

RIVER AND STREAM HEALTH

Annual Monitoring Summary 2012

Why we monitor water quality and the health of our rivers

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 its suitability for human use and biodiversity.

How we classify Nelson's water quality

The Nelson Freshwater Classification (2007) is derived from water and sediment quality surveys from 2000-2007. This 'long term' classification (grades A to E; Excellent to Very Degraded) is incorporated in the Nelson Resource Management Plan, and is used to prioritise streams for improvements and also as a bench mark to compare with annual surface water quality monitoring results. The long term classifications are a better indicator of the health of our rivers and streams than annual results as it reduces the influence of short term events, such as floods and are used to assess trends over time. The Council's target is to continue to reduce the number of rivers and streams that are Degraded or Very Degraded over the next three years and to maintain those at Very Good and Excellent.

Long term water quality trends

The revised Long Term Classification (2013) is based on monitoring data gathered from 2000 to 2012 and can be compared with the 2007 Classification to show whether water quality has improved or deteriorated at sites. Overall there has been a slight improvement in the Long Term Classification of sites, with eight sites classed as Degraded or Very Degraded in 2013, compared to nine sites in 2007 (Table 1). Five of the sites have achieved an overall better long term classification than in the 2007 assessment. Three sites have been re-graded based on new information. Four sites have been down-graded and sixteen sites remain unchanged.

Table 1: Long Term Classification Change

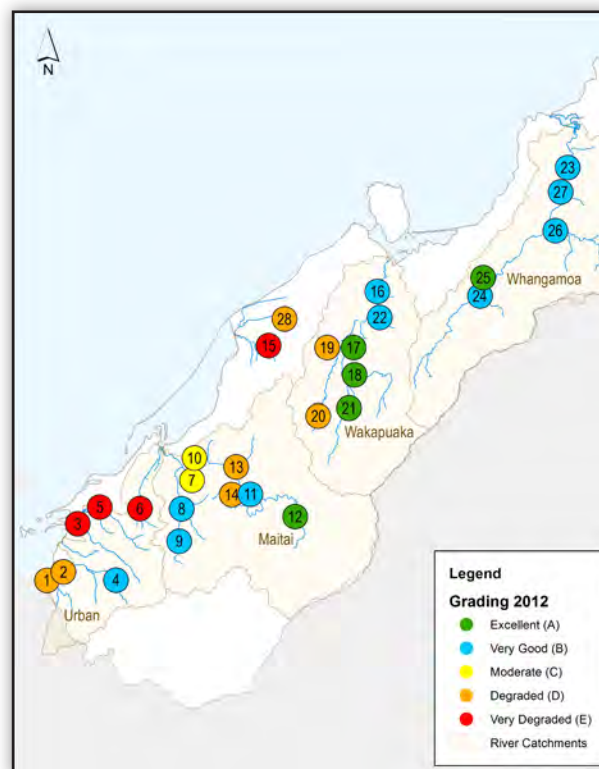
Long Term Classification	A	B	C	D	E
	Excellent	Very Good	Moderate	Degraded	Very Degraded
2007	8	3	7	6	3
2013	6	7	7 ¹	6	2
Change	-2	4	0	0	-1

¹ 2013 classifications include Brook at Burn Pl, not graded in 2007 due to insufficient information.

The five upgraded sites, Saxton at Main Road, Poorman at Barnicoat, Hillwood, Brook at Manuka, Wakapuaka at Māori Pa Road, showed improvements in one or more indicators.

The four down-graded sites are all rural, showing water quality impacts to varying degrees from forest harvesting over the last decade and livestock farming. The Whangamoia at Kokorua Bridge was down-graded to Very Good, whilst Sharland and Groom Creek at the Maitai confluence were downgraded to Degraded. These sites had lower overall grades due to elevated nitrates and phosphates and showed a decrease in the number of healthy freshwater invertebrates. The Wakapuaka at Hira was downgraded to Very Good due to elevated nitrate, phosphate and fine sediment (turbidity), mainly from the Lud tributary.

Fig. 1. Nelson river and stream water quality grades, 2012.



