

UPPER HERBERT WATER QUALITY PROGRAM

Achievements and learnings



August 2024



Australian Government

REEF TRUST



Great Barrier
Reef Foundation

Introduction

The Great Barrier Reef is globally renowned for its intrinsic beauty, immense spatial scale, outstanding biodiversity as well as its natural, social, economic, and cultural values. A healthy and resilient Great Barrier Reef is critical to protect the vast array of ecological communities and species that inhabit coastal, marine, and terrestrial ecosystems. However, the health of the Reef is at risk from a range of factors including climate change, expanding coastal development, direct human use and poor water quality from land-based runoff.

In a bid to significantly improve the health of the Great Barrier Reef, the Reef Trust Partnership (the Partnership) – a landmark collaboration between the Australian Government’s Reef Trust and the Great Barrier Reef Foundation (the Foundation) – was awarded \$443 Million to elevate and amplify efforts to build Reef resilience. As part of the Partnership, the Water Quality Program received \$199 Million to address poor water quality from land-based runoff and respond to the priorities of the Reef 2050 Water Quality Improvement Plan (WQIP).



Upper Herbert Water Quality Program

The Upper Herbert Water Quality Program was one of ten regional water quality programs delivered under the Partnership between 2020 and 2024. Through the adoption of improved land management practices, this \$3.4 Million program aimed to prevent 13 kilotonnes of fine sediment lost from grazing lands from entering the Reef's waters every year.

The Herbert is the largest river in the Wet Tropics with its upper catchment dominated by grazing. The Herbert River catchment covers an area of around 10,000 square kilometres and extends 288 kilometres from the Atherton Tablelands to the coast at Ingham, north of Townsville. The Herbert catchment is one of the four main contributors to fine sediment loads within the inner lagoon of the Great Barrier Reef.

The Upper Herbert Water Quality Program (the Program) was delivered by Terrain Natural Resource Management (Terrain NRM).

Progress to targets was tracked using the Paddock to Reef [Projector Tool](#) for fine sediment which estimates water quality improvements based on a reported change in land management practices by graziers involved in the program.

Cost-effective gully and streambank remediation sites were prioritised using the Gully and Streambank [Toolbox](#) and the Gully Erosion and Streambank Erosion Control Assessment Tools for design and implementation of erosion control activities.

Program activities centred around gully remediation and streambank rehabilitation work, including the construction of rock chutes to address gully erosion, installation of pile-fields to stabilise banks, reshaping of streambanks, and revegetation. Three whole-of-property plans were completed and on-ground grazing land management projects undertaken to improve groundcover, soil health, water quality and productivity.

The support provided to graziers included expert grazing land management practice change advice and access to new data for increased understanding of soil health and its link to pasture management and erosion prevention.

The Program delivered 17 workshops and training events to 68 graziers to increase local knowledge of sustainable grazing systems and approaches.

The Program prevented over 3.7 kilotonnes of fine sediment from leaving grazing properties and entering the Great Barrier Reef lagoon every year demonstrating the landholder's commitment to care for their land.



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“Our goal is to create minimal run-off, or no run-off if we can. Who wants to hurt the Reef? It’s one of the most important, or nicest, things we have in the north. And it’s good to be able to feel like you’re doing the right thing.”

Upper Herbert Water Quality Program Manager Duncan Buckle

Achievements



56,000

hectares of grazing land under changing management practices



68

grazier attendees at Upper Herbert Water Quality Program events



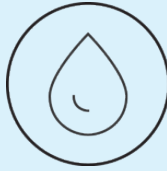
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graziers with whole-of-property plans taking direct on-ground actions



