

**BEFORE THE CANTERBURY REGIONAL COUNCIL
AT CHRISTCHURCH**

IN THE MATTER of Variation 1 to the proposed
Canterbury Land & Water Regional
Plan related to the Te Waihora/ Lake
Ellesmere catchment)

BETWEEN **CANTERBURY REGIONAL COUNCIL**
Consent Authority

AND **ROYAL FOREST AND BIRD
PROTECTION SOCIETY OF NEW
ZEALAND INCORPORATED**
Submitter

AND **NORTH CANTERBURY FISH AND
GAME COUNCIL**
Submitter

**JOINT MEMORANDUM ON BEHALF OF THE ROYAL FOREST AND BIRD
PROTECTION SOCIETY OF NEW ZEALAND INCORPORATED AND THE NORTH CANTERBURY
FISH AND GAME COUNCIL**

22 September 2014

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MAY IT PLEASE THE HEARING COMMISSIONERS

1. During the presentation of the case for Forest & Bird and Fish & Game some matters arose in relation to:
 - a. Scope, particularly whether the relief sought was within scope;
 - b. The provisions sought by Forest & Bird and Fish & Game;
 - c. Response to information requested from Brett Stansfield.
2. Mr Stansfield's response to the information requested is attached as Appendix 1. The issues of scope and the planning provisions sought are dealt with in turn.
3. A final minor matter relates to questions raised by Commissioner van Voorthuysen regarding Mr Pearson's evidence:
 - a. paragraph 126, which refers to key policies 4.3 and 4.5; and
 - b. paragraph 109 makes a reference to paragraph 83, when the correct reference is paragraph 94.

SCOPE

4. The section 42A report raised scope, noting that some original submitters had reserved their position on some matters. Fish & Game and Forest & Bird are two such submitters, with the most important reservation relating to the content of the Tables, including Tables 11(a), 11(b), 11(c), 11(i), and 11(j), 11(k) and 11(l). This is important because the Tables contain targets and limits for the catchment, which are cross referenced to the policies.
5. In light of the s42A report comments on scope, the Commissioners have requested Forest & Bird and Fish & Game provide a jurisdictional basis for the changes sought to Variation 1 as set out in the revised Appendix 5 to Scott Pearson's evidence.

6. In summary and for the reasons set out fully below, Forest & Bird and Fish & Game's position is that the relief now sought is within scope. The test is: are the changes sought raised expressly or by reasonable implication, when the submissions as a whole are considered fairly and reasonably?
7. The relief sought by Forest & Bird and Fish & Game in Appendix 5 of Mr Pearson's evidence relate to issues that are expressly or by reasonable implication raised in the submissions of Forest & Bird and Fish & Game and other submitters.
8. The argument that the requirement in Form 5 of the Resource Management (Fees, Forms and Procedure) Regulations 2003 to "provide precise details" overrides the accepted case law, including High Court authority, is a novel proposition, contrary to Regulation 4 and lacking merit.

The case law regarding scope

9. It is not necessary for the precise details of the relief sought to be contained in the submission, or indeed for any relief to be contained in the submission. In *Countdown Properties (Northlands) Ltd v Dunedin City Council* the High Court said:¹

Many of the submissions did not specify the detailed relief or result sought. Many (such as Countdown's) pointed up deficiencies or omissions in the proposed plan. These alleged deficiencies or omissions were found in the body of the submissions. Countdown sought no relief other than the rejection of the plan change. The Council in its decision accepted many of the criticisms made by Countdown and others and reflected these criticisms in the amendments found in the decision.

Councils customarily face multiple submissions, often conflicting, often prepared by persons without professional help. We agree with the Tribunal that councils need scope to deal with the realities of the situation. To take a legalistic view that a council can only accept or reject the relief sought in any given submission is unreal.

10. In *Campbell v Christchurch City Council*, Judge Jackson considered *Countdown*, noting that

[17] In this context there are three points particularly worth noting about Countdown:

¹ [I9941 NZRMA 145 at 167.

(1) that some of the modifications to the proposed plan change were not specifically sought as “relief” in a submission, but were contained in “grounds”. Thus there is High Court authority for the proposition that one cannot rule out relief based on reasons in a submission. Countdown was followed by the Environment Court in Re an Application by Vivid Holdings Ltd where the reasons for a reference were held to give guidance as to the real relief sought;

11. *Campbell* also considered *Countdown* with respect to the Council’s ability to make consequential changes not sought in any submissions. The Court considered that consequential changes not sought in submissions could be made where they flowed downwards from any amendment sought in the submissions as a whole:

[20] The High Court’s guidance in Countdown is, with respect, very useful on the issue as to whether a Council may make changes not sought in any submission. It appears that changes to a plan (at least at objective and policy level) work in two dimensions. First an amendment can be anywhere on the line between the proposed plan and the submission. Secondly, consequential changes can flow downwards from whatever point on the first line is chosen. This arises because a submission may be on any provision of a proposed Plan. Thus a submission may be only on an objective or policy. That raise the difficulty that, especially if:

- (a) a submission seeks to negate or reverse an objective or policy stated in the proposed plan as notified; and*
- (b) the submission is successful (that is, it is accepted by the local authority)*

- then there may be methods, and in particular, rules, which are completely incompatible with the new objective or policy in the proposed plan as revised. It would make the task of implementing and achieving objectives and policies impossible if methods could not be consequentially amended even if no changes to them were expressly requested in a submission. The alternative - not to allow changes to rules - would leave a district plan all in pieces, with all coherence gone.

12. The High Court considered the matter again in *Royal Forest & Bird Protection Society Inc v Southland District Council* where Pankhurst J stated:

. . . it is important that the assessment of whether any amendment was reasonably and fairly raised in the course of submissions, should be approached in a realistic workable fashion rather than from the perspective of legal nicety.

13. *Campbell*, after considering *Countdown* and *Forest & Bird* went on to set out the test as whether the submission, as a whole, fairly and reasonably raises some relief, expressly or by reasonable implication, about an identified issue.

Both of the High Court cases were concerned with what relief could be granted even if not expressly sought as such in a submission. There was no direct issue in those cases as to whether the relevant submissions were sufficiently clear in themselves. I hold that the same general test applies - does the submission as a whole fairly and reasonably raise some relief, expressly or by reasonable implication, about an identified issue.

14. It is submitted that the approach adopted by the section 42A report is unduly legalistic and fails to take into account Regulation 4 of the Resource Management (Fees, Forms and Procedure) Regulations 2003 which provides:

4 Use of prescribed forms

Use of a form is not invalid only because it contains minor differences from a form prescribed by these regulations as long as the form that is used has the same effect as the prescribed form and is not misleading.

15. As discussed fully below, nobody could reasonably have been misled about the outcomes sought by *Forest & Bird* and *Fish & Game*.
16. The Courts have avoided the overly legalistic approach proposed in the s42A report. The Courts' approach can be seen in *Groome v West Coast Regional Council*,² where a submission on a jointly notified application which related to matters within the jurisdiction of the Regional Council was not struck out notwithstanding it was recorded on a District Council submission form and served on the District but not Regional Council.

THE SUBMISSIONS

17. Applying the test set out above, the question becomes, whether or not the changes sought by *Forest & Bird* and *Fish & Game* were fairly raised in the submission, expressly or by reasonable implication, or are consequential

² C73/09

changes to “lower order” provisions which flow from relief fairly and reasonably sought in relation to a higher order provision.

