Waikato
REGIONAL COUNCIL
Te Kaunihera ā Rohe o Waikato

Riparian characteristics of pastoral waterways in the Waikato Region, 2002-2022

Summary

Riparian zones and why they are important

The Waikato region has more than 16,000 km of streams and rivers which provide a wide range of social, economic, and ecosystem services including water supply, electricity generation, flood control, recreational values, and habitat for aquatic plants and animals.

Riparian margins are the strips of land alongside waterways, such as drains, rivers, or streams where the land meets the water. These margins are usually covered with vegetation, including trees, shrubs, and grasses, which play an important role in supporting water quality and maintaining the health of aquatic ecosystems.

Riparian zones are critical to:

- **Water quality improvement** – Riparian vegetation can filter pollutants, excess nutrients, sediment and pathogens before they reach the water, helping to improve water quality.
- **Erosion control** – Plant roots stabilise streambanks, reducing erosion and the input of sediment into waterways.
- **Habitat support** – Riparian margins provide a range of habitats for native species. These areas can serve as crucial hiding and breeding areas for native species, while the plants offer overhanging shelter and a food source for aquatic animals.
- **Temperature regulation** – Once established, riparian vegetation shades the water, helping to lower its temperature. This limits the growth of weeds and algae, while also maintaining stable conditions that support aquatic life.
- **Flood attenuation** – Riparian margins can store and slow down the flow of drainage waters during floods as well as increase temporary storage of water, reducing flood impacts downstream.

About the survey

The regional riparian survey was established to measure key riparian characteristics along rivers, streams, and drains flowing through pastoral land in the Waikato region over time. Characteristics observed include fencing, vegetation (type and extent), buffer width, stream crossings, and stream bank erosion.

The survey also aimed to quantify differences in riparian characteristics (state and trend) across two land use types (i.e. dairy and dry stock), management zones, and stream orders.

The report, '**Riparian characteristics of pastoral waterways in the Waikato region, 2002-2022**', examines the state and trends of riparian attributes in pastoral waterways across the Waikato region and is based on data collected by the regional riparian characteristics survey.

Survey details:

Scope

The survey assessed fencing (extent and type), vegetation, buffer width, waterway crossings, and stream-bank erosion at various sites.

Timeframe

Surveys were conducted at five-year intervals from 2002 to 2022.

