

BEFORE THE INDEPENDENT HEARING PANEL

IN THE MATTER OF the Resource Management Act 1991

AND of the proposed Timaru District Plan

Evidence of Richard Ian Clayton

on behalf of the Director-General of Conservation *Tumuaki Ahurei*

Hearing A: Overarching Matters, Part 1 and Strategic Directions

Submitter No. 166 Further Submitter No.166

Dated: 22nd April 2024

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Executive Summary of Key Points

1. My evidence provides a brief overview of the pre-human and current ecology of the Timaru District. It addresses the major ecosystem types, what and where they exist and their declining status due to both historic and ongoing environmental pressure.
2. It highlights areas of remaining (terrestrial and wetland) biodiversity that require particular attention and the importance of focussing on the uncommon species and ecosystems when considering a strategic goal of “at least no overall loss” of indigenous biodiversity.

Introduction

1. My full name is Richard Ian Clayton
2. I have been asked by the Director-General of Conservation Tumuaki Ahurei ('the D-G') to provide expert evidence on the proposed Timaru District Plan (PTDP).
3. This evidence relates to Hearing A of the PTDP which includes Overarching Matters, Part 1- Introduction and General Provisions, General Definitions and High-Level Strategic Directions.

Qualifications and experience

4. I am employed by the Department of Conservation (DOC) as an Ecologist. I have worked for DOC since 2018. In my role I provide technical and scientific advice to DOC's work managing threatened plant species and ecosystems in the Eastern South Island.
5. I have previously been employed by Manaaki Whenua Landcare Research as a researcher in animal pest ecology and plant conservation for five years. I have also worked as a contractor and ecological consultant for both regional and central government organizations.
6. I have experience in planning conservation management and reporting on significance of ecological values using standard significance criteria, such as those outlined in the Canterbury Regional Policy Statement.
7. My qualifications are MSc Ecology (with distinction) obtained at Otago University in 2004. My thesis was on the impacts of introduced rats on the island flora of Rakiura/Stewart Island.
8. I have previously provided evidence on regional pest management plans on behalf of DOC. I am currently providing ecological advice and comments as part of preliminary input to the district plans for Waimakariri, Selwyn and Waitaki District Councils.
9. I am a committee member of the New Zealand Plant Conservation Network, representing DOC on this forum.
10. I am also a part of the group of experts inside DOC who manage threatened plant species funds, management and priorities - the equivalent of a threatened taxa advisory group.

11. I have written or contributed to numerous peer-reviewed publications on plant ecology and wider conservation efforts in New Zealand (see Appendix 1).

Code of Conduct

12. Although this is a Council hearing, I have read the code of conduct for expert witnesses as contained in the Environment Court's Practice Note 2023 (the Code). I have complied with the Code when preparing my written statement of evidence.
13. The data, information, facts and assumptions I have considered in forming my opinions are set out in my evidence to follow. The reasons for the opinions expressed are also set out in the evidence to follow.
14. Unless I state otherwise, this evidence is within my sphere of expertise, and I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.
15. For the avoidance of doubt, in providing this evidence as an expert witness in accordance with the Environment Court Code of Conduct, I acknowledge that I have an overriding duty to impartially assist the Panel on matters within my area of expertise. The views expressed are my own expert views, and I do not speak on the D-G's behalf.

Scope

16. I have been asked to provide evidence in relation to the notified proposed Timaru District Plan, the D-G's submission (submitter number 166), the D-G's further submission, and further submissions lodged on the D-G's submission.
17. My evidence for Hearing A addresses the following matters:
 - (a) Terminology.
 - (b) Ecological context for biodiversity in the Timaru District with emphasis on a brief overview of the history, status and trend of key ecosystems and species.
 - (c) An outline of the rationale for seeking to promote the continued identification and monitoring of biodiversity, and better management and restoration of key threatened species and ecosystems.
 - (d) Overall support for the proposed strategic direction of the plan.

18. The evidence in this statement provides the foundation for more detailed evidence that I will submit in future PTDP hearings, particularly during the ECO hearing.