18. In the context of this case the key changes that Forest & Bird and Fish & Game seek relate to:
 - a. The limits/ targets, seeking:
 - i. appropriate freshwater outcomes provided for rivers and lakes in Table (a) and (b);
 - ii. improved environmental flows in Table (c);
 - iii. a reduction in catchment load and the removal of the allocation for CPW provided in Tables (i) and (j);
 - iv. the addition of phosphorous limits to Tables (i) and (j);
 - v. The revision of targets and limits in Tables (k) and (l); and
 - vi. The setting of catchment river and lake nutrient reduction targets and limits, and QMCI targets and limits, in an additional Table (x).
 - b. The timeframe for achieving those limits/targets; and
 - c. monitoring and review needed to ensure that the modelled nutrient load reductions in Table 11(i) are set in accordance with the trajectory of improvement required to achieve the river and lake targets and limits proposed by Fish and Game.
19. It is submitted that the tables form part of the policies. They are referred to in the policies, with policy responses required where limits or objectives are not met. The effect of this is that consequential changes can be made to lower order provisions, including rules, to give effect to changes sought in the policies where these are necessary to ensure Variation 1 retains its coherence.

20. In my submission, the submissions lodged by Forest & Bird and Fish & Game and others, such as Doug Rankin/ Whitewater NZ and the Medical Officer for Health, expressly or by reasonable implication raise the issue that the limits and targets proposed are too lenient and stricter targets/limits are required (discussed further below).
21. Even if the changes are not raised directly by the submissions, many of the changes sought by Forest & Bird and Fish & Game are necessary consequential changes from the challenge to the limits set out in the Tables.
22. It is necessary to consider the submissions as a whole. When the submissions of Forest & Bird, Fish and Game and other submitters including Mr Rankin/Whitewater NZ and the Medical Officer of Health.
23. The submissions:
 - a. Forest & Bird is New Zealand's largest nature conservation organisation, (with 70,000 members and supporters) who regularly engages in resource management processes to improve environmental and nature conservation outcomes.
 - b. Fish and Game has statutory obligations to manage, maintain and enhance sports fish and game in New Zealand, with over 33,000 angling and hunting licenses in Canterbury. An important aspect of our role relates to safeguarding fish and game habitat through natural resource management planning and advocacy.
 - c. issues relating to the effect of the Variation 1 on indigenous biodiversity;
 - d. express concern that Variation 1 does not give effect to the Freshwater NPS, as well as the purpose of the Act, give effect to the Canterbury Regional Policy Statement 2013 (CRPS), the vision and principles of the Canterbury Water Management Strategy 2009 (CWMS);
 - e. submits that Variation 1 fails to adequately address the significant water quality and quantity issues this catchment faces;

- f. raises concern about the impact of additional farming activity, CPW related and otherwise, will have on water quality within the catchment;
- g. raises concern about the provisions regarding monitoring and review; and
- h. seeks the addition of phosphorous limits to Table (i) and (j).

Limits, Dates and Central Plains Water

24. In detail, the Fish & Game submission states:

12. ...a number of concerns regarding the proposed provisions of Variation 1, and submit that in its current form it fails to meet the purpose of the Act, give effect to the National Policy Statement for Freshwater Management 2011 (NPSFM), the Canterbury Regional Policy Statement 2013 (CRPS), the vision and principles of the Canterbury Water Management Strategy 2009 (CWMS) or adequately address the significant water quality and quantity issues this catchment faces.

25. Forest & Bird's submission says similar things

Forest and Bird supports Council's effort to provide for the integrated management of the natural resources within the Selwyn-Te Waihora catchment but it has reservations around the extent to which the Plan gives proper effect to Part 11 RMA, the National Policy Statement Freshwater and the Canterbury Land and Water Plan and the Canterbury RPS.

26. Forest & Bird and Fish and Game both express concern about CPW respectively saying :

Added to this is the fact that the CPW irrigation scheme will see around 60.000ha being irrigated despite the catchment being already over allocated and a considerable number of existing consents will not expire for 15-20 years makes it difficult to achieve the integrated management that is desperately needed to address the declining water quality in the catchment.

Coupled with this issue is the fact that a large scale irrigation scheme "Central Plains Water" (CPW) has received water permits to irrigate up to 60,000 ha within a catchment significantly over-allocated for water abstraction and with many water bodies already degraded.

27. The submission by Mr Rankin / Whitewater NZ expressly raises concerns about the catchment loads and concentrations

In Table 11(i) the nitrogen load in the Catchment for farming of 4830 tonnes/year reflects an increase in nitrogen load and in dairy farming permitted in the Catchment than is currently occurring. It is also predicated on the assumption that strategies such as good management practice (whatever they are) will reduce the impact of this increased load. The catchment is already over allocated without this additional nitrogen load that is likely to lead to increased leaching losses of nitrate to groundwater and surface water.

28. The submission concludes:

I am very concerned about the impact of proposed increases in dairy farming and intensification of farming and lack of controls of same in the PV1 in the Selwyn Waihora Catchment. The permissive rules in PV1 have no teeth. Teeth would be provided by withdrawing consents to farm or prohibiting new farming activities unless the new farming activities would meet new leaching rates that will not lead to increasing nitrate ground water and surface water concentrations and lead to their continued reduction in the Catchment.

29. Forest & Bird sought that the tables be made consistent with the Freshwater NPS.

Despite Forest and Bird's qualified support for the policies that refer to these Tables it is the case that it is not in a position to adequately critique the veracity of the figures and the extent to which Forest and Bird Submission on Proposed Variation 1 to the Proposed Canterbury Land and Water Regional Plan 21 March 2014 they are likely to achieve the Vision of the Plan. It maybe the case that further investigation is necessary which could result in a change to some to ensure they meet the requirements of the Act, NPS Freshwater and the Canterbury Land and Water Plan

30. Forest & Bird has now critiqued the veracity of the figures in the tables and concluded that they do not give effect to the Freshwater NPS. The changes sought to the tables are, it is submitted, necessary to give effect to the Freshwater NPS and are therefore within scope.

31. Fish & Game, along with a number of other submitters have reserved their position in original submissions regarding the quantum of the limits in the Tables.

32. It is submitted that it is either express or a reasonable implication from these submissions that the notified provisions of Variation 1 are insufficient to avoid over-allocation and achieve targets within a defined timeframe, as required by the Freshwater NPS, particularly given the already over-allocated status of the catchment. It follows from that general concern that the submissions expressly or by reasonable implication raise an expectation that the values in the tables and the timeframes for meeting the limits/targets in the tables would be subject to change, either downwards, as is sought by Forest & Bird, Fish & Game, Whitewater NZ/Mr Rankin and Medical Officer of Health or upwards as indicated by the CPW and Fonterra submissions.
33. It is submitted that there is no doubt that the changes sought to Table 11(a) are within the scope of the submission of the Medical Officer for Health, who sought lower values should be set for rivers that are utilised for sources of human drinking water or are important recreational sites.
34. Nobody reading the submissions would be in any doubt that the limits/targets in the tables and the timeframes for meeting those limits/targets were at issue and that they could move either up or down.
35. The changes sought in the policies regarding the time that limits have to be met are a necessary consequential change required to ensure the plan retains its coherence:
- a. The time frame and limits are integrally related. The stricter limits sought by Forest & Bird and Fish & Game will require more time to be complied with than the less stringent limits proposed in Variation 1;
 - b. It is consequential on the removal of the allocation for irrigation schemes that the rules that provide for the irrigation schemes must also be removed. It makes no sense to have a rule referring to a Table which has a zero allocation; and
 - c. The submissions refer to the Freshwater NPS, which requires that targets are met “within a defined timeframe”.