Changes Over Time

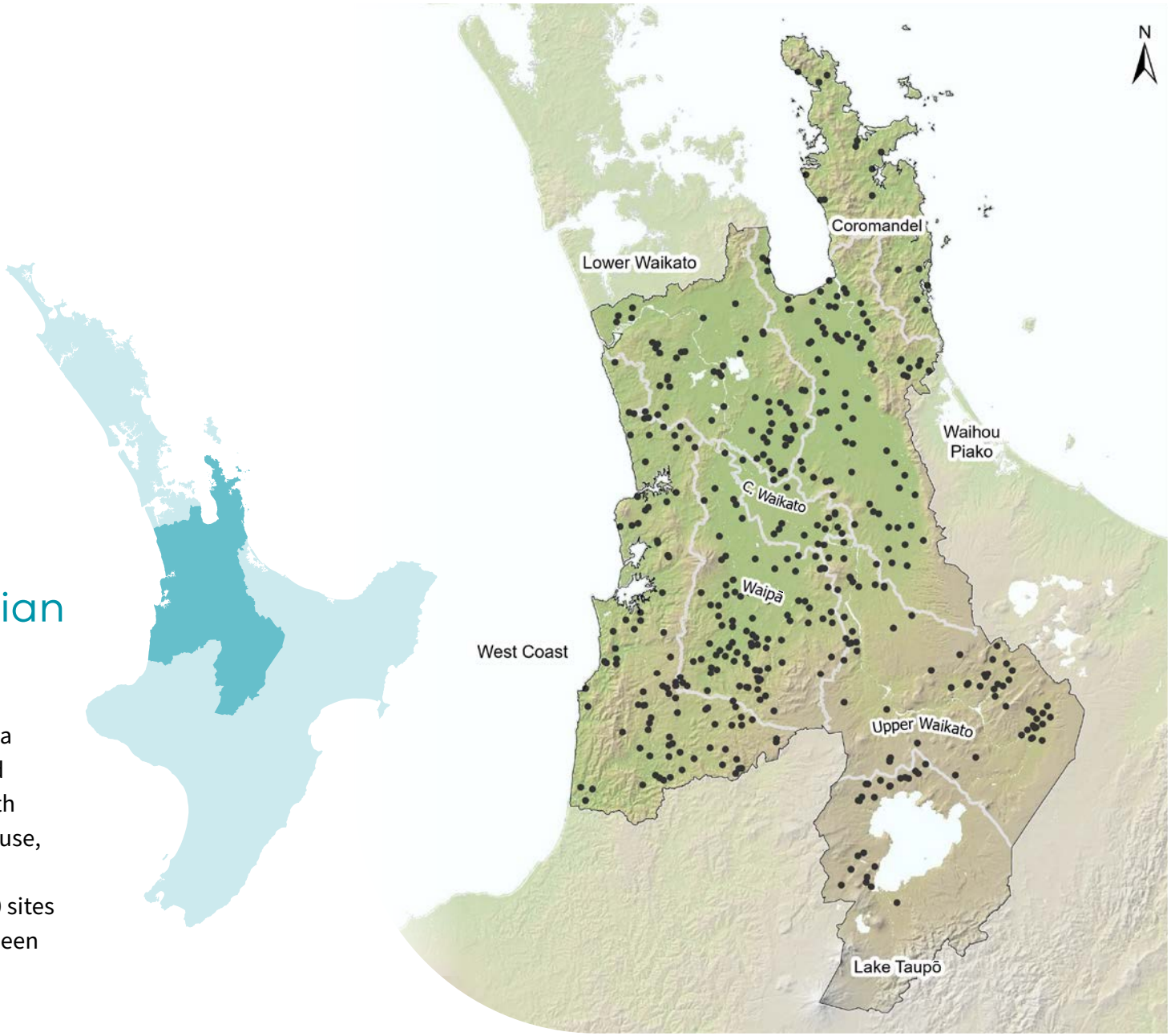
The report tracks key riparian attributes over the past 5, 10, 15, and 20 years.

Latest survey

The most recent data was collected during summer and autumn of 2022/23.

2022 regional riparian monitoring sites

The regional riparian survey selected a random set of monitoring sites, based on relative proportion of stream length under different combinations of land use, stream order and management zone. During the latest survey, a total of 430 sites were assessed across the region between November 2022 and June 2023.



Main survey findings

The report provides a detailed assessment of riparian zones in pastoral landscapes across Waikato. Here are some of the key findings:

- **Fencing and stock exclusion:** Over the past 20 years, there has been a significant increase in fencing along waterways and a reduction in livestock access. The proportion of bank length effectively fenced across the surveyed sites in the Waikato region increased from 29% in 2002 to 58% in 2022, with an average annual increase of about 1.5% of bank length per year. Overall, total stock access to riparian margins decreased over the five years from 51% 2017 to 42% 2022, despite no increase in total fencing across the region during this period.
- Of the eight management zones in the Waikato region, the Upper Waikato and Waihou-Piako management zones had the highest proportion of bank length effectively fenced (81% and 85%, respectively). This was significantly higher than those in the Lower Waikato, Waipā, and West Coast management zones (54%, 66%, and 20%, respectively). The Upper Waikato and Waihou-Piako zones also had the lowest amount of total stock access (19% and 15%, respectively).