Material Considered

19. In preparing my evidence I have read and relied upon the following documents:

- (a) Proposed Timaru District Plan 2022
- (b) The Section 32 Evaluation Reports:
 - (i) Overview Evaluation Report dated July 2022
 - (ii) Strategic Directions dated May 2022
- (c) The D-G's submission dated 15 December 2022 and further submissions dated 4th August 2023 and 18 March 2024.
- (d) The s42a Reports including:
 - (i) Part 1 and Overarching Matters dated 5 April 2024
 - (ii) Strategic Directions and Urban Form and Development Chapters dated 5 April 2024
- (e) Key references on ecosystem and species threat classifications

Terminology

20. Explanation of important terms and concepts used in ecological reporting and used throughout my evidence:
- (a) **Ecological Districts**, themselves a subset of Ecological Regions are areas of New Zealand divided geographically based on extensive amounts of survey data and a consensus of expert opinion. They have been used as a basis for ecological reporting for over 40 years in New Zealand (McEwen, 1987).
 - (b) The **Protected Areas Network** consists of: public conservation land, reserves and covenants from QE2, councils and other agencies such as Nga Whenua Rahui.
 - (c) **Land Environments New Zealand (LENZ)** is a tool that uses physical data to create a classification of environments that can then be overlaid with

biotic data and/or layers of protection. It is most usefully applied to the common ecosystems – forests, sub-alpine grasslands etc. (Cieraad *et al.*, 2015)

- (d) **Naturally Uncommon Ecosystems** are those that originally (i.e. pre-human) occupied small areas (maximum size for the largest ~130,000 ha in total e.g. estuaries, or inland outwash plains and moraine fields, but usually much less – e.g. kettleholes, coastal wetlands and limestone torrs which are often only several hundred ha in total). (Wiser *et al.* 2013)
- (e) Ecosystems, Environments and Species have all been assigned a **threat status** using standard criteria developed by the IUCN (for ecosystems Holdaway *et al.*, 2012), by peer-reviewed literature (for environments; Cieraad *et al.*, 2015) and by the New Zealand Threat Classification for species (de Lange *et al.*, 2018). These are generally grouped by degree of concern e.g. “Nationally Critical”, “Endangered”, “Vulnerable”.

The ecosystems and species of the Timaru District

- 21. The Timaru District covers all of the Geraldine Ecological District and overlaps with eight others. The landscape is made up of the low plains, with rolling hill country, foothills and the high mountains of the Upper Rangitata River. There is a strong correlation in the overall depletion of indigenous vegetation associated with decreasing altitude (Harding, 2016).
- 22. The major, historic reductions to all ecosystems in Timaru occurred through the mass clearance events initiated by early Polynesian, Māori, and European colonizers. Simply combining the spatial data of the remaining areas of indigenous vegetation with an estimate of protected lands highlights the importance of focussing biodiversity protection and restoration efforts in the lower eastern South Island (see Fig 1 in Appendix 2).
- 23. Ongoing, current threats to the remaining indigenous ecosystems are due to both a reduction in area and compromised functioning (MFE, 2024):
 - (a) Conversion of land for new uses – e.g. increased amounts of forestry, cropping, and subdivision;
 - (b) Intensification of land use for agricultural purposes – irrigation, increased nutrient and pesticide application, homogenization of crops etc.;

