



Memorandum

For Your Information

To: The Independent Hearing Panel for the proposed Southland Water and Land Plan

From: Roger Hodson

Date: Friday, 9 June 2017

File Reference:

Subject: *Response to Hearing Panel Question: Site exceedance*

Message:

On 22 May 2017, during the Council Officers' opening presentation at the hearing for the proposed Southland Water and Land Plan, I produced several maps depicting the grading of specific sites against various standards. Sites that exceeded the national bottom lines set out in the National Policy Statement for Freshwater Management 2014 (or in the case of the macroinvertebrate community index, did not meet the standard in the Regional Water Plan) were shown on the maps with a red dot.

In respect of those sites depicted by a red dot, the Hearing Panel asked me to provide information setting out the extent to which each site did not meet that threshold.

In response, I have reproduced below each of the maps from the presentation, which depict the sites that do not meet one of the thresholds by a red dot.

The relevant standards depicted by the maps are:

- (a) secondary contact recreation;
- (b) primary contact recreation;
- (c) lakes – total nitrogen;
- (d) lakes phytoplankton;
- (e) slime algae – periphyton in river; and
- (f) Macroinvertebrate Community Index.

The source of each of the above standards are the National Bottom Lines set out in the National Policy Statement for Freshwater Management 2014, except for the macroinvertebrate community index, which is assessed against the standards contain in the Regional Water Plan.

I have created a table for each map, which identifies:

- (a) the site name;
- (b) the concentration at that site for the relevant statistic;
- (c) the relevant standard against which the comparison is made; and
- (d) the amount by which the site does not meet the relevant standard, both by:
 - (i) absolute concentration; and

(ii) percentage.

For ease of reference, I have added a number to each of the sites on the map depicted by red dot, which corresponds to the relevant row of information set out in each of the tables. Each number is relevant only for that particular map and table, and so the same sites may have different numbers in each of the tables.

