Northland, Auckland, Hawkes Bay, Wairarapa, Horowhenua, Wellington, Chatham Islands, Marlborough, Nelson, Canterbury, Buller, Westland, Otago, and Southland. I am an author of almost 320 contract reports covering these assessments and I have prepared expert evidence in 34 Environment Court or similar cases in relation to these projects.

³ Wildland Consultants 2012: Selection and weighting of attributes for use in biodiversity offsetting currencies. *Wildland Consultants Contract Report No 2946*. Prepared for the Department of Conservation. 23 pp.

⁴ Wildland Consultants 2012: Comparing and contrasting biodiversity offset pilot case studies for the Hunua Quarry, Tahurangi Eco-resort, and the proposed Escarpment Mine. *Wildland Consultants Contract Report No 2857*. Prepared for the Department of Conservation. 48 pp.

Code of Conduct

7. I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses, contained in the Environment Court Practice Note 2014. I have complied with the code in preparing my evidence. Other than where I state that I am relying on the advice of another person, I confirm that the issues addressed in this statement of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

Scope of Evidence

8. This statement of evidence focuses on the following:
 - 8.1. Assess submissions on APP2 Significance criteria for indigenous biodiversity, APP3 Criteria for offsetting, and APP4 Criteria for compensation.
 - 8.2. Provide advice on definitions of 'indigenous species' and 'naturally rare' and advise on proposed policies relating to indigenous biodiversity.
 - 8.3. Provide advice on other definitions in the pORPS21.
 - 8.4. Provide advice on whether 'any decline' or 'any reduction' is preferable in Policy ECO-P3(1)(a).
 - 8.5. Provide advice on the definition of 'indigenous vegetation'.
 - 8.6. Provide advice on the definition of 'occupancy'.
 - 8.7. Provide advice on the wording of ECO-P8(2).
 - 8.8. Respond to issues raised by OGL in its letter dated 21 July 2022.
9. In my evidence I use the term 'SNA' for sites that were assessed by Wildlands staff (by myself and colleagues) as significant natural areas in district-wide survey programmes, and 'significant areas' for areas identified as significant by ecological experts during consenting processes.

10. In compiling this evidence, I was provided with the Annual Ecological Reporting for OGL from 2015-2021 and have commented on these in my evidence.

Reports

11. I prepared the following reports:
 - 11.1. *“Mapping of Significant Habitats for Indigenous Fauna in Terrestrial, Freshwater, and Marine Ecosystems in Otago Region”* dated July 2020;
 - 11.2. *“Mapping of Potential Natural Ecosystems and Current Ecosystems in Otago Region”* dated July 2020;
 - 11.3. *“An Overview of the State of Indigenous Biodiversity in the Otago Region”* dated March 2021;
 - 11.4. *“Ecological Advice on Indigenous Biodiversity Provisions in the Proposed Otago Regional Policy Statement”* dated February 2021; and
 - 11.5. *“Ecological Advice on Biodiversity Policy in the Proposed Otago Regional Policy Statement”* dated April 2022 (“Wildlands April 2022 report”).

Definitions

12. After submissions had closed, I was requested to provide additional advice on definitions.

Indigenous fauna

13. In my opinion the definition of *“indigenous fauna”* proposed by the Department of Conservation in its submission, set out below is appropriate because it has a clear meaning and refers to natural occurrences of indigenous fauna, which is important:

“means animals, including fish and invertebrates, that, in relation to a particular area, are native to the ecological district in which that area is located.”