- (c) Increased and cumulative pressure from introduced invasive species, particularly wilding pines, browsers and small mammalian pests;
 - (d) Climate Change, which both exacerbates existing pressures on native biodiversity and creates new pressures.
24. Despite the history of and ongoing environmental pressure, Timaru District contains many important remnants of both common (tussock grasslands, herbfields, forests and shrublands) and uncommon native ecosystems.
 25. Notable examples of uncommon ecosystems include: all remaining wetlands (both coastal and inland); coastal dunes, the limestone outcrops and torrs (e.g. at Totara Valley, and adjacent to many of the main rivers such as the upper Pareora), all braided rivers and their margins (particularly the Rangitata), and the dry inland moraines and alluvial outwash plains. These areas all have high threat status levels (Holdaway *et al.*, 2012).
 26. Further, these uncommon ecosystems also contain important indigenous biodiversity. For example, small and ephemeral wetlands contribute disproportionately higher numbers of both common, uncommon and threatened species to regional biodiversity (Richardson *et al.*, 2015). Overall, the uncommon ecosystems cover <10% of New Zealand's land area but contain ~86% of the threatened flora (Holdaway *et al.*, 2012).
 27. For native flora, approximately one third of all New Zealand's Threatened plants and one quarter of the Vulnerable taxa are in the Canterbury Region (DOC internal data). The Timaru District contains regional endemics found nowhere else in the world, including Critically Endangered *Gentianella calcis* subsp *taiko*, *Veronica pareora* and *Azorella pareora*.
 28. For fauna values, Blue duck/ whio (Threatened: Nationally Vulnerable) are present, as are many species of threatened braided river and wetland birds, such as the Bittern / Matuku-hūrepo (Threatened: Nationally Critical), Wrybill / Ngutu pare (At risk: recovering) and Black-billed gulls / Tarāpuka (At risk: declining). The Canterbury long-tailed bat (Threatened: Nationally Critical) is also present in the District and forms the only known population on the East coast of the South Island.

Achieving a strategic goal of “at least no overall loss” in indigenous biodiversity

29. Many of the uncommon and threatened ecosystems and large numbers of the most threatened species occur outside of the formally protected area network of public conservation land and covenants or reserves (Figure 2 in Appendix 2). Because of the high correlation between uncommon and threatened ecosystems and species diversity, to achieve meaningful maintenance of biodiversity requires measuring and protecting these ecosystems on private land where they exist and, in many cases, restoring them.
30. Further, despite being much better understood than uncommon ecosystems, the remaining areas of biodiversity associated with “common” ecosystems also require consideration. While the removal of lowland forests and shrublands has been both ongoing and comprehensive across the Eastern South Island lowlands, Timaru District is lucky to have some excellent examples of remaining forest. Larger tracts are all associated with the uplands, or large remnants adjacent to foothills, e.g. Peel Forest, or Woodbury, (Steven and Meurk, 1996) leaving the majority of the lowlands almost completely denuded and concerted efforts to protect and/or restore these remnants along with suitable buffers will be necessary.
31. Overall, the ongoing identification of significant indigenous vegetation and habitat of indigenous flora is a fundamental part of biodiversity protection. Having completed a substantial amount of this work during the previous plan’s tenure, the Timaru DC is in a unique position to further complete this exercise, possibly resulting in the most comprehensive efforts out of any New Zealand territorial authority. On top of continuing this endeavour, it is important to ensure that particularly vulnerable and threatened ecosystems and species-habitats are specifically identified and highlighted throughout the plan as requiring active restoration, above and beyond a “no overall loss” approach.

Areas of Alignment with the s42A report

32. I agree with the overall, strategic direction of the PTDP that:
 - (a) There is at least no overall loss in indigenous biodiversity;
 - (b) Significant indigenous vegetation and significant habitats of indigenous fauna are identified, and their values recognised, protected, enhanced and where ecological integrity is degraded, restored.

Conclusion

33. Although the Timaru District has over the last two decades undertaken to measure the remaining significant biodiversity and habitat, this exercise is unfinished and requires ongoing effort to report on status and trend of the identified sites. Furthermore, there is increasing environmental pressure on all sites of indigenous biodiversity. These significant areas and their surrounding “buffer zones”, plus those areas of remaining indigenous biodiversity not deemed as “significant” require ongoing attention –surveys, protection and pragmatic management actions, conducted by specialists, using appropriate criteria to achieve the strategic direction in this plan.

A handwritten signature in blue ink, appearing to read 'R Clayton', with a long horizontal flourish extending to the right.

Richard Clayton

DATED 22nd April 2024

Appendix 1 References

Cieraad E; Walker S; Price R; Barringer J. 2015. An updated assessment of indigenous cover remaining and legal protection in New Zealand's land environments. *New Zealand Journal of Ecology* 39(2).

De Lange P.J.; Rolfe, J.R.; Barkla, J.W.; Courtney, S.P.; Champion, P.D.; Perrie, L.R.; Beadel, S.M.; Ford, K.A.; Breitwiesser, I.; Shonberger, I; Hindmarsh-Walls, R.; Heenan, P.B. and Ladley, K. 2018. Conservation status of New Zealand indigenous vascular plants, 2017. *New Zealand Threat Classification Series* 22. Department of Conservation, Wellington.