Secondary Contact Recreation

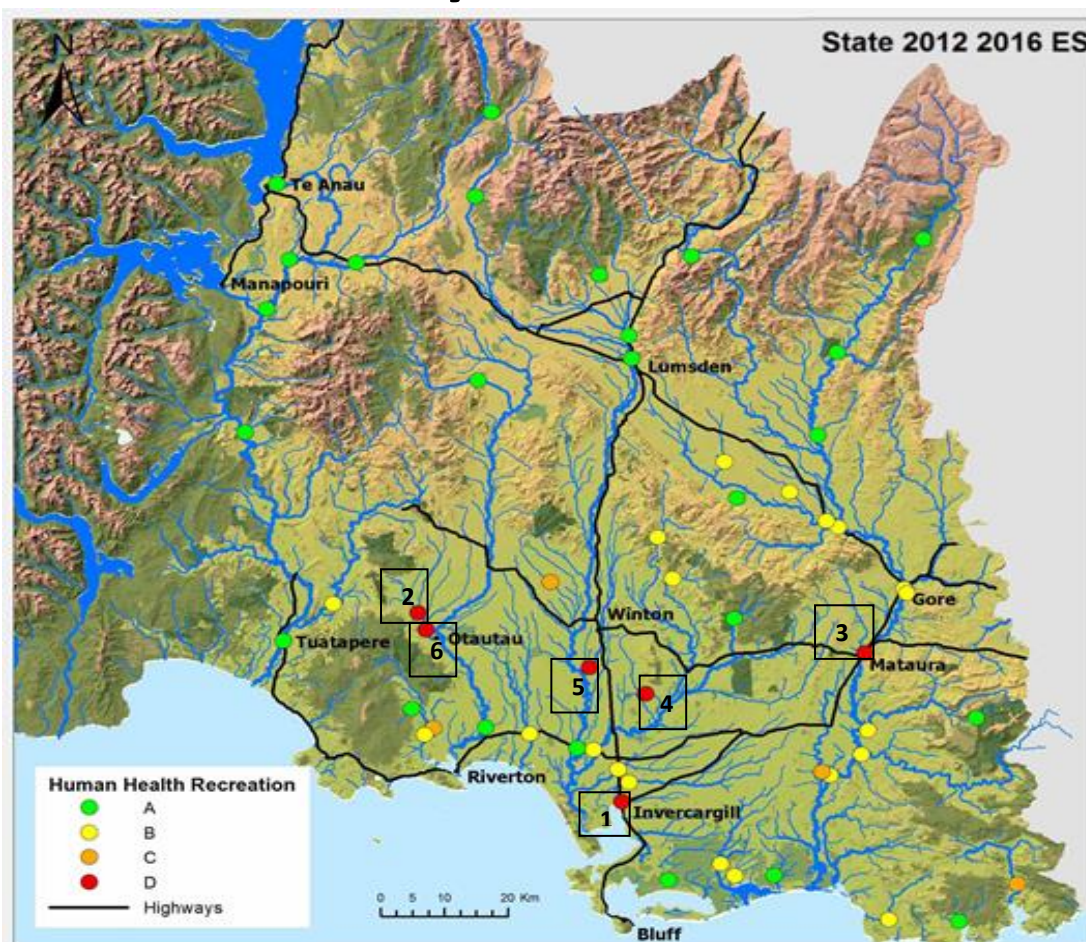


Figure 1.0. Secondary contact recreation banding assessed against the Secondary Contact Recreation National Bottom Lines in the National Policy Statement for Freshwater Management 2014.

Table 1.0. Numerical detail of Southland sites not meeting the national bottom line for secondary contact recreation.

Number on Map	Site Name	Concentration (median) CFU/100 ml	Standard (median) CFU/100 ml	Concentration greater than standard CFU/100 ml	Percentage greater than standard
1	Otepuni Creek at Nith Street	1600	1000	600	60
2	Otautau Stream at Waikouro	1350	1000	350	35
3	Mataura River 200m d/s Mataura Bridge	1300	1000	300	30
4	Tussock Creek at Cooper Road	1100	1000	100	10
5	Winton Stream at Lochiel	1100	1000	100	10
6	Otautau Stream at Otautau-Tuatapere Road	1050	1000	50	5