36. It was simply not practicable or reasonable for submitters to evaluate the limits proposed in the table to Variation 1 and propose alternatives within the submission period. This is evident in submissions from both environmental groups and primary industry. No submitters provided alternative limits.
37. It is submitted that it is contrary to the intent of the submission process, which is to hear and decide public submissions, if those submissions are discarded because they were required to specify something that was impracticable or unreasonable to specify at the time.
38. There appears to be little point in a public submission process if meaningful debate about the values in the tables is precluded due to the complexity of the subject matter and the inability to provide alternative limits in the submission period. The public process serves no useful purpose.

Phosphorus limits

39. Fish & Game expressly sought the inclusion of phosphorus limits.³

Monitoring and Review

40. Fish & Game and Forest & Bird also expressly sought increased monitoring, respectively seeking:

There are some current deficiencies in Variation 1 in relation to achieving the 2037 targets and limits and we suggest additional mechanisms (within the tools available for Ecan to apply) are necessary to monitor and effectively change land use behaviour and outcomes at both the individual property and collective catchment output level (Fish & Game) .

Add new Policy 11.4.1 and renumber accordingly

A new Policy that will provide for the progressive reviewing and monitoring of the Policies and Rules in the Plan by way of Plan Change if necessary similar to what is provided in Policy 5.4 of the Hurunui Waiau Regional River Plan (HWRRP) and add an accompanying rule similar to Rule 10.2 of the HWRR. (Forest & Bird)

³ Paragraph 9.1

41. The reference to the Hurunui Waiau Regional River Plan is particularly relevant given the similar provisions that are now sought in terms of monitoring and review.

Conclusion as to scope

42. The submissions as a whole raise issues relating to:

- a. the limits/targets, with reduced limits/targets expressly sought;
- b. CPW, with concerns about , and one submitter suggesting that the additional load allocation as raised by a number of submitters, to the extent that new farming activities be prohibited and consents withdrawn unless the new farming activities would meet new leaching rates that will not lead to increasing nitrate contamination in ground water and surface water leading to their continued decline in the catchment;
- c. Phosphorous, with limits for phosphorous sought; and
- d. Monitoring and review, with increased monitoring and review sought to ensure desired outcomes are achieved.

43. The changes sought by Fish and Game and Forest & Bird in the revised Appendix 5 are within the scope or a necessary consequence of the submissions when considered as whole, either expressly or by reasonable implication.

44. The unduly narrow approach adopted by the section 42A report is not supported by the authorities referred to above or Regulation 4. Such a narrow approach would render the public participatory process for Variation 1 nugatory, allowing the vitally important limits / targets in the plan to be unimpeachable, simply because the exact alternative numbers had not been provided, when the limits / could not reasonably be determined during the submission period.

45. Given these submissions have been made by parties that are well known to advocate for improved water quality, nobody would be misled as to the

outcomes now sought by Fish & Game and Forest & Bird. The same applies to CPW and Fonterra. Nobody would be misled that by reserving their position on the limits/targets that they would not seek to increase them.

RESPONSE FROM FISH AND GAME/ FOREST AND BIRD IN RELATION TO THE PROVISIONS

46. The Commissioners asked for some points of clarification. These are addressed below. As suggested by Commissioner van Voorthuysen, Fish & Game and Forest & Bird would be happy to explain these to the Commissioners and will be available to do so prior to the conclusion of the hearing.
47. Given these submissions have been made by parties that are well known to advocate for improved water quality, nobody would be misled as to the outcomes now sought by Fish & Game and Forest & Bird. The same applies to CPW and Fonterra. Nobody would be misled that by reserving their position on the limits/targets that they would not seek to increase them.

Commissioner David Sheppard asked to be provided with highlighted changes between Scott Pearson's EIC and the revised copy of Appendix 1 and 5, as submitted on the 16.09.14.

48. *Response:* The highlighted changes show where amendments were made to better clarify the relief requested and show the application of revised Tables as submitted through evidence in chief.

Commissioner van Voorthuysen requested Fish and Game/ Forest and Bird provide further guidance on how Table (x) could be integrated into the current plan, with particular regard to the lack of figures in this table.

49. *Response:* The setting of *provisions* in a plan without specific data or figures has occurred in the Hurunui Waiau Regional River Plan (HWRRP), which included a provision, where no current data or 'limit' figures existed or could be determined for the Waiau River at the time of plan development. A situation that is also apparent for many tributaries in the Selwyn Waihora Catchment.

50. This has also occurred in Variation 1 with respect to the insertion of Good Management Practice (MGM/GMP) figures when they become available.
51. Whether or not the Commissioners chose to include Table (x) into the 'decision plan change', the use of a similar policy as highlighted below could specify the type of data required, the rivers the data is to be collected from, and the timeframe for collection and insertion of 'current state' figures and associated limits into Variation 1.
52. The HWRRP provision is Policy 5.4 (c) (ii), and states:

Policy 5.4 To progressively review, and revise by way of plan change if necessary and appropriate, the Policy 5.3, Policy 5.3A and Schedule 1 water quality limits for the Hurunui and Waiau Rivers and their tributaries to ensure that objective 5.1 and 5.2 are met, by:

- (a) *Implementing a State of the Environment monitoring programme that includes, as a minimum, regular monitoring of instream Dissolved Inorganic Nitrogen (concentration and load), Dissolved Reactive Phosphorus (concentration and load), E. coli, nitrate-nitrogen, Periphyton, Total Nitrogen, Total Phosphorus and Quality Macro- Invertebrate Community; and*
- (b) At the stages set out in (c) below, review the following:**
- (i) *Correlation between total catchment load (if known) of Dissolved Inorganic Nitrogen and Dissolved Reactive Phosphorus, and instream concentrations;*
- (ii) *Corresponding effects of instream concentrations on matters set out in Objective 5.1 and 5.2,*
- (iii) *Revised projections of instream concentrations and instream effects resulting from full allocation up to the Schedule 1, Policy 5.3 and Policy 5.3A limits.*
- (c) *The reviews will be undertaken at the following stages:*
- (i) *For the Hurunui River, the reviews shall be undertaken with reference to the Schedule 1 limit for Dissolved Inorganic Nitrogen at the State Highway One flow recorder, in 10% increments from the 2005-2011 average annual load starting point;*
- (ii) For the Waiau River, the reviews shall be undertaken every 5 years.**

Commissioner van Voorthuysen asked if it were possible for the relief requested by Fish and Game/ Forest and Bird to possibly require up to a 75% reduction in nutrient discharges by farmers in the catchment, on the basis that lag effects could mean a further 25% reduction beyond 50%, in order to meet the river and lake limits requested by Fish and Game.

