BEFORE THE CANTERBURY REGIONAL COUNCIL

IN THE MATTER OF	the Resource Management Act 1991
AND	
IN THE MATTER OF	a submission on the partially operative Canterbury Land and Water Regional Plan - Plan Change 5 (Nutrient Management and Waitaki Sub-region)

STATEMENT OF EVIDENCE OF **HERBERT ROSS FAMILTON**

FOR THE DIRECTOR-GENERAL OF CONSERVATION

Dated 25 JULY 2016

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INTRODUCTION

1. My name is Herbert Ross Familton. I have been employed by the Department of Conservation (DOC) in the position of Resource Management Planner in its South Island Shared Services Office since 21 May 2012. I am responsible for providing information, advice, and analysis on resource management issues for plan and consent hearings and appeals at a national level as part of my job within the Department's Operations Group.

2. I am presenting planning evidence in support of the Director-General of Conservation's (D-G) submission on the Canterbury Land and Water Regional Plan (LWRP) Plan Change 5 (Nutrient Management and Waitaki Sub-region) (Plan Change 5). I hold a Bachelors of Arts Degree with Honours in Geography (1983) and a Masters in Regional and Resource Planning (1985) from the University of Otago. I have thirty years experience in the area of natural resources planning. I became a full member of the New Zealand Planning Institute (NZPI) in 1993.

3. Prior to my current employment with DOC, I was employed by the Auckland Council as a Senior, and Principal, Specialist (Air) from 2011 to 2012. In that role, I was responsible for policy work and drafting for the provisions of the air quality sections of Auckland Council's Unitary plan. I was employed by Environment Canterbury as a Senior Resource Management Planner in the Policy Planning team from 2010 to 2011 in the Air Quality area. From 2006 to 2009, I worked for Environment Canterbury in the Planning section, focusing on water resources planning on the Waipara, Hurunui, and Waiau catchments.

4. Prior to 2006, DOC and the Department of Lands and Survey employed me in a number of planning roles. I was the lead DOC official for the whole of Government submission that advised the Attorney-General for the Waitaki Catchment Water Allocation plan in 2005/2006. I processed restricted coastal activity coastal consents for the Minister of Conservation from 1997-2006 in the Southern Regional Office of DOC.

5. In my current role, I have prepared planning evidence for the Director-General of Conservation on:

    - the Proposed Hurunui and Waiau River Regional Plan;
    - the proposed Canterbury Land and Water Regional Plan - Plan Change 4 (Omnibus);
    - the proposed Canterbury Land and Water Regional Plan - Plan Change 3 (South Canterbury); and
    - the Proposed Canterbury Land and Water Regional Plan.

6. I also case-managed the Director-General's input into the proposed Canterbury Land and Water Regional Plan - Plan Change 2 (Hinds/Hekeo).

7. I am therefore familiar with Canterbury Regional Council's (ECan) Land and Water Regional Plan framework for water resource planning under the Resource Management Act 1991 (RMA) in Canterbury.

8. The data, facts, information and assumptions I have considered in forming my opinions are set out in the part of the evidence in which I express my opinions. I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed.

9. I have read the Environment Court's Code of Conduct for expert witnesses and I agree to comply with it. My qualifications as an expert are set out above. I confirm that the issues in this brief of evidence are within my area of expertise.

10. The literature or other material that I have used or relied upon in support of my opinions is listed in Appendix 2.

SCOPE OF EVIDENCE

11. My evidence will address planning matters focusing solely on four areas of the D-G's submissions on Plan Change 5. They are:

    A. General Provisions

    B. Dryland habitat/Indigenous Biodiversity provisions

    C. Threatened native fish and Freshwater Habitat

    D. Water Quality standards/limits

12. I have relied on the evidence presented by Dr Nicholas Dunn on threatened native fish.

13. The sections and page numbers I refer to throughout this evidence are the sections and page numbers in the section 42A report unless indicated otherwise. Appendix 3 lists the abbreviations used in my evidence.

14. I have proposed amendments to the rules that are the subject of my evidence. Those proposed amendments are attached as Appendix 1.

15. The format of my evidence is as follows:

Policy, Rule or Schedule Number

i. *D-G's Submission:* I briefly state the D-G's submissions and/or further submission.
ii. *Officer Comment and Recommendation:* I comment on any aspects of the section 42A report that are relevant.
iii. *Comment:* I provide commentary on the D-G's position in light of the section 42A report.
iv. *Recommendation:* I make a recommendation based on the previous points (i) to (iii).

16. Where I have not directly addressed a point raised in the D-G's submission in this evidence, it is because the planning rationale I set out in this evidence and justifications offered in the D-G's submission and/or in the section 42A report apply.

A. GENERAL PROVISIONS

17. The D-G's submissions and further submissions were generally supportive of Plan Change 5 and the approach taken in it of managing water bodies by establishing four freshwater management units (FMU), which are to align with freshwater objectives in the tables at 15B of the Plan Change.

i. D-G's SUBMISSION

18. The general provisions which D-G supports include:

a. The codification of good management practise with regards to water quality;
b. Setting cumulative limits for contaminants;
c. Ensuring Nitrogen load limits in the Waitaki catchment are accounted for and not exceeded;
d. Setting in-stream limits for particular water bodies;
e. Red-zoning the Ahuriri and Hakataramea zones to indicate no increase in nutrient load can be accommodated in those zones; and
f. The general zoning approach adopted in Figure One of the Plan Change.

19. In my opinion, that approach, including setting water quality limits for lakes and rivers in the catchment, and addressing cumulative effects of nutrients in the catchment will, generally, give effect to the NPS (Freshwater Management) (NPS FM).

20. The D-G proposed additional text to be included in the introductory section of Part 15B, outlining the values of public conservation land in the catchment and the DOC's role in management of that land.

ii. OFFICER COMMENT AND RECOMMENDATION

21. The section 42A report includes recommendations to include some additions based on the D-G's submission, and the inclusion of a sentence to acknowledge the smaller lakes in the Upper Waitaki (paragraph two of page 3-1 of the section 42A report).

iii. COMMENT

22. Sensitive lake zones are established as management zones under the LWRP. In my opinion, it would be appropriate for a plan which addresses water quality and which establishes sensitive lake zones to explicitly recognise that those shallow lakes are particularly vulnerable to water quality changes, and to include provisions to address their vulnerability.

23. I note that the list of technical reports relied on by Council officers in drafting the plan includes reference to Clarke (2015), which in turn relies on Kelly, Robertson and Allen (2014) (at page i) which is a report that was jointly commissioned by ECan and DOC.

24. According to Kelly, Robertson and Allen (2014), at page 52, and to Clark (2015), at page 2, one of the key management implications for shallow lakes is that they are vulnerable to water quality degradation.

25. In my opinion, inclusion in the plan of provisions which address the vulnerability of shallow lakes to water quality changes would give effect to NPS FM Objective A1, which state, respectively:

> *"Objective A1*
> *To safeguard:*
> *a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
> *b) the health of people and communities, at least as affected by secondary contact with fresh water;*
> *in sustainably managing the use and development of land, and of discharges of contaminants.*
>
> *Objective A2*
> *The overall quality of fresh water within a region is maintained or improved while:*

a) protecting the significant values of outstanding freshwater bodies;

b) protecting the significant values of wetlands; and

c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated."

26. The provisions I have proposed would also give effect to Policy 7.3.5 of the Canterbury Regional Policy Statement (RPS) which is:

> *"To avoid, remedy or mitigate adverse effects of land uses on the flow of water in surface water bodies or the recharge of groundwater by:*
>
> *(1) controlling the diversion of rainfall run-off over land, and changes in land uses, site coverage or land drainage patterns that will, either singularly or cumulatively, adversely affect the quantity or rate of water flowing into surface water bodies or the rate of groundwater recharge; [...]"*

27. These provisions are quite specific about the need to manage land uses to achieve water quality objectives in lower order plan instruments.

28. Principles 2, 5 and 8 of the Canterbury Water Management Strategy (CWMS), to which particular regard must be had, are also relevant.

29. Those principles include:

(i) to "integrate land management and enhance water quality" (principle 2);

(ii) to "protect indigenous flora and fauna and their habitats in ... lakes" (principle 5); and

(iii) to "ensure high quality water for contact recreation such as swimming, fishing, boating and other water sports" (principle 8).

30. The inclusion of provisions having regard to those principles will provide a policy basis for ensuring water quality is maintained and, importantly, will provide a management framework for considering the cumulative effects of contamination on water quality when assessing applications for resource consents for land use and discharges.

31. The inclusion of references to areas which are managed by DOC and to plans prepared under the Conservation Act 1987 and National Parks Act 1980 would be consistent with the requirement in section 66(2)(c)(i) of the RMA, which requires regional councils to have regard to management plans and strategies prepared under other Acts when changing a plan.

32. Much of the western catchment is public conservation land which is administered by DOC. While downstream water users are reliant on the naturally high quality water which has its source from that land, in areas further to the east of the catchment, land uses have effects on water quality in smaller water bodies, including those on public conservation land. Two examples are Lake Middleton, which is a Recreation Reserve, and Lake Alexandrina, which is largely surrounded by Scenic Reserve. Lake Alexandrina also has an overlay of wildlife refuge status over its catchment for the protection of birds.

33. The sensitive nature of those shallow lakes and their vulnerability provide a basis for setting water quality objectives at a suitably precautionary level to protect their water quality in a new policy 15B.3A as submitted by the D-G.

iv. RECOMMENDATION

34. I recommend that as well as the additions recommended in the section 42A report, further additions are made to:

i) the introductory text, as discussed above and outlined in Appendix 1, and
ii) the inclusion of a new policy 15B.3A outlining the key documents guiding management of public conservation land as outlined in paragraph 32.

