Proposed Otago Regional Policy Statement 2021

Response to Minute 12 by Dr Kelvin Lloyd

Commissioner Cubitt's Questions

1. *The starting point for determining the level of decline in biodiversity in Otago appears to be based on ecosystems that would have occurred in Otago prior to human settlement (Appendix 13 to the Section 32 Evaluation). Paragraph 51 of the s42 Report refers to your Overview report and infers that biodiversity decline is 'reflecting the current effects management framework is failing to protect and maintain indigenous biodiversity in the Otago region'. As a practitioner in the region for over 30 years, this does not reflect my experience of biodiversity management in the region, at least over the last 20 years. It would seem to me from reading Appendix 13 to the Section 32 Evaluation that the majority of the decline occurred prior to this, given Central Otago was originally covered in forest before humans arrived (your reference to McGlone (2001) 'Eight hundred years of fire and 150 years of pastoral development have obscured the original vegetation patterns of the south eastern South Island'). Such a massive area of change would significantly affect the biodiversity decline in the region if this is where the baseline has been set.*

   Can you clarify from what point the 'decline' has been measured? And if it is based on prehuman conditions, what percentage of the decline has occurred under 'current effects management framework' (i.e. since the RMA came into force)?

   Response

   The most significant decline was the loss of forest cover in the drier and coastal parts of Otago since human arrival in Aotearoa. Inland areas were deforested earliest, by Polynesian settlers, whereas coastal forest was largely deforested by European settlers.

   There has been ongoing recent decline in the cover of indigenous ecosystems in parts of Otago in the last 20 years. These include in Macraes Ecological District where pastoral farming and mining have caused significant recent loss of indigenous vegetation, and in the Wanaka Basin, where the advent of pivot irrigation resulted in significant loss of outwash plain ecosystems. Both areas are 'hot spots' for Threatened and At Risk plant species and Otago now retains only fragments of outwash plain habitat.

2. *How do you reconcile the statement at section 6 page 16 of the Appendix 13 to the Section 32 Evaluation (and highlighted again at page 10 of Appendix 17) that there is now 300,000 hectares of tall tussock grassland in Otago more than there would have been historically with the conclusion of the Appendix 14 report where you say this tussock grassland has experienced considerable recent loss of extent?*

Response

Tussock grassland in alpine areas and in rock outcrop habitats expanded significantly into areas deforested by Polynesian settlers. i.e. this tussock grassland is present below treeline in areas that formerly supported forest.

In the last 50 years, there has been significant loss of tussock grassland extent at lower elevation, for example in Macraes Ecological District, in the area between Maungatua and the Lammermoor Range, and as a general elevational retreat up mountain slopes in inland Otago.

The 300,000 hectares of snow tussock grassland that remain below treeline are now mostly at higher elevation.

3. *Why is it being prioritised for identification as a significant natural area under ECO-M2 given how extensive it is? This issue is potentially compounded by the fact that much of these tussock grasslands are in Central Otago, most of which is pastoral farming land. This land was generally not forested when pastoral farming began in the interior of the Otago (and the South Island in general) (i.e. the pre-human natural diversity was already well below the 20% before pastoral farming began) so would tussock in this environment fall under the Rarity criteria(d) (ii)?*

Response

Good question. I don't believe tussock grassland in general should be specifically prioritised for protection, though as indigenous vegetation it provides habitat and also enables a successional pathway to woody indigenous vegetation. While the tussock grassland below treeline is mostly not representative, important examples of it would meet rarity, diversity, or ecological context criteria.

4. *If tussock is not within the 'below 20%' threshold', what is bearing in mind that the reports essentially say that very little, if any, of that pre-human vegetation is left?*

Response

The pre-human indigenous vegetation cover below treeline in Otago would have been very different to what is currently present; all areas currently covered by pasture would once have been forest. In that sense indigenous vegetation has been significantly reduced below treeline. Tussock grassland could still be captured as below 20% indigenous vegetation cover in ecological districts where indigenous cover has been more strongly depleted, for example in the Macraes Ecological District or Maniototo Ecological District.

