

**PROPOSED LAND AND WATER REGIONAL PLAN
EVIDENCE OF ZOE DEWSON PRESENTED FOR THE CHRISTCHURCH CITY COUNCIL**

**HEARING GROUP 1:
SECTION OF THE PLAN:
Sections 2, 3, 4, and 5**

1.0 INTRODUCTION

1.1 My full name is Zoe Spence Dewson and I am employed as a Waterways Planner Ecologist in the City Environment Group of Christchurch City Council (the Council). I hold a Bachelor of Science from Victoria University of Wellington and a PhD in Ecology from Massey University, specialising in freshwater ecology. After completing my study, I worked as an environmental scientist consultant for two years. I have been employed by the Council since 2009. In my role at Council, I am responsible for the Council's waterways monitoring programme, which includes water quality and ecological monitoring and investigations in the rivers and Avon-Heathcote Estuary/Ihutai. I also provide ecological assessments and evidence for City Plan Changes and resource consent applications as required.

1.2 This evidence is presented on the submission by the Christchurch City Council (Council). I support the Council submission in relation to the proposed Land and Water Regional Plan (LWRP). I confirm that I have read and agreed to comply with the Code of Conduct for expert witnesses. This evidence is within my area of expertise, except where I state that I am relying on facts or information provided by another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.

1.3 The following table summarises the submissions which will be covered in this evidence.

Paragraph number in this evidence	Submission Number and section of plan	Page(s) in s. 42A report	s. 42A report recommendation (accept/reject)	Council position on s. 42A report recommendation (support/oppose)
3.0	0106 – Section 3 – Objective 3.13	98	Reject	Oppose
4.0	0106 – Section 4 – Table 1a	112	Reject	Support in part
5.0	0106 – Section 5 – Rule 5.115	340	Reject	Oppose

2.0 KEY ISSUES ADDRESSED IN THIS EVIDENCE

2.1 This evidence is on ecological issues identified in the Council's submission. These are:

1. Section 3 Objective 3.13
2. The values listed in Table 1a – outcomes for Canterbury Rivers.
3. Conditions for a permanent culvert to be considered as a permitted activity.

3.0 OBJECTIVE 3.13

3.1 Objective 3.13 states:

“Those parts of lakes and rivers that are valued by the community for recreation are suitable for contact recreation”

3.2 The s42A report recommends that there be no changes to this objective, although it is now numbered (in recommendation R3.0 on page 97), as Objective 3.18.

3.3 Council sought that the objective be amended to include only those parts of lakes and rivers that are beyond urban areas. I consider that objectives in the LWRP need to be reasonably achievable. It is well known that the Christchurch community values rivers for contact recreation, but in many cases it may be unachievable for these urban rivers to meet the required standards for contact recreation. I assume here that the term “suitable for contact recreation” in the proposed objective

refers to the MfE guidelines for microbiological water quality¹, but this is not stated in the objective and could therefore be subject to misinterpretation.

3.4 Within New Zealand, urban streams have higher average levels of faecal contamination compared with natural or pastoral waterways². Often, a significant source of faecal contamination in waterways is human wastewater, either from leakages or authorised discharges. However, research undertaken in the Avon River (Christchurch) prior to the 2010-2011 earthquakes suggested that for this urban river, wildfowl and dogs were the main source of faecal contamination, with human faecal contamination only detected after very heavy rainfall³. In this study, samples were collected from two important contact recreation sites, Antigua Boatsheds (punting) and Kerrs Reach (rowing). Faecal source tracking was used to identify the source of faecal pollution in samples from these sites. During dry weather, wildfowl were identified as the main source of faecal material, and following wet weather, dog faeces were identified as the main source of contamination. My concern with this objective is that even with ongoing improvements to urban stormwater and wastewater systems over time, the levels of faecal contamination in the rivers may not improve. The focus of Council on creating naturalised waterways, treatment wetlands and stormwater basins to improve water quality and enhance biodiversity may actually contribute to increased faecal contamination levels in the rivers, as these systems tend to encourage wildfowl. This is particularly relevant for stormwater wetlands and basins in urban areas, as these may attract large numbers of wildfowl.