B. INDIGENOUS BIODIVERSITY PROVISIONS

i. D-G's SUBMISSION

35. The D-G's submission sought amendments to policy 15B.4.23 (indigenous biodiversity) to include "habitat" and to apply across the plan catchment, and the insertion of new Policy 15B.4.23A for freshwater biodiversity.

36. Additionally, the D-G sought that all controlled activity rules for use of land for farming become restricted discretionary rules, with matters of control reserved over effects on significant indigenous terrestrial biodiversity and habitat and significant freshwater biodiversity and habitat. The same two matters of control were sought for the restricted activity rules.

37. The D-G also further submitted in support of Mackenzie District Council's submissions on Policy 15B.4.23

ii. OFFICER COMMENT AND RECOMMENDATION

38. The section 42A report recommends a number of changes to give effect to the Mackenzie District Council's submissions and the D-G's further submission on Policy 15B.4.23, but none directly addressing the D-G's submission on the rules in 15B.5.10 – 50.

iii. COMMENT

39. I have identified an error in the D-G's submission in that in reference to the controlled activity (CA) and restricted activity (RDA) use of land for farming activity rules, it referred to 4.12- 4-35 rather than Plan Change provisions 15B.4.12 - 35. It is clear from the next column in the D-G's submission that the rules being referred to are those which relate to land use for farming CA and RDA rules, and in the plan change the CA and RDA rules are actually in 15B.5.10—50.

40. Plan Change 5's rule framework is complicated by the plan nomenclature of having four general freshwater management units, comprising the Upper Waitaki, Valley and tributaries, Hakataramea, and Northern Fan FMUs as required by the NPS FM, into which various Plan Change 5 zones (such as the Haldon, Ahuriri, and Sensitive Lake zones) are divided.

41. This framework becomes complicated when implementing Policy 15B.4.23. Policy 15B.4.23 establishes an interim regime for Regional Council land use consents to consider indigenous biodiversity values until relevant District Council Planning provisions are notified and "given effect". I particularly support this addition by the Reporting Officer.

42. Principle 2 of the CWMS, which is a matter ECan needs to have "particular regard to" states that:

> *"There is a strong emphasis on the integration of water and land management including the protection of biodiversity and enhancement of water quality".*

43. Inclusion of the proposed provisions for indigenous biodiversity would in particular give effect to Objective 9.2.3 of the RPS which states:

> "*... significant habitats of indigenous fauna are identified and their values and ecosystem functions protected*".

44. Policy 9.3.2 of the RPS clearly identifies the lead responsibilities on indigenous biodiversity to territorial authorities in method 4 which states that territorial authorities should:

> *"(4) Recognise the national priorities for the protection of biodiversity through objectives, policies and methods in district plans"*

45. Plan Change 5 recognises this split between Regional and District functions. However, it has identified the need for an interim land use rule 15B.5.18B which would address indigenous biodiversity in an interim land use rule by requiring the identification and assessment of

significant indigenous biodiversity by a suitably qualified ecologist until relevant District Council land use provisions are established.

46. Waimate District Plan includes a schedule of terrestrial sites, (see Appendix 5) which appears to be reasonably comprehensive. Most of the upland sites are in "Areas of Conservation Merit" (see Appendix 5). However, no particular rule is attached to trigger a land use consent application which would require an assessment ofthe significance of the vegetation or the effects on it (pers. comm. Michael Sewell, Waitaki District). Clearly therefore, the Waitaki District Plan is not comprehensive in terms of addressing significant terrestrial indigenous biodiversity. I therefore recommend extending the interim rule regime for use of land for a farming activity to include any area within Waitaki District, with consequential amendments to Policy and Rules.

47. While land use for faming rules are a subset of potential landuse consent activities, failure to consider indigenous biodiversity would be inconsistent with principles, objectives and policies of the CWMS, RPS, and LWRP. This situation justifies an interim RDA rule for land use until Mackenzie and Waitaki district have complete schedules of significant sites of indigenous biodiversity established in their District Plans, and associated rules for their maintenance protection that have legal effect. This will, in planning terms, ensure that there is consistency with the principles, objectives and policies of the superior instruments, and ensure that consideration of applications for consents under the regional plan regime can include assessment of effects on biodiversity.

iv. RECOMMENDATIONS

1. I support the revised wording of the indigenous biodiversity policy (Policy 15B.4.232) recommended in the section 42A report. However, it could be improved by the insertion of "and habitat". I also recommend extending the application of rules for interim land use for farming to the Mackenzie and Waitaki District, for the reasons outlined above.
2. A new policy and methods framework on freshwater biodiversity is required and in my opinion a future plan change to address this matter may be required.
3. Matters of control are required in relation to significant indigenous biodiversity (terrestrial and freshwater) in the use of land for farming activity controlled and restricted discretionary activity rules (Rules 15B.5.10 to 15B.5.50) in order to give effect to CWMS principles and RPS objectives.

C. THREATENED NATIVE FISH AND FRESHWATER HABITAT

i. D-G'S SUBMISSION

48. The D-G has sought the inclusion of provisions referring to "habitat quality" in Policies 15B 4.18, 4.19, 4.20, 4.24, 4.25 and 4.26, and an amendment to policies 15B 19, 24, 25, and 26 to

include a requirement to "avoid adverse effects on threatened native fish habitats after 13th February 2016".

ii. OFFICER COMMENT AND RECOMMENDATION

49. The section 42A report has recommended amendments to Policy 15B 4.20 (d) to ensure that adaptive management conditions relate to the effects of the activity concerned and accord with the water quality limits in tables 15(B)(c)(d) and (e).

iii. COMMENT

50. Currently there are no provisions in the LWRP for protecting the specific threatened native fish species or the habitats of those species described by Dr Dunn in his evidence, notwithstanding the direction in section 6(c) of the RMA, the NPS FM, the Canterbury RPS and the principles of the CWMS, each of which are discussed in more detail below.

51. NPS FM Objective 1A is:

> *"To safeguard:*
> *a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
> *b) the health of people and communities, at least as affected by secondary contact with fresh water;*
> *in sustainably managing the use and development of land, and of discharges of contaminants."*

52. Objective A1, to safeguard ecosystems associated with freshwater species, can be achieved by including provisions regarding the habitat of those species in the plan. The fish species in Dr Dunn's evidence, are highly endangered and occupy relatively small areas of freshwater habitat, which equate to the ecosystem they rely on. These habitats currently have no specific protection under the LWRP. Managing nutrient and sedimentation will contribute to safeguarding the life-supporting capacity of the freshwater ecosystems of which threatened native fish are a component.

53. NPS FM Objective B1 is:

> "*To safeguard the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems of fresh water, in sustainably managing the taking, using, damming, or diverting of fresh water."*

54. Inclusion of provisions for the protection of freshwater fish habitat would give effect to Objective 9.2.1 of the RPS which states:

> "*The decline in the quality and quantity of Canterbury's ecosystems and indigenous biodiversity is halted and their life-supporting capacity and mauri safeguarded*"

and to Objective 9.2.3 of the RPS which states:

> "... *significant habitats of indigenous fauna are identified and their values and ecosystem functions protected*".

55. RPS Policy 10.3.2(7) is a matter to which this plan is required to "give effect". That Policy states:

> *To preserve the natural character of river and lake beds and their margins and protect them from inappropriate subdivision use and development, and where appropriate, to maintain and/or enhance areas of river and lake beds and their margins and riparian zones where:*
>
> *(7) Riparian zones provide spawning or other significant habitats for at risk or threatened species, such as inanga or Canterbury mudfish*

56. RPS Policy 10.3.2(7) is not limited in its application to inanga and Canterbury mudfish, it is also relevant to other threatened native fish species. While RPS Policy 10.3.2(7) specifically mentions Canterbury mudfish, it names that species as an example of at risk or threatened species. In my view, this Policy also applies to Upland and Lowland Longjaw galaxias which are other species which have similar threat status, to which the policy should apply. The policy discusses "providing spawning and other significant habitats for at risk and threatened species". Further, method 1 states that ECan may include methods in regional plans to "maintain and enhance river and lake bed values as appropriate". While appropriateness may depend on the context and location, in the Waitaki catchment where threatened endemic species exist, it is appropriate to protect the significant habitats of those species.

57. Additionally, the inclusion of provisions in Plan Change 5 for the protection of the freshwater fish habitats described by Dr Dunn would implement CWMS principle 5 concerning the protection and value of indigenous biodiversity, which is a matter to which ECan must have "particular regard" under section 63 of the ECan Act. Principle 5 states:

> *Indigenous flora and fauna <u>and their habitats</u>* (my emphasis) *in rivers, streams, lakes, groundwater and wetlands are <u>protected</u>* (my emphasis) *and valued.*

58. The combined effect of both the RPS and CWMS is that there is clear strategy and policy direction to ensure the protection of native fish habitat. The Plan Change 5 provisions proposed in the officer's report do not, in my opinion, adequately achieve the planning framework anticipated in the RPS and CWMS for threatened native fish.

59. The LWRP includes objective 3.17 and policy 4.31, which state:

> *Objective 3.17 The significant indigenous biodiversity values of rivers, wetlands and hāpua are protected, and*
>
> *Policy 4.31 Damage to the bed or banks of water bodies, sedimentation and disturbance of the*
> *waterbody, direct discharge of contaminants, and degradation of aquatic ecosystems is*
> *avoided by:*
> *(a) excluding intensively farmed stock from lakes, rivers and wetlands; and*
> *(b) excluding stock from swimming, salmon spawning and other sensitive waterbody areas and the waterbody bed and banks closely upstream of these areas; and*
> *(c) limiting access to wetlands, and the banks or beds of lakes and rivers to stock species that prefer to avoid water and at stocking rates that avoid evident damage.*

60. Section 67 (1) RMA requires rules, where appropriate, to implement the policies of the plan, and policies are required to implement the objectives of the plan.

