

High Country and Foothill Streams and Lakes

Water quality in the high country is variable among river types, predominantly influenced by sediment inputs and associated contaminants from overland run-off and stock access. Aquatic ecosystem health and water quality is typically higher than in lowland streams, particularly for streams that receive a large volume of flow from higher up in the catchment. Spring-fed streams in the high country are particularly vulnerable to habitat degradation and siltation through stock access, upwelling of groundwater and associated contaminants or runoff from intensive land use. Hill-fed streams may be hampered by inflowing spring-fed tributaries or fluxes of contaminant sources during high flows. Alpine and hill sourced rivers are generally less impacted by contamination sources due to a large volume of flow originating high up in the catchment.

Targets

By 2015:

Highlighted any high country spring-fed or foothill streams where ecosystem health is declining, and identified the cause with an action plan in place.

By 2020:

All foothill rivers and high country rivers and/ or lakes either in good ecological health or better, or showing upward trends.

By 2040:

Maintained upland spring-fed streams and lakes in very good aquatic ecosystem health (no decline from 2010). 80% of other rivers/streams and lakes with very good aquatic ecosystem health.

Progress to 2020

Not started	Started	Progress	Good progress	Achieving
<ul style="list-style-type: none"> ■ By 2017, Immediate Steps has allocated \$1.4m to 65 sites in high country and intermontane streams. ■ Aquatic Ecosystem Health (AEH) (page 20), habitat and Water Quality Index (WQI) (page 21), is being monitored by Environment Canterbury throughout the region. Sites are selected to represent different river types that encompass various sources of flow, elevations and land uses. ■ Smaller high country rivers and streams have variable AEH and WQI, depending primarily on the intensity of land use along their banks. ■ The AEH grades indicate that around 50% of sites are graded good or very good. 19% of sites have shown a general improvement in aquatic ecosystem grade, while 23% of sites have shown a general decline. ■ The WQI indicates that 64% of high country and foothill streams are in good or very good condition. 38% of sites have shown a general improvement in AEH grades, while 3% of sites have shown a general decline. ■ The Trophic Level Index (TLI) indicates that 92% of high country lakes are between Ultramicrotrophic to Mesotrophic. ■ Freshwater outcomes for Canterbury’s High Country lakes have been set in the Land and Water Plan. Lakes have a set TLI based on their characteristics. TLI is calculated using monthly measurements over summer of three separate factors: total nitrogen, total phosphorous, and chlorophyll-a. 15 of the 27 regularly monitored lakes are currently below their target TLI. There are specific provisions within the planning framework that set rules for the management of land activity around sensitive lake zones in Canterbury whereby farming activity will require a resource consent. Environment Canterbury is working with landowners in these lake zones to improve land management practices and improve water quality. ■ There are specific provisions in the Land and Water Regional Plan, relating to vegetation clearance, stock exclusion and earthworks on river margins. ■ Environment Canterbury is working with landowners to protect and maintain riparian margins. It is a now a non-complying activity for intensively farmed stock to use and disturb the bed and banks of any lake. ■ Environment Canterbury provides data on the state of Canterbury’s waterways to the national database – LAWA. For more information on local to national state and trends of water resources, visit www.lawa.org.nz. 				

Fig 7: Aquatic Ecosystem Health (AEH) Grade of Lowland and High Country Streams

Aquatic Ecosystem Health monitoring is carried out annually, in spring/early summer, at around 200 sites throughout Canterbury. Streams are chosen to represent the full range of waterways in the region; alpine, lowland, spring-fed and hill-fed.

Ecosystem health is determined according to the number and types of aquatic organisms present at a site. The score for each stream type is standardised against the score from a reference, or 'best available', site to control for natural variability which affects all streams.

