

Before	the West Coast Regional Council
IN THE MATTER OF	the Resource Management Act 1991
And	
IN THE MATTER OF	the Proposed West Coast Regional Land and Water Plan – Plan Change 1

STATEMENT OF EVIDENCE OF DR JANE MARSHALL

On behalf of the DIRECTOR-GENERAL OF CONSERVATION (Submitter #14)

RECONVENED HEARING

DATED 14 January 2019

Department of Conservation

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Introduction

1. My full name is Jane Elizabeth Marshall. I refer to my original statement of evidence on 7 June 2018 for my qualifications and experience.
2. As previously noted, I have over ten years professional experience as a practicing ecologist working with wetlands of the West Coast. I have assisted the West Coast Regional Council with their work around the Land and Water Plan Schedule of Wetlands over the last five years by providing advice to its staff who lacked ecological knowledge and experience.
3. I have visited many of the Scheduled wetlands in the course of supporting the Regional Council staff. These site visits include eight of the of the fourteen wetlands reported on by the Council's contracted assessor, Ms Charlotte Phelps (the Assessor), in her report '*Schedule 2 Wetland Boundary Review 2018*'.
4. I have been asked to present my opinion on the methodology for the assessment of wetlands, the application of that methodology by the Assessor and her conclusions regarding wetland status of part or all of the fourteen properties reported on in Ms Phelps' report.
5. Although this is not an Environment Court hearing, I have read and agree to comply with the Code of Conduct for Expert Witnesses produced by the Environment Court. My qualifications as an expert are set out above, and in my statement of evidence dated 7 June 2018. Other than any matters identified within my evidence as being from other experts, I confirm that the issues addressed in this brief 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 expressed.

Process used to determine wetland status

6. The task assignment as described in the Brief for the Assessor¹ (referred to as the Brief) is appropriate from an ecological perspective as it provides:

¹ Appendix 1: Brief for the Assessor. Proposed Plan Change 1 to the Regional Land and Water Plan. Section 42A staff recommending report. Wetland Boundaries Review 2018. (The Brief).

- for the application of the statutory definition of a wetland but also notes that the definition is not exhaustive;
 - three key questions in the process of determining if an area is wetland or not.
 - a researched based tool, to assist in the delineation of wetlands (Clarkson, 2013).
7. The design, process and resources provided for the delineation of the wetlands in the Brief, are similar to those I used in assessments carried out with Regional Council staff from 2013-2017, as presented in my evidence statement in June 2018. As I described in my June statement, my role in the Regional Council's process was to advise their staff, who had limited ecological knowledge, in their assessments of wetland boundaries based on the evidence of hydrology and vegetation. In that process, my advice was given about a site, on the balance of evidence on site, of the combined hydrology, vegetation and effects of prior modification. Council staff were responsible for documenting the decisions and recommendations reached.
 8. The Brief appropriately recognises hydrology as the primary driver of wetlands and identifies the importance of plant and animal species as indicators of wetlands. The statutory definition of 'wetland' is provided, however the use of such a broad definition has proved difficult to apply consistently in the field (Clarkson, 2013). The supporting information in the Brief also states that this definition is not exhaustive.
 9. The Landcare Research tool for the delineation of wetlands (Clarkson, 2013) provides the rationale behind using plants as indicators of wetlands. It also provides a list of native plant species which are divided into classes based on their dependence on saturated soils and wetland habitats. These classes in order of dependence on water, either standing or ground water are:
 - obligate² wetland species

² "obligate" means able to exist under only one set of environmental conditions (Collins Concise English Dictionary, Third Edition, 1992)

- facultative³ wetland species
 - facultative species
 - dryland species.
10. The number and proportion of plants classified in this way allows for the Dominance and Prevalence tests for wetland *plant* species⁴ - which describe the proportion of wetland plant species at a site. Therefore, the ability to identify plants to species rank (not just family or genus rank i.e. grass, sedge or rush) and assess their abundance on site is important to providing a reliable conclusion when weighing the ecological evidence of hydrology, vegetation and fauna.
11. I agree with six of the fourteen assessments in the Report based on my knowledge of the sites and will not discuss these sites further. These sites are:
- MAIP003 Fletcher Creek
 - HOKP099 D Chinn
 - HOKP018 Whiley Creek
 - HOKP079 Cropp Road, Kowhiterangi
 - HOKP064 and 009 Totara lagoon
 - HAAP012 Turnball Waitoto
12. I partially agree with the assessments of two wetlands
- Mahers Swamp – Coates property
 - Lake Kini
13. I found that a lack of convincing, ample, or consistent evidence hampered my ability to agree with the Assessor's conclusions in six of the remaining assessments.

