

FRESH WATER



FRESHWATER QUALITY

The quality of Taranaki's fresh water is highly valued for a wide range of uses from recreational of fishing and swimming, to uses for agriculture, industry and town supplies. Maintaining and enhancing the mauri (life form) and wairua (spirit) of water is of fundamental importance to tangata whenua. Management of water quality has been a significant issue for the Taranaki Regional Council and its predecessors for the past 40 years. Monitoring has shown that:

- measures of ecological health, such as the communities of invertebrates living in streams, are good to excellent in the upper catchments where there is more stream bank vegetation cover but only fair further down the catchment where land use is more intense;
- over the past 12 years, ecological health has demonstrably improved at a number of sites, including a number in the middle and lower reaches of catchments, and has not demonstrably deteriorated at any sites;
- the region's fresh water usually meets the bacteriological guidelines for swimming, although at certain times of the summer (immediately after a flood event) or in certain catchments (such as small intensively farmed catchments) water quality may not meet national guidelines;
- the region's water quality comfortably meets guidelines for dissolved oxygen and clarity;
- measures of levels of organic pollution (BOD), bacteriological pollution (faecal coliforms and enterococci) and toxicity (ammonia) are now stable regionally, after past improvements;
- Taranaki rivers are naturally high in phosphorus and so do not meet national guidelines, furthermore levels of phosphorus are generally increasing; and
- nitrogen levels meet guidelines in the upper reaches of catchments, but not further down, where impacts of agriculture are more intense.

The *Regional Fresh Water Plan*, made operative in 2001, contains policies, methods and rules to maintain and enhance water quality in Taranaki. Council officers regularly monitor for compliance with the plan and resource consents, undertaking enforcement action where necessary. Management highlights over the past five years include:

- a decline in the number of point source discharges to surface water from 1,612 in 2003 to 1,413 in 2008;
- significant investments have been made by agriculture, industry and the community in wastewater treatment and disposal systems;
- 100% of dairy farms have effluent treatment and disposal systems that are monitored and inspected each year;
- a high rate of compliance with consent conditions with an average of 96% of farm dairy discharges complying with consent conditions and 93% of consent holders showing high or good levels of performance;
- a significant growth in the Council's riparian management programme – 2,009 riparian plans have now been prepared (treble the number of plans that had been prepared by 2003 (385), covering a total of 10,818 km of stream bank);
- 1.3 million riparian plants provided at low cost to riparian plan holders since 1997; and
- landowners' fencing of 504 km of stream bank and planting of 426 km through implementing riparian plans, which, added to existing fencing and planting means that 60% of stream bank on the ring plain, under a riparian plan, is fenced, and 43% is vegetated.

The Council will continue to promote fencing and planting of ring plain streams to meet the target of 90% of riparian plans implemented by 2015.



FRESHWATER QUANTITY

Surface fresh water is used for a wide range of uses from agriculture and industry to town water supplies. The region is well-endowed with fresh water having no less than 530 named rivers or streams. For most of the time, there are no significant water use pressures in Taranaki. Since 2003 the region has experienced some of the biggest floods and lowest flows on record, with floods for the Waitōtara region in 2004 and the May 2007 flash flood event between Ōākura around to Egmont Village. Conversely, the region experienced a drought over the summer of 2007-08, recording extremely low rainfall totals, and low stream flows. The main features of water quantity are that:

- there are 150 resource consents to take and use surface water, and 52 consents to direct and use surface water;
- total surface water use is over 474,371 m³ (the equivalent of 194 Olympic-sized swimming pools) per day;
- the single largest use category is for municipal and rural water supply schemes, with a total allocation of 152,333 m³ per day (1,763 litres per second) or 32% of all allocated water use;
- overall there has been a 7% increase in surface water used since 2003;
- more than 30% of the average low flow is allocated for use in 8% of catchments, but flows at which abstraction must cease are set to safeguard ecological values; and
- interest in irrigation has increased in recent years, especially in the coastal and southern areas of the region.