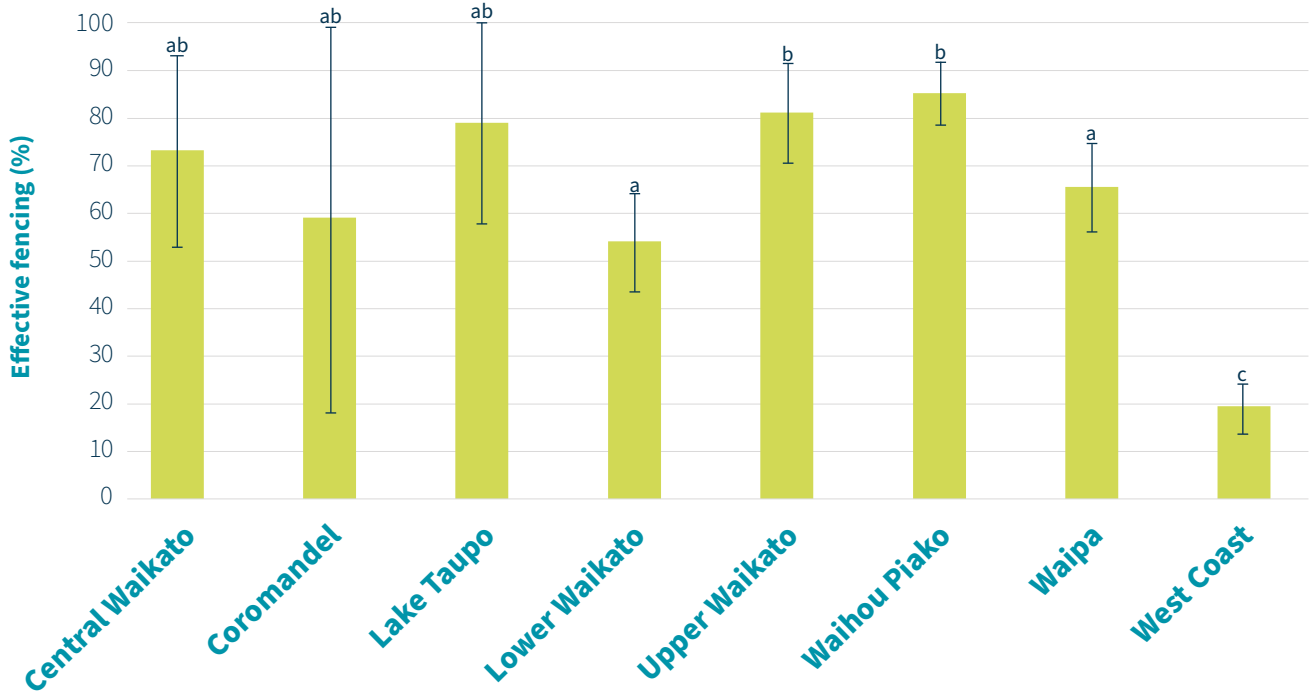
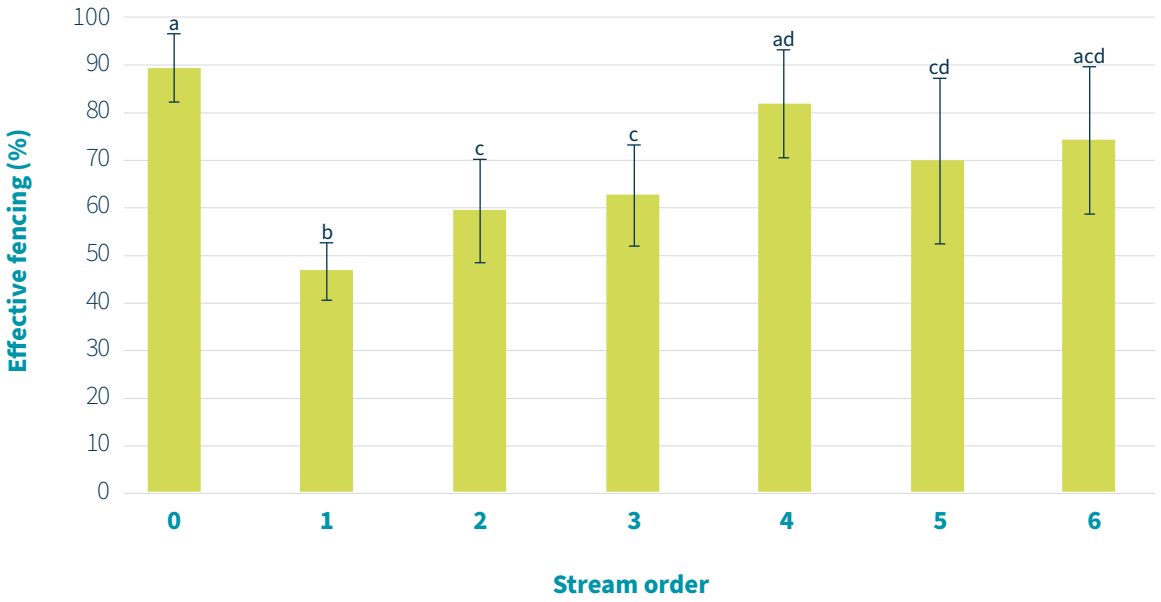