5. *Is there a case for a biodiversity management approach in this environment to be more about achieving wider environmental goals such as soil and water quality enhancement, as opposed to purely biodiversity gain, given it is a relatively modified, food producing environment?*

Response

These outcomes are interrelated and to get the best results should be managed together. Achieving improvements to soil and water quality can provide leverage for restoration of indigenous biodiversity in landscapes that have little indigenous biodiversity remaining.

6. *In the executive summary of the Appendix 14 to the Section 32 Evaluation, you say that coastal forest has been significantly depleted in Otago. In the context of the South Island, the Catlins coastal forest would appear to be the most significant area of such forest left. Historically, when has the depletion of the coastal forest occurred? And what is the evidence you refer to at section 5.2 page 11 of 'recent clearance' in the coast?*

Response

The depletion of coastal forest has largely occurred since European settlement. Recent clearance has largely been of saltmarsh vegetation on the margins of estuaries, through deposition of fill or creation of bunds to block intrusion of saline water.

7. *At section 5.4 of Appendix 14 to the Section 32 Evaluation you observe that limestone ecosystems generally have little indigenous cover remaining and they have also been identified as a priority ECO-M2. Given Otago's main area of limestone landforms no longer reside within the Otago Regional Council boundary (because much of North Otago has been transferred into the Canterbury Regional Councils jurisdiction), how significant is this as an issue in Otago?*

Response

Otago retains limestone ecosystems in the Waihemo/Shag Valley in Waitaki District and in North Otago. During SNA surveys in the Waihemo Valley access was denied to most examples of limestone habitat, and limestone habitats on only one property were assessed. Limestone habitats in this area are poorly known as a consequence. Otago Region also still contains considerable areas of limestone habitat in North Otago, in for example between Weston and Island Cliff.

8. *At section 3.5 of Appendix 14 to the Section 32 Evaluation, you refer to 13 indigenous fish species being threatened or at risk, the most in NZ. Is this due to trout/salmon predation or are there wider environmental issues at play here?*

Response

I'm not a freshwater expert but from what I understand predation by salmonids is a big issue for the threatened inland galaxiid fish which Otago is notable for.

9. *In the second paragraph section 3.5 of Appendix 14 to the Section 32 Evaluation, you refer to several rivers and at 3.7.4, to the Tahakopa and Tautuku estuaries. The vast majority of these areas would appear to be within land already protected or owned by the Crown (e.g. riverbed)? Can you confirm this. Likewise, the environments identified in bullet points 1, 2, 4, and 8 of the Conclusion at page 15 of the Appendix 14. If so, what is the role of local authorities in relation to these environments?*

Response

The Hunter River catchment predominantly comprises conservation land but the western valley floor does not comprise conservation land.

The upper Makaroa River, Wilkin River, catchments are contained within Mt Aspiring National Park, but in the lower catchments the valley floor does not comprise conservation land.

Similarly only the upper reaches of the West Branch and East Branch catchments of the Matukituki River are located within Mt Aspiring National Park, the valley floors lower down not comprising conservation land.

The Dart River catchment is relatively well-protected in its upper and mid-reaches but its lower reaches are not located on conservation land.

Most of the Rees River catchment is not located on conservation land.

The valley floors of the Caples River and Greenstone River are not located on conservation land. Sizeable parts of their lower catchments do not comprise conservation land.

The Nevis River catchment contains some conservation land but is mostly not on conservation land.

The higher elevation parts of the upper Manuherikia River catchment are located on conservation land, but the lower parts are not.

Relatively little of the Clutha River catchment is protected as conservation land, and generally at higher elevation.

The Tautuku Estuary and Tahakopa Estuary are partly surrounded by conservation land.

Concluding bullet points

Bullet point 1 relates to extensive tracts of indigenous vegetation along the Main Divide, and these areas are well-protected.

Bullet point 2 relates to alpine grassland and herbfield of the Central Otago block mountains, and these habitats are relatively well-protected as conservation land, apart from the Rough Ridge and Raggedy Range which only small areas of conservation land on them.

Bullet point 4 relates to inland saline habitats. Twenty four of these have been identified in Otago, of which only five are located on conservation land.