The *Regional Fresh Water Plan*, contains provisions to manage water use to protect aquatic life and other values. Measures are required to be put in place to mitigate or reduce the environmental effects of water use and these are closely monitored by the Council.



GROUNDWATER

Taranaki's groundwater is increasingly becoming an important source of water for a variety of purposes including domestic, industrial, agricultural and domestic water supply, particularly in South Taranaki. Groundwater is also the major component of stream flow during dry weather periods for the hundreds of streams in the region. Groundwater systems are complex, being influenced by the nature of geological systems. In summary:

- there are 81 resource consents for groundwater use in Taranaki;
- a total of 1,550 wells are recorded on the Council's database. Most of them are used for farm and domestic water supplies, although it is estimated that a large number of bores are not recorded on the Council's database;
- 44,022 m³ (the equivalent of 17 Olympic-sized swimming pools) of groundwater a day is currently allocated, twice the amount reported in 2003, but still not a significant pressure on groundwater levels;
- the deeper aquifers mostly show less variation in groundwater levels than do the shallower aquifers;
- groundwater quality in Taranaki is generally high, there are no problems associated with pesticide residues, microbial contamination or saltwater intrusion and mineral levels reflect the geology of the aquifers;
- 94% of the 68 groundwater wells monitored had nitrate levels that met national drinking water standards, although nitrate levels have been found above the guidelines in a few wells tapping into shallow aquifers in South Taranaki; and
- shallow groundwater quality, in terms of nitrate levels, is generally improving.

The *Regional Fresh Water Plan*, controls groundwater use and discharges to land that have the potential to affect groundwater quality.



BIODIVERSITY

The diverse freshwater wetlands in Taranaki range from pristine ones surrounded by national park to small remnant wetlands that are the subject of restoration by some landowners, but drainage and land reclamation by others. The region has a diverse range of rivers and streams - mountain fed rivers with their headwaters in the Egmont National Park; ring plain streams arising in pasture land; and river systems draining hill country. Taranaki rivers and streams support a diverse range of native fish and invertebrates. In summary:

- regionally significant wetlands have, on the whole, been adequately protected through formal mechanisms and proactive protection works such as fencing and planting;
- 63 small wetlands have been drained or reclaimed since a study undertaken in 1995;
- Over the past five years, consents have been granted for 25.5 km of small streams to be piped underground and the realignment of almost 7 km of streams for the purpose of land improvement with consequential loss of native fish habitat;
- of 108 structures that have the potential to impede fish passage, 49 provide adequate fish passage, two have been removed and the others need remedial work;
- since 2001, fish passage has been improved over 12 structures; and
- four out of five sites monitored for the threatened brown mudfish show healthy breeding populations.

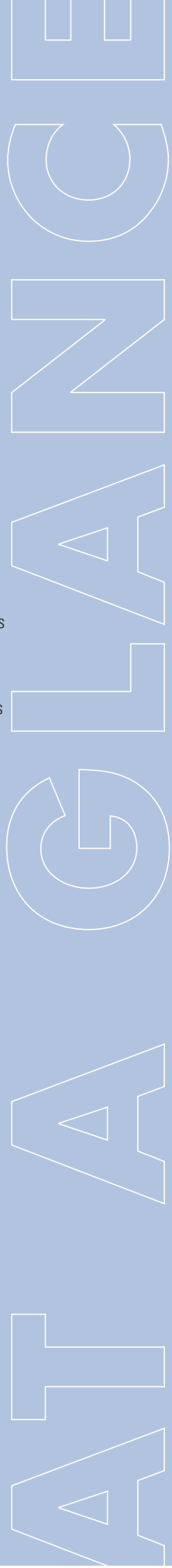
The *Regional Fresh Water Plan*, contains policy and objectives for managing freshwater biodiversity through provisions for land drainage, protection of regionally significant wetlands and provision of fish passage over structures. The Council works with landowners to protect regionally significant wetlands.