17

information, knowledge sharing and training events



500

metres of degraded streambank rehabilitated and revegetated

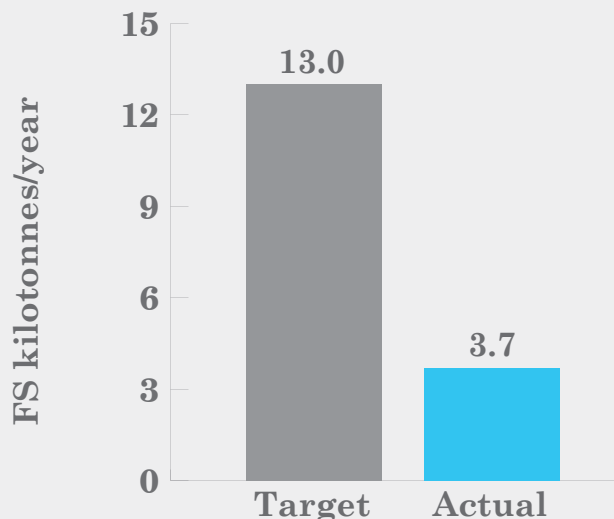


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large gullies remediated and revegetated prevent future erosion

PROGRAM IMPACTS ON THE UPPER HERBERT RIVER CATCHMENT

Progress against Fine Sediment reduction targets*



*It was identified early that there would be a significant short-fall in the regional-level sediment target set by the [Alluvium Report](#) due to disparity between sediment calculation tools and the substantial underestimation of the original costs associated with on-ground activities to meet the Program target in this region. The contracted target was met.