61. The LWRP also includes matters of discretion in rules regarding indigenous biodiversity and significant habitats of indigenous fauna which will assist when deciding on applications for resource consent which affect threatened native fish.

62. As under any RMA plan framework, Objectives are intended to state the general outcomes, and Policies outline the methods by which the Objectives may be achieved. A logical planning extension of this is that one would have expected the regional plan to have methods that actively seeks to implement RPS Objective 9.2.3 and RPS Policy 10.3.2(7), and LWRP objective 3.17 and policy 4.31 so far as threatened native fish species are concerned.

63. In my opinion, the difficulty with the proposed Plan Change 5 provisions is that they will not adequately give effect to the provisions of the CWMS and RPS discussed above, and they are not consistent with the objectives and other policies in the LWRP as discussed above. In short, the plan as proposed does not do two things:

- firstly, it does not identify the locations of indigenous biodiversity and habitats of indigenous fish, and

- secondly, it does not include appropriate Policy and rule provisions which will implement Principles, Objectives, and Policies from the CWMS, RPS, and LWRP relevant to indigenous freshwater fish species and their habitat. As a result, habitat can be modified and significant habitats may be lost, sometimes perhaps completely unwittingly. As Dr Dunn's evidence illustrates, the consequence in the Waitaki may be the loss of threatened endemic species.

iv. RECOMMENDATIONS

64. My recommendations are that:

a) "Freshwater habitat quality" is included in Policies 15B 4.18, 4.19, 4.20, 4.24, 4.25.

b) It could be open to the Panel to recommend that a plan change be promulgated for protecting threatened fish habitats. Lowland and Upland longjaw galaxias and bignose galaxias habitat could be addressed in a future plan change to the Waitaki Catchment Water Allocation Regional Plan (and in plans for other catchments in the Canterbury region). A future plan change could address the habitat of Canterbury mudfish in the LWRP, as the distribution of that species extends a considerable distance north of the Waitaki Catchment (to the Ashley River) as explained in paragraph 15 of Dr Dunn's evidence.

c) Based on Dr Dunn's evidence and the CWMS principles RPS and LWRP Objectives and Policies as discussed above, amendments to Policy 15B 4.18 and Schedule 7 can be justified to address the protection of springheads, through requirements for riparian margins protection and constructed wetlands.

d) Including "avoiding adverse effects on threatened native fish habitat" (from 13 February 2016) in Policies 15B 4.19, 4.24, 4.25, 4.26.

D. WATER QUALITY STANDARDS/LIMITS

i. D-G'S SUBMISSION

65. The D-G sought to amend Tables 15B (b) and (d) to argue for alternative water quality limits and to include some specific water quality limits for Lake Ruataniwha.

ii. OFFICER COMMENT AND RECOMMENDATION

66. The section 42A report has recommended some changes to the sub-tables 15.6 and 15 .7 of Table 15B, but has not included any provisions for a separate specific water quality limits for Lake Ruataniwha.

iii. COMMENT

67. Firstly, a comment on Aoraki/Mt Cook village and its inclusion in Table 15B(h). The D-G's submission in its introduction supported accounting for all the nitrogen load limits in the catchment. The Amenities area established under section 15 of the National Parks Act 1980 has enabled the development of Aoraki/Mount Cook alpine village. The Amenities area is important in the Plan Change 5 context as Aoraki/Mount Cook Village has a wastewater treatment plant, and DOC holds resource consent for discharge from that plant. The nutrient discharge from Aoraki/Mount Cook alpine village wastewater treatment plan is factored in at its maximum discharge rate in the schedule 15B(h) Community Wastewater discharge limit included in the plan. It is significant in terms of community load limits in the catchment and I support its inclusion in table 15B(h) as outlined in Plan Change 5.

National Objectives Framework

68. The NPS FM, at Appendix 2, sets out the national attribute tables, which identify the attributes for the National Objectives Framework (NOF), discussed in Policy A2 of the NPS FM. Policy A2 of the NPS FM states that:

> *Where freshwater management units do not meet the freshwater objectives made pursuant to Policy A1, every regional council is to specify targets and implement methods (either or both regulatory and non-regulatory), in a way that considers the sources of relevant contaminants recorded under Policy CC1, to assist the improvement of water quality in the freshwater management units, to meet those targets, and within a defined timeframe.*

69. From a planning perspective there are at least two inconsistencies relevant to the NOF in the 15B table limits when applying the Kelly, Robertson, and Allen (2014) work.

70. One inconsistency relates to the measure of phosphorous and its effect on water quality in Lake McGregor. That lake is in Band "A" for TP in the Kelly, Robertson, and Allen (2014) table. However, setting it at <20 median mg/m^3 as is proposed in Plan Change 5 would put it close Band "C" in the Kelly, Robertson, and Allen (2014) figure 18 (see appendix 4). A shift from band A to Band C equates to a significant decrease in water quality.

71. The NOF requires that lakes do not change Bands. Consequently, a limit of <10 median mgs/m^3 is required to ensure Lake McGregor remains in Band "A", which it is identified as being in, in the Kelly, Robertson, and Allen (2014) report.

72. Kellands Pond (of which there appear to be two in the NZMS topographical map series) is modelled by Kelly, Robertson, and Allen (2014) as being below the national bottom line NOF for Chlorophyll-a. On that measure it would have to meet a long-term target of <12 mg/m^3 to meet the NOF band "C" for Chlorophyll-a to be above the national bottom line.

73. The NOF attribute tables (NPS FM, Appendix 2) state that where a value of 12 mg/m^3 is exceeded, "*lake ecological communities have undergone or are at high risk of a regime shift to a persistent degraded state, due to impacts of elevated nutrients leading to excessive algal and/or plant growth, as well as from losing oxygen in bottom waters of deep lakes*".

74. In Kellands Pond there appears to have been significant water quality degradation that needs to be addressed if long-term compliance with the NPS FM Policies A1 and A2 is to be achieved, as required by section 67(3) RMA.

75. RPS Policy 7.3.6 seeks to establish and implement appropriate water quality standards "which are appropriate for each water body". In my opinion, the planning framework requires water quality limits to be set for water bodies to give effect to this policy. It would be unusual, in my experience, to have a plan addressing water quality for lakes in a catchment to set standards for some lakes and not others. To be a comprehensive regime for water quality, Plan Change 5 should include Lake Ruataniwha, which ought to have its own set of water quality limits. Such an approach, in my view, would be consistent with NPS FM Objective A1 and A2 and the RMA's sustainable management purpose.

iv. RECOMMENDATION

76. I recommend that:

a) table 15B(h) be retained as notified,

b) Lake Ruataniwha be managed by including an appropriate set of water quality limits in table 15B(d),
c) Lake McGregor's TP limits should be <10 median mg/m^3 to ensure it remains within NOF "A" band limits, and
d) Kellands Ponds should desirably stay at a value of less than 12 mg/m^3 for Chlorophyll-a.

CONCLUSIONS

Relating to the Introduction

77. The addition of some more descriptive material would improve the Plan Change by providing scientific and ecological context. Extra descriptive material regarding recreational and tourism values and use trends in the very large Conservation Areas and *Aoraki* / Mt Cook National Park managed by the Department of Conservation in the west of the Waitaki basin would also be useful.

Relating to Significant Indigenous Biodiversity

78. The proposed policy as amended by the submissions will create an improved policy framework for an interim ECan land use regime to manage significant terrestrial indigenous biodiversity until appropriate District plan rules have been made operative. I support the changes recommended by the section 42A report in this regard. To give effect to this requirement interim rules are also required in the Waitaki District as well as the Haldon area (in Mackenzie District) to protect indigenous biodiversity.

79. One significant improvement sought by the D-G's submission clarifies that to address biodiversity comprehensively, and include both terrestrial and freshwater biodiversity, a further plan change may be required.

Relating to Threatened Native fish

80. NPS FM Objective A1, RPS Policy 10.3.2(7) and CWMS Principle 5 provisions mandate the identification and protection of significant habitat of threatened native fish species of Canterbury mudfish, Lowland and Upland Longjaw galaxias, and Bignose galaxias.

81. The habitats of these fish species currently have no specific protection under the LWRP. Therefore, I would support the use of the term "habitat" in Policies and rules in Plan Change 5.

82. Riparian protection and fencing around native fish habitats are also proposed as methods that will protect freshwater fish habitat. Provisions requiring those steps would help ensure the ongoing maintenance and protection of native fish habitat and, in my opinion, are therefore consistent with the superior RMA Principle, Objective and Policy Framework instruments.

Relating to Water quality standards and limits

83. The D-G's submission has proposed water quality standards/ limits for some lakes which were omitted from the notified version of plan change 5 seek to maintain existing water quality in these lakes in their appropriate NOF bands. The Kelly, Robertson and Allen (2014) and Clarke (2015) technical reports outline in particular the vulnerability of the shallow high country lakes to nutrient enrichment, and their vulnerability to major step changes in ecosystems functioning.

84. ECan has appropriately established sensitive lake zones in the plan change and I agree these provisions are necessary to maintain water quality. I agree that these lakes are substantial water bodies and establishing standards for them is highly desirable.

85. The proposed provision will, in my opinion, give effect to the NPS FM Objectives A1 and A2, having particular regard to CWMS Principle 2 which requires the actual or potential cumulative effects of using freshwater to be " recognised and managed within defined standards". In so doing, this will maintain the lake values, in particular of the smaller lake values, that are managed by the Department and others in the Waitaki catchment for current and future generations.