Bullet point 8 relates to nationally significant forest habitats for species such as mohua, kea, kaka, Tautuku gecko, and long-tailed bat. These habitats are mostly protected by being located on conservation land.

In summary, the headwaters of many of the important rivers in Otago have protected catchments, but their valley floors and lower catchments generally do not. Large tracts of forest and alpine habitat are generally well-protected as conservation land. Indigenous vegetation and habitats on the Central Otago basin floors and lower slopes are poorly protected, and these areas provide landforms on which naturally uncommon ecosystems such as ephemeral wetlands and inland saline habitats are found.

Local authorities control land use which can significantly affect water bodies and naturally uncommon ecosystems.

10. *Where are the majority of the 'ephemeral wetlands' that are of concern? At around 3,000, they do not appear rare and are likely to be located within protected areas or pastoral lease country, where land development is controlled. How are they 'critically endangered' in Otago? Would the NPS-FW not apply here also?*

Response

The majority of ephemeral wetlands in Otago are found in Macraes Ecological District and on the Rough Ridge and Raggedy Range, but they can also be found at lower frequency on the coastal hills north of Dunedin and in western areas such as the Shotover Valley. While around 3,000 ephemeral wetlands have been mapped in Otago, they are mostly very small and total only around 300 hectares. Apart from a few examples, these wetlands are not well-known, but many of those in Macraes Ecological District have been invaded by exotic pasture grasses and would not be captured by the NPS-FM 'inland natural wetland' definition, which has an exemption for improved pasture. None the less, many of these pasture-dominated ephemeral wetlands still provide habitat for Threatened and At Risk plant species, and many of these species are not found in surrounding habitats. Nationally, ephemeral wetlands are critical habitats for Threatened and At Risk plant and bird species. Most of Otago's ephemeral wetlands are located on private land. Their location on basin floors and on broad ridges makes them vulnerable to cultivation.

11. *In terms of ECO-M5(7) how would you measure/define/determine an appropriate buffer? Would this approach be permitted under the NES for forestry?*

Response

ECO-M5(7) relates to buffer zones around SNAs where necessary to protect them. As SNAs can comprise a range of different habitats and experience different threats in different parts of Otago, it is not a simple exercise to determine an appropriate buffer without site context. Some scenarios might be helpful. For an SNA comprising indigenous forest surrounded by grazed pasture the main threats might be from stock and herbicide spraying. A stock-proof fence would be a sufficient buffer against the effects of domestic stock, but a wider buffer might be necessary to prevent spray drift. For an SNA comprising dry outwash plain vegetation in Central Otago, the main threat might be irrigation, and a buffer of 20 metres or more from irrigation might be necessary to protect the significant values of such an area.

The NES for plantation forestry permits incidental indigenous vegetation clearance to areas of indigenous vegetation within or adjacent to forestry operations. Requiring buffers would not appear to be consistent with this activity status of incidental vegetation clearance.

12. *I note that the Joint Witness Statement (JWS) has recommended that the reference to 'original natural diversity' in Representativeness criterion (a) be changed to 'pre-human natural diversity' and that the extent of degraded habitats that would be caught under this criterion has been clarified. The criterion still relates to an 'ecological district'. Has the entire region been assessed/broken into ecological districts? [I note the McEwen document referred to in the JWS seems to identify such districts for the entire Otago region, but it does not seem to contain information on them]*

    What is the relevance of ecological districts in this context, particularly when there may be far better examples of the same SNA in another ecological district? This question is also applicable to Rarity d(i) which also refers to ecological districts.

    Response

    Ecological districts have been mapped nationally and fully cover Otago. Some ecological districts will be wholly contained within Otago, others will overlap into adjoining regions. Summaries of the features of all ecological districts are available.

    Ecological districts is a biogeographic framework which is recognised and accepted nationally among experts. The relevance of ecological districts is that they distinguish landscapes with different landforms, soil, climate, and vegetation, and thus provide an ecologically-relevant sub-regional scale for assessment. Evaluations at this scale are necessary if the full range of Otago's indigenous biodiversity is to be managed and protected.