3.5 For those reasons, I consider that the objective ought to exclude urban waterways as it is unobtainable for those waterways.

4.0 TABLE 1a - OUTCOMES FOR CANTERBURY RIVERS

4.1 The Council submission was generally supportive of the Table 1a Outcomes for Canterbury Rivers, but sought a number of relatively minor amendments, including:

- Correction of column headings for macrophyte indicators and periphyton indicators

¹ Ministry for the Environment (2002) Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas. Wellington: Ministry for the Environment

² Ministry for the Environment (2007) Environment New Zealand 2007. Wellington: Ministry for the Environment.

³ Moriarty & Gilpin (2009) Faecal source tracking in the Avon River, Christchurch, March-May 2009. Report prepared for Environment Canterbury by Institute of Environmental Science and Research Ltd. Environment Canterbury Report No. R09/67.

- Provide definitions of river management units and reference to Planning maps
- Display QMCI as a minimum score rather than a range , as per column heading
- The statement that “natural frequency of hapua, coastal lake, lagoon and river openings is not altered” for all river management units suggests that artificial openings for flood protection would not be supported, whereas Policy 4.40 lists situations where artificial openings could occur, including for fish migration and to avoid land inundation. This appears inconsistent and should be removed

4.2 Another aspect of the Council submission on Table 1a was that the siltation indicator values listed in Table 1a have changed in comparison to Table WQL5 of the NRRP. Fine sediment is now defined as less than 2 mm diameter (compared with 0.0625 mm in the NRRP). The maximum percentage cover values have also decreased. In combination, these changes will make the outcomes more difficult to achieve, as this definition now includes sand sized sediments, as well as silt and finer particles. I accept the reasoning for this change (as listed in Appendix 1 of the S42A report) and understand that this is a practical solution that will enable the visual assessment of fine sediment levels. Even so, I consider that these outcomes will be difficult to achieve in many of the City waterways, because many waterways in the spring-fed-plains and spring-fed plains urban river management units have low gradients and slow water velocities. These conditions encourage the accumulation of fine sediments, rather than the maintenance of clean gravels and cobbles. With the physical and hydrological constraints of spring-fed streams, it may be unrealistic to expect that these outcomes will be achieved. It is also unclear what the natural or reference condition would be for fine sediments in these spring-fed urban waterways.

4.3 The recommendation in the S42A report for Table 1a, (page 112 Recommendation RT1a-1c) states: “That Tables 1a, 1b and 1c be retained without amendment.” I am surprised that none of the minor amendments sought (paragraph 4.1 above) have been made, as some of these seem to be simply errors in drafting the Table. Moreover, the officers’ recommendation that there be no change appears to be in conflict with the assessment by Dr Adrian Meredith in Appendix 1 of the s42A report, on which it relies. Appendix 1 appears to support the change to QMCI values, as Dr Meredith there states that

“The proposed changes to the QMCI indicator are not unreasonable because they convert a range figure (i.e. 5-6) into a single figure that is simple and more understandable.”

- 4.2 The intention and effect of Table 1a will also be altered if the Commissioners accept the change to Policy 4.1 recommended in the officers' report (page 101). With the intent of acknowledging that water quality and quantity outcomes are not universally achieved at present, timeframes for achieving these outcomes have been included in recommendation R4.1, which proposes to amend Policy 4.1 as follows:

"Lakes, rivers, wetlands and aquifers will meet the fresh water outcomes set in Sections 6-15 within the specified timeframes. If outcomes have not been established for a catchment, then each type of lake, river or aquifer will meet the outcomes set out in Table 1 by 2023".