Primary Contact Recreation

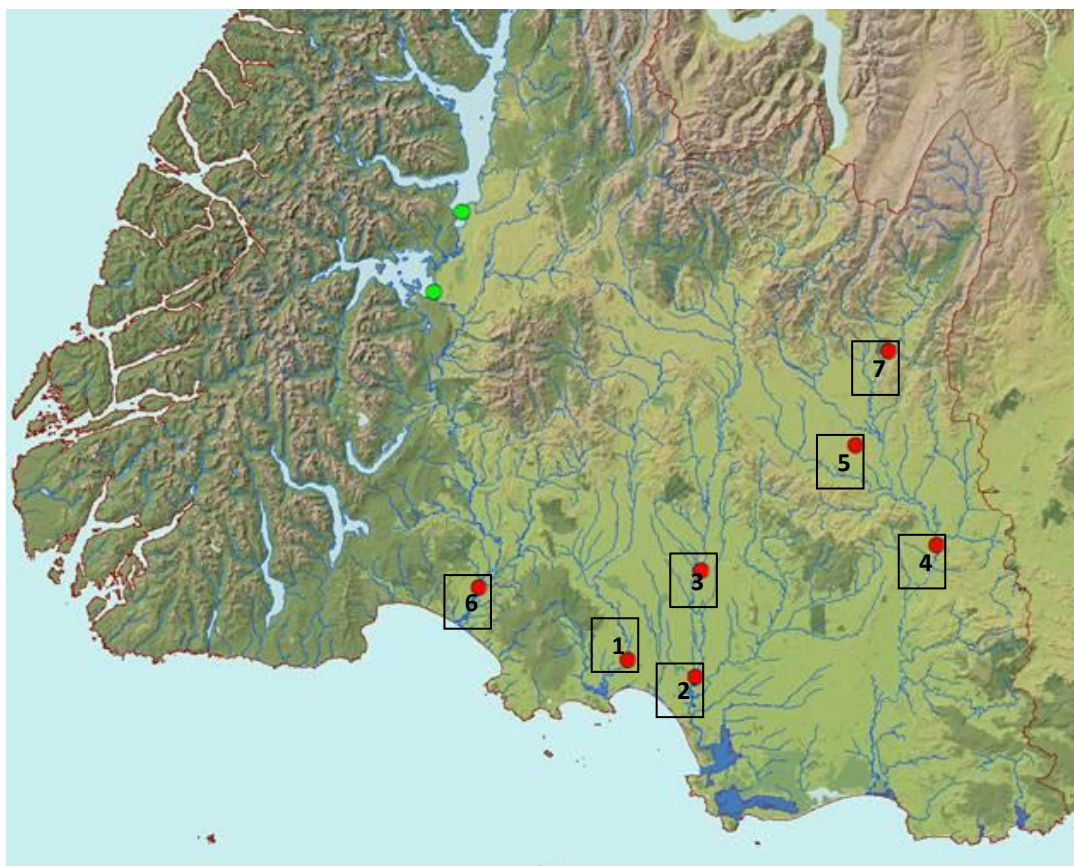


Figure 2.0. Primary contact recreation grading assessed against the Primary Recreation National Bottom Line in the National Policy Statement 2014. For 5 years up to 2015/16 summer. Summer sampling is weekly from December through to March inclusive.

Table 2.0. Numerical detail of Southland sites not meeting the national bottom line for Primary Contact Recreation.

Number on Map	Site Name	Concentration (95 th percentile) CFU/100 ml	Standard (95 th percentile) CFU/100 ml	Concentration greater than standard CFU/100 ml	Percentage greater than standard
1	Aparima River at Thornbury	2094.5	540	1555	288
2	Oreti River at Wallacetown	1589	540	1049	194
3	Oreti River at Winton Bridge	941	540	401	74
4	Mataura River at Gore	2421	540	1881	348
5	Mataura River at Riversdale	2420	540	1880	348
6	Waiau River at Tuatapere	2094	540	1554	288
7	Waikaia River at Waikaia	2421	540	1881	348