Herb R Familton

Planner

25 July 2016

APPENDIX 1:

Recommended Changes to Plan Change 5

Key to recommended changes

- **Strikeouts ~~indicate deleted text~~**
- **Red underline indicate additional text**

	Reference to Plan Provision	**Relief Sought** *(Note that references are to the section 42A report)*
A. General Provisions		
1	Section 15B Waitaki Sub-region, introductory text	On page 3-1 before the last sentence of paragraph two, add: The shallow lakes are particularly susceptible to nutrient enrichment from agricultural intensification.
2	Section 15B Waitaki Sub-region, introductory text	On page 3-2, alter the first paragraph as follows: "The Waitaki Sub-region includes the iconic Mackenzie Basin, an area recognised as nationally significant for its diverse range of dryland and aquatic ecosystems, which provide habitat to a large number of indigenous fish, invertebrates and birds. The Waitaki catchment is a distinct centre of endemism and diversity for native species.
3	Section 15B Waitaki Sub-region, introductory text	On page 3-2, add a new sentence to the second paragraph as follows: The public conservation land including National Park is managed in the catchment under the Canterbury Conservation Management Strategy (2016) and *Aoraki* /Mount Cook National Park Management Plan (2005) by the Department of Conservation.
4	Section 15B Waitaki Sub-region, after 15B.3	After 15B.3, add a new Policy 15B.3A as follows: 15B.3A DOC Management Plans that apply to the Waitaki Sub-region • Canterbury Conservation Management Strategy • Aoraki/ Mount Cook National Park Management Plan
B. Significant Indigenous Biodiversity		
5	Section 15B Waitaki Sub-region, Policy 15B.4.23	In 15B.4.23, amend as follows: *"Significant indigenous biodiversity and habitat is proteceted* ; Retain (a) and (b) After 15B.4.23, add a new Policy 15B.4.23A:

		15B.4.23A:*Significant indigenous freshwater biodiversity and habitat is maintained in the four freshwater management units by:* *(a) The implementation of a regional plan change to the Canterbury Land and Water Regional Plan notified after 13 February 2016 that requires the identification and protection of significant freshwater biodiversity and habitat.*
C. Threatened Native Fish and Freshwater Habitat Quality		
6	Section 15B Waitaki Sub-region, Policy 15B.4.18	Amend Policy 15B.4.18 as follows: "Within the Waitaki sub-region, water and freshwater habitat quality is maintained by requiring: Add after (a) a new (b) as follows: (b) the following freshwater protection mechanisms: i. Provision of riparian buffer strips on waterways ii. Native planting where appropriate iii. Fencing of springheads and spring-fed waterways iv. Use of artificial wetlands where appropriate; and Consequential renumbering of (b) to (c)
7	Section 15B Waitaki Sub-region, Policy 15B.4.20	Amend Policy 15B.4.20 as follows: "Water and habitat quality is maintained in the Upper Waitaki Freshwater Management Unit by: Delete existing section (d) and replace with a new (d) and (e) as follows: (d) avoiding increases in nitrogen losses from farming activities adjacent to and upstream of threatened native fish habitat, in particular, springs and spring fed rivers; and (e) applying to all resource consents granted for the use of land for a farming activity, aquaculture operation, or waste water activity, monitoring and response conditions providing for, but not limited to: 1. Water quality triggers 2. Receiving environment monitoring 3. Nutrient discharge allowances 4. Graduated nutrient discharge reductions

		to meet the water quality outcomes in the relevant table 15B(c), 15B(d) and 15B(e) and relates specifically to the effects caused by the activity, consistent with Policies 15B.4.13-16.
8	Section 15B Waitaki Sub-region, Policies 15B.4.19	Amend Policy 15B.4.19 as follows: "Water and Habitat quality in the Upper Waitaki Freshwater Management Unit is maintained by: Add a new (a) as follows: (a) after 13 February 2016, avoiding adverse effects on threatened native fish habitats; and Consequential renumbering of (a) and (b) to (b) and (c).
9	Section 15B Waitaki Sub-region, Policy 15B.4.24	Amend Policy 15B.4.24 as follows: "Freshwater and Habitat quality is maintained within the Hakataramea Freshwater Management Unit by: Add a new (a) as follows: (a) after 13 February 2016, avoiding adverse effects on threatened native fish habitats; and Consequential renumbering of (a), (b) and c) to (b), (c) and (d).
10	Section 15B Waitaki Sub-region, Policy 15B.4.25	Amend Policy 15B.4.25 as follows: "Freshwater and Habitat quality is maintained within the Valley and Tributaries Freshwater Management Unit by: Add a new (a) as follows: (a) after 13 February 2016, avoiding adverse effects on threatened native fish habitats; and Consequential renumbering of (a), (b) and (c) to (b), (c) and (d).
11	Section 15B Waitaki Sub-region, Policy 15B.4.26	Amend Policy 15B.4.26 as follows: "Freshwater and Habitat quality is maintained within the Greater Waikākahi Zone by: Add a new (a) as follows: (a) after 13 February 2016, avoiding adverse effects on threatened native fish habitats; and Consequential renumbering of (a) and (b) to (b) and (c).
12	Schedule 7	Amend Schedule 7, Management Area: In-stream Biodiversity Values as follows:

		Objective: To protect and enhance in-stream biodiversity values and avoid adverse effects on threatened fish species. Add two further new targets: *3. "Fence out spring heads and spring-fed streams to sustain threatened fish populations and fish habitat."* *4. "Fence out waterways from all stock and provide riparian buffers to mitigate the effects of P, N, e.coli, and suspended sediment."*
D. Water Quality		
13	Table 15B(d)	Amend Table 15B(d) as follows: Lake McGregor <10 ~~<20~~ TP mg/m^3 [annual median] Kellands Pond less than 12 mg/m^2 for Chlorophyll-a [annual median]
14	Table 15B(d)	Amend Table 15B(d) by inserting a new water body new water quality limits as appropriate: Lake Ruataniwha: • TLI X • TP <10 mg/m^3 [annual median] • TN < X mg/m^3 [annual median] • Chl-a <X mg/m^3 [annual median], and <X mg/m^3 [annual maximum]

APPENDIX 2: Literature

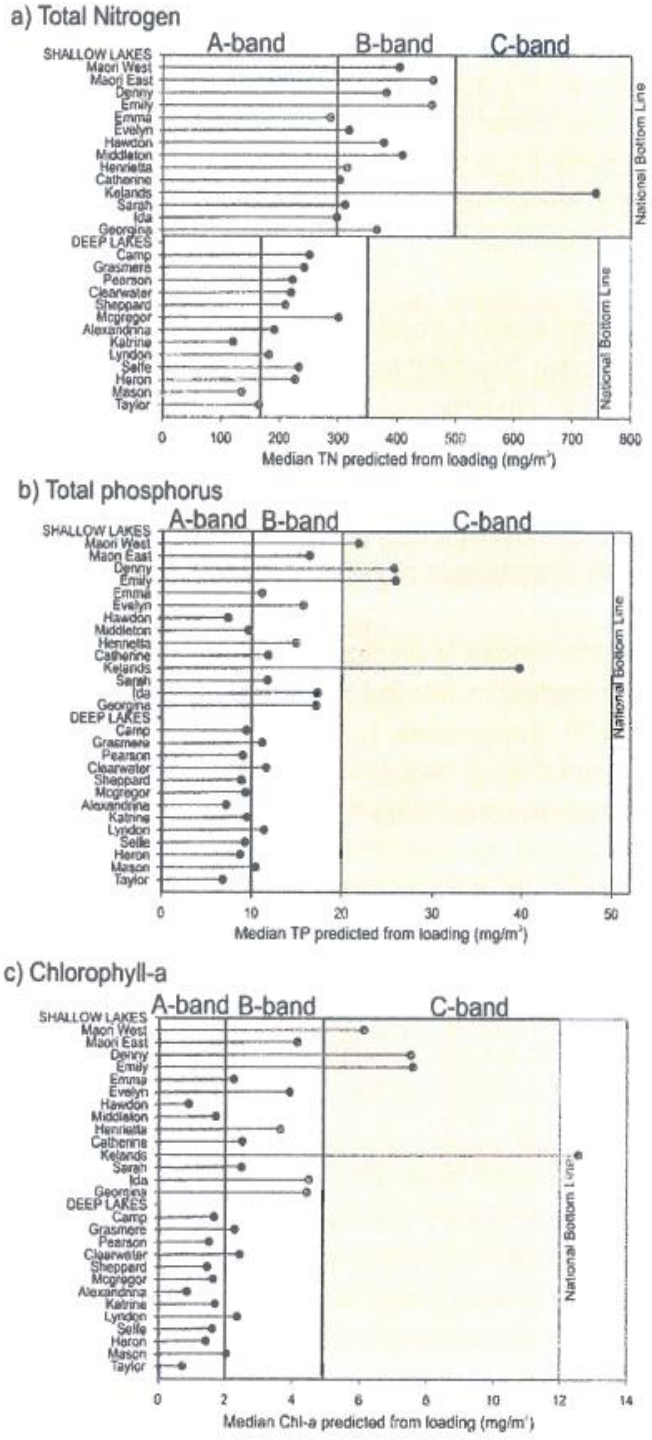
1. Resource Management Act 1991
2. National Policy Statement for Freshwater Management 2014
3. Kelly DJ, Robertson HA, Allen C (2014) Nutrient loading to Canterbury High Country lakes for sustaining ecological values (2014). Cawthron Institute Report No. 2557 prepared for the Department of Conservation and Environment Canterbury.
4. Tanner CC, Sukias JPS, Yates CR 2010. New Zealand Guidelines: Constructed Wetland Treatment of Tile Drainage. NIWA Information series No 75. National institute of Water and Atmosphere Research Ltd 48 p.
5. Wilcock RJ, Monaghan RM, Quinn JM, Srinivasan MS, Houlbrooke DJ, Duncan MJ, Wright-Stow AE, and Scarbrook MR. Trends in water quality of five dairy farming streams in response to adoption of best practise and benefits of long-term monitoring at the catchment scale. Marine and Freshwater Research 2013 64 401-412. CSIRO Publishing.
6. Clarke G. Upper Waitaki Limit setting process. Predicting consequences of future scenarios: Lake Water Quality. ECan Report R15/156. December 2015
7. The second and third report of the Land and Water Forum April and October 2012, Wellington, NZ.
8. The Parliamentary Commissioners report “Growing for Good” (2006)
9. Water Quality in New Zealand: Landuse and Nutrient Pollution. (November 2013). Parliamentary Commissioner for the Environment, Wellington.
10. The New Zealand Biodiversity Strategy (2000)
11. The Canterbury Regional Policy Statement (2013)
12. The Canterbury Conservation Management Strategy, DOC (2000)
13. The expert witness evidence of Dr Nicholas Dunn for the Director-General of Conservation
14. The ECan section 42A report R16/23 dated July 2016. Environment Canterbury.
15. The ECan section 32 report, dated February 2016. Environment Canterbury.