53. *Response:* It is not possible, given the recommended provisions and relief of Fish and Game/ Forest and Bird, for there to be a required reduction for individual farm nutrient discharges above 50% unless by plan change. The reason is that under the recommended provisions, farmer nutrient outputs will still be measured against the modelled load in Table 11(i) as opposed to the proposed limits in Tables 11(x), 11(l) and 11(m).
54. Under Fish and Game/ Forest and Bird's requested relief, any increase in catchment wide nutrient reductions above 50% could only occur via a plan change and the associated review of load loss limits in Table (i) against the requirements to meet the river, lake and groundwater limits.
55. The effect of lag is included in the proposed Policy 11.4.17A under clause (b)(i), (b) (iib) and (b) (iv). Clause (b) (i) takes into account the correlation between measured loads with instream concentrations and QMCI. Clause (b) (iib) takes into account the effects of lag in relation to achievement of the load limit in Table 11(i). This requirement is also integrated into the plan review process under Policy 11.4.14A, which requires that the exact nature of reductions are to be reviewed in accordance with 11.4.17A by way of plan change.
56. Clause (b) (iv) builds a protection clause into the plan review process in terms of the achievability of reductions in nitrogen.
57. Please see the specific clauses in 11.4.17A shown below:

- (i) Correlation between ~~total catchment load (if known)~~ measured load at each of the locations listed in Table 11(x) of Dissolved Inorganic Nitrogen and Dissolved Reactive Phosphorus, instream concentrations and QMCI;
- (iib) Comparison between the measured load at each of the locations in Table 11(x) and the limits for nitrogen losses in Table 11(i) taking into account the most up to date understanding of groundwater lag times, attenuation and other environmental factors.
- (iv) the achievability of the reductions in nitrogen loss from farming activities required by policy 11.4.14 and 11.4.14A and whether new technologies make these reductions or further reductions more or less achievable.

58. Furthermore, Policy 11.4.15 as revised by Fish and Game/Forest and Bird, takes into account the implications of achieving the required reductions in relation to Table 11(i) and the nature, sequencing, measurability and enforceability of any steps proposed.

59. Therefore Fish and Game/Forest and Bird consider there would be sufficient provisions to prevent Table 11(i) farm output reductions, requiring individual farmers to increase reductions beyond 50%, without significant advancements in mitigation technologies and methods. Also a demonstration of how lag effects can be factored into assessing reduction targets has been demonstrated by Dr Cooke's Figure 4 of his evidence in chief. Such assessment will no doubt improve with better environmental monitoring and soil nutrient loss validation as outlined in Fish and Game/Forest and Bird evidence in chief.

DATED: 22 September 2014

A handwritten signature in black ink, appearing to read "P Anderson", with a vertical line extending upwards from the end of the signature.

Peter Anderson
Counsel for the Royal Forest and Bird
Protection Society of New Zealand Incorporated

Scott Pearson
Environmental Advisor
for the North Canterbury Fish and Game Council

A handwritten signature in blue ink, reading "Scott Pearson", enclosed within a blue oval.

**APPENDIX 1: RESPONSE BY MR BRETT STANSFIELD
TO MATTERS RAISED BY THE COMMISSIONERS**

1. At the hearing the Commissioners requested that I provide further information on minimum flows, the representativeness of fauna tested for nitrate toxicity and my opinion that the life supporting capacity of the lake has been drastically reduced. My response to these matters is below.

MINIMUM FLOWS

2. The proposed national environmental standards on ecological flows and water levels, recommends the following criteria for setting minimum flows.

For rivers and streams with mean flows less than or equal to 5 m³/s

- A minimum flow of 90% of mean annual low flow (MALF) as calculated by the regional council and an allocation limit of, whichever is the greater of:
 - 30% of MALF as calculated by the regional council
 - the total allocation from the catchment on the date that the national environmental standard comes into force less any resource consents surrendered, lapsed cancelled or not replaced
3. As all tributaries of the Te Waihora Catchment have a mean annual flow of less than 5 m³/s the minimum requirement of the proposed NES is 90% of MALF for all tributaries of the Te Waihora Catchment. In paragraph 72 of my evidence I further suggested that for all tributaries with a naturalised 7 day MALF of less than 300 l/s that the minimum flow should be set at the 7 day MALF. The reason I had given greater protection to these smaller tributary systems is because it is widely acknowledged that the smaller tributaries are more sensitive to water abstraction due to their small size. In the sub clauses that follow paragraph 72 of my evidence I had provided additional reasons as to why a precautionary approach should be used for these smaller stream systems. I stand by the recommended minimum flows recommended in paragraph 72 of my evidence in chief.

REPRESENTATIVENESS OF FAUNA TESTED FOR NITRATE TOXICITY

4. In paragraph 108 of my evidence in chief, I questioned the validity of applying nitrate nitrogen toxicity criteria to the Te Waihora Catchment based on research of 2 native species (*Deleatidium* mayfly and Inanga white bait) and questioned how representative these two taxa would be of all fauna (fish and invertebrates) of the Te Waihora Catchment.

5. In my oral evidence on 17 September 2014 I had stated that most species tested for nitrate toxicity in the guidelines developed by Dr. Chris Hickey were not native and that only two species were native to New Zealand. This is acknowledged on page 24 of the guidelines (Hickey 2013) where he states "The database is relatively limited in native species with only seven species resident in New Zealand and two native species (mayfly and inanga)".
6. On request of the commissioners I have provided a table (overleaf) of biota known to occur in the Lake Ellesmere and Selwyn River catchments. In total I have listed the more common taxa of fish (20) and invertebrates (36) that are found in the Lake Ellesmere and Selwyn River Catchments. If rare taxa were included the fish taxa list becomes (47) and invertebrates (97). However I have only focused on the more common taxa of the catchment to provide some guidance on the more representative fauna.
7. My taxa lists have been derived from Arscott et al 2010 (Selwyn River) and Kelly & Jellyman 2007 (Lake Ellesmere) for invertebrates and Jellyman & Smith 2008 for fish.

Table 1: Common taxa that inhabit the Te Waihora Catchment and those taxa that have previously been tested for nitrate toxicity

Group	Common Name	Scientific Name	Present in Lake Ellesmere	Present in Te Waihora Catchment	Tested for Nitrate Nitrogen Toxicity
Fish	Inanga	<i>Galaxias maculatus</i>	Yes	Yes	Yes
	Torrent fish	<i>Cheimarrichthys fosteri</i>	Yes	Yes	No
	Koaro	<i>Galaxias brevipinnis</i>	Yes		No
	Banded kokopu	<i>Galaxias fasciatus</i>	Yes		No
	Lamprey	<i>Geotria australis</i>	Yes	Yes	No
	Giant bully	<i>Gobiomorphus gobiodes</i>	Yes	Yes	No
	Longfin eel	<i>Anguilla dieffenbachia</i>	Yes	Yes	No
	Shortfin eel	<i>Anguilla australis</i>	Yes	Yes	No
	Canterbury galaxias	<i>Galaxias vulgaris</i>		Yes	No
	Upland bully	<i>Gobiomorphus breviceps</i>		Yes	No
	Common Bully	<i>Gobiomorphus cotidianus</i>	Yes	Yes	No
	Yellow eyed mullet	<i>Aldrichetta forsteri</i>	Yes		No
	Canterbury mudfish	<i>Neochanna burrowsius</i>		Yes	No
	Estuarine triplefin	<i>Grahamina sp.</i>	Yes		No
	Common Smelt	<i>Retropinna retropinna</i>	Yes	Yes	No
	Black Flounder	<i>Rhombosolea retiaria</i>	Yes		No
	Koura	<i>Paranephrops spp.</i>		Yes	No

Group	Common Name	Scientific Name	Present in Lake Ellesmere	Present in Te Waihora Catchment	Tested for Nitrate Nitrogen Toxicity
	Brown trout	<i>Salmo trutta</i>	Yes	Yes	No
	Yellowbelly Flounder	<i>Rhombosolea leporina</i>	Yes		No
	Sand Flounder	<i>Rhombosolea plebeia</i>	Yes		No
Invertebrates	Caddisfly	<i>Oxyethira albiceps</i>	Yes	Yes	No
	Blood worm	<i>Chironomus zelandicus</i>	Yes		Yes ⁴
	Midge larva	Orthocladiinae	Yes		No
	Worms	Oligochaeta	Yes		No
		Nematoda	Yes		No
	Snail	<i>Potomapyrgus antipodarum</i>	Yes	Yes	No
		Physa		Yes	No
	Crustaceans	Paracalliope		Yes	No
		Copepods		Yes	No
		Isopods		Yes	No
	Dobson fly	<i>Archichauliodes diversus</i>		Yes	No
	Mayflies	<i>Coloburiscus</i>		Yes	No
		<i>Neozephlebia</i>		Yes	No
		<i>Deleatidium</i>		Yes	Yes
	Stoneflies	<i>Stenoperla</i>		Yes	No
	Caddisflies	<i>Olinga</i>		Yes	No
		<i>Costachorema</i>		Yes	No

⁴ While *Chironomus zelandicus* have not been tested for toxicity, a very similar invertebrate from the same genus has been tested overseas (*Chironomus dilutes*) for which I expect the animals to have similar tolerances.