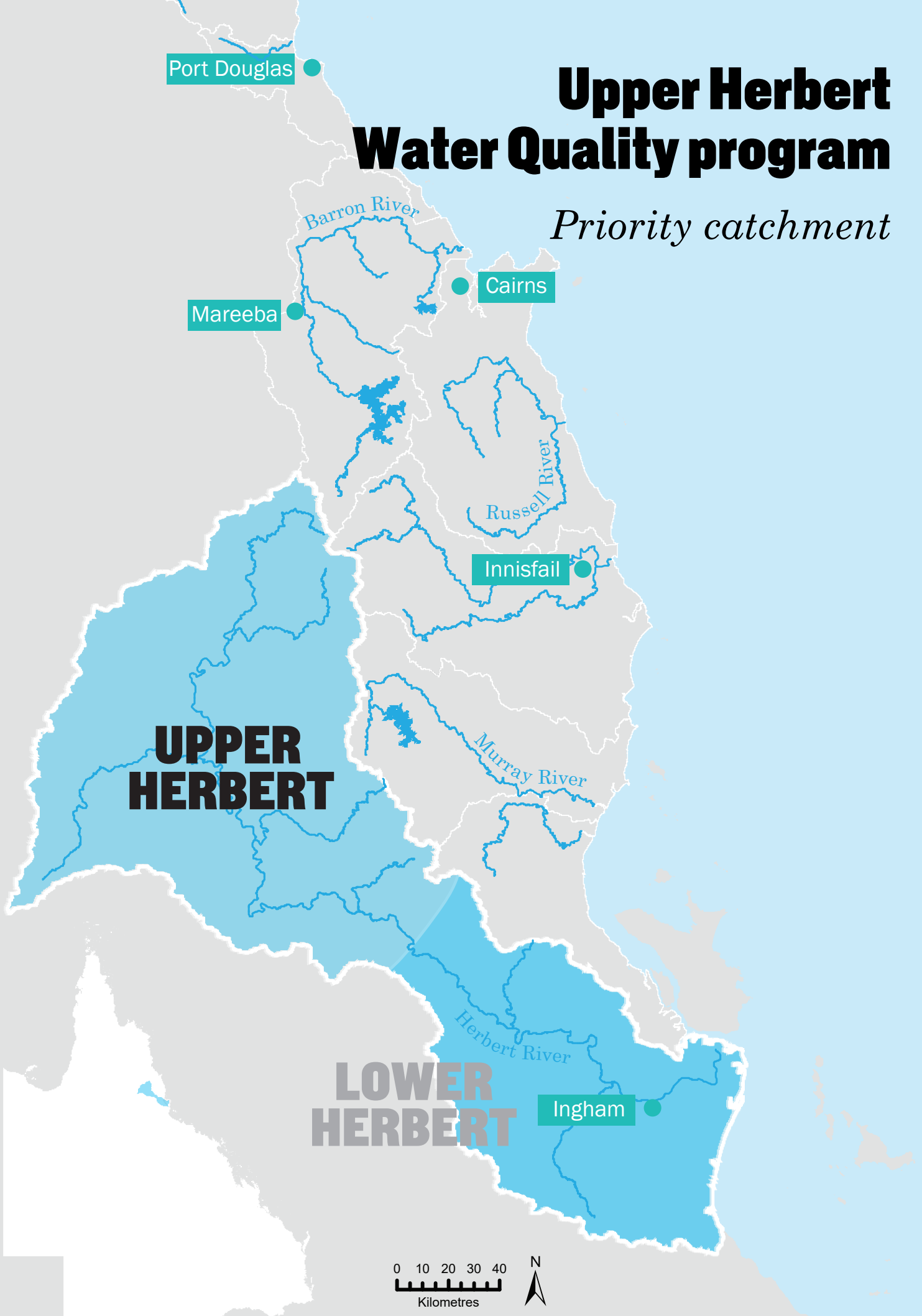


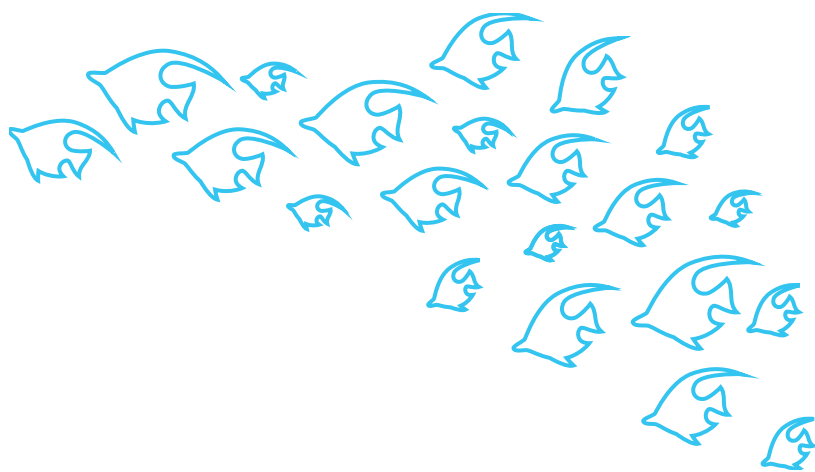
“Sandy soil areas are another challenge; they are more susceptible to erosion. We are aiming for better ground cover through the changes we are making, and that should lead to less topsoil movement in the wet season. Prevention is always better than a cure.”

Minamoolka Station grazier Margie Atkinson (pictured)

Upper Herbert Water Quality program

Priority catchment





Program Model

Governance arrangements for the program ensured the project delivering on the ground reported directly to the Foundation. This model, shown in Figure 1, increased the transparency of outcomes while also facilitating agility to manage contractual commitments.

The delivery provider, Terrain NRM, reported directly to a regional steering committee made up of key stakeholders including Terrain NRM, C2O Consulting, and the Foundation.

The steering committee was supported by a Technical Advisory Group and the Water

Quality Working Group, which provided technical and strategic advice across the whole of the Reef Trust Partnership Water Quality Program.

The design of the governance model recognised the importance of local leadership and oversight, as well as strategic and technical guidance.

A verification initiative focused on independently verifying the extent and quality of the on-ground projects which were being reported to ensure the accuracy of the data in the Foundation’s spatial reporting dashboard.