Harding M, 2016. Significant Natural Areas Timaru District. A report on a district-wide survey of areas of significant indigenous vegetation and significant habitats of indigenous fauna. A report to Timaru District Council. 32pp.

Holdaway, R.J.; Wiser, S.K.; Williams, P.A. 2012. Status Assessment of New Zealand's Naturally Uncommon Ecosystems. *Conservation Biology* 26: 4; 619 – 629.

McEwen, W.M. (editor) 1987. Ecological regions and districts of New Zealand, third revised edition (Sheet 4). *New Zealand Biological Resources Centre Publication No.5*. Department of Conservation, Wellington.

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Richardson SJ, Clayton RI, Rance BD, Broadbent H, McGlone MS, Wilmshurst JM.2015. Small wetlands are critical for safeguarding rare and threatened plant species. *Applied Vegetation Science* 18:2; 230-241.

Stephen, J.C.; Meurk, C.D. 1996. Low and High Plains ecological districts, Plains Ecological Region, Canterbury. Protected Natural Areas Programme Survey Report (unpublished draft). 114pp.

Wiser SK, Buxton RP, Clarkson BR, Hoare RJB, Holdaway RJ, Richardson SJ, Smale MC, West C, Williams PA 2013. [New Zealand's naturally uncommon ecosystems](#). In Dymond JR ed. *Ecosystem services in New Zealand – conditions and trends*. Manaaki Whenua Press, Lincoln, New Zealand. Pp. 49–61

Appendix 2 Figures to support text

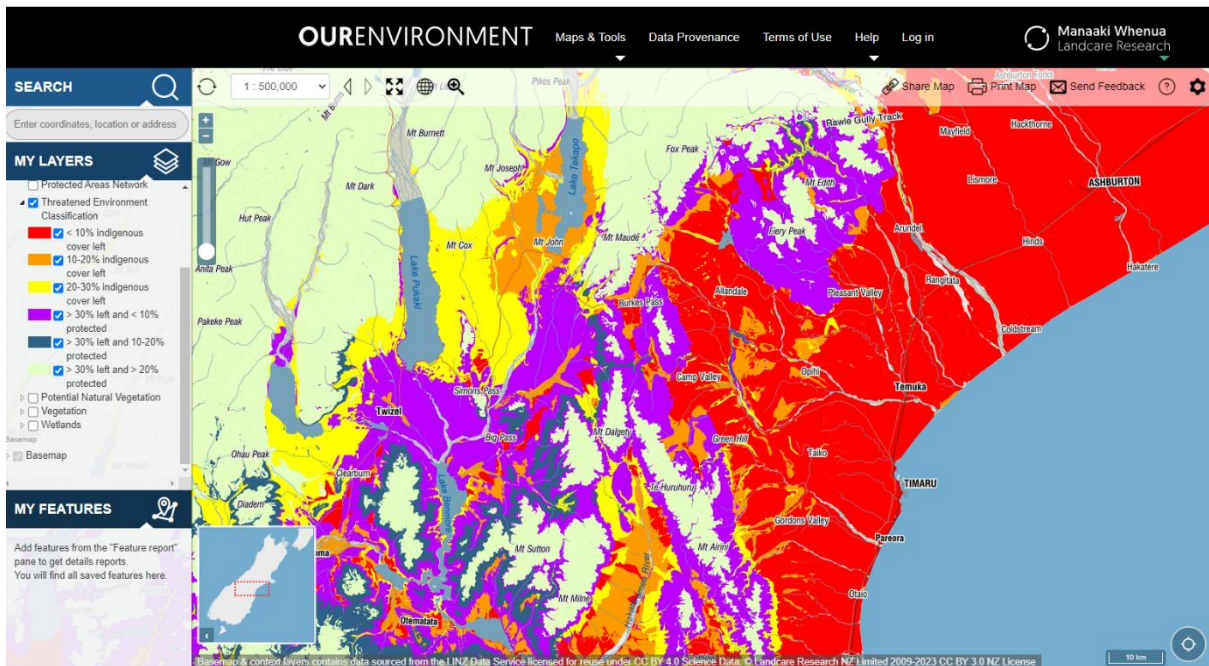


Figure 2. Threatened Environments Classification for areas in and around the Timaru District, highlighting where very little indigenous vegetation remains and/or is protected (red areas are of greatest concern). Source Manaaki Whenua Landcare Research website, Reference = Cieraad *et al.*, 2015).