Indigenous vegetation

14. DOC sought to have “*indigenous flora*” replaced with “*indigenous vegetation*”. In my opinion the definition of “*indigenous flora*” should be replaced with “*indigenous vegetation*” because flora refer to plant species themselves, while vegetation refers collectively to a community of plant species.
15. I provided advice on a definition of “*indigenous vegetation*” suggested by QLDC:

“Means vegetation that occurs naturally in New Zealand or arrived in New Zealand without human assistance including both vascular and non-vascular plants.”
16. I advised that the definition was reasonable, but could capture indigenous species that are not naturally found in Otago, e.g., rangiora (*Brachyglottis repanda*), which has become naturalised in the Dunedin area and often requires control. Use of this definition in district plans could mean that clearance of weedy non-local indigenous species is restricted by vegetation clearance rules. An ecological district framework can help to resolve this, by requiring plants to be naturally occurring within the relevant ecological district.
17. I subsequently provided advice on another suggested definition of “*indigenous vegetation*”:

“Indigenous vegetation: Means vascular and non-vascular plants that, in relation to a particular area, are native to the ecological district or bioregion (whichever is applicable to the area) in which that area is located.”
18. I suggested it could be amended to make it more concise. I later confirmed that non-vascular plants should be included in the definition, because in dryland parts of Otago, bryophytes can make up a sizeable proportion of indigenous vegetation cover. The amended definition I proposed is:

“Means vascular and non-vascular plants that, in relation to a particular area, are native to the ecological district or freshwater or marine bioregion in which that area is located.”

19. This definition resolves the issue with indigenous species not naturally present in Otago, by requiring them to be naturally occurring in the areas they are found in. The definition also extends the definition to indigenous vegetation in freshwater and marine habitats, where non-vascular plants such as algae are more important.

Occupancy

20. I advised that 'occupancy' could be defined as 'the number of sites occupied in Otago'. This would mean that to assess the effectiveness of ECO-O2, an increase in the number of sites occupied in Otago would be required. The same applies to Policy ECO-P8 where it refers to occupancy. An increase in the number of sites occupied would generally mean the overall population size is also increasing.

Policies

21. The Department of Conservation requested that ECO-P8(2) be amended to refer to "*ecosystem functions*", and not be restricted to "*important ecosystem functions*". At the time I supported this suggestion because ecosystem functions such as pollination, regeneration, succession, carbon storage, and nutrient cycling are generally held to be important *per se*, as they enable ecosystem services that maintain conditions suitable for human life. However, on further consideration, the word 'important' does not need to be removed if ecosystems are important *per se*.
22. I also advised that Policy ECO-P3(1)(a) was best retained, and that 'any reduction' had a better fit to it than 'any decline'. This is because 'reduction' has a better relationship to 'areas' such as the area of SNAs referred to under ECO-P3(1)(a).

OGL

23. In a letter dated 21 July 2022, OGL listed a number of concerns relating to the advice contained in the Wildlands April 2022 report I address these below.

All OGL's developments take place on land owned by OGL, and areas previously consented for mining, such as the Deepdell North mine site qualify as SNA.

Therefore, where the Wildlands report states that the Deepdell North Stage III project did not affect any SNAs, this is incorrect⁵.

24. The discussion of the Waitaki SNA programme in the Wildlands report relates to potential SNA sites that were assessed under that programme, and which have not yet been incorporated as SNAs into the Waitaki District Plan. It is in this context that the report states that no SNAs were affected by the Deepdell North project. The intention was not to imply that no significant ecological values are present on OGL land. As stated in the report:

“The areas Wildlands assessed as SNAs in Macraes Ecological District are mostly relatively small, discrete areas, and collectively cover only a small part of the ecological district. Many landholders refused to provide access for SNA surveys, and no surveys were undertaken on land owned by Oceana Gold.”

25. I am aware that other areas of habitat on land owned by OGL would qualify as ecologically significant under s 6(c) of the RMA. For example, all of the areas protected by OGL as ‘averted loss’⁶ compensation for the effects of mining contain areas that are ecologically significant. At the Deepdell North mine site, only limited areas would qualify as ecologically significant in my opinion, these being the seven ephemeral wetlands and small areas of more diverse indigenous shrubland and rock outcrop habitat which respectively meet the rarity and ecological context criteria in Appendix 4 of the operative Otago RPS. I am aware that OGL’s consultant classified ‘low producing grassland’ at Deepdell North as ecologically significant, but I do not share that view, as in my opinion the ecological values of the low producing grassland did not meet any of the Otago RPS ecological significance criteria.