13. *As discussed in questions 1 and 2 above, much of the land in central Otago was under forest cover in pre-human times. How much of the land in Otago is likely to fall under the Rarity criterion (d) (ii)? And what does 'land environment' mean in this context?*

    Response

    Indigenous forest and scrub is estimated to have covered 2,316.720 hectares of Otago prior to human colonisation, approximately 75% of Otago. Land environments are from Land Environments of New Zealand, a national-scale framework based on climate, soil, and tree distributions, that differs from ecological districts in that its units are not discrete – land environments of the same type can be found scattered across many regions. The Threatened Environment Classification is based on land environments, and maps indigenous cover on these to determine land environments that retain less than 20% of their original indigenous cover. These land environments are generally located at lower elevation on basin floors and plains, and their foothills.

    As these land environments have lost most of their original indigenous cover, Rarity criterion (d) (ii) would not capture extensive areas, but would capture what indigenous vegetation remains on these land environments.

14. *Would Rarity criterion (d) (i) also cover non-indigenous 'areas' (such as plantation forestry) that support threaten species such as Karearea and South Island robin (toutouwa)?*

    Response

    Technically Rarity criterion (d) (i) would capture areas such as plantation forest, but in practice ecologists would not normally evaluate such areas. To maintain populations of species such as karearea or toutouwai in these habitats, it is important that the land use does not change, but the forestry activity can still be undertaken within a framework that adds constraints such as not disturbing active nest sites.

15. *Why is subsection (ii) and (ii) necessary in the Rarity criterion (d) when (i) essentially covers the board?*

    Response

    Rarity subsection (1) does not cover the board, it only relates to Threatened, At Risk, and uncommon *species*. Rare vegetation is covered by subsection (ii), and originally rare ecosystems in subsection (iii). All three categories are necessary if these different attributes of rare species and rare vegetation and ecosystem types are to be captured by the criteria.

16. *What is the relevance of 'distributional limit' in the distinctiveness (f) criterion when climate change may impact on this? Also, would environments in (f)(iii) not be covered in other criterion?*

    Response

    National distribution limits are important because they represent the margin of a species' range. Marginal populations are often those that evolve more rapidly into different taxonomic units. Conserving populations at distribution limits thus promotes ongoing evolution.

    Criterion (f) (iii) relates to associations of species at a finer scale than, for example vegetation types, and they typically have not been classified as 'originally rare'. In practice, relatively few sites meet this criterion.

17. *What is meant in spatial extent terms (on the ground) by (g)(ii) in Ecological context criterion? Does this extend to any land?*

    Response

    The buffer area would be a zone of varying width depending on the ecological values within the adjacent significant area. It could extend to any land, but only if it contained buffering indigenous vegetation.

18. *In relation to the new criterion 'vulnerable and sensitive species' proposed by the s42A report, does this not cover all indigenous biodiversity? And will these areas not be covered under other criteria? (I note that the JWS agreed that this new criterion should be deleted but that was on the basis that it relates to managing effects)*

    Response

    It would only cover 'fragile' indigenous biodiversity. In addition to this criterion relating to managing effects, species that are fragile/sensitive and with slow recovery rates would often be captured by Rarity criteria, as they would be classified as Threatened or At Risk species.

Commissioner Kirikiri's Questions

1. *The only issue I want to raise is around biodiversity decline and mauri. How do you, for example, align what Ngāi Tahu is saying about the degradation of the mauri of the environment - particularly in the coastal environment - with what science is saying? There are bits of the mahika kai issue wrapped up in this as well. Do you have any views you would like to express about the alignment of matauraka Māori and science?*

    Response

    The coastal environment is degraded (there is little indigenous vegetation cover in the coastal environment, and estuary macrofauna indices indicate poor health in some estuaries) and the science is thus aligned with the views of Kāi Tahu ki Otago. Science would also support the integrated management approach that Kāi Tahu ki Otago desires for the coastal environment.