Figure 7. Average proportion of bank length effectively fenced within each management zone in 2022. Error bars represent the 95% confidence interval about the average. Averages carrying the same letter are not significantly ($P < 0.05$) different.

The average proportion of bank length effectively fenced was largest for drains (89%), reflecting the relative ease with which these features can be fenced (often straight, linear features located on flat land) and their location on predominantly dairy enterprises. Lower order streams (stream orders 1–3) had the lowest proportion of bank length effectively fenced, ranging from 47–63%, while across larger waterways (stream orders 4 – 6), 72–82% of bank length had effective fencing.

- **Buffer Widths:** Riparian buffer width varied considerably across sites, with dairy farms having a significantly higher proportion of bank length with 'narrow' buffers (74%) compared to drystock (53%). Across the region, about 60% of the riparian margins were considered 'narrow' (< 5 m) in 2022, with the remaining 40% considered 'wide' (> 5 m). Wider buffer zones are generally associated with greater benefits for stream health, providing more habitat for indigenous vegetation and greater filtering of contaminants from runoff, increasing soil infiltration of soluble pollutants, sediment trapping, stream bank stabilisation, and flood attenuation. It is important to note that the current survey design does not include an assessment of buffer width effectiveness in mitigating or attenuating contaminant transfer.



- **Waterway Crossings:** Most waterway crossings (83%) across the Waikato region were categorised as culverts in 2022, with the remaining crossings being categorised as either bridges (14%) or fords (3%). There were more fords observed across drystock farms (9%) compared to dairy (< 1%). Drystock farms more often occur in remote hill-country areas, where fords are more likely to be used to cross waterways in difficult to access areas. The low number of streambed crossings across dairy farms confirms the findings from the final Sustainable Dairying Water Accord progress report (DairyNZ). The report highlighted that 99.8% of regular stock crossing points on dairy farms were either bridged or culverted.

- **Riparian vegetation:** Riparian margins across the Waikato Region were dominated by non-woody vegetation (occupying about 73% of surveyed bank length), with grass and weeds occupying 64% of surveyed bank length across the region. Woody vegetation occupied 27% of surveyed bank length, with woody native species covering 11% of the surveyed river margins. While the total coverage of woody species across riparian margins is relatively low, the coverage of woody native species in riparian margins increased by about 6% over the past 20 years, most likely in response to riparian restoration efforts.

- **Stream-Bank Erosion:** The proportion of bank length affected by stream bank erosion across the region in 2022 was approximately 9%, significantly lower than the 17% measured in 2017, and similar to that measured in 2012. Overall, the total erosion measured in 2022 was low compared to the previous 2017 survey.

What happens next

The next regional riparian survey will be undertaken in 2027/2028 using the existing methodology, with minor adjustments to sample numbers and locations to ensure better representation of land use and stream order combinations in our sampling dataset.

The 2027/2028 survey will be the 6th regional survey, spanning 25 years since its establishment in 2002.

We would like to thank all the landowners who granted us access to the sites via their property. This survey could not have been successfully completed without the assistance and cooperation of all those involved.

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