PUBLIC ACCESS

Public access to rivers and lakes is important for all people of Taranaki who use freshwater sites for a variety of recreational purposes, such as swimming, fishing, whitebaiting and enjoying picnics. Public access to rivers and lakes in Taranaki is often provided by way of public roads, or directly through parks and reserves. However, access to many rivers and stream sites requires the permission of the adjoining landowner. Respondents to several surveys have indicated that public access to freshwater sites is “about right”. No major constraints on public access exist to rivers and streams in Taranaki.

District plans prepared by the New Plymouth, Stratford and South Taranaki district councils provide for the creation of esplanade reserves and esplanade strips alongside rivers and streams.





Waiwhakaiho River and Mount Taranaki.

OUR FRESH WATER

Fresh water is important to the people of Taranaki, and is vital for community water supplies, major industrial uses and agriculture. Maintaining and enhancing the mauri and wairua of water is of fundamental importance to tangata whenua. Water forms an important part of the cultural and spiritual values of Māori who have a kaitiaki or guardianship role in relation to water. It is highly valued for its association with a wide range of amenity and recreational uses such as swimming, angling, enjoying picnics, walking and tramping.

Wise management of that freshwater resource is a significant regional issue for the people of the region and for the Taranaki economy, and has been for at least the past 40 years. It is a key component of a 'prosperous Taranaki', a region that has a sustainable, resilient and innovative economy that prospers within the natural and social environment. Equally it is a key component of a 'sustainable Taranaki', a region that appreciates its natural environment and its physical and human resources in planning, delivery and protection¹. Protecting the quality of water in our streams, rivers and lakes is considered by most people to be very important (81% of people surveyed in the *Future Taranaki* report agreed). Interestingly, protecting water quality was identified by only 17% of people surveyed as an area where significantly more effort was required, indicating that the large majority of respondents consider that current efforts and current progress are

delivering on their aspirations. Access to high-quality recreational sites (i.e. lakes and rivers), was also noted as important to the community in this and other surveys².

Rainfall in Taranaki is generally high and frequent, meaning water supply for agriculture, community water supplies and industry is generally plentiful and streams are well-flushed, although certain parts of the region can still find themselves stretched for water during periods of low rainfall and low flows, as witnessed during the dry summer of 2007-08. Increasingly, those needing water at critical periods are seeking groundwater, to ensure continuity of availability during times of water restriction. Demand, particularly from agriculture, for

groundwater is increasing, but is still not at levels seen elsewhere around the country.

The region contains hundreds of rivers and streams. Those around the ring plain are, on the whole, short, relatively small and fast-flowing, and they drain catchments formed from volcanic geology. These characteristics influence the water quality and stream ecological health, which are generally high, particularly in the upper catchments of those rivers with their headwaters in Egmont National Park. Naturally high levels of phosphorus in Taranaki rivers can be attributed to the volcanic catchments they drain. Rivers and streams draining the eastern and northern hill country tend to be more silt-laden, largely due to the erodible nature of the geology of their catchments.

The quality of Taranaki's fresh water is also strongly influenced by uses of it and the adjacent land. Intensive agriculture leads to contamination from surface run-off particularly from pastoral land, point source discharges, and structural alteration of streams and wetlands for the purpose of land improvement. Pastoral and urban development over the past 150 years has resulted in dramatic changes to the character of Taranaki's rivers and their catchments. Rivers and streams that once flowed through forest cover, today flow through farmland for most of their length. Streams where stream bank vegetation has been retained or restored are less susceptible to erosion, flooding, loss of shading, increased water temperature, and increased nutrients, and support richer natural aquatic and stream bank habitat.



Manganui River at Everett Park.

¹ Community Outcomes Project Team, 2004. *Future Taranaki: A Report on Community Outcomes for Taranaki*.
² Taranaki Regional Council, 2008. *Recreational Use of Coast, Rivers and Lakes in Taranaki 2007-08*.