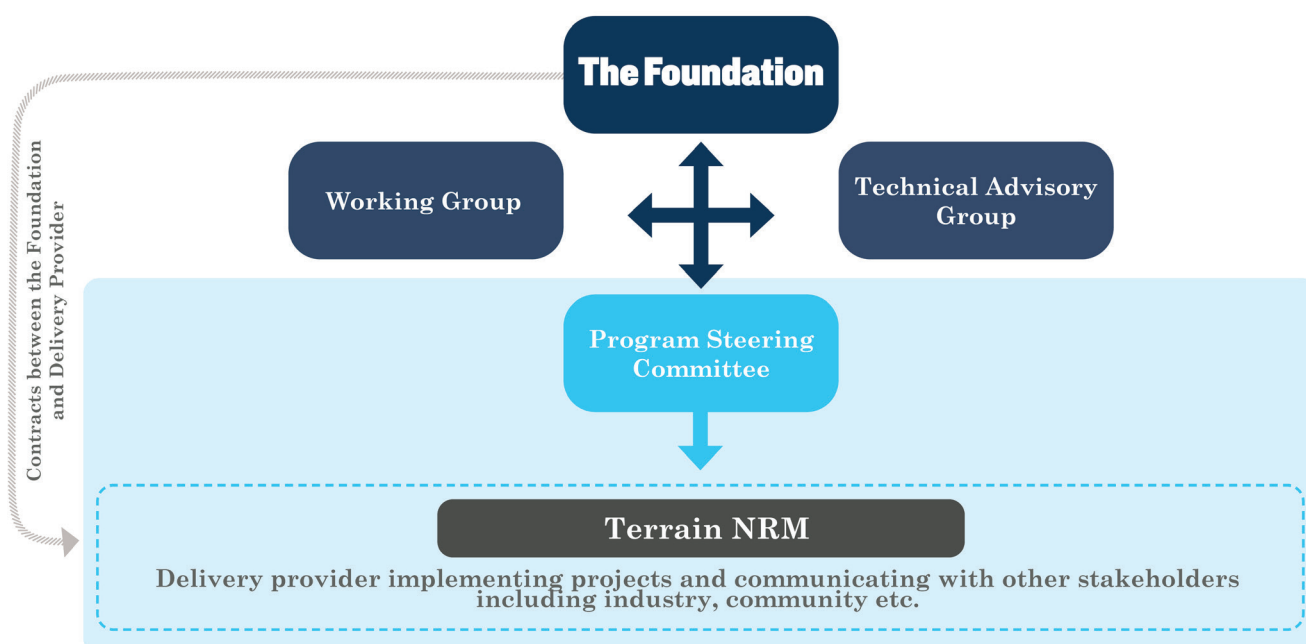


Figure 1 Reef Trust Partnership Upper Herbert Water Quality Program governance model



“When you spell paddocks, even in the dry time, they still grow a little bit. So, we can see the benefits of more regular rotation. Financial help made this happen quicker.”

Goshen Station grazier Brett Blennerhassets

Grazing Land Management

GLEN RUTH STATION

Glen Ruth grazier Curtis Archer is changing how the family's 33,000ha cattle station in the Mt Garnet region is managed. With support from the Program, stocking rates were reduced by 50 per cent on 2,400ha to increase ground cover and improve woody weed management. A three-paddock rotational grazing system was implemented on 17,300ha to better manage grazing pressure and a large area of river frontage was fenced off in an existing 11,400ha paddock to reduce cattle impact. These changed grazing management practices will reduce erosion and boost productivity.

GOSHEN STATION

Grazier Brett Blennerhassett runs 3,000 to 3,500 head of cattle on the family's 19,335ha property, Goshen Station which includes the Herbert River and the Herbert River Falls. With support from the Program, 6km of fencing, 3km of pipeline and a new trough were installed to divide a 3,000ha paddock into two as part of a five-paddock grazing rotation system using two mobs of cattle over a 10,000ha area. Pasture is now getting longer periods of rest and fire is being used to control invasive weeds like lantana and to reduce woody thickening. The management changes implemented will improve pasture and productivity while improving land condition.