Lakes – Total Nitrogen

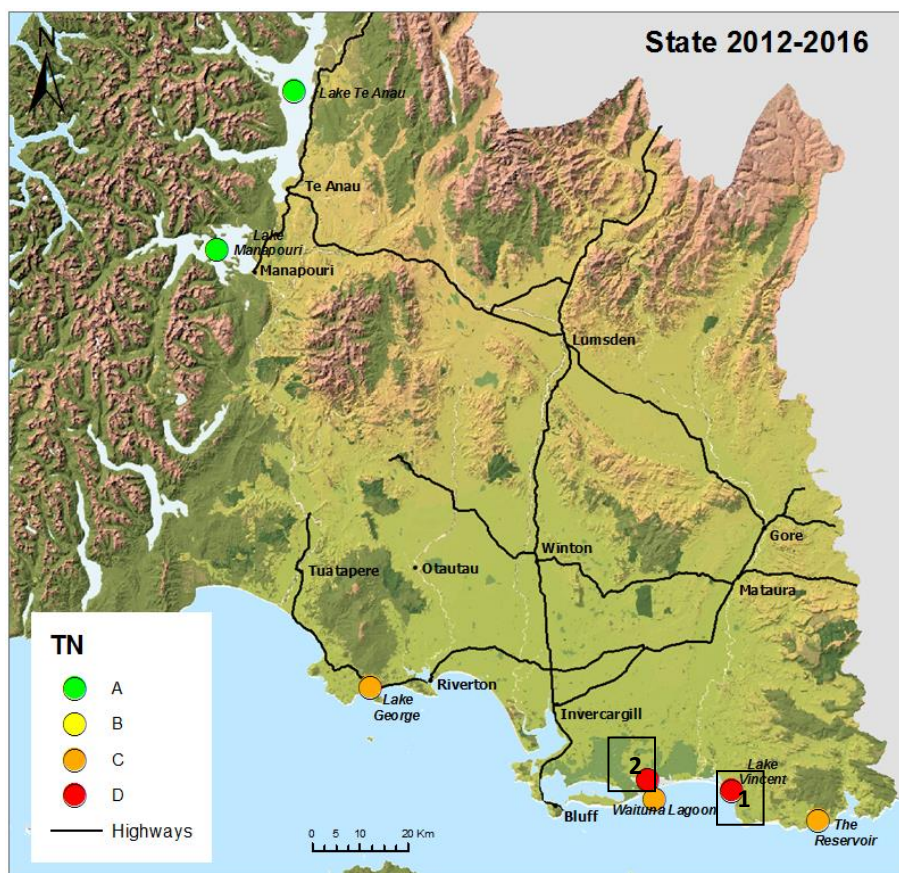


Figure 3.0. Lakes total nitrogen grading assessed against the National Bottom Line in the National Policy Statement for Freshwater Management 2014.

Table 3.0. Numerical detail of Southland sites not meeting the national bottom line for total nitrogen in lakes.

Number on Map	Site Name	Concentration (median) mg/m ³	Standard (median) mg/m ³	Concentration greater than standard mg/m ³	Percentage greater than standard
1	Lake Vincent Centre	980	800	180	22.5
1	Lake Vincent North	915	800	115	14.4
2	Waituna Lagoon at Lagoon Centre (Closed)	820	800	20	2.5
2	Waituna Lagoon at Lagoon West (Closed)	810	800	10	1.25

Lakes Phytoplankton

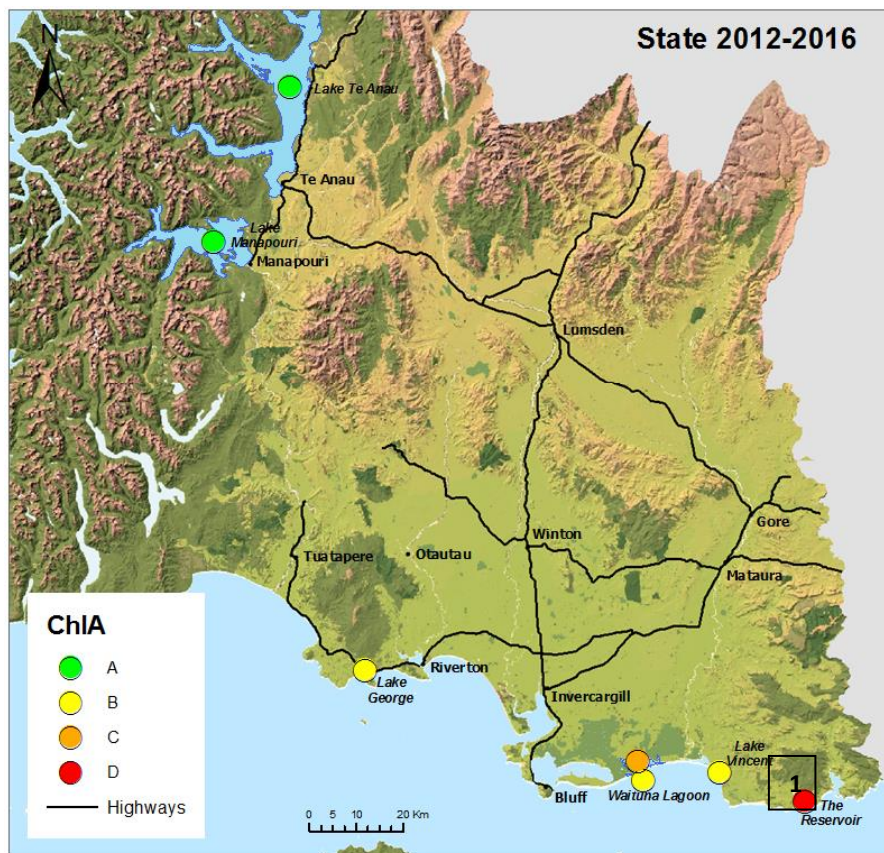


Figure 4.0. Lakes chlorophyll-A grading assessed against the National Bottom Line in the National Policy Statement for Freshwater Management 2014.

