

LOGAN CREEK STREAMBANK REHABILITATION



RESTORING RESILIENCE IN THE BURDEKIN CATCHMENT

The Logan Creek Streambank Rehabilitation project is restoring resilience in the Burdekin catchment through targeted erosion control and riparian restoration works, helping stabilise damaged creek systems while improving water quality and strengthening the landscape for the future.



Site condition before rehabilitation works.



Site condition after rehabilitation works.

RESTORING DAMAGED CREEK SYSTEMS AFTER MAJOR FLOOD IMPACTS

Project background and location

Severe flooding during the 2021–22 wet season caused significant erosion along Logan Creek, in the upper Burdekin catchment, destabilising streambanks, stripping native vegetation, and sending large volumes of sediment downstream toward the Great Barrier Reef lagoon.

High flow events damaged sections of the creekline, causing bank collapse and disrupting the creek's natural shape and stability. Without intervention, ongoing erosion risked further land degradation, reduced productivity, and continued sediment movement into downstream waterways and aquatic habitats.

To address these impacts, rehabilitation works were undertaken across five priority erosion sites on three grazing properties north-east of Clermont. Sites were selected based on erosion severity, risk of continued bank failure, and potential sediment contribution to the broader Burdekin system.

Nine priority erosion sites were originally identified. However, following further assessment, Sites 1, 2, 3, and 9 were deemed less severe and did not proceed. Resources were instead focused on Sites 4, 5, 6, 7, and 8. This is reflected in the document, which is why the first site listed is Site 4.

In total, more than 1.5 kilometres of creekline was stabilised and rehabilitated.

Repair works started in September 2025 and were completed in December 2025. The site was then revisited and monitored in April 2026, following the wet season.



Inspecting post-works project sites at Dooruna Station are pictured from left, Lervion (Bon) McLennan, Colin McLennan, Jangga Elder and Jangga Operations Director, Dave Waterson, Sector Lead - Verterra Ecological Engineering, James Duddy, Dooruna Station owner, and Angus Hogg, NQ Dry Tropics Project Manager.

WHAT WAS DONE

Engineering response

A combination of ecological engineering and practical earthworks was used to stabilise severely eroded streambanks and reduce ongoing sediment loss.

Key interventions focussed on reshaping and reinforcing unstable creek banks to improve long-term stability, including:

- Regrading steep, eroded banks to a stable 1:3 slope.
- Reintegrating fallen timber and other stripped material into the landscape to help restore natural landform and water movement processes.
- Constructing a rock chute at a high-energy erosion point.
- Applying targeted soil amelioration to improve structure and support vegetation growth.

These measures were designed to slow water flow, reduce erosive forces, and create conditions suitable for long-term recovery.



Logan Creek lies within the Brigalow Belt Bioregion, where important remnant Brigalow vegetation lines the creek system. These photos show significant bank undercutting caused by the 2021 flood event and subsequent flows, highlighting the need to protect and restore these valuable riparian ecosystems.

Restoring riparian function

Revegetation was a critical part of restoring creek health and stabilising treated areas.

Works included:

- Establishment of approximately seven hectares of riparian vegetation.
- Use of locally appropriate native seed mixes.
- Placement of salvaged timber and root material to assist stabilisation.
- Installation of fencing to protect regenerating areas from grazing and disturbance.

In the long-term, vegetation will bind soil, reduce erosion risk, and improve habitat for both aquatic and terrestrial species. These natural processes work alongside engineering structures to strengthen long-term creek stability.



HOW IT WAS DESIGNED

Science-led design and planning

The rehabilitation approach was informed by detailed site investigation and contemporary best-practice methodologies.

This included:

- Drone-based LiDAR surveying to map terrain and erosion features.
- Soil sampling to assess structure, salinity, and subsoil conditions.
- Riparian vegetation assessments to guide species selection.
- Geomorphological and hydrological analysis of creek behaviour.

Designs were developed through collaboration between Verterra Ecological Engineering and Alluvium Consulting under the Landscape Restoration Partnership, supported by established waterway and streambank restoration guidelines. A Construction Environmental Management Plan (CEMP) guided delivery to ensure works were implemented safely, sustainably, and in line with environmental objectives.

On-ground works were carried out by Bennett Contracting and Plant Hire, Clermont.



Jangga Elder Colin McLennan stands beside a scar tree identified during cultural heritage surveys. The trees have been protected.

Cultural Heritage survey assessments

Before any on-ground works started, Cultural Heritage surveys were undertaken at each site to identify and protect areas of cultural and historical significance throughout the project.

There are laws in place to protect Aboriginal cultural heritage, which means we all have a responsibility to help preserve and protect it. During this project, artefacts found on site — such as grinding stones — were carefully removed for safekeeping during construction works and returned to their original locations once the works were completed.

The project sites are located on Jangga Country, with surveys carried out by Jangga Operations Pty Ltd to help prevent accidental harm to Aboriginal cultural heritage, ancestral remains, and historical sites, while ensuring compliance with heritage legislation.

The project received endorsement from the Bulganunna Aboriginal Corporation RNTBC, trustee for the native title rights and interests of the Jangga People, for Jangga Operations to undertake the survey work.

PROJECT SITES

Dooruna Station
SITE 4

At Sites 4 and 5, more than 150m of severely eroded streambank was reshaped from a steep 1:0.27 slope to a stable 1:3 profile. The banks were seeded with a native mix and fenced to exclude fauna, supporting revegetation and long-term stabilisation.



SITE 5



Talki Station
SITE 6

More than 181m of unstable streambank was reshaped to a stable 1:3 slope and revegetated to improve long-term bank stability. Overburden from the works was used to fill an adjacent gully threatening the rehabilitation area.

