Nelson City Council
te kaunihera o whakatū

# RIVER AND STREAM HEALTH

## Annual Monitoring Summary 2013

## Why we monitor water quality and ecosystem health

Rivers and streams have important natural and cultural values. They are also important resources for drinking water, recreational activities, managing storm water flushes and industrial use. Direct discharges to rivers, or indirect via storm water and run-off from land, affects the quality of water and it's suitability for human uses and biodiversity.

## How we classify Nelson's water quality

Nelson's streams and rivers are classified from grades A to E (Excellent to Very Degraded) based on regular water quality and stream sediment monitoring across 28 sites. A long term water classification has been derived from monitoring data collected from 2000 to 2007 and updated in 2013. The long term classification provides a better indicator of the health of our rivers and streams than annual results as it reduces the influences of short term events, such as floods. The updated long term freshwater classification is compared to the 2013 annual classification in Table 1, to show changes in water quality at each site relative to the trend.

## Key Results

Overall in 2013 there was a decline in water quality across Nelson streams and rivers with 12 of the 28 sites classified as Degraded or Very Degraded, compared to eight sites with similar long term grades. Most of the Stoke streams were severely damaged by the April 2013 flood, in particular Saxton and Orphanage Creeks, requiring removal of flood debris and work to protect Council infrastructure and private property. Drought conditions in streams and rivers over early summer led to low river flows and led to unwanted blooms of filamentous algae, slime and blue-green cyanobacteria, which impacted on freshwater invertebrate (aquatic bug) diversity.

Monitoring sites with riparian shading in the upper catchments of the Whangamoa, Wakapuaka, Teal, Maitai, Brook and Poorman Valley had Very Good or Excellent (grades B or A) because they were less affected by flooding and subject to fewer land use impacts than at lowland sites.

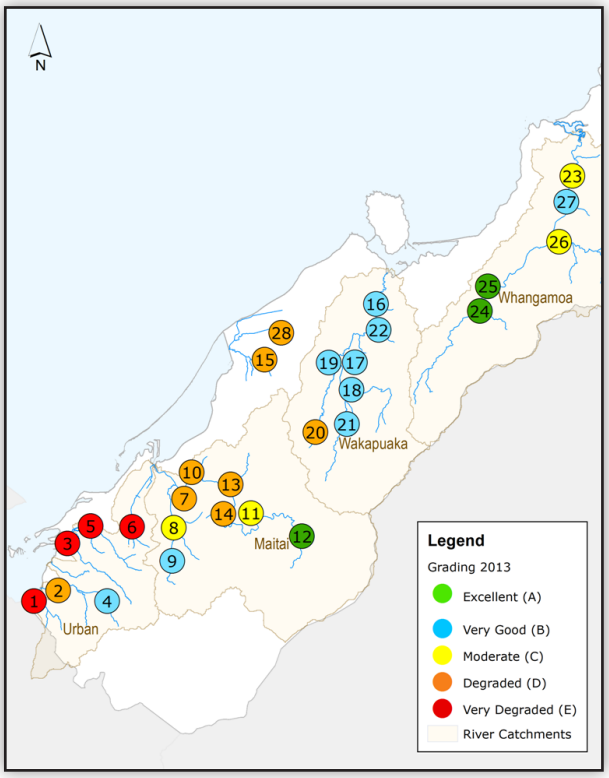
**Table 1.** Long Term Classification (trend) and 2013 Annual Water Quality Grades

| Nelson Freshwater Classification | | Long Term Classification (2000-2012) | 2013 Annual Classification |
|---|---|---|---|
| 1 | Saxton at Main Rd | D | E |
| 2 | Orphanage at Saxton Rd East | D | D |
| 3 | Poorman at Seaview Rd | D | E |
| 4 | Poorman at Barnicoat Walkway | B | B |
| 5 | Jenkins at Pascoe St | E | E |
| 6 | York at Waimea Rd | E | E |
| 7 | Brook at Manuka St | C | D |
| 8 | Brook at Burn Pl | C | C |
| 9 | Brook at Motor Camp | A | B |
| 10 | Maitai at Riverside | C | D |
| 11 | Maitai at Groom Rd | C | C |
| 12 | Maitai South Branch at Intake | A | A |
| 13 | Sharland at Maitai Confluence | D | D |
| 14 | Groom at Maitai Confluence | D | D |
| 15 | Todds at SH6 | D | D |
| 16 | Wakapuaka at Māori Pa Rd | B | B |
| 17 | Wakapuaka at Hira | B | B |
| 18 | Wakapuaka at Duckpond Rd | A | B |
| 19 | Lud at SH6 | C | B |
| 20 | Lud at 4.7km | C | D |
| 21 | Teal at 1.9km | B | B |
| 22 | Pitchers at 890m | A | B |
| 23 | Whangamoa at Kokorua Bridge | B | C |
| 24 | Whangamoa at Hippolite Rd | A | A |
| 25 | Graham at SH6 | A | A |
| 26 | Collins at SH6 | B | C |
| 27 | Dencker at Kokorua Rd | B | B |
| 28 | Hillwood at Glen Rd | C | D |

## Catchments

The key water quality issues are summarised for the four river catchments, the Maitai, Wakapuaka, Whangamoa and urban streams. The catchments and water quality grades for each site are shown in Figure 1.