³ 'facultative' means able to exist under more than one set of environmental conditions (Collins Concise English Dictionary, Third Edition, 1992)

⁴ methods described fully in "A vegetation tool for wetland delineation in New Zealand". Landcare Research 2013.

Wetlands

BULP050 Oweka

14. The Oweka Kahikatea forest was originally identified as wetland by soil maps (Mew, 1980) which indicate it is an area of imperfectly to poorly draining Maimai soils, and by the vegetation association, which appears (from publicly available aerial photography) to be dominated by kahikatea. The area is described in the Land Environments of New Zealand (Leathwick, *et al* 2002) as an O3 environment, which is defined by imperfectly drained soils, amongst other things. I have not been on this site.
15. The Assessor reports that the ground was solid, that she saw no pooling of water, and the vegetation was not wetland vegetation. In my opinion the evidence and conclusion that the site is not a wetland is not supported by convincing evidence:
 - The lack of pooled water does not mean a site is not a wetland, as the definition in the task assignment states “wet, whether at the time of inspection or otherwise” (pg 29 pp 8 Appendix 1). Simply saying “the ground was firm underfoot” on one day, does not mean the soils are not regularly saturated.
 - the Assessor lists seven plant species of which two, kahikatea (*Dacrydium dacrydiodes*) and flax (*Phormium tenax*) are wetland species on the Clarkson (2013) list, and a third, rimu (*Dacrydium cupressoides*) is described as one of the few native tree species that can grow in saturated soils and tolerate long periods of flooding (McGlone, 2009).
 - The photos (figure 3) show several other wetland species such as *Astelia grandis*, *Blechnum novae-zelandiae*, and many sedge plants. Sedges, as a group, are either obligate wetland, facultative wetland or facultative – categories which indicate they are predominantly found on wetland soils. Figure 4 shows clearly a large rush in the foreground. Rushes are, like sedges, on the whole either obligate wetland, facultative wetland or facultative species. Without species identification it is impossible to say which wetland vegetation class they are in, but the likelihood is that they are wetland species.

- As there is no quantitative vegetation data provided, such as the relative abundance of any plant species, I am unable to properly assess the wetland species dominance. Nor has the Assessor undertaken such an assessment.
16. The Assessor makes no mention of native fauna at Oweka but the little evidence that is provided about this site is not inconsistent with its designation as kahikatea wetland forest.

PUNP001 Barrytown Flats, Maher Swamp – Coates property

17. The assessment of the Coates section of Maher Swamp concludes that the developed paddocks are not wetland, as previously concluded by the Council, and I agree with this, based on my knowledge of the local area, and the photos provided in the Report. The Assessor also concludes that the rest of the designated wetland on the Coates property is not wetland. The Assessor provides very little evidence to support her conclusion and I am unable to agree with it.
- The evidence provided about the hydrology on site is contradictory. The Assessor describes the ground as both “boggy” and “not particularly soft”. The photos all show standing pools of water and the stream appears to be a permanent water course due to the lack of sedimentation and algal growth, as shown in the Figure 85.
 - The vegetation evidence provided is limited for interpretive purposes. Of the seven plant species identified in the reported, one is a wetland species. Figure 84 shows many large sedges are also present, a group of plants that are generally indicative of wetlands. There is no information about the relative abundance of species provided.
18. The lack of convincing evidence presented in the report, and the lack of any obvious feature that differentiates the Coates’ part of the wetland from the rest of the wetland (through publicly available aerial photography) I am unable to agree with the conclusion that that area is not a wetland.

HOCP004 Candlelight Pakihi

19. The Assessor concludes that the area of the Candlelight Pakihi, beyond that which the Council has already recommended be removed from the Schedule, is

also not a wetland. I disagree with this conclusion, based on my own visit to this site and the lack of evidence presented in the Report.

20. The report identifies one plant species – gorse – and two plant families – grass and rushes – both of which contain many wetland species. The notes show the Assessor walked along the same farm track I had used when visiting the property with the Council staff in May 2014. The evidence to support her conclusion that none of this land is wetland is limited but included a very short list of plant species, and the fact the ground on the track under foot was gravelly. I agree that the farm track itself is not a wetland.
21. My assessment of Candlelight Pakihi in May 2014 clearly identifies this is a wetland because the hydrology in the southern half (as depicted in the Council's Draft boundary adjustment) was still functioning naturally despite historic attempts to drain it. The vegetation in the northern section was dominated by a diverse range of wetland species such as *Drosera spathulata* (facultative wetland species) *Cladonia* lichens *Empodisma minus* (obligate wetland species), manuka and *Gahnia rigida* (facultative wetland species). The dominant species are *Gleichenia dicarpa* (a facultative wetland species), *Sphagnum cristatum* (an obligate wetland species) and *Baumea* spp (obligate and facultative wetland species).