MINAMOOKKA STATION

Graziers Margie Atkinson and Greg Jenkins run 4,000 head of beef cattle on their 29,000ha 120-year-old Minamoolka cattle station at the headwaters of the Herbert and Burdekin rivers. With support from the Program, a four to six paddock rotational grazing system was implemented on 12,200ha of land by adding 32.5km of fencing and by installing off-stream watering systems (two bores, one of them a solar pump-operated bore, and a header tank supplying two automated water stations). On a separate 2,500ha section of the land, which is more susceptible to erosion, stocking rates were reduced and seasonal spelling introduced. The smaller paddocks created for rotational grazing means the cattle have shorter, more intense grazing periods and the paddocks have rest periods needed to create better ground cover and more diverse and nutritious pastures which retains water in the soil and reduces sediment losses.



Landscape Remediation

STREAMBANK REHABILITATION

Abergowrie cane farmer Terry Sheahan provided access to several hundred metres of actively eroding riverbank. The installation of 800 wooden piles and revegetation are helping solve erosion problems along the flood-damaged section of the Herbert River. Vegetation established in and around the timber piles will act as the long-term erosion control measure as these piles eventually break down.



GULLY REMEDIATION

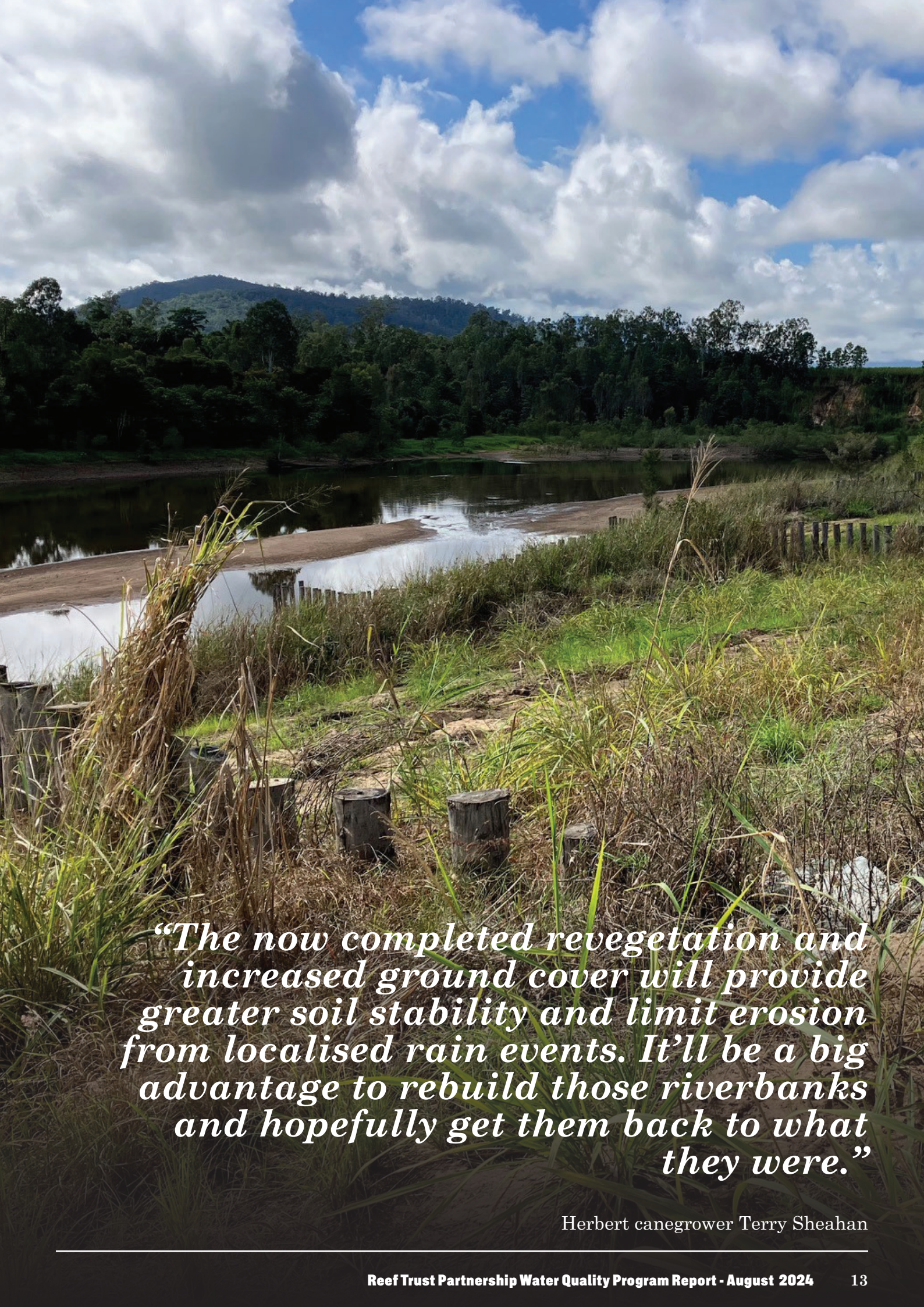
On Woodleigh Station south-east of Mt Garnett, on-site gully remediation was completed on two large gullies. Rock chutes were constructed to address active gullies to prevent future erosion. Earthen bunds were installed on either side of the rock chutes, to direct flows to the crest of the rock chute. Rock check dams were installed throughout the gully channel, downstream of the rock chute to mitigate the impacts of the increased flows during the wet season.