Group	Common Name	Scientific Name	Present in Lake Ellesmere	Present in Te Waihora Catchment	Tested for Nitrate Nitrogen Toxicity
		Aoteapsyche		Yes	No
		Psilochorema		Yes	No
		Pycnocentrodes		Yes	No
		Helicopsyche		Yes	No
		Hudsonema		Yes	No
		Neurochorema		Yes	No
		Pycnocentria		Yes	No
	Diptera flies	Maoridiamesa		Yes	No
		Tanypodinae		Yes	No
		Austrosimulium		Yes	No
		Tanytarsini		Yes	No
		Stictocladius		Yes	No
		Aphrophila		Yes	No
		Orthocladius		Yes	No
		Polypedilum		Yes	No
		Orthoclaadiinae		Yes	No
		Corynoneura		Yes	No
	Beetles	Antiporus		Yes	No
		Elmidae		Yes	No

8. Table 1 shows that 5% of the more common fish have been tested for nitrate toxicity while 5.5% of the more common invertebrates have been tested for nitrate toxicity. If we were to include the rarer taxa of the catchment these percentages become 2% and 2% of the total fish and invertebrate fauna respectively.

LIFE SUPPORTING CAPACITY

9. The commissioners have requested that I provide more information to support my rebuttal statement (paragraph 10) that “the life supporting capacity of the lake has been drastically reduced.”
10. In my view any water body can have life supporting capacity, for example a large puddle in a paddock which has a cow pad immersed in it has life supporting capacity for an enormous diversity of bacteria, fungi, pathogens and viruses. So the question becomes what sort of life do we wish Te Waihora / Lake Ellesmere and its tributaries to support. The desired outcome of the zone implementation committee is a healthy functioning ecosystem for both the lake and river environments.
11. In my view this outcome means these freshwater environments should support healthy stable populations of birds, fish and vegetation. Unfortunately there are many species that are showing decline that indicate that the life supporting capacity is being drastically reduced for these species.
12. In my opinion there is a distinction between productive and healthy ecosystems.
13. Te Waihora / Lake Ellesmere is the most polluted lake in New Zealand and nutrient rich systems such as these are highly productive because they are nutrient saturated which enables a high productivity of phytoplankton. While the lake supports a diverse range of biota and is productive, I do not consider Lake Ellesmere to be ecologically healthy and I had indicated my concerns at the hearing.
14. To help with interpretation of my statements regarding the terms nationally endangered, nationally critical and nationally vulnerable, I have appended the criteria a species needs to meet to fit within these categories (taken from Townsend et al 2008 in Appendix 1). What is important is the population size, the area of habitat they currently occupy and the long term trend (measured and predicted trends) of the animal or plant concerned.

15. The populations of a number of threatened species have declined over the past decade, in some cases significantly. These are discussed below and illustrate why, in my opinion, the life supporting capacity of the lake has been drastically reduced.
16. In general nationally endangered birds of the Te Waihora Catchment such as Australasian Bittern have shown a 10 – 50% decline over the past decade and are predicted to continue declining at this rate over the following 10 years. For nationally vulnerable species such as the Wrybill and Banded Dotterel, the decline rate is 30-50% and is expected to decline at this rate over the forthcoming 10 years. For nationally critical species such as the Black Stilt the decline rate is 50-70% and this trend is expected to continue over the forthcoming 10 years.
17. In terms of threatened fish species Longfin eel, Torrentfish, Koaro and Inanga have declined at a rate of 10-70% and are predicted to decline at this rate over the forthcoming 10 years. Nationally vulnerable Lamprey have declined at a rate of 10 – 50% and are predicted to decline at this rate over the forthcoming 10 years. Canterbury galaxias have shown a decline of 10-30% and are predicted to decline at this rate over the next ten years. For the nationally critical Canterbury mudfish, the decline rate is reported as > 70% and is expected to continue at this rate over the forthcoming 10 years. Threat classifications for these fish have been taken from Goodman et al 2013.
18. The coastal sedge *Desmoschoenus spiralis* has extreme fluctuations in abundance and is very conservation dependent. The classification for this sedge is “general decline” which means that although the species is not seriously threatened at present it may become so if the trajectory of decline continues into the future.
19. While I accept these are national threat classifications, I am very confident that a further significant decline in the species discussed above will occur over the next ten years in the Te Waihora / Lake Ellesmere catchment. This is a key reason why I reached the conclusion that the life supporting capacity of the lake has declined dramatically. The evidence is that it will continue to do so.
20. The entire lake ecosystem has changed trophic state from a mesotrophic (moderately nutrient enriched) to a hypertrophic system (excessively nutrient enriched). This accelerated change in trophic status is not expected over such a short duration and can only be attributed to poor land management

practices within the catchment. The change in nutrient status has given rise to a drastic change in photosynthetic production from aquatic macrophyte (plants) to phytoplankton domination. This change has resulted in a drastic change in the macroinvertebrate communities of the lake which then drives fish productivity. A healthy mesotrophic lake should remain in a mesotrophic state. The change in trophic state from mesotrophic to hypertrophic is a key ecosystem health indicator that the health of the lake has declined.

21. The decline in the trout sports fishery as evidenced by Mr Pearson is further evidence that the ecosystem health of the Te Waihora tributaries life supporting capacity is in a state of decline.

CYANOBACTERIA EVENTS

22. In my verbal evidence on Wednesday 17 September I had also referred to the life supporting capacity being of concern in terms of the number of cyanobacteria events occurring in the Te Waihora Catchment. I have requested data from Canterbury Regional Council and have plotted the number of occasions in which potentially toxic cyanobacteria have been present at all lake sites and two sites of the Selwyn River. All sites show a dramatic increase in the number of cyanobacteria events occurring in these freshwater environments since monitoring commenced.
23. Of particular note are the increasing trends at Selwyn River at Whitecliffs, and the lake sites of Fisherman's Point, Lakeside Domain, Kaituna, Mid Lake, off Selwyn Mouth, Taumutu and South of the timber yard.
24. If nutrient concentrations increase in the Te Waihora / Lake Ellesmere catchment we can expect a continuing increase in the frequency of cyanobacteria events occurring in both Te Waihora / Lake Ellesmere and the Selwyn River.
25. The charts for each monitoring site are provided in Appendix 2.