Appendix 3 Terms used in Evidence

CA	Controlled Activity
CWMS	Canterbury Water Management Strategy
ECan	Canterbury Regional Council
ECan Act	Environment Canterbury (Temporary Commissioners and Improved Water Management Act) 2010
DA	Discretionary Activity
D-G	Director-General of Conservation
DOC	Department of Conservation
FMU	Freshwater Management Unit
NPS FM	National Policy Statement Freshwater Management 2014
PA	Permitted Activity
LWRP	Partially operative Canterbury Land and Water Regional Plan (ECan 2012)
NCA	Non Complying Activity
RDA	Restricted Discretionary Activity
RMA	Resource Management Act
RPS	Canterbury Regional Policy Statement (January 2013)
TLA	Territorial Local Authority
TP	Total Phosphorus (expressed as median mg/m^2)
TN	Total Nitrogen (expressed as median mg/m^2)
ZIP	Zone Implementation plan

Appendix 4

Predicted median Water Quality attributes and the National Objectives Framework (NOF) numeric water quality bands (Figure 18 page 54 Kelly, Robertson, and Allen (2014)



APPENDIX 5

Waimate and Waitaki Schedules of Significant Nature Conservation Value

APPENDIX G – SIGNIFICANT NATURAL AREAS AND FEATURES

The following sites of known natural significance have been currently identified within Waimate District. They represent plant and animal communities and habitats which are representative, rare or unique within the District, or otherwise considered to be significant in terms of section 6(c) of the Resource Management Act. A range of geological and geomorphological sites have also been identified which are considered to be outstanding natural features in terms of section 6(b) of the Act. Those habitats, communities and natural features which adjoin or encompass lakes, streams, rivers and wetlands also contribute to the natural character of these water bodies in terms of section 6(a).

Significant sites of indigenous vegetation and fauna habitat have principally been identified from the following information sources:

1) Recommended Areas for Protection (RAP) identified in the Mackenzie Ecological Region Protected Natural Area (PNAP) Survey Report, 1984. Some of the RAPs identified within the Mackenzie Ecological Region have been enlarged on the basis of recommendations from the Protected Areas Scientific Review Committee (PASAC). A small number of these areas were also extended in consultation with the Forest Research Institute (FRI) (now Landcare NZ Ltd), or as a result of invertebrate surveys in the area. They reflect better representation of communities and improved management boundaries.

2) Special Sites of Wildlife Interest (SSWI) identified in *Wildlife and Sites of Special Wildlife Interest in the Upper Waitaki and Adjacent Areas* by Liz Jarman (1987), and O'Donnell, C.F.J. and Moore, S.M. 1993. *The Wildlife and Conservation of Braided River Systems in Canterbury*; NZ Wildlife Service, Wellington.

3) Wetlands of ecological and representative importance (WERI). The WERI database is an inventory of all types of wetlands in New Zealand. It focuses on those wetlands which are ecologically important or significant and which are representative of the natural diversity of the country. The database is administered by the Department of Conservation.

4) Given, D.R. (1981) *Rare and Endangered Plants of New Zealand*, Reed, Wellington.
5) Goodson, P.N., Holgate, G.L. and Ward-Smith, R.A. (1984) *Crown Land Management Plan for the Kirkliston Range Management Area*. Department of Lands and Survey, Christchurch.

6) Johnson, P. (unpub) *Stony Stream - Deep Stream Botanical Report 340.* Unpublished Report. Botany Division, DSIR.

7) Kelly, G.C. (1972) *(Scenic Reserves of Canterbury*, Botany Division, DSIR

Geopreservation sites, referred to as Significant Natural Features in the Plan, are those identified in the Geopreservation Inventory held by the Science and Research Division of the Department of Conservation, and published in Kenny, J.A., and Hayward, B.W., 1993 Inventory of Important Geological Sites and Landforms in the Canterbury Region..., Geological Society of New Zealand Miscellaneous Publication.

The schedule is cross-referenced by the site numbers to the Maps. Where the site includes RAP(s), SSWI, or a WERI the reference names for these is given. RAP's are identified by Ecological District as follows: B = Benmore, G = Grampians. References to "district" are to the Ecological District, and "region" are to the ecological region.

SIGNIFICANT NATURAL AREAS AND FEATURES

	Name	Map Reference	Data Source Description
1	Grampian Range 1a RAPG-6 1b RAPG-7 1c RAPG-8	I39 23122 56472 Maps 3	RAPs G-6 (Black Rocks - Grampian Range); G-7 (South Grampians); G-8 (South Grampians above Stony River): Combined area provides best example of alpine fellfield. Good example of transition from snow tussock to fellfield, and a Festuca matthewsii community. Black Rocks has only known occurrence of Celmisia rumulosa in the district, and largest population of Aciphylla dobsonii.
2	Big Range	I39 23028 56383 Map 4	RAP G-9: Subalpine/montane slim/snow tussock. The only red tussock community in the District and only example of high altitude C. rubra association in Region. Matagouri/Oleria communities occupy the valley bottom.
3	Lake Benmore	H39 22879 56275 Maps 1 and 2	SSWI; WERI: Largest artificial lake in New Zealand. Associated rush and sedge swamp. Popular waterfowl habitat, feeding area for black stilt, little shag, white heron, grey duck, grey teal and pukeko present. Southern crested grebe reported. Native bullies and galaxids in lake.
4	Whalans Stream	I39 22911 56248 Map 2	RAP B-8 (Whalans Stream): This merges into Coprosma/Olearia scrub in a large fesuce tussock community and finally into an open Chionchloa rigida stand. Whalans Stream contains one of the thickest examples of Olearia odorata in the district. RAPS extended to follow catchment boundaries and include altitudinal sequences to subalpine level.
5	Lake Aviemore	I40 22960 56176 Maps 2, 5 and 6	SSWI; WERI: Large artificial lowland lake. 95% open water with generally steep shoreline and surrounding tussock grassland.
6	Deep Stream	I40 23005 56152 Map 6	6: Dryland scrub communities. Deep stream gorge contains many scrub species including the very rare Coprosma kirkii. Bracken fernland dominates talus slopes at base of shady hillsides. Silver and hard tussock grassland is predominant on shady gorge faces, with Bromus diandrus common on sunnier grassed faces. Lake shore vegetation includes niggerheads and raupo. Rock outcrops support plants typical of crevices and ledges, including whipcord daisy and dryland ferns.
7	Lake Waitaki	I40 23032 56118 Maps 6 and 7	SSWI; WERI: Lowland artificial lake, with associated rush and sedge swamp. Steep shoreline with wetland areas on some margins. Excellent waterfowl habitat especially for feeding and loafing. White faced heron and grey warbler breeding. Other birds present include bellbird, banded dotterel, grey duck and black shag.
8	Aviemore Ponds	I40 23041 56129 Map 6	SSWI; WERI: Lowland lake providing waterfowl habitat. Breeding area for grey duck.

	Name	Map Reference	Data Source Description
9	Kirkliston Range	I40 23085 56196 Maps 4, 5, 6 and 9	5: Area of high natural value. Vegetation includes of summit vegetation of scree and cushion plants, with snow tussock on higher, sunnier faces. Slim snow tussock, blue tussock and associated herb species dominate shady moist slopes, this association replaced by narrow leaved snow-tussock below 1400m. Hard and silver tussock common at lower altitudes, but displaced by scrub covered gullies further down. Remnant Halls totara and isolated kowhai are present. Ground beetles of Megadromus sp are reported to be confined to the Kirkliston and Grampian ranges.
10	Hakataramea River	I40 23215 56162 Maps 6, 7, 8, 9, 10 and 11	SSWI; WERI: Shallow braided river with mid channel islands and large open cobble and shingle areas. Black fronted tern and banded dotterel breeding area. Headwaters have potential to support native species such as banded kokopu, koaro, bullies and eels. Important trout and salmon fishery.
12	Waitaki River	J40 23366 55900 Maps 7, 12, 13, 19 and 24	SSWI: Wide braided river channels free of permanent vegetation. Willow-dominated berms with tributary streams and swampland offer sheltered habitat for swamp birds. Forty-eight wetland bird species recorded in lower Waitaki River catchment, 23-24 of these breeding. Lagoon is an inanga spawning area. Important trout and salmon fishery..
13	Waihuna Stream	J40 23405 55925 Map 19	Slow flowing stream containing a known population of Canterbury mudfish.
16	Waikakahi Stream	J40 23515 55904 Map 19	Slow flowing stream that may provide habitat for Canterbury mudfish.
17	Whitney's Creek	J40 23560 55901 Map 24	WERI: Rush and sedge swamp, slow single channel river. Very promising habitat for Canterbury mudfish.
18	Dog Kennel Stream	J40 23543 55929 Map 19	WERI: Coastal stream. Nationally significant habitat for large Canterbury mudfish population
20	Waihao River and Margins	J40 23483 55995 Map 18	SSWI; WERI: Fast, single channel river. The northern riparian land contains both native and exotic mixed age regenerating bush, forest and scrubland. An inanga spawning area and trout and salmon fishery.
21	Fletchers Oxbow/Cruickshank's Reserve	J40 23631 56009 Map 23	SSWI; WERI: Lowland lake and flax swamp. Wildlife management reserve, important part of Waihao River system. Significant waterfowl habitat for New Zealand shoveler. Other bird species present include Australian brown bittern and marsh crake. Canterbury mudfish may be present. Vegetation consists mainly of a dense willow canopy, Carex spp, flax, rushes, emergent and non-emergent aquatic plants.
22	Waihao Box	J40 23652 56028 Map 23	SSWI; WERI: Wildlife management reserve consisting of a sand/shingle beach ridge on impounded brackish stream wetland. Ridge sparsely vegetated, wetland margins contain rush and sedge swamp. Provides a roosting place for seabirds and waterfowl, including white heron, bittern and banded dotterel. Lagoon is an inanga spawning habitat.