Long Term River Classification	2007	2013
1 Saxton at Main Rd	E	D
2 Orphanage at Saxton Rd East	D	D
3 Poorman at Seaview Rd	D	D
4 Poorman at Barnicoat Walkway	C	B
5 Jenkins at Pascoe St	E	E
6 York at Waimea Rd	E	E
7 Brook at Manuka St	D	C
8 Brook at Burn Pl	-	C
9 Brook at Motor Camp	A	A
10 Maitai at Riverside	D	C
11 Maitai at Groom Rd	C	C
12 Maitai South Branch at Intake	A	A
13 Sharland at Maitai Confluence	C	D
14 Groom at Maitai Confluence	B	D
15 Todd at SH6	D	D
16 Wakapuaka at Māori Pa Rd	C	B
17 Wakapuaka at Hira	A	B
18 Wakapuaka at Duckpond Rd	A	A
19 Lud at SH6	C	C
20 Lud at 4.7km	C	C
21 Teal at 1.9km	C	B
22 Pitchers at 890m	A	A
23 Whangamoia at Kokorua Bridge	A	B
24 Whangamoia at Hippolite Rd	A	A
25 Graham at SH6	A	A
26 Collins at SH6	B	B
27 Dencker at Kokorua Rd	B	B
28 Hillwood at Glen Rd	D	C

Key to site codes in map



Key Results for 2012

The December 2011 rainfall event required the removal of excess gravel from streams and rivers and the restoring of habitat. This work also involved a large fish salvage operation. Approximately 13,000 fish, including 21 species were shifted to suitable habitat. The diversity and number of fish found highlights the importance and potential of our urban streams for providing fish habitat. Monitoring sites affected by gravel extraction in 2012 had depleted invertebrate communities and poor water clarity through disturbance of sediment.

Eleven out of 28 sites monitored in 2012 (Figure 1) were classified as Degraded or Very Degraded and compares to eight sites in the 2013 long term classifications. The December 2011 rain fall event impacted on the health of Nelson's water ways especially the smaller streams. The peak flooding scoured river beds and banks, eroding and removing significant volumes of alluvial and riparian material. Fish, invertebrates and their habitat were washed down stream or covered in debris from erosion upstream, impacting on aquatic animal and plant scores, particularly in the lower catchments.

Overall, streams within the lowland Nelson urban and pastoral farming areas were Degraded or Very Degraded. Poorman Stream at Barnicoat, the lower Brook at Manuka St and Maitai at Riverside did attain a Moderate water quality grade.

Rural streams and rivers in the Whangamoia, upper Wakapuaka, upper Maitai and Brook catchments have maintained Excellent or Very Good grades.

Catchments

The key water quality issues are summarised for the four river catchments, the Maitai, Wakapuaka, Whangamoia and urban streams. The catchments and water quality grades for each site in 2012 are shown in Figure 1.

MAITAI RIVER AND BROOK STREAM CATCHMENT

Water quality in the Maitai ranges from Excellent (grade A) at the South Branch Intake, Very Good (grade B) at Groom Road (Maitai camp) and Moderate (grade C) near Riverside Pool. Grades at these three sites have remained the same or improved. Sediment monitoring for contaminants entering our waterways via storm water indicated that elevated levels of



Inanga egg laying habitat in grass verge upstream Collingwood Street bridge.

Livestock access the lower Wakapuaka River.



pollutants, associated with fuel burning and vehicle emissions, are present in the lower Maitai and Brook rivers that may have possible ecological effects. Elevated bacteria levels are present in the lower Maitai down stream of Collingwood Street Bridge, the source is being investigated by Council staff.

The water quality grades at the smaller streams of Sharland and Groom Creek are Degraded (grade D) and have got worse in the Long Term Classification (2013). Both these sites have elevated nitrate and poor water clarity scores, resulting from soil disturbance from flood debris and recent logging activities in these catchments. The aquatic animal and plant communities are in moderate condition despite the nutrient and water clarity issues.

WAKAPUAKA RIVER CATCHMENT

Water quality in the upper Wakapuaka catchment ranges from Excellent at Duckpond Road to Very Good at Pitchers Creek and Māori Pa Road. The Teal River has improved in recent years from Moderate to Excellent, due to improvements in bacteria counts and aquatic animal and plant communities.

The Lud River has declined in water quality from Moderate to Degraded in the upper catchment and lower catchment, where it merges with the Wakapuaka at Hira Reserve. Water



Forestry and pastoral farming in the upper Lud catchment.

quality in the Lud has elevated nitrates, and moderate bacteria and invertebrate community grades. The current land use impacts on the water quality in a number of ways. Elevated warm water temperatures (>23°C) during summer low flows are stressful to invertebrate and fish communities and encourage slime growth that smother available habitat for most aquatic life. Nitrate and bacteria loads originate from livestock accessing the river and tributaries, and to a lesser extent from fertiliser used to improve grazing land and leaching from soil associated with forestry harvesting.

In the lower Wakapuaka catchment the Māori Pa Road grade has improved from Moderate to Very Good because

of a slight improvement in nitrate and aquatic animal and plant scores. Elevated faecal bacteria are recorded downstream at Paremata Flats Reserve due to livestock and feral animals (goats and geese) on the flats upstream.