Commissioner Sullivan's Questions

1. *Dr Thorsen, in his evidence for Oceania Gold Limited (OGL), considered the spatial extent of the representativeness and rarity criteria in APP2 for the Otago Region. This sits alongside the work of Wildlands (Appendices 12 and 13 of the s32 report) to determine the extent of indigenous habitat. The approaches of Dr Thorsen and Wildlands are different, and Dr Thorsen is critical that the APP2 criteria could potentially result in large areas unnecessarily qualifying as SNAs. What is your view on Dr Thorsen's approach? Do you consider it to be an accurate estimate of the spatial extent of SNAs for the representativeness and rarity criteria?*

    Response

    Following expert conferencing, Dr Thorsen agrees with the representativeness criterion as reworded to specify 'pre-human' instead of 'original', and with tightening of the 'degraded sites' wording. He also agrees with Rarity (d) (i) which relates to Threatened, At Risk, and uncommon species.

    With respect to Rarity, the analysis in Dr Thorsen's evidence does not take into account that an important population must be present to capture habitats of At Risk species; The majority

of records in Table 2 of his evidence are of species with an At Risk classification (Relict, Recovering, Declining, and Naturally Uncommon are all subcategories of At Risk). Furthermore, mapping an area of 25 hectares or 100 hectares around each occurrence of a Threatened or At Risk taxon would vastly over-represent the actual extent of most of their populations (with the exception of matagouri, for which the national classification of At Risk-Declining does not fit well in Otago). It is also not clear whether this buffer area is restricted to indigenous vegetation or contains both indigenous and exotic vegetation.

Table 1 of Dr Thorsen's evidence purports to illustrate indigenous vegetation, but includes the 'low producing grassland' cover category which makes up 70% of his total area. This does not provide an accurate estimate of the area of indigenous vegetation cover in Otago, as while the 'low producing grassland' category does include indigenous plants and in some cases indigenous vegetation, most of it would not meet the definition of indigenous vegetation. An analysis of LCDB information must be used with caution because of the numerous thematic and spatial errors associated with LCDB polygons. Use of LCDB does not substitute for an on-the-ground evaluation.

For these reasons, the areas that Dr Thorsen lists in Table 3 of his evidence are not accurate.

2. *In your experience, how would a site be evaluated as an SNA? Would this typically involve an on-the-ground ecological survey? How is this undertaken if land access is not provided, or in those cases are the sites not evaluated?*

Response

In my experience, an evaluation of a potential SNA is done against district or regional plan criteria on the basis of a field survey of a site to identify, describe, and map its ecological values. This necessarily requires landholder consent for access to sites. If this is not provided, then no field survey is undertaken in our work for district councils.

It would be possible, in many cases, to evaluate some ecological significance criteria through a desktop process. But for most criteria a field evaluation is necessary.

3. *Biodiversity offsetting and biodiversity compensation are not defined in the Interpretation section of the pORPS. In response to a submission by QLDC, the s42A report at 10.3.1.2 provides little analysis as to why a definition of biodiversity offsetting is not defined. APP3 and APP4 provide guidance on when offsetting and compensation, respectively, can be used but do not provide a definition or principles for use. In your view, are biodiversity offsetting and biodiversity compensation accepted approaches which practitioners would have a common understanding of? If not, do you consider that the pORPS should define these terms? If you consider that a definition is required, would you recommend the NPSIB exposure draft definitions or something different?*

Response

A key problem with implementation of biodiversity offsetting approaches in New Zealand has been implausible net gain claims from offsetting models that do not sufficiently capture

indigenous biodiversity values. Any biodiversity value that is left out of an offsetting model is not accounted for and risks net loss.

Definitions of biodiversity offsetting and biodiversity compensation could help. The definition of biodiversity offsetting should stress measurable conservation outcomes. This is a key distinction from compensation which generally has un-measurable outcomes. The definition in the exposure draft of the NPSIB would help to ensure that measurable conservation outcomes are achieved by requiring that the offset must

> *achieve a measurable net gain in type, amount, and condition (structure and quality) of indigenous biodiversity compared to that lost*

This is strong wording which would assist the delivery of robust offsetting in Otago.

The biodiversity compensation definition in the NPSIB only refers to criteria and the mitigation hierarchy and has little utility in the Otago RPS given these matters are addressed elsewhere in the plan.