	Name	Map Reference	Data Source Description
26	Wainono Lagoon	J40 23638 56100 Map 22, 23	SSWI; WERI: The **only** substantial coastal lake and mudflat between Lake Ellesmere and the Tairi Valley, a wetland of international importance under the RAMSAR wetland convention. Area consists of flax swamp, rush and sedge swamp, succulent herb swamp and mudflat. Important for a number bird species, including white heron, royal spoonbill, wrybill, grey teal and pied stilt. Habitat for a range of native fish species, an inanga spawning ground and Maori eel fishing area.
27	Waituna Stream	J40 23594 56084 Map 22	Slow flowing creek containing a population of Canterbury mudfish.
30	Uretane Bush	J40 23542 56014 Map 18, 23	SSWI: Forest habitat. Lowland mixed broadleaved forest with bush birds present including tomtit and rifleman.
31	Waimate Gorge Bush	J40 23523 56027 Map 18	SSWI: Forest habitat. Lowland mixed broadleaved forest with basic bush birds present
32	Waihao Gorge Bush	J40 23434 56079 Maps 17 and 18	SSWI: Forest habitat. Lowland broadleaved forest connected by shrubland along Waiho River. Riparian lands contain exotic and native species in transition from past disturbances. Some steep gorges already fairly densely covered with natives. Forest birds present, with high numbers of bellbirds. Some wetland birds also present including a reported black shag colony, grey duck and paradise shelduck.
33	Mill Road Bush	J40 23491 56071 Maps 17 and 18	SSWI: Forest habitat. Several patches of lowland mixed hardwood forest connected by scattered shrubland and trees. Good canopy with frequent big trees, including totara,. Good bird numbers and diversity.
34	Kelceys Bush	J40 23481 56107 Map 17	SSWI: Forest habitat. Large mixed broadleaved lowland forest remnant. Good canopy with some excellent large matai trees, and remnant totara. Regionally common birds present, also sightings of kingfisher, shining cuckoo, and morepork. Large part of bush already reserved as town water area.
35	Meyers Road Bush	J40 23490 56126 Map 17	SSWI: Forest habitat. High quality lowland mixed broadleaved forest. Good floor cover and high bird numbers. Bush flanked by pasture and modified tussock grassland.
36	Gunn's Bush	J40 23480 56137 Map 17	SSWI: Forest Habitat. Area of lowland mixed boradleaf forest. Low canopy with a few kahikatea, but little understorey. Bush bireds present, include rifleman and South Island tomtit.
37	Hook Bush	J40 23480 56162 Map 17	SSWI: Forest habitat. Large lowland broadleaved hardwood forest with remnant podocarps. Mature podocarp hardwood forest in lower reaches merging with mixed tussock, scrub, herbfields above a fire-induced bushline. High bird numbers and diversity, including New Zealand pigeon.
38	Jackson Bush	J40 23484 56185 Maps 16 and 17	SSWI: Forest habitat. Lowland podocarp/hardwood forest and scrub. Good quality habitat with good range of vegetation. Bush birds present include New Zealand pigeon, South Island tit and morepork.
39	Milne's Road Bush	J39 23474 56205 Map 16	SSWI: Forest habitat. Mixed broadleaved hardwood forest. Birds present include New Zealand pigeon, bellbird, rifleman, South Island tit and grey duck.

	Name	Map Reference	Data Source Description
40	Stanley's Road Bush	J39 23486 56220 Map 16	SSWI: Forest habitat. Mixed broadleaved hardwood forest on lowland hill slopes. Good quality vegetation. Bush birds present including South Island tit, rifleman and reported sightings of New Zealand pigeon.
41	Mount Cecil Bush	J39 23475 56226 Map 16	SSWI: Forest habitat Podocarp/mixed hardwood forest on lowland hill slopes. Good regeneration. Birds present include South Island tit, brown creeper, rifleman and New Zealand Pigeon (reported.)
42	Teshemakers Bush	J39 23478 56238 Map 16	SSWI: Forest habitat. Lowland podocarp/mixed broadleaved forest. Unusual for large numbers of matai and kahikatea on lower slopes. Bush birds present including rifleman and South Island tit.
43	Robbs Road Bush	J39 23474 56254 Map 16	SSWI: Forest habitat. Lowland mixed broadleaved forest and scrub. Bush birds present, including South Island tit.
44	Horseshoe Bend Stream	J39 23601 56224 Map 21	WERI: Coastal stream containing known population of Canterbury mudfish.
45	Kohika Lagoon	J39 23642 56217 Map 21	WERI: Wetland. Succulent herb swamp, salt rush and reed swamp.
46	Otaio Flats	J39 23646 56239 Map 21	WERI: Wetland. Salt rush and reed swamp. Water fowl waders present.
47	Otaio River Bush	J39 23432 56256 Map 16	SSWI: Forest habitat. Lowland podocarp/mixed broadleaved forest and scrub effectively joining scenic reserve. Few large trees but close canopy. Good bird diversity and numbers. Black shag colony reported.
48	Otaio Gorge Scenic Reserve	J39 23441 56285 Map 16	SSWI: Forest habitat. Lowland broadleaved forest remnant and montane podocarp/mixed broadleaved forest. Fairly good stand composed of species common in this area. Bush birds present, including New Zealand pigeon and South Island tit also grey duck and blue duck on Otaio River
49	Silverstream Bush	J39 23423 56294 Map 16	SSWI: Forest habitat. Large area of lowland mixed broadleaved forest and scrub with some totara. Good structure and composition. Bush birds present including New Zealand pigeon and reported sightings of kingfisher.
50	Mt Airini Bush	J39 23410 56326 Map 15	SSWI: Forest habitat. Lowland mixed broadleaved forest on steep, mainly south facing slopes. Small area with broken canopy. Bush birds present.
51	Grange Hill Bush	J39 23398 56343 Map 15	SSWI: Forest habitat. Lowland mixed broadleaved forest. Bush birds present include rifleman, brown creeper and South Island tit.
52	Motukaika Bush	J39 23398 56361 Map 15	SSWI: Forest habitat. Hardwood forest and shrubland on steep slopes. Forest structure has many gaps. Low to moderate numbers of most bush birds in the district and New Zealand pigeon.

	Name	Map Reference	Data Source Description
53	Hunters Hills Conservation Land	J39 23330 56356 Maps 9 and 15	4: Large remote area of dissected montane ridges and basins. Scattered montane shrublands and snow tussock merging with tussock grasslands at lower altitudes. Includes a good variety of aspect and altitude, plus large tracts of several upper catchments.
54	Mt Nimrod Scenic Reserve	J39 23403 56385 Map 15	7: SSWI: Contains altitudinal sequence of plant communities. Mixed broadleaved forest running to tussock hill pasture; mahoe/broadleaved mixed broadleaved forest; ribbonwood/mahoe mixed broadleaved forest; mixed shrublands; native tussock and pasture grassland. Excellent example of mixed broardleaved lowland forest. Fairly high numbers of bush birds present including New Zealand pigeon, South Island tit and rifleman.
55	Matata Scenic Reserve	J39 23397 56410 Map 15	7: SSWI: Forest habitat. Mahoe and mixed broadleaved dominated lowland forest remnant with scattered podocarps, Coprosma shrublands and mixed tussock grassland. New Zealand pigeon and New Zealand falcon present in addition to bush birds.
56	White Rock Bush	J39 23396 56440 Maps 14 and 15	SSWI: Forest habitat. Lowland mixed broadleaved forest, mainly on steep gully slopes. Bush birds present.
57	Mahoe Farm Bush	J39 23396 56454 Map 14	SSWI: Forest habitat. Lowland mixed broadleaved foreset, mainly on steep gully slopes. Bush birds present include New Zealand pigeon, brown creeper, and South Island tit.
58	Pareora Scenic Reserve	J39 23372 56482 Map 14	7; SSWI: Small area of lowland regenerating mixed broadleaved forest, with small-leaved shrubland. Botanically interesting low rainfall limestone vegetation present. Bush birds present include South Island tit and brown creeper.
59	Pareora River	J39 23581 56404 Maps 14 and 20	SSWI; WERI: Small braided river and coastal stream. Marsh crake present in berm areas, otherwise low numbers only of common riverbed bird species. Inanga spawning area.
60	Pareora Rivermouth and Lagoon	J39 23678 56323 Map 20	SSWI; WERI: Wetland. Reed swamp, rush and sedge swamp, mudflat, shingle rivermouth, and two small coastal lagoons. Low bird numbers, but bittern crake, and grey teal present.
61	Un-named Stream, St Andrews	J39 23671 56311 Map 21	WERI: Coastal stream containing reasonably large Canterbury mudfish population.