WHANGAMOA RIVER CATCHMENT

Water quality in the upper Whangamoia, Collins and Denker Creek is Very Good. However, nitrates were elevated in the upper Whangamoia catchment, which is mainly a forestry block and also elevated downstream at Denker and Kokorua Bridge. A significant source of nitrate-nitrogen to land is the breakdown of logging slash. Council staff will be working with forestry companies to look at ways to buffer water ways from impacts of local logging activities.

SMALL URBAN STREAMS

All of the small urban streams were significantly impacted by the December 2011 rain fall event, resulting in loss of habitat and impoverished aquatic invertebrate communities. Todd Valley, Hillwood, Saxton, Orphanage, Jenkins, York and lower Poormans stream all have Degraded or Very Degraded grades.

Monitoring at additional sites throughout the Stoke stream catchment has contributed to our understanding of how fine sediment, bacteria and other water quality contaminants impact on water quality grades moving down the catchment. A summary of the Stoke Stream Rescue Project can be found below.



WORKING WITH COMMUNITIES

The Stoke Stream Rescue Project, in partnership with the Cawthron Institute, and largely funded by Ministry for the Environment, has been working with the Stoke community to improve water quality in the Stoke Streams and ultimately the Waimea Inlet. The key water quality issues and actions required for Poorman, Orphanage, Saxton and Jenkins Creek have been outlined in catchment plans, which involved walk-through surveys of the entire catchment. Twelve monitoring sites along the four streams have indicated various sources of pollution in the upper tributaries of Jenkins, Orphanage and Saxton. Beef and dairy farming and sediment input from forestry activity have an impact in the upper catchments, while several reservoirs and ponds that host a high number of birds are a source of bacteria and nutrients in the Saxton catchment. Urban and industrial pollutants dominate the sediment contaminants in the mid and lower catchments. The identification and management of residential and industrial contamination, and other land-management related issues, will help improve conditions at the lower most sites in these catchments.

Information flyers have been delivered to over 7,000 Stoke households explaining the issues and suggesting actions that can be taken to reduce contaminants entering waterways, especially by

way of the stormwater system. The Waimaori Streamcare Programme is being introduced to the wider community and a number of initiatives are underway to encourage residents to take ownership of their streams.

Proposals are underway with landowners in the upper catchments of Jenkins and Saxton Creek to retire land from grazing and fence and plant it with natives. The catchment plans have identified other sections of waterway that can be enhanced, through improving fish passage at natural and artificial barriers and through fencing and riparian planting.

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 Mel McColgan 03 545 1752 waimaori@ncc.govt.nz.

Council wants to work with other communities and schools to improve the health of streams and caring for them. If you are interested in getting involved please contact Lynne Hall, Land Management Adviser 546 0308 or Jo Martin, Environmental Education Officer 03 546 8728.



WHAT ARE WE DOING ABOUT IT?

Initiatives to improve water quality

WORKING WITH LAND OWNERS

The Nelson City Council Land Management Adviser provides free advice for land owners and financial assistance toward fencing and native plants for riparian planting and biodiversity enhancement. This Council service has been very popular with land owners from all catchments requesting advice, resulting in full use of the fencing and planting grants available in 2012.

Improving water quality in the Lud and Wakapuaka River continues to be a key focus, with the majority of land owners in the upper catchment being visited in the last two years. Several land owners have taken up the offer of Council assistance to fence and plant along the Lud River and its tributaries.

NCC work in progress

- Enhancement of riparian margins and instream habitat for wildlife in urban streams, as part of the flood recovery remediation work.
- Working with local Iwi to improve the well being of the Nelson environment through site assessments using Iwi Cultural Health Indicators, building stronger relationships and targeting actions.
- Working with Tasman District Council to identify and improve whitebait spawning habitat and establish a network of native fish monitoring sites across the region.
- Working with Landcare Research to characterise river behaviour to achieve better gravel management and erosion control in North Nelson.
- Working with NIWA to evaluate the most appropriate technical solutions to improve existing storm water systems and minimise contaminants from roads and adjoining land reaching rivers and streams.
- Working with Cawthron to study 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 how this can be reduced.
- Working with other regional councils and local government to share national water quality trends on the Land and Water web portal. For more information see <http://www.landandwater.co.nz/>
- Review of the long term water quality classification for each monitoring site, incorporating data from 2000 to 2012.
- Facilitating and supporting environmental education through primary school to college utilising Nelson City Council monitoring results.
- Investigating bacteria contamination in lower Maitai from the storm water system, and potential cross-connections in other Nelson urban areas.
- Working closely with the District Health Board Health Protection Officers and Cawthron to find more effective ways to reduce the potential public risk of toxic blue green algae in our waterways.

For further details about NCC environmental monitoring please visit www.ncc.govt/environment

