FITZROY BASIN ASSOCIATION

CASE STUDY

Junee — Mackenzie

Gully Erosion

High velocity flows erode the banks and threaten the concrete crossing where the main access road crosses Junee Creek.

The titles for Junee have been in the Luck family (Richard, Gaye, Matt, Jo and Nerida) for almost 100 years. The 25,000 hectare property, which has considerable river frontage, extends from the Junee tableland to the Mackenzie River.

The Luck's run a successful breeding and fattening operation, carrying upwards of 4,600 head of cattle. Their mob includes three single-sire Brahman Stud herds which they use to supply their commercial herd.

Junee covers diverse land and vegetation types, including eucalypts and bloodwood on loamy tablelands, lancewood and bendee rosewood on the tableland, box country in the valley and alluvial brigalow in the lower country. Blue gum and poplar box along Junee Creek are interspersed with sally wattle, yellow wood and emu apple.

EROSION IMPACTS AND CAUSES

Junee's significant erosion issues have had a considerable and expensive impact on the Luck's daily operations.

In addition to addressing erosion at their creek crossing, the Luck's have had to install a number of new watering points and relocate several existing fence lines in the lower reaches of their paddocks to account for increasing silt deposits in these areas.

Whilst the steep slopes of the Junee Tableland and area's fragile subsoil are considered natural factors contributing to erosion at both sites, historical imagery suggests that past tracks to the homestead may have exacerbated erosion processes in the area.

Over time, continued stock access has resulted in cattle padding in and around the edges of the gullies; leading to increased pugging and exposure of highly dispersive subsoils during wet periods.

FUNDING REMEDIATION FOR MULTIPLE BENEFITS

To help Matt and other landholders experiencing similar erosion issues in the Mackenzie sub-catchment, Fitzroy Basin Association Inc. (FBA) partnered with Capricornia Catchments Inc. to work with graziers. Together they have implemented a range of innovative gully repair works through funding provided by the Australian Government's Reef Trust.

In addition to helping graziers improve their land condition and overall productivity, on-ground works are specifically designed to reduce excess sediment and nutrients from gullies washing off property and into local creeks which eventually combine with rivers that discharge into the Great Barrier Reef Lagoon.

SITE DESCRIPTION

The Junee Tableland is on the watershed of the Mackenzie River and includes the upper 22km course of Junee Creek, where the elevation drops by 150 metres. The combination of land types and slope in the mid-section of Junee make it highly susceptible to erosion.

Junee's two main erosion areas consist of gully complexes adjacent to Junee Creek and occur at the break of slope in box country. Soils at both sites are void of top soil, exposing up to three meters of the highly sodic subsoils characteristic of box country.

This project was supported by Fitzroy Basin Association through funding from the Australian Government and delivered through Reef Trust, in collaboration with Capricornia Catchments.

Australian Government | REEF TRUST | FITZROY BASIN ASSOCIATION | Capricornia Catchments Inc.

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"…any positive results of the works we have undertaken can act as practical research for all landholders on this soil type."

SITE REMEDIATION WORKS

In total, 2.7 kilometres of fencing was installed around gullies at both sites (including a section of Junee Creek) to exclude stock and reduce ongoing soil disturbance. Resting this area will enable juvenile tree recruitment and an improvement in the recovery rate of groundcover.

To reduce the velocity of run-off before entering gully heads, and thus erosive potential, the family used a grader, loader and body truck to re-shape and top-dress an existing 160 metre diversion bank with perennial tussock grass which will enhance its structure and ensure long-term effectivity.

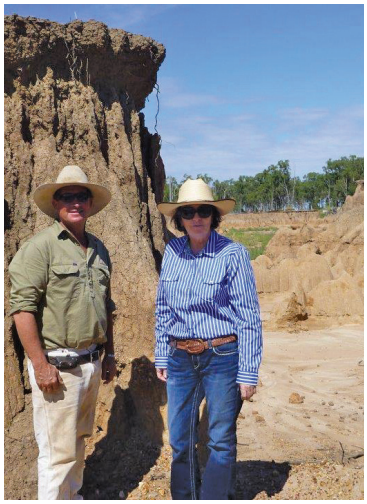
In addition, low rails and logs will be placed on the contours above the gully heads to further reduce the rate of overland flow. In addition to reducing run-off velocity, contour barriers also help capture sediment and seed, further promoting the growth of ground vegetation above gully heads.

POSITIVE IMPACTS FOR THE PROPERTY

Given the significant extent of erosion at Junee, the Luck's are aware it will likely take some time before they are able to notice significant improvements as a result of the works they have undertaken. Despite this, they remain positive that over time and with nature on their side, the works will reduce further soil loss by stabilising the gully floor, boost regeneration and stop the gully head advancing into their access road. They look forward to sharing the outcomes with others down the track.

POSITIVE IMPACTS FOR THE REEF

By working to reduce the amount of soil leaving their property, the Luck family are helping to improve water quality in their local creeks, the rivers they join as well as reducing sediment loads reaching the Great Barrier Reef Lagoon.



SITE 1 - BEFORE
This five hectare area contains two deep (mostly >2.5m in depth) gullies with steep, undercutting walls.

SITE 1 - AFTER REMEDIATION WORKS
Porous check dams (PCD's) constructed in the upper reaches of the two major gullies will aid sediment trapping on the gully floor to provide a more favourable environment for natural revegetation.

SITE 2 - BEFORE
Gully walls in this eight hectare area are similarly steep, although depths average approximately one metre.

ALTERNATIVE MATERIALS FOR PCDs
Square hay bales are used instead of the recommended sticks to fill the PCDs given the amount of packing required to fill long PCDs and as a more effective trap for particularly sodic soils.