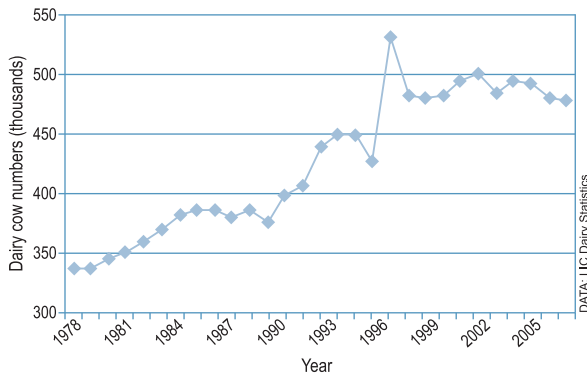


Figure 4.1: Dairy cow numbers in Taranaki.

In Taranaki, the predominant agricultural pressure on freshwater resources comes from the dairying sector, which covers the majority of the ring plain. Dairy herds are increasing in size through stocking rate intensification and farm amalgamations, resulting in larger operations. Overall, the number of cows in Taranaki has steadily increased from 350,000 in the late 1970s and appears to be on a plateau of about 480,000 cows (Figure 4.1). Pressures on freshwater quality and quantity also come from industrial uses.

Managing freshwater quantity and quality, and managing freshwater habitats (streams, rivers and wetlands) in a manner that is sympathetic to the demands of 21st century living, and which allows the regional community to meet its aspirations and expectations, is the challenge for not just the Council, but for all of Taranaki.

Looking to the future, it is anticipated that a mix of regulatory and non-regulatory measures such as increasing riparian planting, the exclusion of stock from water courses and from stream banks, and continued vigilance in terms of managing point source discharges, should result in maintaining, or improving upon existing water quality and ecological health.

4.1 SURFACE WATER QUALITY

Water quality may be influenced by a number of natural factors such as climate, flow, geology, soils and vegetation cover. It is also influenced by human activities such as waste disposal, urban and industrial development, and agricultural land use.

Monitoring water quantity and quality has been, and continues to be, an important component of the Taranaki Regional Council's work. Results enable the Council to compare Taranaki's water quality against national water quality guidelines and to examine trends in water quality over time. Being able to report accurately on the environmental results of the management of Taranaki's freshwater resources will depend on continuing the Council's scientifically robust monitoring programmes, something the Council is committed to doing.

When water quality is investigated or monitored, it is for the purpose of being able to assess what the health of the river, stream or lake is like, and the suitability of the water for other uses. Stream ecological health can be measured directly by looking at the composition of the communities of invertebrates (such as insects, crustaceans and snails) that live on the stream bed and by looking at the algae (in terms of how



There are around 480,000 dairy cows in Taranaki.

much and what type) growing on the rocks. These communities respond directly to water quality and ecological conditions, so the indices derived from the data are particularly useful for monitoring trends in stream health over time. This chapter first discusses the outcomes of the Council's biomonitoring programme. It is the state of the ecology that is one of the ultimate measures of the success or otherwise of water management in the region.

Water quality is also assessed indirectly through a range of physical and chemical measurements such as levels of nutrients, water clarity, water temperature and bacteria. These indicators can help identify specific pressures or problems (in turn allowing remedial and control measures to be better focused). This chapter then discusses the outcomes of the Council's physicochemical monitoring programme and whether Taranaki streams comply with guidelines for physical and chemical variables in order to safeguard water quality for such purposes as protecting the aquatic ecosystem, for ensuring that water quality is adequate for stock drinking water, for irrigation or for contact recreation. Furthermore, trends in the variables monitored are examined to see if Taranaki's water quality is moving closer to the guidelines or further away.

In considering Taranaki's water quality, as measured by either physical, chemical or biological variables, monitoring aims to examine differences between sites, between catchments, down catchments, and over time. Interpreting the data aims to answer questions of why water quality differs, whether differences are due to natural or human impacts, the effectiveness or otherwise of management interventions, and what amount of change (either between sites or over time) is appropriate.



Measuring water temperature.