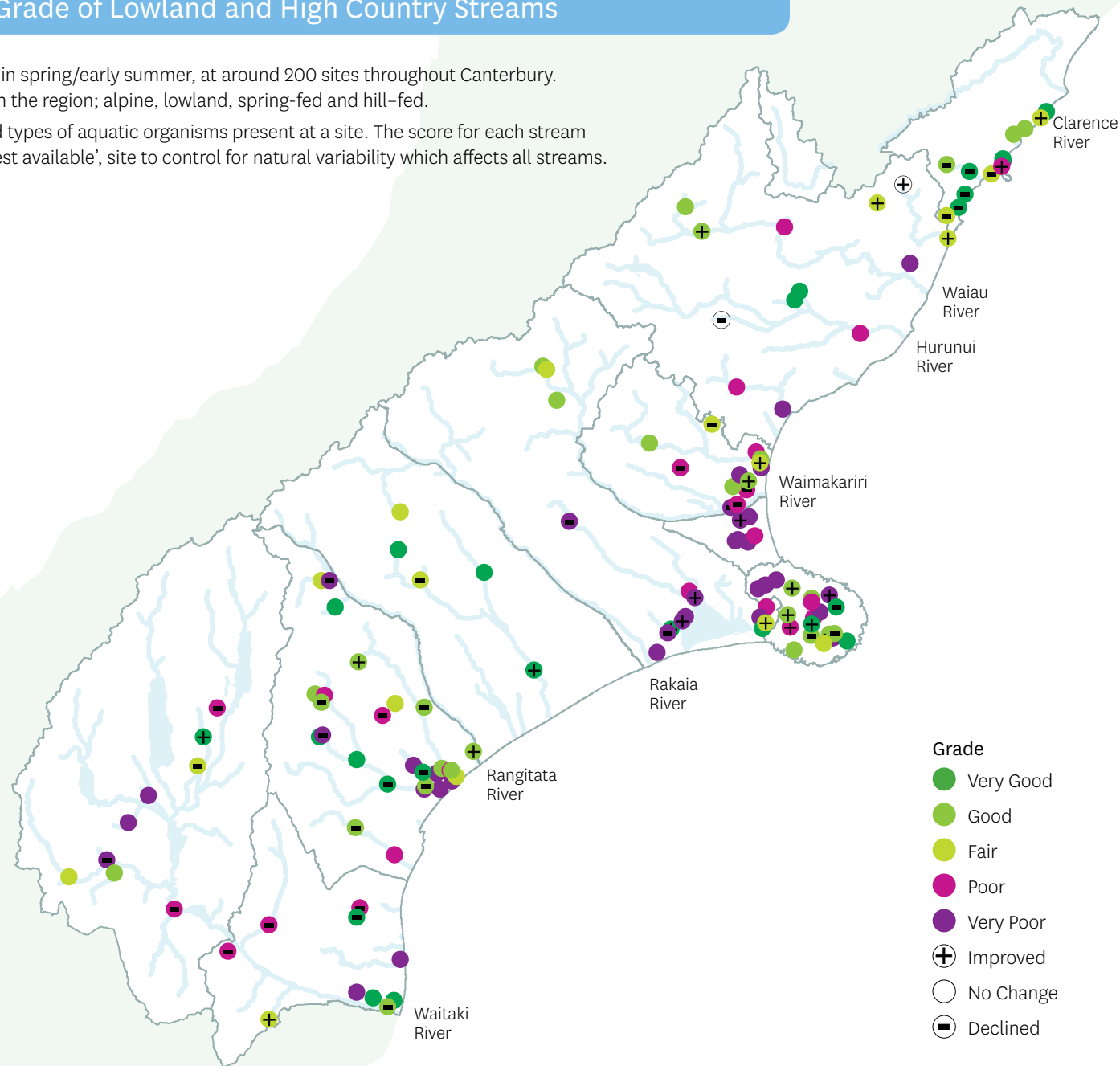
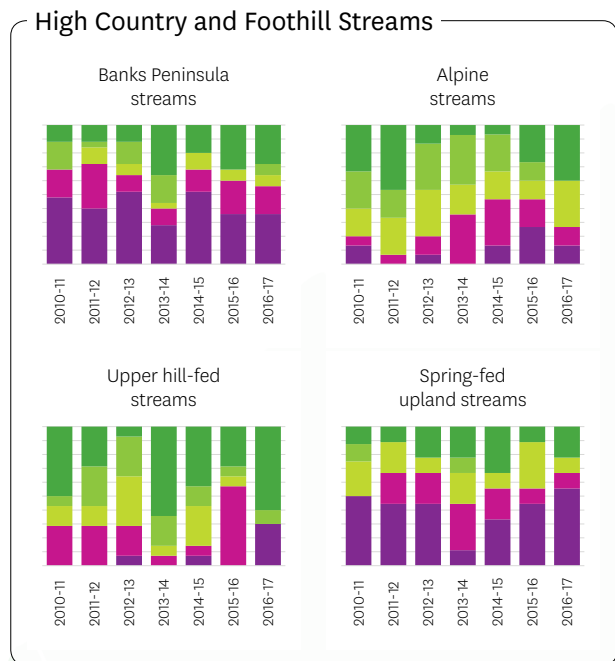
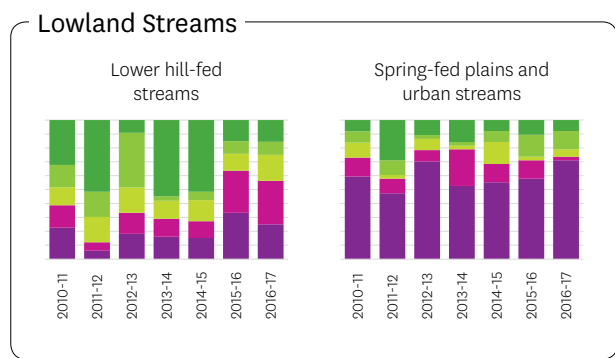
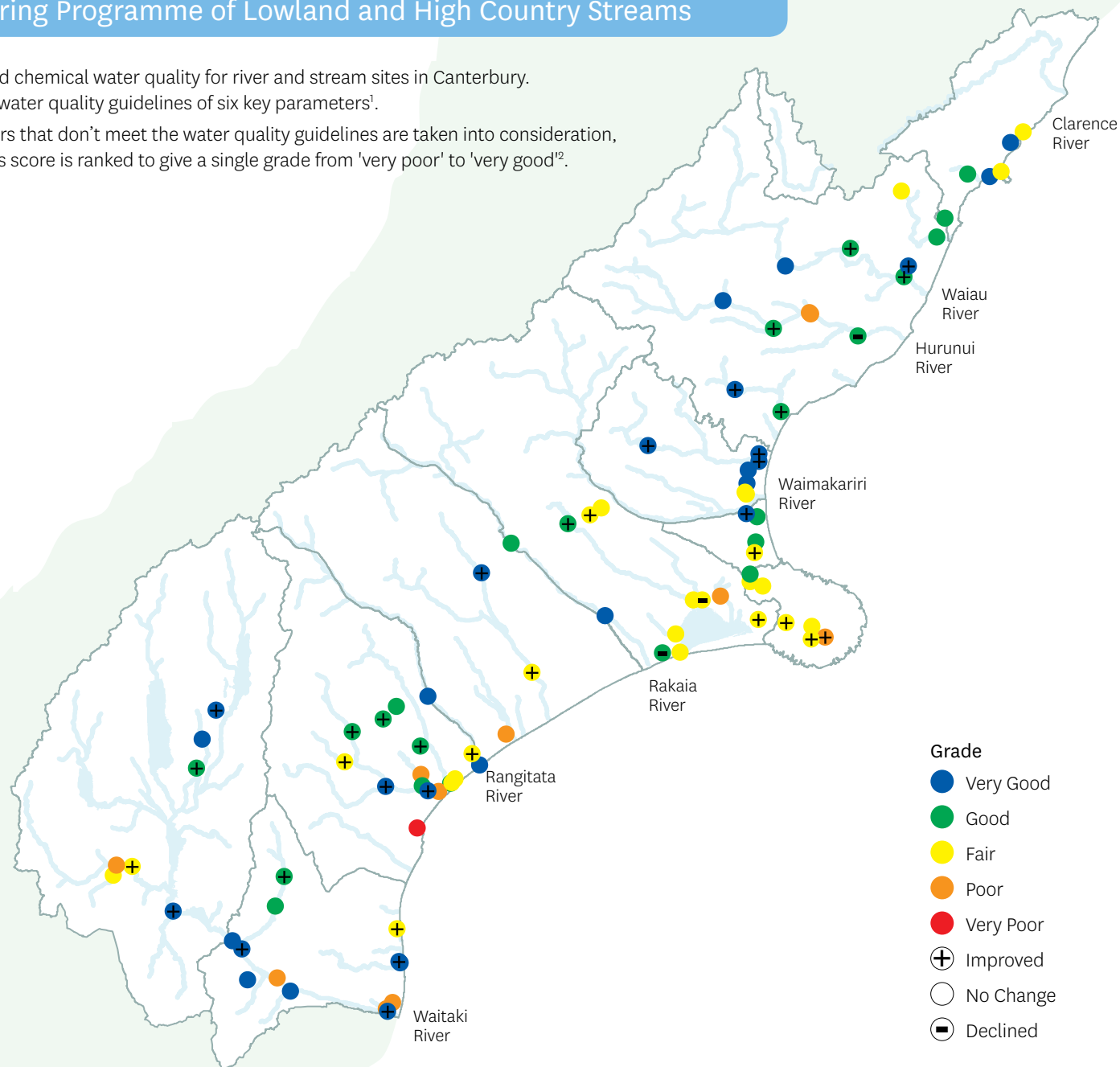
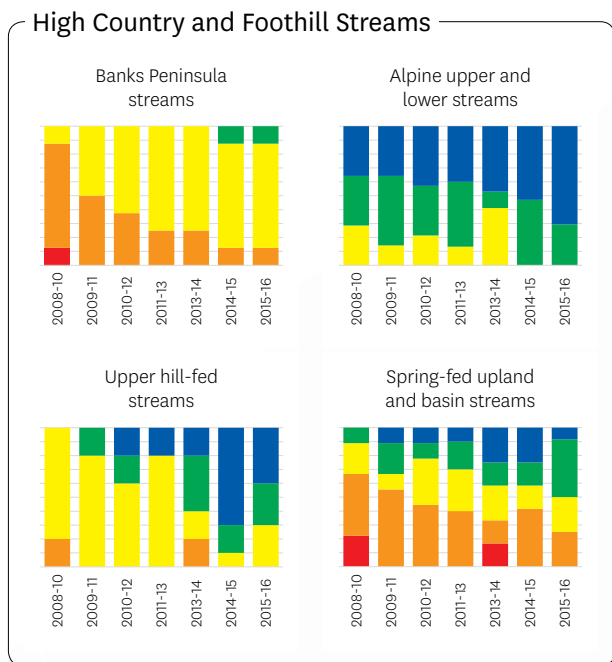
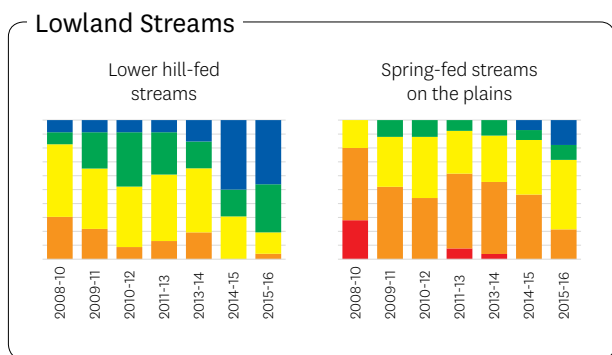


Fig 8: Water Quality Index (WQI) Monitoring Programme of Lowland and High Country Streams

A Water Quality Index (WQI) is used to summarise physical and chemical water quality for river and stream sites in Canterbury. The index compares raw water quality data to recommended water quality guidelines of six key parameters¹.

When deriving a WQI score for a site, the number of parameters that don't meet the water quality guidelines are taken into consideration, as well as the frequency and magnitude of transgressions. This score is ranked to give a single grade from 'very poor' to 'very good'².



¹Nitrate+nitrite nitrogen, Escherichia coli, Ammonia-nitrogen, Suspended Sediment, Dissolved Reactive Phosphorus, Dissolved Inorganic Nitrogen.

²The WQI is intended to provide a summary of key water quality parameters, but should be used only as an indicator of overall water quality.