Table 4.0. Numerical detail of Southland sites not meeting the national bottom line for Chlorophyll-A in lakes.

Number on map	Site Name	Concentration (median) mg/m^3	Standard (median) mg/m^3	Concentration greater than standard mg/m^3	Percentage greater than standard
1	The Reservoir Centre	12.6	12	0.6	5

Slime algae – Periphyton in Rivers

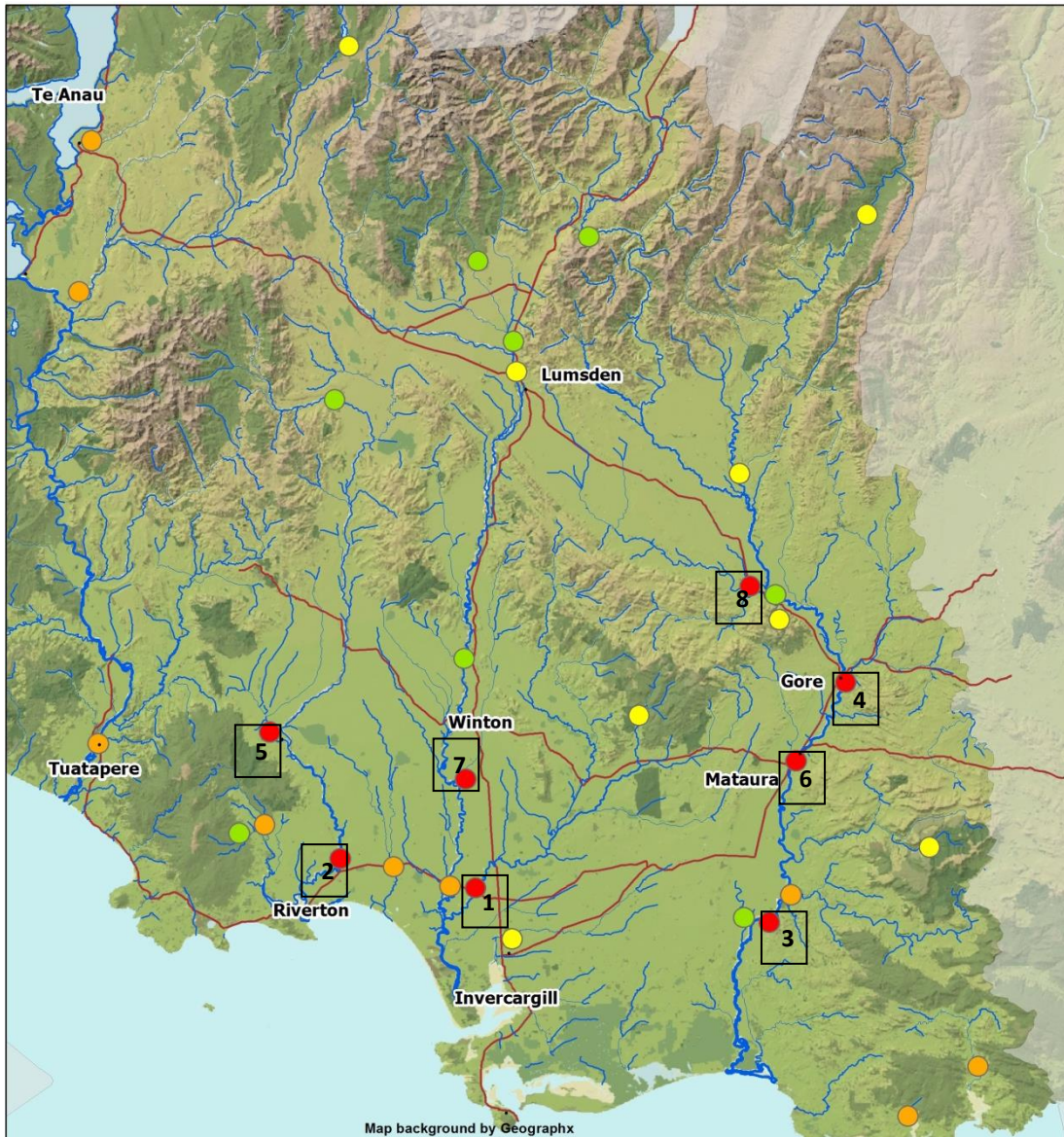


Figure 5.0. River periphyton (slime algae) grading assessed against the National Bottom Line in the National Policy Statement for Freshwater Management 2014.