Previous developments at Macraes have demonstrated that unavoidable residual adverse effects are able to be offset and compensated to produce net positive outcomes for biodiversity⁷ and while offsetting and compensation proposals may have often been very poor in New Zealand, the offsetting and compensation

⁵ OGL’s letter dated 21 July, page 4, bullet points 1 to 3

⁶ ‘Averted loss’ comprises legal protection to avert the future loss of indigenous vegetation and habitats, and thus reduces the background rate of loss in the ecological district.

⁷ OGL’s letter dated 21 July, at page 3, bullet point 4

activities undertaken by OGL at Macraes demonstrate how these can be done successfully⁸.

26. In my opinion offset and compensation at previous OGL developments at Macraes have not demonstrated net positive outcomes for indigenous biodiversity. Unavoidable adverse effects have largely been addressed through 'averted loss' protection of other areas of indigenous vegetation and habitat. They are 'like for unlike' forms of compensation, and not offsets, that cannot demonstrate net gains for indigenous biodiversity because they result in trade-offs between losses and gains of different kinds of indigenous biodiversity. None the less I consider that the 'averted loss' protection of other areas of indigenous vegetation and habitat has been a very positive effect, particularly because there were previously few other protected areas in the northern part of Macraes Ecological District, in the north-western part of the Waihemo/Shag River catchment.
27. Despite the 'averted loss' protection of other areas, OGL developments at Macraes have generally resulted in net losses of many elements of indigenous biodiversity, and a formal offsetting approach has only been used in one consent application.
28. By way of example, OGL's Macraes Phase III (2011) development that I and other Wildlands staff helped audit, included development of a new tailings storage facility in the upper Tipperary Creek, expansion of existing mining pits, new waste rock stacks, and extensions to existing rock stacks, which would potentially generate substantial adverse effects on indigenous biodiversity values. Not all of the proposed activities were undertaken, but the new Tipperary Creek tailings facility affected a sizeable area of tussock grassland vegetation and gully wetlands, and the Frasers East Waste Rock Stack destroyed a large ridge top ephemeral wetland. Effects were primarily addressed by offsite 'averted loss' protection of three relatively small areas of indigenous habitat. There was a net loss of tussock grassland, wetland, and shrubland habitats, and of avifauna populations and lizard populations⁹. The 2021 annual compliance report showed that shrubland planting in the Highlay Creek covenant, one of the averted loss sites, still had not been undertaken in

⁸ *ibid* at page 4, bullet point 6

⁹ Wildland Consultants 2011a: Review of Oceana Gold Macraes Phase III project ecological assessments (updated 25 July 2011). *Wildland Consultants Contract Report No. 2657e*. Prepared for Waitaki District Council. 12 pp.

2021. Wildland Consultants (2011)¹⁰ suggested that a rehabilitated tussock grassland corridor be established along the realigned Macraes-Dunback Road, to create a permanent and semi-continuous corridor of indigenous vegetation through the anticipated heavily-modified area after mining. This suggestion was not adopted, but planting of indigenous trees and shrubs along the margins of the tailings facility was undertaken.

29. Further specific examples of OGL mining consent applications that I and other Wildlands staff have been involved in are discussed below.

The Deepdell North III project affected significant indigenous vegetation and habitats, but adverse effects were addressed by offsetting and compensation proposals that were a good outcome for indigenous biodiversity¹¹.

30. Deepdell North (2020): Effects management at Deepdell North comprised 'averted loss' protection of an offsite Redbank ecological enhancement area, a research project on distant ephemeral wetlands, important plant propagation and relocation, and creation of lizard habitat. These activities were viewed as potentially compensating for many of the adverse effects of the project, though subject to significant risks and uncertainty. The project is predicted to result in loss of seven naturally uncommon and critically endangered ephemeral wetlands and this loss would be contrary to the 'no loss of extent' provision in Policy 6 of the National Policy Statement for Freshwater Management. The offsetting approach used for all habitat types used simplistic metrics (indigenous cover and species richness) often with inflated benchmarks and unrealistic values for other parameters and did not address indigenous fauna or rare plant species. For example, a simplistic species richness metric means the identity of species is concealed, so loss of rare species could be substituted for gain in a common species, but this would not be recognised in the offsetting outcome. As such, the offsetting approach incorporated concealed trade-offs (such as substitution of species) and was an example of low-quality offsetting practice. The 2021 annual compliance report shows that establishment targets have been met for six translocated plant species, but less than 15% survival has resulted for four planted species, and many plant species had not yet been planted. For example, the Coronation