This appears to contradict the response by Dr Adrian Meredith (Appendix 1 to the S42A report), who confirms that the outcomes are at times aspirational and are not intended as numerical limits. By including a timeframe, Policy 4.1 could be interpreted to mean that the outcomes included in Table 1a are intended to be numerical limits that will be met within 10 years.

5.0 **RULE 5.115 Condition 6a: culverts**

- 5.1 Proposed Rule 5.115 relates to bridges and culverts and states:

"The installation, extension, use, maintenance or removal of bridges and culverts, including the erection or extension of the structure and the consequential deposition of substances on, in or under the bed of a lake or river, the excavation or other disturbance of the bed of a lake or river, and in the case of culverts, the associated take, discharge or diversion of water is a permitted activity, provided the following conditions are met:"

Condition 6(a) provides that the maximum permitted length of a culvert is 25 metres.

- 5.2 The Council submission is that the maximum permitted length should be 7.5 metres. Permitting culverts that are 25 metres long is a considerable increase compared to the 7.5 m maximum length condition in Rule BLR4 of the NRRP. Culverts have the potential to limit fish passage⁴ and the dispersal of freshwater invertebrates⁵. Because of the potential impacts of culverts on aquatic

⁴ Boubee, J., Jowett, I., Nichols, S., and Williams, E. (1999) Fish passage at culverts: a review, with possible solutions for New Zealand indigenous species. Report prepared by NIWA and Department of Conservation.

⁵ Blakely, T.J., Harding, J.S., McIntosh, A.R. and Winterbourn, M.J. (2006) Barriers to the recovery of aquatic insect communities in urban streams. *Freshwater Biology* 51: 1634-1645.

- ecological values and the connectivity of waterways, I consider that the more conservative NRRP culvert length (7.5 m) is more appropriate for a permitted activity condition.
- 5.3 The S42A report (page 342) states that the new maximum length of 25 meters "...is considered to better provide for the purposes of a culvert which is a road (two-way) across a waterway". The report indicates that there are quite a number of conditions that have to be met to ensure that the short and long term effects of the culvert are not materially adverse.
- 5.4 Recommendation R5.115 does not recommend any amendment to condition 6 of Rule 5.115.
- 5.5 I support the officers' recommended inclusion of condition 9 that states: "*The works or structures do not impede any existing fish passage*" (page 345 Recommendation R5.115). This partly meets my concern. However, without the requirement for resource consent, there will be no assessment by the consent authority as to whether the culvert will impede any existing fish passage before culvert installation.
- 5.6 As well as potential impacts on fish passage, culverts reduce the connectivity of upstream and downstream sections of the waterway, reduce the overall length of open waterway habitat and reduce the connectivity of riparian vegetation. My concern is that longer culverts may have greater effects on stream connectivity and by treating culverts of up to 25 m as a permitted activity, this may encourage the use of culverts that are longer than necessary. Multiple culverts could be installed (Condition 2 of Rule 5.115 requires a minimum distance of 10 m from any dam, weir, bridge, or network utility pole, pylon or flood protection vegetation) that could effectively pipe substantial lengths of a waterway without the requirement for resource consent, leading to a substantial loss of aquatic values.
- 5.7 I understand the officers' reasoning that the 25 m length is included to better allow for the width of a two lane road, however this permitted activity standard is not limited to road crossings and my concern is that as a permitted activity, the frequency of long culverts could increase in rural areas, having both individual and cumulative effects on stream connectivity.

6.0 SUMMARY

- 6.1 My evidence presented covers several issues identified in the Christchurch City Council submission to the Land and Water Regional Plan. These are summarised in the table in

paragraph 1.3 of this evidence, including Section 3 objectives, the values listed in Table 1a – outcomes for Canterbury Rivers and the conditions for a permanent culvert to be considered as a permitted activity.

6.2 I agree with the Christchurch City Council's submission, which seeks amendments to Objective 3.13, Table 1a and Rule 5.115.

Date: 4 February 2013

Dr. Zoe Dewson
Waterways Planner Ecologist
Christchurch City Council