Table 5.0. Numerical detail of Southland sites not meeting the national bottom line for periphyton in rivers. Note: the National Policy Statement for Freshwater Management 2014 allows on average a 1 month per year exceedance of the standard in the default river class and 2 months per year in the productive river class. The productive river class is defined by River Environment Classification “Dry” climate categories, and “Soft Sedimentary” or “Volcanic” Geology (i.e. in Southland Cool-Dry and Soft –Sedimentary (CD-SS), illustrated by # below).

Number on map	Site Name	Aerial density(* 92 nd percentile, or # 87 th percentile for productive class) ug/m ²	Standard (* 92 nd percentile 1 exceedance per year, # 87 th percentile allowing 2 monthly exceedance per year in productive class) ug/m ²	Aerial density greater than standard ug/m ²	Percentage greater than standard
1	Makarewa River at Wallacetown	249 [#]	200	49	25
2	Aparima River at Thornbury	313 [*]	200	113	57
3	Mataura River at Mataura Island Bridge	310 [*]	200	110	55
4	Waikaka Stream at Gore	212 [#]	200	12	6
5	Otautau Stream at Otautau-Tuatapere Road	249 [*]	200	49	25
6	Mataura River 200m d/s Mataura Bridge	238 [*]	200	38	19
7	Winton Stream at Lochiel	237 [*]	200	37	19
8	Waimea Stream at Mandeville	214 [*]	200	14	7