4. *How do you believe ECO-O1 will be achieved by a biodiversity compensation outcome?*

Response

As compensation could include many possible scenarios, including net loss of some biodiversity values. The key risk of compensation is that it allows non-measurable transactions involving indigenous biodiversity loss and gain. It is therefore hard to demonstrate whether such transactions are equitable. Non-equitable transactions would not be consistent with ECO-O1.

5. *Following from question 4, the effects management hierarchy in ECO-P6 would apply to a Lake Onslow scenario where it would appear offsetting may not be able to be achieved. Is biodiversity compensation realistic in that type of larger scale project setting?*

Response

Wildlands has advised MBIE that Lake Onslow scale effects should be offset as much as possible, but that there would be significant residual adverse effects that could only be compensated. A particular issue is the loss of extensive, diverse, and rare wetlands and while a range of compensation options would be available, a net loss of wetland condition and extent would be likely. For most other biodiversity features, compensation could likely result in outcomes that do not result in net loss of condition and extent.

Chair Ron Crosby's Questions

1. *In the Wildlands Report Appendix 10C to the s.42A report at para 3.12 the following statement was made:*

"Offsetting was originally conceived as relating to significant residual effects, but there are no practical reasons why it cannot address all residual effects."

a) *What are the practical reasons why offsetting should be required for all residual effects rather than only for significant residual effects?*

b) *When did such a change in conception occur, how was that resolved upon, and by whom, and in what process?*

Response

I was not stating that offsetting should be required to address all adverse effects, but that it could be used in this way. Biodiversity offsetting was originally conceived as applying to significant residual effects by the global Business and Biodiversity Offsets Programme (BBOP) in 2010. Department of Conservation guidance for New Zealand in 2014 followed this approach. The exposure draft of the NPSIB represents a change in thinking and now refers to offsetting and compensation being required to address 'more than minor' adverse effects. This represents a smaller scale of effects than significant adverse effects. Biodiversity offsetting is generally reserved for larger scale residual effects because it does require (if done well) additional collection and processing of data. For a small scale development this might require an additional day of time. The advantage of using offsetting to address smaller scale residual effects is that measurable outcomes should be obtained by using this data, which have utility for performance targets and verification.

2. *At para 5.8 of the Wildlands Report Appendix 10C to the s.42A report at p.26 the statement is made:*
"The ecological justification for this approach is that it will require potential adverse effects on irreplaceable and vulnerable indigenous biodiversity to be avoided, and this is consistent with the principles of biodiversity offsetting."

a) *Does that approach entirely align with the statements such as at para 5.7 of the same report that:*

"The key values of SNAs that need to be maintained are the significant values;..."

Or:

b) *in paragraph 35 of your supplementary evidence that:*
"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.

Response

Limits to what can be offset were originally conceived by BBOP as relating to vulnerable and irreplaceable biodiversity values and followed by the Department of Conservation guidance.

The exposure draft of the NPSIB goes further and places limits in relation to effects being uncertain but potentially significantly adverse, or where there are no feasible options to secure gains by offsetting.

The significant values within an SNA or at a site would include the vulnerable and irreplaceable values (if those values were present), so protection of vulnerable and irreplaceable biodiversity values is consistent with maintenance of significant values. In other words, significant values encapsulate a wider range of indigenous biodiversity values than vulnerable and irreplaceable values.

3. *At para 25 of your statement of evidence dated 29 September, 2022 you stated:*

"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."

a) *Is the Deepdell North mine site referred to in that paragraph the same as the Deepdell North Stage III project?*
b) *If so how do you reconcile the statement above with the statement in the Wildlands Report Appendix 10C at para 5.7 page 26 as follows:*
"The Deepdell North Stage III project, which the submitter notes was consented, did not affect any SNAs.

Response

Yes these are the same projects. My reference to SNAs related to SNAs proposed or defined in a district plan. Wildlands assisted Waitaki District Council in field surveys of potentially significant sites and the Deepdell North site was not one of the proposed or field-assessed sites. To me, an SNA is a defined site intended for scheduling in a district plan, whereas significant values are often present outside these areas, and could potentially become SNAs, but are not yet proposed for scheduling.

Dr Kelvin Lloyd

12 April 2023