Note

Sites of Natural Significance 11, 14, 15, 19, 23, 25, 28, and 29 have been deleted from this list.

SIGNIFICANT NATURAL FEATURES – (GEOPRESERVATION SITES)

Site	Name	Map Reference	Description
G1	Black Jacks Triassic Macroflora, Benmore Dam	H39 22883 56232 Map 2	Nationally important site containing Lower Mesozoic plant fossils and middle Triassic estuarine deposits.
G2	Benmore Dam Faulted Greywacke	H39 22875 56226 Map 2	Faulted and subvertical sandstones and argellites providing a good example of structure within the Torlesse terrain of late Mesozoic, Tertiary age.
G3	Benmore Permian Fusulinids	I39 22910 56205 Map 2	One of only three fusulinid foraminifera localities in new Zealand. A site of international importance.
G4	Kirkliston Fault	I39 23164 56203 Map 10	Zone of late Tertiary to late Quaternary deformation of up to 3 km in width, associated with range front reverse faulting, gently backtilted and offset fan surfaces and deformed Tertiary and Quaternary sediments.
G6	Dryburgh Fault	I40 23158 56006 Map 12	Major reverse fault system in the Waitaki Basin with obvious topographic expression and Quaternary offset. System of splay faults form a zone approximately 500m wide where Tertiary sediments overthrust Quarternary gravels and greywacke overthrusts Tertiary along moderately steep angle contacts.
G7	Foveran Sarsen Stones	I40 23210 56100 Map 11	Remnant Sarsen stones after stripping off of Tertiary cover. Particularly good example of an extensive group of Sarsen stones.
G8	Brothers Stream Oligocene Fauna	I40 23203 56131 Map 11	Site containing diverse Waitakian molluscan fauna, deemed to be of national importance.
G9	Sisters Creek Oligocence Fauna	I40 23231 56159 Map 11	Site of diverse Waitakian macrofauna including whales, brachiopods and corals. Nationally important site
G10	Waihao River (South Branch) Eocene Molluscan Fauna	J40 23355 56109 Map 17	Site of national importance displaying diverse molluscan fauna
G11	Waiho Downs Eocene Molluscan Fauna	J40 23447 56000 Map 18	Nationally important site containing diverse Bortonian molluscan fauna.
G12	Waihao Forks Miocene Sandstones	J40 23465 55998 Map 18	Cross-bedded and channelled glauconitic calcarenites with some very good trace fossils. The maximum marine transgression in the region is shown and the site, deemed to beat international importance, also contains informative and interesting sedimentary structures.
G13	Waiho River Eocene Deepwater Fauna	J40 23489 55989 Map 18	Nationally important site containing diverse Kaiatan deepwater molluscan fauna.

Site	Name	Map Reference	Description
G14	McCulloch's Bridge Eocene Fauna and Unconformity	J40 23500 55989 Map 18	Unconformity marked by partly cemented and phosphatised bed. A site of national importance containing exceptionally diverse Bartonian and Kaiatan molluscan faunas. Also a boundary stratotype for these two stages and stratotype of disused Tahuian Stage. A possible correlation exists between the unconformity and a drop in sea level at 39.5 Ma.
G15	Otaio River Paleogene Fossiliferous Sediments	J39 23455 56301 Map 16	Paralic coal measures, shelfal sandstone, liminitic greensand, micritic limestone, greystone. Nationally important site providing good exposure of Eocence, Oligocence, and Miocene, including unconformities. Best documented upper Dannevirke molluscan fauna in New Zealand
G16	Squires Farm Oligocene Marshall Paraconformity	J39 23448 56309 Map 16	Well exposed burrowed contact between Squires Greensand and Home Station Limestone. Type section of the nationally important Oligocene Marshall paraconformity. rich unusual brachiopod fauna.
G17	Blue Cliffs Miocene Macrofauna	J39 23516 56336 Map 15	Diverse macrofauna and holostratotype of Otaian stage. A nationally important site.
G19	White Rock River Miocene Molluscan fauna	J39 23435 56466 Map 14	Nationally important site containing diverse Altonian molluscan fauna.
G22	Dolines (Pt Lot2 DP 9641)	J39 23492 56395 Map 15	A field of dolines formed in Tertiary limestone.

Note

Geopreservation Site G18 Pareora has been deleted from this list.

APPENDIX C

SCHEDULE OF AREAS OF SIGNIFICANT NATURE CONSERVATION VALUE AND GEOPRESERVATION SITES
(referred to as natural significance sites on the Planning Maps)

Note: This Appendix is **still subject to references. No part** of this Appendix is considered to be Operative.

The following sites of nature conservation significance and geopreservation sites have been identified on the Plan.

AREAS OF SIGNIFICANT INDIGENOUS VEGETATION AND HABITAT OF INDIGENOUS FAUNA

12	Lake Dumbell	Map 4	H38 513 577	RAP A3, WERI: Large tarn surrounded by C. macra and Dracophyllum pronum community. The tarn supports the only population of Marsippospermum gracile found in the district. A new genus and species of Carabidae - Megadopinae was collected here, and an endemic weevil (Lyperobius spp) is present. Part Conservation Area.
19	Black Jacks Island	Map 7	H39 875 265	RAP B7: Habitat for three lizard species, including the rare scree skink, Leiolopisma otagense form waimatense. Largest island in the lake and supports a high diversity of potential habitats, and examples of some of the driest associations within the upper Waitaki, as well as high frequency of exotic plants. Notable plants include Carmichaelia curta (rare). Will be important as a benchmark for future scientific work.
62	Mt Ida	Maps 14 and 19	H41 812 829	RAP H12: Representative of vegetation and landforms of the high-alpine zone in the southwest of the district. Important as a type locality for the rare plant Myositis oreophila. Mount Ida contains an extensive alpine herbfields of Celmisia viscosa, which are not found elsewhere in the District, and large populations of vegetable sheep. The area contains scree skink habitat and is a key area for insect conservation.
81	Kakanui River Mouth	Maps 64	J42 449 556	SSWI: A river mouth lagoon confined behind a shingle barrier that

		and 65		provides suitable habitat for waders during winter. Bird species recorded include black billed gulls, white heron, royal spoonbill, white fronted tern, spotted shag, black stilt, pied stilt and banded dotterel.
82	All Day Bay Lagoon	Map 29	J42 436 527	SSWI: Coastal lagoon with saltmarsh (Carex sp., Scirpus sp., Cotula coronopifolia, and Sarcocornia quinqueflora) providing good wader habitat. Wader species recorded include pied stilt, banded dotterel, royal spoonbill and white heron. Large and high diversity of waterfowl.
91	Katiki Point	Map 35	J43 388 279	SSWI: Rocky point with a scattering of salt-tolerant plants including Coprosma repens and Hebe alliptica. Important nesting area for birds, particularly the yellow-eyed penguin. Other birds recorded include white fronted tern, spotted shags, little blue penguins, and sooty shearwater. The site is a fur seal haul-out area. Katiki Point is a Historic Reserve under the Reserves Act.
92	Katiki Beach	Map 35	J43 388 231	SSWI: 6km of sandy beach with rocky outcrops. Beach grades from sand dunes with marram at northern end to soft rock cliffs in the centre and south. The threatened plant Euphorbia glauca is present. The area has high habitat value for yellow-eyed penguin, and a good diversity and number of waders and seabirds. Species recorded include pied stilt, variable and South Island oystercatcher, white fronted tern, white faced and reef herons, little blue penguin, and little shag.
93	Shag Point	Map 35	J43 393 231	SSWI: Yellow-eyed penguin and sooty shearwater breed. Major haul-out for seals and shag roosting area. Unusual coastal vegetation includes alpine species such as snow tussock, Celmelsia hookeria, as well as broadleaf, ngaio, flax and clematis. Includes Shag Point Recreation and Scientific Reserves.
99	Pleasant River Estuary	Map 38	J43 320 145	SSWI: Estuarine habitat with Salicornia saltmarsh, mudflats and sandspit. Valuable for waders and waterfowl, including Godwit, South Island and variable oystercatchers, pied stilt, banded dotterel, white faced heron, gull and shag species, and grey duck and grey teal. White fronted terns have been reported breeding on

				the sandspit, and fur seals have been recorded. The area is important for estuarine terrestrial invertebrates.
102	Deighbton Creek	Maps 33 and 36	I43 057 210	Priority habitat area for Otago skink and Grand skink. Common skink, spotted common gecko also present. Deeply entrenched stream with extensive outcrops and bluffs. Vegetation includes snow tussock grassland, manuka and matagouri shrubland and outcrop vegetation. Significant historic values.
103	Emerald Stream	Maps 33, 34, 36 and 37	I43 080 238	Priority habitat area for Grand skink and Otago skink. Most diverse lizard population in the South Island. Other species include green skink, common skink, spotted common skink, speckled common skink and common gecko. Shallow valleys and gentle rolling ridges with extensive outcrops and bluffs along streams and standing tors. Vegetation includes snow tussock vegetation, manuka shrubland and outcrop vegetation. Falcon present.
106	Macraes Ponds	Map 72	I42 099 334	SSWI: Important waterfowl area. Rare moth Gingidiobora nebulosa present on local form of plant Gingidia montana.
G10	Kokoamu Bluff brachiopods	Map 17	I40 296 910	Abundant Duntroonian brachiopods in cliff face and fallen blocks below.
G26	Lorne Eocene Molluscan fauna	Map 26	J41 433 702	Very diverse Kaiatan Moluscan fauna and unusual hard-bottom fauna. Holostratotype of disused Waiarekan Stage.
G27	Old Rifle Butts	Map 26	J41 498 627	Section through Eocene pyroclastic volcano, superb and rare rhodolith deposits of the MacDonald limestone. Also Pleistocene penguin and sea eagle (?) remains and excellent raised Pleistocene beach.
G32	Trig M Eocene Brachiopod Fauna	Map 26	J41 445 623	Diverse Runangan brachiopod fauna in Totara Limestone.
G45	Moeraki Bboulders	Map 32	J42 395 379	A group of about 20 concretions (1-2m in diameter) eroded out of rocks at the back of Moeraki Beach.
G46	Moeraki Peninsula erionite	Map 70	J42 421 362	Good examples of zolite, erionite and phillipsite, and barite.