**Fig. 1.** Nelson 2013 Annual Water Quality Grades.




### MAITAI RIVER CATCHMENT

Water quality in the Maitai ranges from Excellent above the South Branch Intake to Moderate (grade C) at Groom Road by Maitai camp. Extensive algae blooms over the summer in the lower Maitai and Brook depressed invertebrate numbers resulting in the Maitai at Riverside Pool and Brook at Manuka St attaining Degraded (grade D).

The water quality grades at Sharland and Groom Creek were Degraded. Both these sites have elevated dissolved nitrate and phosphate. The aquatic animal and plant communities are in moderate condition despite the nutrient issues.

### WAKAPUAKA RIVER CATCHMENT

Water quality in the upper Wakapuaka catchment has declined from Excellent to Good at Duckpond Rd. However, all of the other monitoring sites including the Teal, lower Lud, Pitchers Creek and Māori Pa Road remained at Very Good, the same as the long term classification. The upper Lud has declined from Moderate to Degraded due to elevated dissolved nitrates and phosphates, warm water temperatures and extensive algae and cyanobacteria blooms. The lower Lud River, where it merges with the Wakapuaka at Hira Reserve, has remained at Moderate water quality. The long term classification at Hira Reserve has declined from Excellent to Very Good, largely due to elevated *E coli* from surrounding land and the Lud River.

The Māori Pa Road Reserve in the lower Wakapuaka catchment has a Moderate grade, no change from the long term classification. Previous source tracking of bacteria has indicated that livestock and wildfowl are the most likely cause of historical elevated bacteria levels in the Lud and at the Māori Pa Road Reserve.

### WHANGAMOA RIVER CATCHMENT

Water quality in the upper Whangamoa and Graham Stream has remained at Excellent with no change from the long term classification. The lower Whangamoa at Kokorua Bridge and Collins Rivers declined to a Moderate grade largely due to extensive algae blooms and low abundance in invertebrates. The Collins water quality was also affected by more fine sediment, impacting on water clarity and turbidity (cloudiness).

### URBAN STREAMS

Hillwood, Todd Valley, Saxton, Orphanage, Jenkins, York and lower Poormans stream all have Degraded or Very Degraded grades that have not improved. These small urban streams have elevated nitrates, bacteria levels, poor water clarity and low abundance in invertebrates. Wastewater from house-hold, garden and industrial activities combine with fine sediments and pollutants from roads and earthworks, which are transported to the streams in stormwater and run-off. Elevated nutrients and temperatures along unshaded stream banks promote increases in aquatic plants and slime during summer months that are detrimental to aquatic animals and limit flows.

Friends of the Maitai Stream monitoring.

# WHAT ARE WE DOING ABOUT IT?

## Initiatives to improve water quality

### WORKING WITH LAND OWNERS

Nelson City Council provides free advice for land owners and financial assistance toward fencing livestock out from waterways and native plants for riparian planting and biodiversity enhancement. Several residents have taken up the offer of Council assistance to fence and plant along the Lud, Wakapuaka River and Stoke streams.

### WORKING WITH COMMUNITIES

The Friends of the Maitai community group was established in 2013. The group promotes a collaborative responsibility for the health of our waterways and gives community members a gathering place to learn about the issues that face our river and work together to take positive action. Group members are actively involved in learning more about the Maitai through participating in Council water quality monitoring, native fish surveys, inanga spawning habitat surveys, and through campaigning, raising community awareness and contributing to the Nelson Biodiversity Forum. For more information about Friends of the Maitai contact friendsofmaitai@gmail.com.

The Waimaori Streamcare Programme works with schools and local people to actively monitor the health of streams through practical hands-on-workshops at the riverside. This raises community awareness about water quality and also brings a cultural perspective as to why clean water matters. For more information about Waimaori contact waimaori@ncc.govt.nz or 03 545 1752.

Council is collaborating with NIWA, the Friends of the Maitai and the Wakapuaka River Care Group to trial a new community stream monitoring programme. With the government's Freshwater Reforms there is an expectation that communities will require a greater understanding and involvement in managing waterways. The NIWA led citizen science project will assess whether community monitoring data can be used alongside regional council water quality monitoring and add value to the national environmental picture. For more information about NIWA's community monitoring projects http://www.niwa.co.nz/environmental-information/research-projects/freshwater-monitoring-and-reporting.

## Work in progress for 2013/14

- Working with the community in a collaborative process to understand the values, issues and options for improving the Maitai River and Nelson environment.
- The Cawthron Institute is working closely with Council to better understand the water quality from the bottom of the Maitai Dam and how its discharge to the Maitai impacts on the aquatic animal and plant communities and occurrence of cyanobacteria blooms in the river.
- Investigating the source of high conductivity in York Stream and sources of faecal contamination in the lower Maitai River, identified as priorities in the 2013 Freshwater Classification Review http://nelson.govt.nz/environment/water-3/freshwater-2/river-and-stream-health/.
- Working with iwi, civil engineering contractors and scientists to integrate the ecological values as part of upgrades to stormwater networks and post flooding clean ups of gravel and debris. Remediation work has included removing and relocating fish populations prior to works in stream beds, reconstructing stream habitat for wildlife and fish surveys to assess habitat quality and connectivity of our waterways.
- Contributing to the national perspective on water quality and recreational bathing water monitoring through the Land- Air- Water- Aotearoa (LAWA) web portal http://www.lawa.org.nz/explore-data/nelson-region/. The LAWA web portal provides a summary of the national and regional outlook for water quality at freshwater and recreational bathing monitoring sites, news stories and events across the country.

For further details about Council environmental monitoring please visit http://nelson.govt.nz/environment/.

Fish surveys in the Brook stream found healthy numbers of koaro fish.

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