Brett Stansfield

22 September 2014

APPENDIX 1: Department of Conservation Threat Classifications

NATIONALLY CRITICAL

1. Very small population (natural or unnatural)

A taxon is 'Nationally Critical', regardless of population trend and regardless of whether the population size is natural or unnatural, when evidence⁷ indicates that:

1. There are fewer than 250 mature individuals; or
2. There are ≤ 2 sub-populations and ≤ 200 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 1 ha (0.01 km²).

2. Small population (natural or unnatural) with a high ongoing or predicted decline

A taxon is 'Nationally Critical' when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The population comprises 250–1000 mature individuals; or
2. There are ≤ 5 sub-populations and ≤ 300 mature individuals in the largest

sub-population; or

3. The total area of occupancy is ≤ 10 ha (0.1 km²).

Trend

There is an ongoing or predicted decline of 50–70% in the total population due to existing threats, taken over the next 10 years or three generations, whichever is longer.

3. Population (irrespective of size or number of sub-populations) with a very high ongoing or predicted decline ($> 70\%$)

A taxon is 'Nationally Critical' when the population has an ongoing trend or predicted decline of $> 70\%$ in the total population due to existing threats taken over the next 10 years or three generations, whichever is longer.

NATIONALLY ENDANGERED

1. Small population (natural or unnatural) that has a low to high ongoing or predicted decline

A taxon is 'Nationally Endangered' when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 250–1000 mature individuals; or
2. There are ≤ 5 sub-populations and ≤ 300 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 10 ha (0.1 km²).

Trend

There is an ongoing or predicted decline of 10–50% in the total population due to existing threats, taken over the next 10 years or three generations, whichever is longer.

2. Small stable population (unnatural)

To trigger this pathway to 'Nationally Endangered', taxa must have current population sizes that result from unnatural causes. Such taxa are defined as 'Nationally Endangered' when evidence indicates that they fit at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 250–1000 mature individuals; or
2. There are ≤ 5 sub-populations and ≤ 300 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 10 ha (0.1 km²).

Trend

The population is stable ($\pm 10\%$) and is predicted to remain stable over the next 10 years or three generations, whichever is longer.

3. Moderate population and high ongoing or predicted decline

A taxon is 'Nationally Endangered' when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 1000–5000 mature individuals; or
2. There are ≤ 15 sub-populations and ≤ 500 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 100 ha (1 km²).

Trend

There is an ongoing or predicted decline of 50–70% in the total population due to existing threats, taken over the next 10 years or three generations, whichever is longer.

NATIONALLY VULNERABLE

1. Small, increasing population (unnatural)

To trigger 'Nationally Vulnerable', taxa must have current population sizes that result from unnatural causes. Such taxa are defined as 'Nationally Vulnerable' when evidence indicates that they fit at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 250–1000 mature individuals; or
2. There are ≤ 5 sub-populations and ≤ 300 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 10 ha (0.1 km²).

Trend

The population is increasing ($> 10\%$) and is predicted to continue to increase over the next 10 years or three generations, whichever is longer.

2. Moderate, stable population (unnatural)

To trigger 'Nationally Vulnerable', taxa must have current population sizes that result from unnatural causes. Such taxa are defined as 'Nationally Vulnerable' when evidence indicates that they fit at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 1000–5000 mature individuals; or
2. There are ≤ 15 sub-populations and ≤ 500 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 100 ha (1 km²).

Trend

The population is stable ($\pm 10\%$) and is predicted to remain stable over the next 10 years or three generations, whichever is longer.

3. Moderate population, with population trend that is declining

A taxon is 'Nationally Vulnerable' when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 1000–5000 mature individuals; or
2. There are ≤ 15 sub-populations and ≤ 500 mature individuals in the largest sub-population; or
3. The total area of occupancy is ≤ 100 ha (1 km²).

Trend

There is an ongoing or predicted decline of 10–50% in the total population due to existing threats, taken over the next 10 years or three generations, whichever is longer.

D. Moderate to large population and moderate to high ongoing or predicted decline
A taxon is ‘Nationally Vulnerable’ when evidence indicates that it fits at least one Status criterion and the Trend criteria as follows:

Status

1. The total population size is 5000–20 000 mature individuals; or
2. There are ≤ 15 sub-populations and ≤ 1000 mature individuals largest sub-population; or
3. The total area of occupancy is ≤ 1000 ha (10 km²).

Trend

in the

There is an ongoing or predicted decline of 30–70% in the total population due to existing threats, taken over the next 10 years or three generations, whichever is longer.

E. Large population and high ongoing or predicted decline

A taxon is ‘Nationally Vulnerable’ when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 20 000–100 000 mature individuals; or 2. The total area of occupancy is $\leq 10 000$ ha (100 km²).

Trend

There is an ongoing or predicted decline of 50–70% in the total population or area of occupancy due to existing threats, taken over the next 10 years or three generations, whichever is longer.

DECLINING

‘Declining’ taxa do not qualify as ‘Threatened’ because they are buffered by a large total population size and/or a slower decline rate. However, if the declining trends continue, these taxa may be listed as ‘Threatened’ in the future.

1. Moderate to large population and low ongoing or predicted decline

A taxon is ‘Declining’ when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 5000–20 000 mature individuals; or 2. The total area of occupancy is ≤ 1000 ha (10 km²).

Trend

There is an ongoing or predicted decline of 10–30% in the total population or area of occupancy due to existing threats, taken over the next 10 years or three generations, whichever is longer.

2. Large population and low to moderate ongoing or predicted decline

A taxon is ‘Declining’ when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

1. The total population size is 20 000–100 000 mature individuals; or 2. The total area of occupancy is $\leq 10\,000$ ha (100 km²).

Trend

There is an ongoing or predicted decline of 10–50% in the total population or area of occupancy due to existing threats, taken over the next 10 years or three generations, whichever is longer.

C. Very large population and low to high ongoing or predicted decline

A taxon is ‘Declining’ when evidence indicates that it fits at least one Status criterion and the Trend criterion as follows:

Status

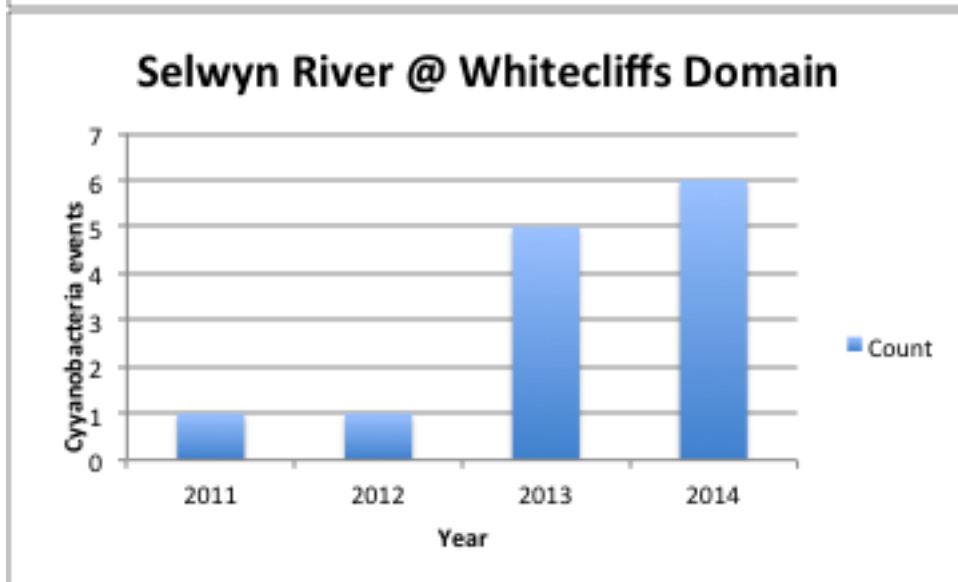
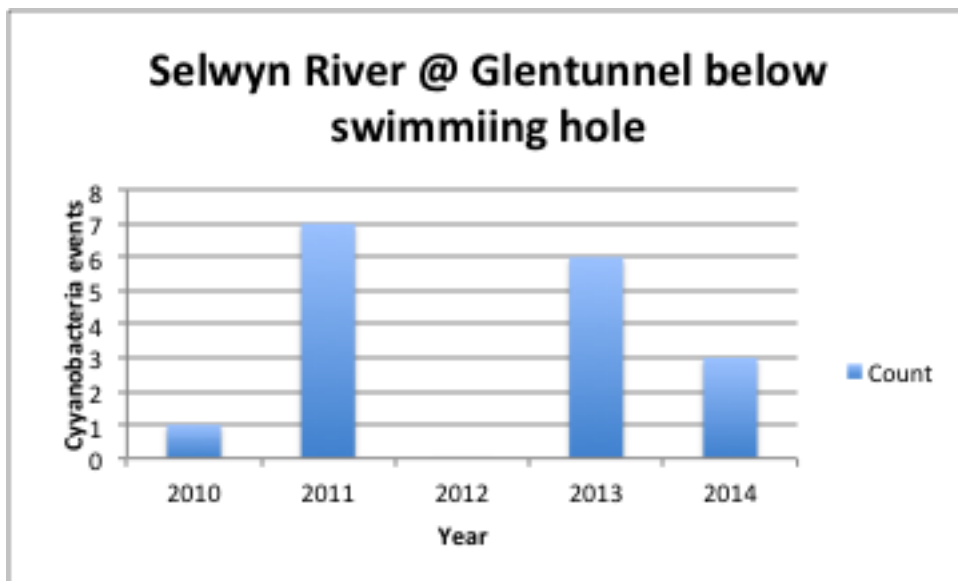
1. The total population size is $> 100\,000$ mature individuals; or 2. The total area of occupancy is $> 10\,000$ ha (100 km²).

Trend

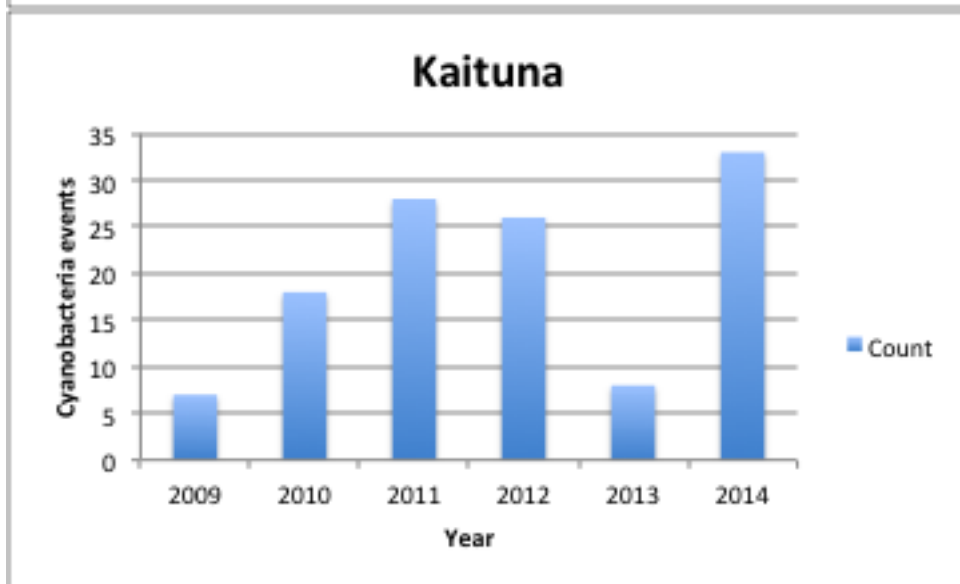
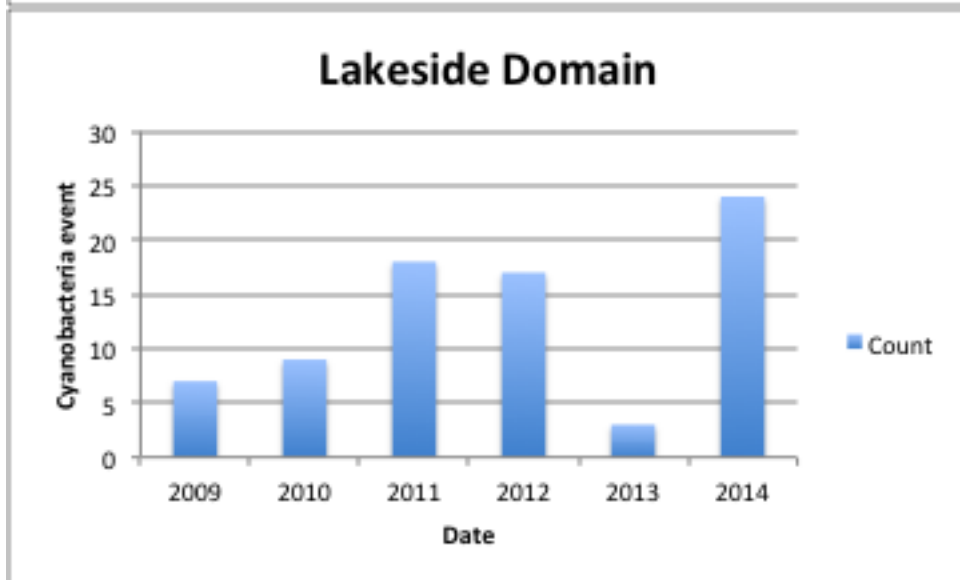
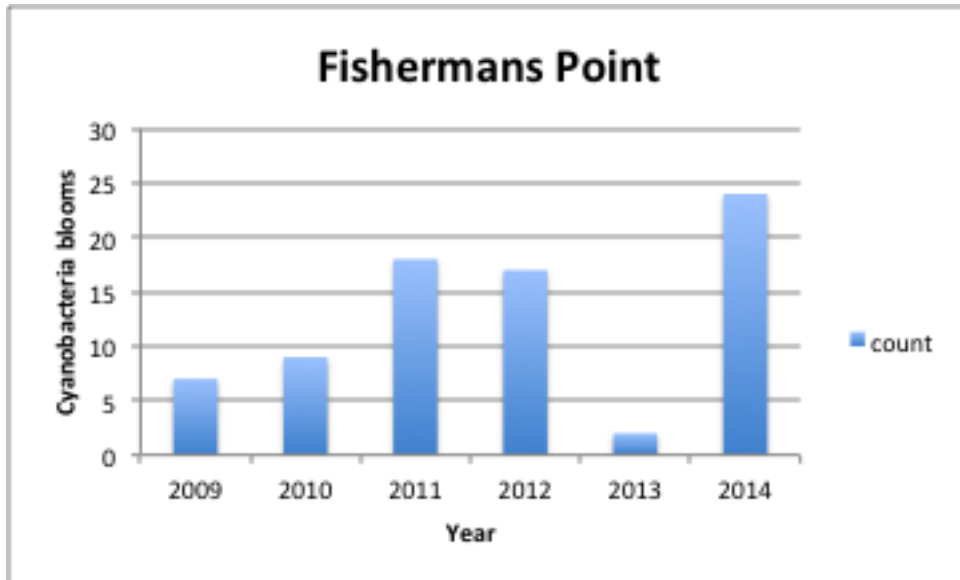
There is an ongoing or predicted decline of 10–70% in the total population or area of occupancy due to existing threats, taken over the next 10 years or three generations, whichever is longer.