Macroinvertebrate Community Index

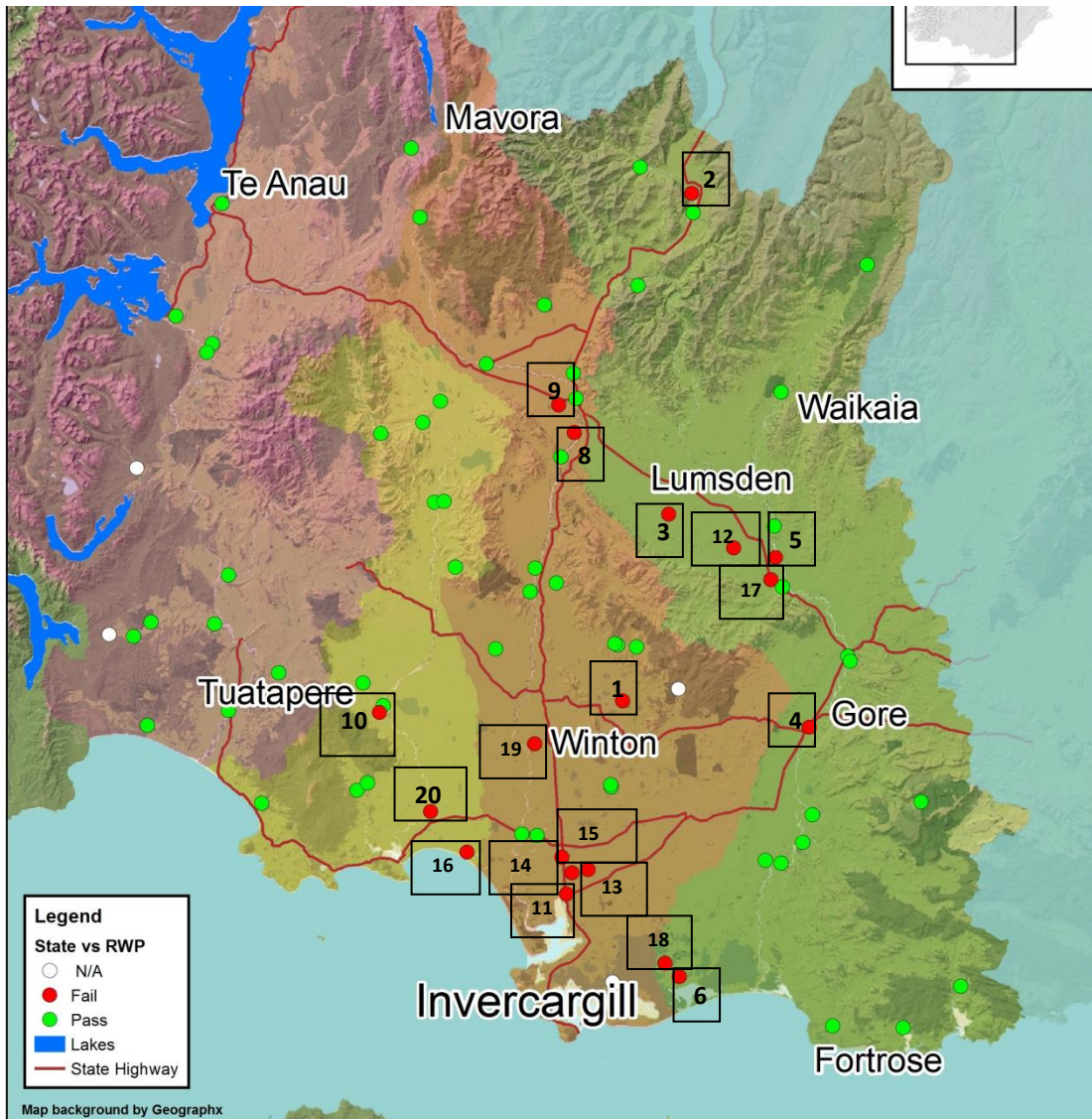


Figure 6.0. Macroinvertebrate Community Index (MCI) grading assessed against the Regional Water Plan Standards. Note for sites in the Matakana 1, 2 and 3 categories MCI score has been compared to the equivalent Hill, Lowland-Hard Bed, Lowland-Soft Bed, or Spring Fed category using the River Environment Classification to allow a region wide comparison to be made.

Table 6.0. Numerical detail of Southland sites not meeting Regional Water Plan standards for MCI. *Note for sites in the Mataura 1, 2 and 3 categories MCI score has been compared to the equivalent Hill, Lowland-Hard Bed, Lowland-Soft Bed, or Spring Fed category using the River Environment Classification to allow a region wide comparison to be made.

Number on Map	Site Name	MCI score (median)	Standard (pass if median MCI > standard)	MCI units lower than standard	Percentage Lower than standard
1	Aparima River at Thornbury	88.5	90	1.5	2
2	Brightwater Spring West at Garston Kings	90	90	0	0
3	*Longridge Stream at Sandstone	85	90	5	6
4	*Mataura River 200m d/s Mataura Bridge	94	100	6	6
5	Meadow Burn at Round Hill Road	87	90	3	3
6	Moffat Creek at Moffat Road	72	90	18	20
7	Murray Creek at Castlerock Road	80	90	10	11
8	Murray Creek at Double Road	85	90	5	6
9	Otapiri Stream at Anderson Road	88	90	2	2
10	Otautau Stream at Otautau	90	90	0	0
11	Otepuni Creek at Nith Street	68	80	12	15
12	*Sandstone Stream at Kingston Crossing Road	84	90	6	7
13	Waihopai River at Waihopai Dam	78	90	12	13
14	Waihopai River u/s Queens Drive	78	90	12	13
15	Waikiwi Stream at North Road	76	90	14	16
16	Waimatuku Stream at Rance Rd	86	90	4	4

17	*Waimea Stream at Mandeville	87	90	3	3
18	Waituna Creek at Marshall Road	77	80	3	4
19	Winton Stream at Lochiel	79	90	11	12
20	Aparima River at Thornbury	88.5	90	1.5	2