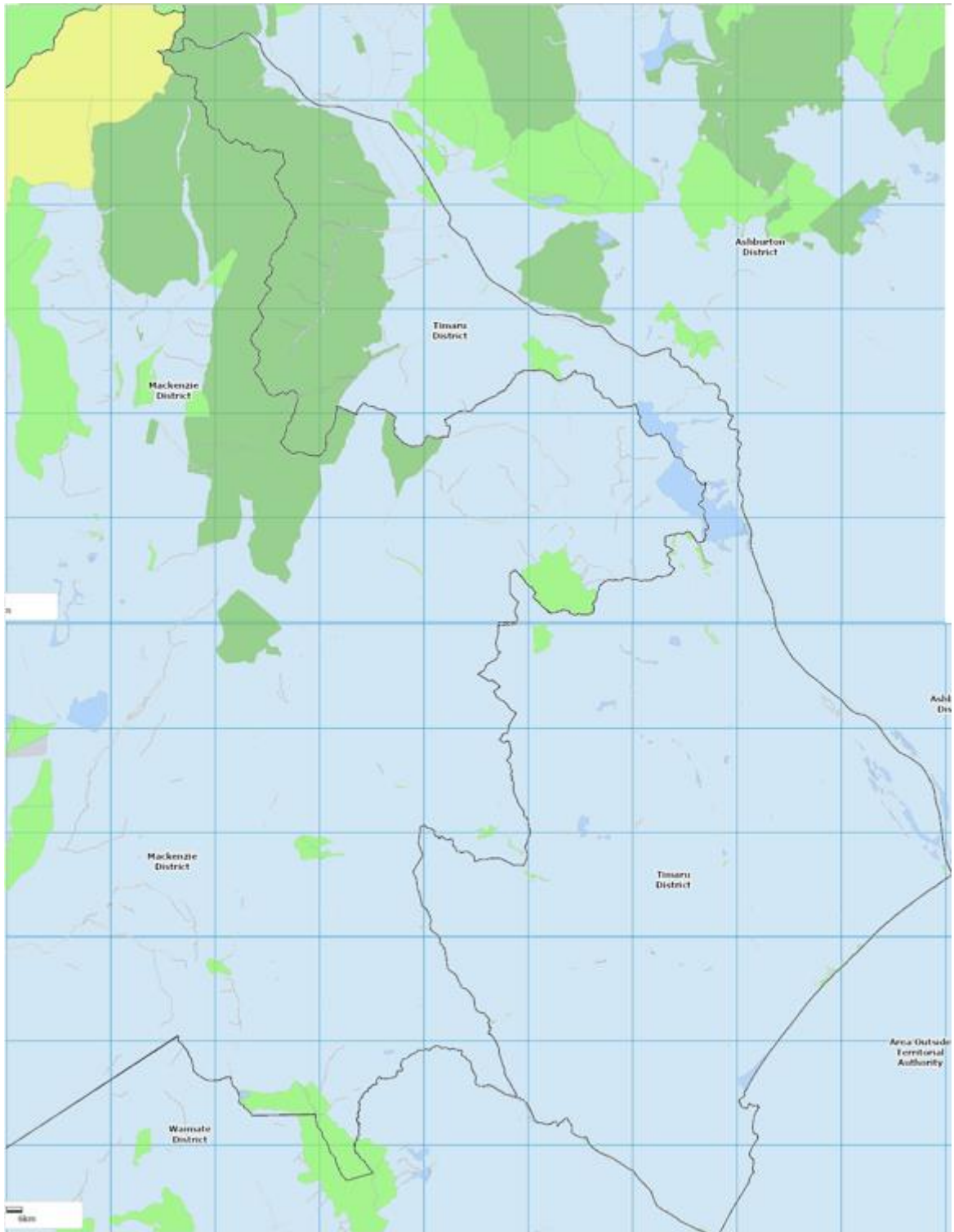


Figure 2 Timaru District with layers of public conservation land highlighted in Green (Conservation Parks and Stewardship land), Yellow (Aoraki Mt Cook National Park), Blue (Reserves, including Peel Forest Scenic Reserve and Rangitata River Reserves, Source: DOC GIS showing current PCL layers and the Timaru District boundary.