HOKP099 Little Houhou Creek (Allan Lowe)

22. The Assessor concludes that the very small (<0.5ha) area of cleared forest within Mr Lowes section of the Houhou wetland is not wetland based on vegetation, but reports it has permanent standing water. I have visited the site on several occasions and disagree with the conclusion in the report.
23. On my visits to the site I also encountered standing pools of water in the area cleared of forest species except for the single kahikatea (facultative wetland species) and dominated by *Isolepis prolifera* (obligate wetland species) and *Carex coriacea* (facultative wetland species) (Figure 1). Despite the modification the cleared area within Mr Lowes section is still a wetland based on the hydrological and vegetation evidence at the site.



Figure 1. The clearing at HOKP099.

HOKP119 Lake Mudgie

24. The report recommends that a small area in the south of the designated wetland be removed from the wetland mapping. The evidence provided is that the ground was firm underfoot and the identification of three plant species. The Assessor reports that the site was only partially accessed by her, and that access was limited.
25. I have not visited this wetland but the assessment (Figure 60) shows an area with *Gahnia rigida* (facultative wetland species) *Gleichenia dicarpa* (facultative wetland species) manuka and *Coprosma propinqua* (both facultative species). The lack of evidence is not convincing, and the aerial photography shows no differentiation between the vegetation cover of the piece of the property recommended for removal, and the wetland surrounding it.

HOKP086 Ross

26. The report recommends the removal of the entire Ross Wetland based on the evidence from walking around the outside of the wetland (Report Figure 36), and within the area already proposed for removal.

27. The hydrological gradients of a wetland vary along slopes, distance from drains and streams, and distance from tracks and roads, as described in the methodology of Clarkson (2013), and this needs to be accounted for in an assessment. In the assessment, the areas looked at are all parallel to the edge of the wetland and did not account for the potential effects of the hydrological gradients.
28. The assessment describes being unable to penetrate beyond the edges because of the density of flax (facultative upland species) and gorse (facultative wetland species). Three other plant species are recorded (two facultative wetland species and a facultative upland species). Other rush and sedge species can be seen in Figures 38 and 39 of the Report.
29. The assessment provides no conclusive evidence that the site is not a wetland.

HARP021 Lake lanthe

30. The wetland at the southern end of Lake lanthe is a large and good representative example of a swamp in the Harihari Ecological District. The Assessor indicates that based on her assessment of: firm ground, the lack of any standing water and no wetland plant species, apart from the stand of kahikatea, she recommends part (on the southern boundary) of the Lake lanthe swamp (HARP021) is removed from the schedule
31. The hydrological evidence is contradictory. The assessment reports no permanent pools of water and surface water of 50mm. It is unclear how the distinction was made.
32. In support of the conclusion is a list of three plant species (one facultative species and two facultative wetland species). The assessment (Figure 14) also shows many rush and sedge plants which, as discussed previously, are indicators of wetlands. All four photos show standing pools of water.
33. It is my opinion, based on the information and photos supplied, that the balance of evidence does not support the recommendation to remove the approximately 14 ha from the designated wetland.

Lake Kini

34. The assessment recommends removing three areas of the Kini wetland from the schedule. The areas recommended for removal are smaller than that

recommended by the Council. The evidence is not convincing that all of these three areas addressed by the Assessor are not wetland.

35. The assessment reports that a part of the northern section (KAGP008a) of the wetland is not wetland. The hydrological evidence is contradictory and says the ground was both well drained and also had standing pools of water. Six plant species are listed from this area of which one, kahikatea, is a facultative wetland species. The evidence is not conclusive that this area is not wetland.
36. The area of KAGP008b recommended for removal is described as developed pasture, and Figure 74 shows that the area is developed. I agree with the Assessor that this pasture should be removed from the wetland designation.

Conclusions

37. The Brief to the Assessor provided appropriate guidance for the assessment of wetland status by reference to vegetation.
38. Two common problems with the assessments is the lack of adequate information on native plant species, and an inconsistent or contradictory approach to applying the definition of a wetland as a site “that is wet or intermittently wet”. Without some quantitative measurement of species abundance, it is difficult to assess the site description adequately let alone apply the dominance and prevalence tests (Clarkson, *et al* 2013). The lack of vegetation evidence has made it very difficult to assess or rely on the conclusions of the Assessor’s report.
39. I agree with six of the assessments and partly agree with two, based on my own knowledge of the sites, and disagree, or found no evidence to support the removal of six of the other sites from the designated wetlands.

Dr Jane Marshall

14 January 2019

References

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