A rock chute was installed to manage overland flow into the reshaped gully, and fencing was installed to protect revegetation works during establishment.

Soil conditioning helped improve growing conditions, giving plants a better chance of establishing.



1 Before works, September 2025



2 During works, October 2025



3 During works, October 2025



4 After works, April 2026

Talki Station
SITE 7

More than 125m of eroded streambank was reshaped to a stable 1:3 slope to improve stability and reduce sediment loss. Lower and upper bank areas were seeded with a native seed mix, with fencing installed to protect revegetation works during establishment.

Revegetation works have re-established ground cover and initiated natural recovery processes across the site.



1 Before works, September 2025



2 During works, October 2025



3 During works, October 2025



4 After works, April 2026

Avon Downs Station
SITE 8

Site 8 represented one of the largest treatment areas, more than one kilometre of actively eroding streambank was reshaped to a stable 1:3 slope and revegetated to improve long-term stability.

The original 263m treatment area was extended after Sites 1, 2, 3 and 9 were deemed unsuitable for repair works. Rehabilitation priorities were identified using a Digital Elevation Model (DEM) of Difference (DoD), which measures changes in land elevation over time by comparing two topographic surveys to identify areas of erosion, deposition, and volumetric change.

Verterra compared 2023 LiDAR data with LiDAR captured in June 2025, supported by drone imagery and on-ground reconnaissance. Fencing was installed to protect revegetation works during establishment.





1 Before works, September 2025



2 During works, October 2025



3 During works, October 2025



4 After works, April 2026



1 Before works, September 2025



2 During works, October 2025



3 During works, October 2025



4 After works, April 2026



1 Before works, September 2025



2 During works, October 2025



3 During works, October 2025



4 After works, April 2026

MONITORING AND MAINTENANCE

A monitoring schedule was built into the project, supported through drone operations. Due to the size of the area, aerial monitoring provided an efficient way to track change.

Four rounds of drone flights were completed across the site, from August 2025 to April 2026, documenting how conditions evolved from the start through to completion.

The information gathered helped guide targeted maintenance requirements where needed, post the 2025–2026 wet season. A maintenance budget was incorporated into the project design.



PEOPLE ON THE PROJECT

Working together on Country and landscape recovery



Colin McLennan
Jangga Elder
Director Jangga Operations

Cultural heritage surveys were undertaken to identify and protect areas of significance and to ensure cultural values were respected throughout planning and delivery. Protecting these places means protecting our story and our connection to Country. We found grindstones, scar trees and stone artefacts, signs of people living closely with the water for thousands of years.



Dave Waterson
Sector Lead - Rehabilitation and Land Management,
Verterra Ecological Engineering

The key is working with the landscape, and every site is different. We reshaped and stabilised the banks, improved the soils and revegetated the area to rebuild the riparian zone. Healthy vegetation is the best defence against erosion, improving water quality, providing habitat, and enhancing productive grazing land at the same time. It's a win for the graziers and for the environment.



James Duddy
Grazier, Dooruna Station

On our property, the on-ground works achieved what it needed to, reducing erosion, protecting nearby infrastructure and cutting soil loss into the reef catchment, while allowing the area to return to productive grazing under best management practices. Streambank stability directly influences productivity and long-term land condition.



Angus Hogg
Project Manager, NQ Dry Tropics

The project aimed to remediate damaged sites while protecting vulnerable riparian habitat, including an endangered Brigalow stand being lost to severe creek erosion. It also delivered significant sediment savings, helping protect surrounding grazing land and downstream waterways feeding into the Burdekin Dam. It was also about building resilience into the landscape so it can better withstand future flood events.

WHAT'S BEEN ACHIEVED

The results so far

The Logan Creek rehabilitation works have delivered measurable environmental and land management benefits:

- Stabilised 13 erosion areas across five priority sites on three grazing properties.
- Restored about seven hectares of riparian vegetation.
- Improved more than 1.5km of creekline.
- Across all sites combined, the project achieved an estimated average annual reduction of 869 tonnes of fine sediment runoff.
- Strengthened habitat along the waterway.
- Protected productive grazing land and infrastructure.
- Improved resilience for future flood events.

By combining engineering with ecological restoration, the project has supported environmental recovery and long-term land use sustainability. Logan Creek forms part of the Burdekin River catchment, one of Queensland's most significant river systems.

Sediment from unstable streambanks does not stay confined to one area. It moves through connected waterways, impacting water quality, aquatic habitats and downstream ecosystems, including the Great Barrier Reef lagoon.

By addressing erosion at its source, the project has contributed to improved catchment health, reduced sediment loads and improved landscape resilience. The works demonstrate how targeted intervention at priority sites can deliver benefits well beyond the immediate area.



Before works began, surveys identified existing plants, wildlife habitat, and ecosystem values to guide rehabilitation. This ensured the right local native species were planted to safeguard important habitats.

LOGAN CREEK STREAMBANK REHABILITATION TRANSFORMATION



These photos show the transformation at Site 4 following rehabilitation works.



These photos show the transformation at Site 7 following rehabilitation works.



These photos show the transformation at Site 8 following rehabilitation works.

LOGAN CREEK STREAMBANK REHABILITATION



This project was delivered with assistance provided through the jointly funded Commonwealth-state Disaster Recovery Funding Arrangements (DRFA).

The works address damage associated with the Central, Southern and Western Queensland Rainfall and Flooding event (10 November – 3 December 2021).

NQ Dry Tropics was proud to partner with Verterra Ecological Engineering, Jangga Operations Pty Ltd and Bennett Contracting and Plant Hire.



Australian Government



Queensland Government