¹⁰ Wildland Consultants 2011a: Review of Oceana Gold Macraes Phase III project ecological assessments (updated 25 July 2011). *Wildland Consultants Contract Report No. 2657e*. Prepared for Waitaki District Council. 12 pp.

¹¹ OGL's letter dated 21 July, at page 4, bullet point 4

North Extension consent condition 15.3 required translocation and/or cultivation of three plant species, *Aciphylla subflabellata*, *Deyeuxia quadriseta*, and *Epilobium insulare*. In 2021, the establishment targets specified in condition 15.5 had been met for *Aciphylla subflabellata*, but all planted *Deyeuxia quadriseta* and *Epilobium insulare* had died and successful establishment had not been achieved for these species.

*Residual adverse effects on significant biodiversity have been successfully addressed at other recent OGL mining projects, such as the Coronation and Coronation North mines*¹².

31. Coronation Mine (2013): The application had an insufficient description of ecological values, and the consented mine resulted in a net loss of indigenous biodiversity¹³. For example, rock outcrop habitat, an ephemeral wetland, a *Carex*-dominant wetland, an *Olearia bullata* shrubland, and several locally uncommon, At Risk, and Threatened plant species were destroyed by mining. All of these values met ecological significance criteria. No corresponding offset or compensation was provided to the best of my knowledge.
32. Coronation North mine (2016)¹⁴: Legal protection of Highlay Hill and Island Block as 'averted loss' compensation of dissimilar biodiversity, with translocation of some rare plant species. Net loss of several At Risk and locally uncommon plant species, and of indigenous invertebrates, non-vascular plants and lichens. Workable effects management was suggested for lizards but with uncertain outcomes, and rock stacks that would be created for lizard habitat had not been completed in 2021¹⁵. The conditions do not appear to place time-bounds on completion of actions on the ground.
33. In general, the Wildlands role in these consent application processes finished once the resource consent was granted with finalised conditions. Conditions of consent often required monitoring and reporting actions, but

¹² ibid at page 4, bullet point 5

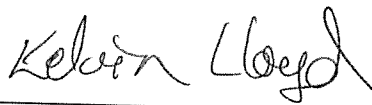
¹³ Wildland Consultants 2013: Supplementary review of the ecological assessment of the proposed Coronation Mine, Otago. *Wildland Consultants Contract Report No. 3195d*. Prepared for Waitaki District Council. 12 pp.

¹⁴ Wildland Consultants 2016: Review of terrestrial ecology evidence provided by the applicant and the Department of Conservation for the Coronation North mine consent application. *Wildland Consultants Contract Report No. 4034b*. Prepared for Waitaki District Council. 12 pp.

¹⁵ Annual Ecological Report 2021 [spreadsheet based]. Overview of compliance with consent conditions 02 August 2021.

to date Wildlands has only been asked to comment on a wetland management plan specified by conditions of the MPIII consent.

34. If rare plant relocations had been incorporated into a robust offsetting currencies, the offsetting currencies could have generated standards to be used in assessing compliance. Typically, offsetting currencies utilise a discount rate that penalise delays in implementing offset actions. Delays in implementing the offset might require a larger area to be planted, or additional plants planted.
35. I understand that OGL seeks to have access to the full mitigation hierarchy for adverse effects of mining on significant indigenous vegetation and habitats. If mining is included as an activity that has such access, then strong standards in APP3 offsetting and APP4 compensation criteria will be required to ensure that significant values are maintained. The effectiveness of the standards proposed in APP3 and APP4 should be evaluated over time, and stronger standards developed if offsetting and compensation outcomes do not maintain ecologically significant values.



Kelvin Michael Lloyd

Dated: 29 September 2022