Learnings

1. Effective coordination and good relationship management were essential for program success.
2. A local grazing land management specialist with well-established relationships in the region was essential to grazier engagement to deliver desired outcomes.
3. Small targeted and tailored on-property workshops were the preferred knowledge sharing approach for Upper Herbert graziers.
4. Peer-to-peer connections and knowledge sharing were essential to the identification of potential practice change projects across the region.
5. For large-scale remediation projects, monitoring and maintenance should continue post-project and maintenance repairs should be carried out as soon as required to maximise effectiveness and achieve sediment reduction outcomes.
6. The combination of property-wide soil health and pasture condition monitoring, increased knowledge through educational workshops and field days, extension support, and the implementation of infrastructure was required to drive change and embed management practice changes.



“The now completed revegetation and increased ground cover will provide greater soil stability and limit erosion from localised rain events. It’ll be a big advantage to rebuild those riverbanks and hopefully get them back to what they were.”

Herbert canegrower Terry Sheahan

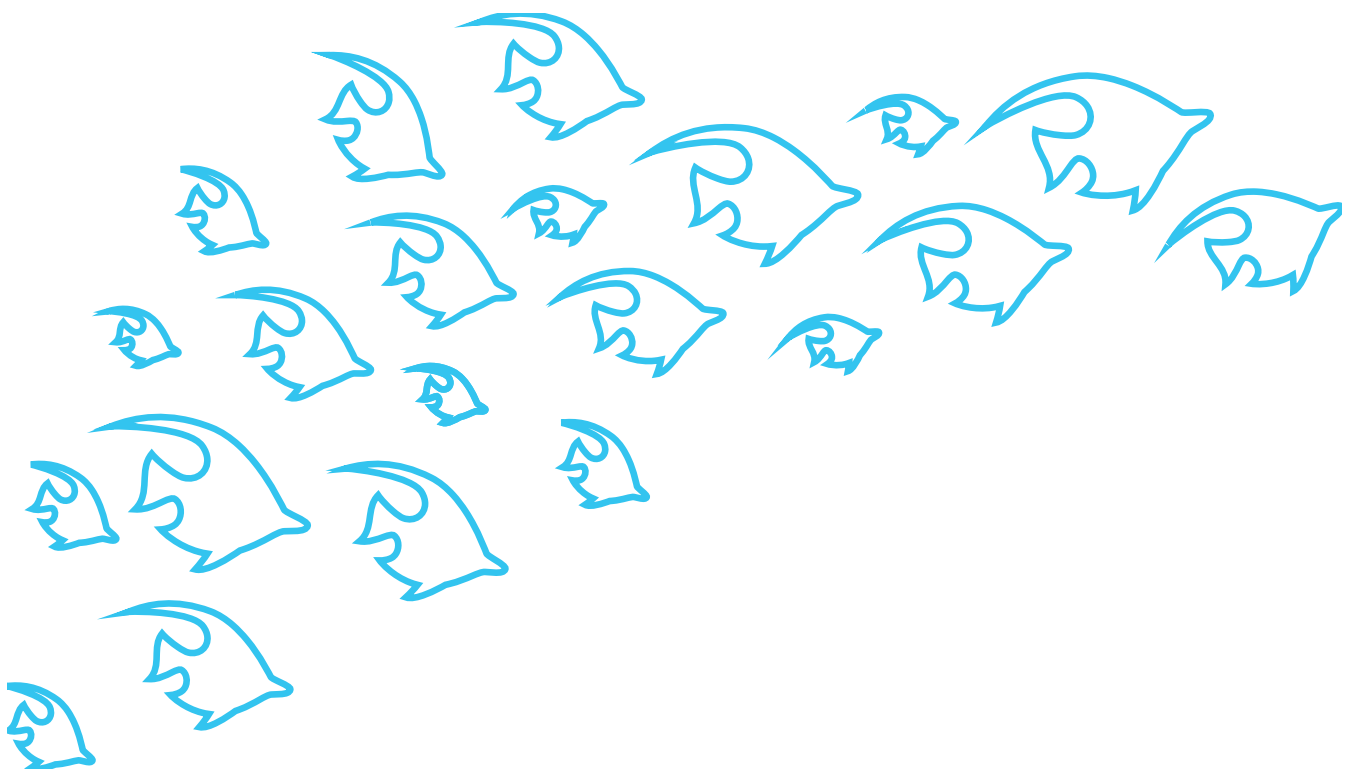
Summary

Over the four years of the Reef Trust Partnership Water Quality Program, 68 graziers have gained new knowledge and improved grazing land management practices which has increased the productivity and sustainability of over 56,000 hectares of grazing land in the Upper Herbert region.

Transparency and accountability were delivered through a regionally-specific governance model and an independent on-ground verification process. Real-time data of on-ground actions provided timely and public progress towards pollutant reduction targets.

Three whole-of-property plans supported by incentives for timely infrastructure development have resulted in improved grazing practices. Expert grazing management practice change support increased the understanding of soil health and its link to pasture management and erosion prevention. Landscape remediation activities centred around on-site gully remediation and streambank rehabilitation work, including the construction of rock chutes to address gully erosion, installation of pile-fields on 500 metres of streambank, reshaping and battering of streambanks, and revegetation for a significant reduction in sediment losses.

The combination of landscape remediation, agronomic extension support, soil and pasture monitoring, grazing land management planning and financial incentives contributed to the Program achieving a reduction of 3.7 kilotonnes of fine sediment per year which has resulted in better water quality in the local waterways and the Great Barrier Reef lagoon.





Acknowledgements

Reef Traditional Owners have been caring for land and sea Country for more than 60,000 years, using Traditional Knowledge passed down through ancestral lines for millennia. The Great Barrier Reef Foundation extends its deepest respect and recognition to all Traditional Owners of the Great Barrier Reef and its Catchments, as First Nations People, holding the hopes, dreams, traditions and cultures of the reef.

The Upper Herbert Water Quality Program was funded by the partnership between the Australian Government's Reef Trust and the Great Barrier Reef Foundation.

Program images supplied by Terrain NRM.



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