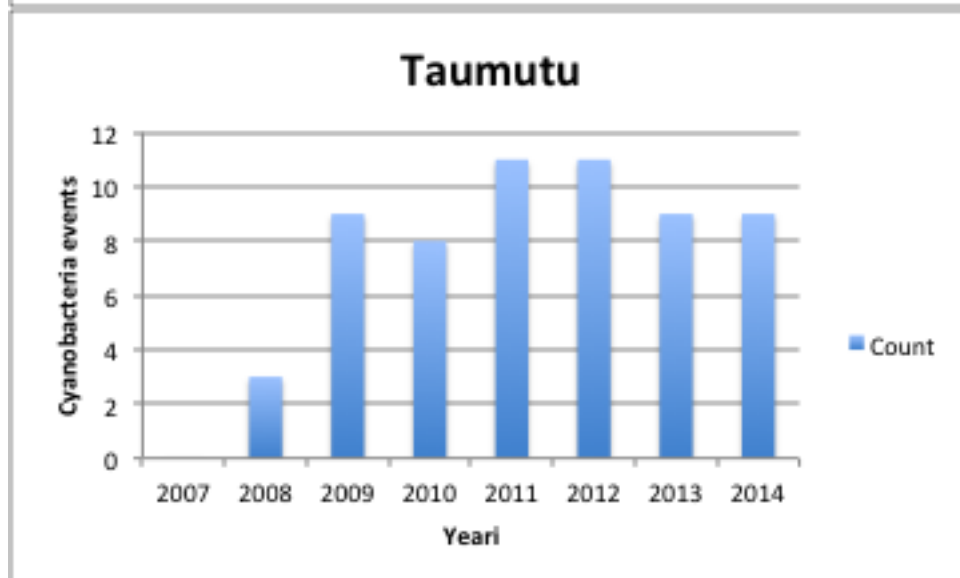
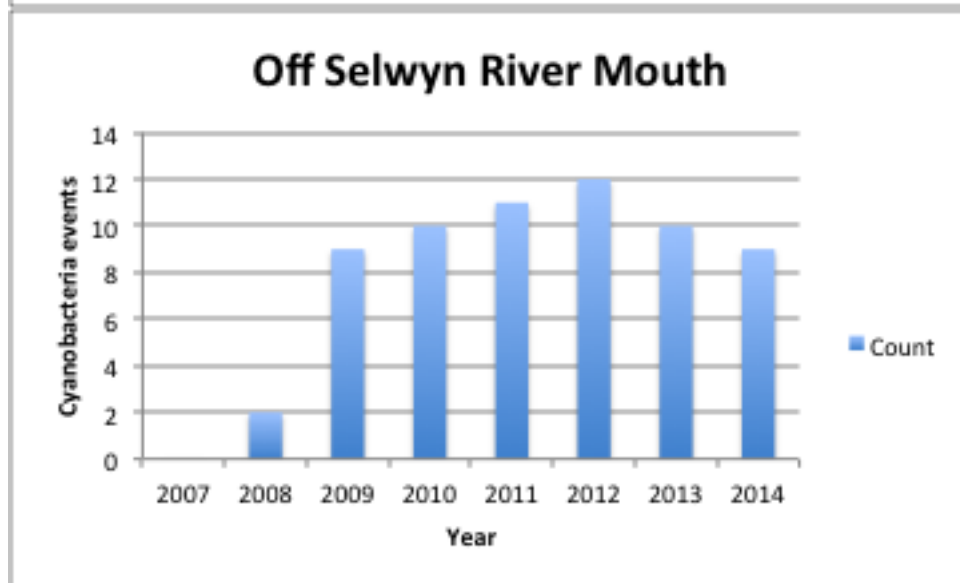
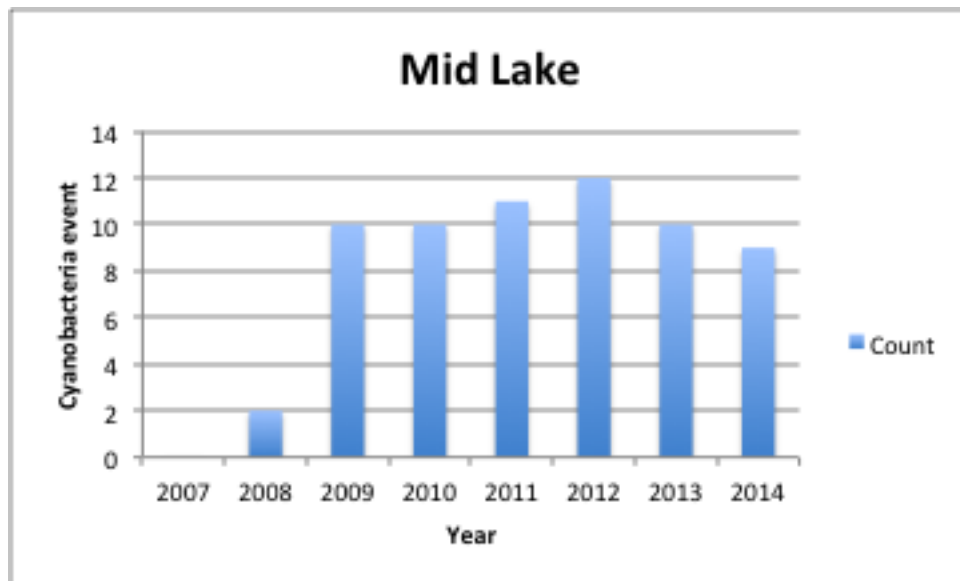
Taken from Townsend et al 2008

APPENDIX 2: Frequency of cyanobacteria events occurring at river and lake sites of the Te Waihora / Lake Ellesmere Catchment
River bathing Sites

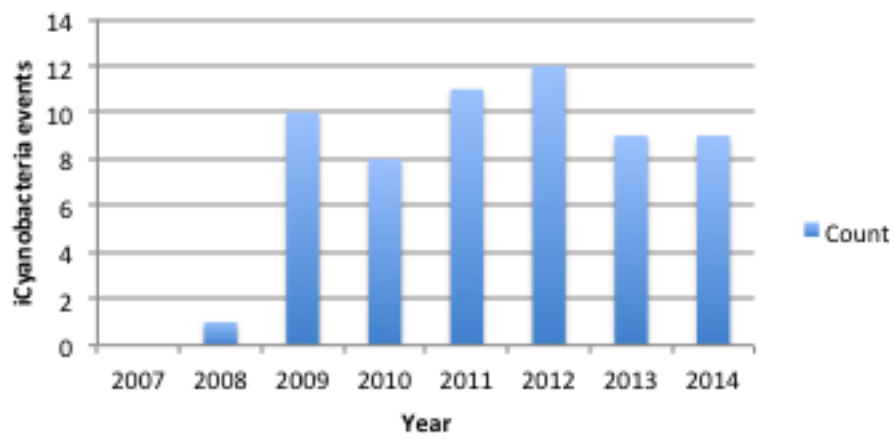


Lake Sites





Sth of Timer Yard



DATED this 22nd day of September 2014

Brett Stansfield

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