a	Nenthorn Ridge Wetland Management Area	Map 33	I43 057 243	This area contains a wide variety of wetland types including a low turf ephemeral tarn, a medium turf ephemeral tarn, *Purei* wetlands, pools, bogs and moist red tussock grasslands in a relatively small area (112 ha) on upper slopes and ridge crests at altitude 540 – 570m. The threatened herb *Gratiola nana* is present in the low turf ephemeral tarn at Emerald Creek, one of only 23 known locations throughout the South Island (Johnson 1993). Two locally rare *species Elatine gratioloides* and *Glossostigma* sp. Occur in the medium turf ephemeral tarns. A very diverse range of wetland vegetation, a distinctive insect fauna and a diverse and relatively abundant waterfowl fauna are present. A wetland which is highly valued by Kai Tahu for mahika kai or other waahi taoka.
b	Redbank Wetland Management Area	Map 34	I43 085 275	A copper tussock wetland and a low turf ephemeral tarn. Altitude 470 – 654m. The threatened plant species *Isolepis basilaris* and *Myosurus minimus* subsp. *Novae zelandiae* are present in the low turf ephemeral tarn. A high diversity of wetland species is present. A diverse and interesting aquatic insect fauna in seepages and creeks, including the brown caddis *(Psilochorema tautoru)*.
c	Paddy's Rock Ephemeral Tarn	Map 36	I43 051 177	A small low turf ephemeral tarn supports the threatened plant *Tetrachrondra hamiltonii* on the tarn margin. The tarn has a high plant diversity. The tarn contains the native herb *Hypsela rivalis*, the sedge *Carex gaudichaudina* and the rush *Eleocharis acuta*.
d	Devils Bridge Lagoon	Map 23	J41 480 722	Previously an ephemeral lake, after installation of a weir this area has become a permanent lagoon protected by a QEII covenant. It provides important habitat for a high diversity of wetland bird species and is one of the few habitats of this type in North Otago. Habitat for marsh crake, banded rail, Austrialian coot, NZ scaup, white heron, white faced heron, pied stilt, grey teal, black swan, pukeko and others.

e	Kemps Road Lagoon	Map 35	J42 418 334	A shallow lagoon immediately inland from the mouth of Kemps Road Creek. Area 10 ha. Altitude 15m. Regionally significant waterfowl and wader habitat. Breeding and feeding area for a number of species including paradise, shoveller and grey ducks, grey teal, pied stilt, black swan and spur winged plover.
f	Goodwood Salt Marsh	Map 38	J43 316 152	A saltmarsh near the Pleasant River mouth. A scarce wetland type. The saltmarsh plant community contains *Sarcocornia quinqueflora* (glasswort), *Puccinellia* spp. *Atriplex* spp. *Selliera radicans*, *Samolus repens* and jointed rush.
g	Shag River Estuary Swamp	Map 35	J43 375 242	An area of saline swamp above the Shag River mouth. A scarce wetland type. The saltmarsh community contains *Sarcocornia quinqueflora* (glasswort), jointed rush, and *Atriplex* spp. A wetland which is highly valued by Kai Tahu for mahika kai or other waahi taoka.

APPENDIX C(1)

AREAS OF CONSERVATION MERIT

Note: This Appendix is **still subject to references. No part** of this Appendix is considered to be Operative.

***Note:** The following areas have conservation merit but do not have any formal legal protection in this Plan.*

Barrier & Ohau Ranges	Large tracts of high alpine herbfield and scree with a very high degree of naturalness and characteristic flora and invertebrate fauna. Extensive alpine grassland communities with mixtures of low shrubs and large herbs. Significant mountain beech forest in Maitland catchment.
Ahuriri River, Ben Avon Moraine Kettleholes and Shamrock Flats	Ahuriri River and its associated wetlands have high significance in representativeness, naturalness and diversity of native flora, fauna and landform. Ben Ohau kettleholes are the best in the Ahuriri system and is significant for its native bird species and tarn-edge flora. Presence of breeding habitat for the black stilt underlines the quality of the river system and the variety of wetland systems present.
Shelton Downs	An important and extensive montane short-tussock grassland system containing significant shrubland and kettlehole systems. Diversity of native flora, especially the short turf surrounding the kettleholes, and fauna is high with the array of insects especially significant.
Benmore Range	Important for its alpine and high-alpine landforms, fellfield vegetation and representative insect species. High degree of naturalness and representativeness.
Stony Peak	This area adjoins the Ahuriri River is an altitudinal sequence from valley floor wetlands, through shrublands, snowgrass to high-alpine herbfield and fellfield. Larger area of lateral moraine containing abundance of wetlands with a high diversity of flora and fauna. Significant area for insect species.
Wether Range	Contains significant connected areas of native grasses, shrublands on boulderfields and high-alpine fellfield communities that have high representativeness and high natural values. Relict Halls totara and celery pine areas.

Mt St Cuthbert	Large intact alpine and high-alpine area of very high diversity, naturalness and representativeness. Chionchloa macra grasslands at high altitude, celery pine and snow totara communities on boulderfields and Olearia odorata shrublands at low altitude. Area has significant altitudinal sequence with good quality communities.
Hawkdun, Ewe and Ida Ranges	Form a large and continuous area with very high naturalness, diversity and distinctiveness in landform, flora. fauna and plant communities. Glacial cirques with tarns and extensive boulderfields, hummocky topography with extensive cushionfields, southern limit of screes and scree vegetation in the eastern South island, high-alpine cushionfields and grassland, extensive wetlands, scree skink, large-bodied insects such as two species of each of speargrass weevil and weta, and excellent populations of local endemic plants such as Raoulia petriensis, Acipyhlla dobsoni and A gracilis. Ewe Range has an altitudinal sequence from low altitude fescue through to snowgrass and shrubland to high-alpine vegetation. Superb expanse of mixed communities on a high alpine plateau of national significance in terms of landform, intactness and biodiversity.
Otematata Saline Area	Only saline site in inland New Zealand outside Central Otago with a suite of halophytic plant species and attendant insect species. Site and saline soils are of national importance. Features nationally rare plant species including Chenopoduim detestans, Plantago sphathulata and Polygonium plbeium.
Lower Waitaki River	Important braided river and back-water habitat for a large range of native bird species. Also contains smaller stony river terrace areas of native flora and high entomological values. River-mouth wetlands, including saltmarsh vegetation are important as feeding and breeding sites for both native fish and birds.
Kakanui Mountains	Alpine and high-alpine areas are important because they contain a range of vegetation types on both volcanic and schist substrates, large array of landforms including snowbanks, wetlands, and patterned ground. Intactness, representativeness and biodiversity values are very high with native plants and insects being particularly distinctive and diverse. Many uncommon local and rare plant and insect species present. Contains altitudinal sequences of significance for their intactness and representativeness. Many significant remnant forest patches and shrubland, copper tussock and impressive rocky areas within snowgrass found and are important for the diversity of the bird and invertebrate species present.
Herbert Forest	Large and important area of forest, forest remnants and steep rocky areas of shrubs and herbs that have an excellent diversity of native plant, bird and insect species. Some local endemic species of insects add to the general richness of the area.

Swampy Hill	Large expanse of upland snowgrass vegetation on peneplain landform, with shrub- or wetland-filled gullies. Highlights the high diversity of three large-bodied skink species in the genus Oligosoma, endangered herbs and grasses, bog pine remnants, rare moths of tors and tor-ledge herbs, good falcon population and ephemeral wetland communities. Area is of major importance for its cohesiveness, diversity, naturalness and intactness. Impressive variety of different communities.
Awahokomo Limestone	Important refugia for a suite of rare and endangered native herbs, grasses and shrubs. Several species, of which two are about to be formally described, are now completely confined to the limestone outcrops.
Twizel-Omarama Grassland	Large corridor of semi-natural short-tussock grasslands with a good degree of naturalness. Sparsely dotted with native shrubs and open low vegetation. Important area of short tussock grassland with good diversity of inter-tussock herbs. Invertebrate values are of significance. In terms of size, visibility and condition, it is of national significance.
Sailors Cutting Shrubland	Sparse dry important for its array of native brooms, both prostrate and upright species. Significant because of diversity, viability and representativeness of the flora and fauna of these very dry slopes.
Aviemore Shrublands	Patches of mainly prostrate kowhai shrubland on dry slopes, interspersed with wetlands of sedge and Olearia-dominated shrub communities. Significant on the basis of rarity, viability, diversity and naturalness. Also important for the insect assemblages present.
Kurow Hill Shrublands	Dense shrubland on steep, dry slopes that is significant in terms of the diversity of native species, its large area and for the presence of the shrub Primelea aridula at its type locality. The site is significant for the number of small-leaved native plant species and the suite of insects present.

Appendix C(1)