Appendix 3 Peer-reviewed authorship

TITLE	CITED BY	YEAR
<p>Small wetlands are critical for safeguarding rare and threatened plant species SJ Richardson, R Clayton, BD Rance, H Broadbent, MS McGlone, ... <i>Applied Vegetation Science</i> 18 (2), 230-241</p>	49	2015
<p>Management of animal and plant pests in New Zealand—patterns of control and monitoring by regional agencies R Clayton, P Cowan <i>Wildlife Research</i> 37 (5), 360-371</p>	48	2010
<p>Effect of prefeeding on foraging patterns of brushtail possums (<i>Trichosurus vulpecula</i>) about prefeed transects B Warburton, R Clayton, G Nugent, G Graham, G Forrester <i>Wildlife Research</i> 36 (8), 659-665</p>	27	2009
<p>Improving the efficacy of aerial poisoning of brushtail possums (<i>Trichosurus vulpecula</i>) through reduced fragmentation of bait G Nugent, D Morgan, R Clayton, B Warburton <i>International Journal of Pest Management</i> 57 (1), 51-59</p>	17	2010
<p>Removal of livestock alters native plant and invasive mammal communities in a dry grassland–shrubland ecosystem AL Whitehead, AE Byrom, RI Clayton, RP Pech <i>Biological Invasions</i> 16, 1105-1118</p>	16	2014
<p>What limits a rare alpine plant species? Comparative demography of three endemic species of <i>Myosotis</i> (Boraginaceae) KJM Dickinson, D Kelly, AF Mark, G Wells, R Clayton <i>Austral Ecology</i> 32 (2), 155-168</p>	16	2007
<p>Using home-range data to optimise the control of invasive animals DHV Smith, R Clayton, D Anderson, B Warburton <i>New Zealand Journal of Ecology</i> 39 (2), 288-290</p>	13	2015
<p>Density estimates and detection models inform stoat (<i>Mustela erminea</i>) eradication on Resolution Island, New Zealand RI Clayton, AE Byrom, DP Anderson, KA Edge, D Gleeson, P McMurtrie, ... <i>Island Invasives: eradication and management</i>. Gland, Switzerland, IUCN, 413-417</p>	12	2011
<p>Dual 1080 bait switching for killing cereal-bait-shy possums G Nugent, R Clayton, B Warburton, T Day <i>New Zealand Journal of Ecology</i> 44 (1), 1-6</p>	8	2020
<p>Best practice operational and outcome monitoring for pest management: a review of existing council approaches and activity RI Clayton, PE Cowan <i>Landcare Research New Zealand</i></p>	4	2009
<p>Response of seedling communities to mammalian pest eradication on Ulva Island, Rakiura National Park, New Zealand RI Clayton, DJ Wilson, KJM Dickinson, CJ West <i>New Zealand Journal of Ecology</i>, 103-107</p>	4	2008
<p>Predator Free Rakiura Halfmoon Bay Project—biosecurity options R Clayton <i>Invercargill: Predator Free Rakiura (PFR) Governance Group, o/o Southland ...</i></p>	2	2015
<p>Using genetics and Bayesian modelling to evaluate the eradication of stoats (<i>Mustela erminea</i>) from Resolution Island, Fiordland, New Zealand DP Anderson, A Byrom, R Clayton, D Gleeson, B Warburton <i>New Zealand Journal of Ecology</i> 35 (2), 193-193</p>		2011
<p>The Influence of Introduced Mammals on Forest Regeneration on Islands in Paterson Inlet, Rakiura National Park: A Thesis Submitted in Partial Fulfilment for the Degree of ... RI Clayton <i>University of Otago</i></p>		2005