



Case study: Lorrina

Project location: Braidwood, NSW
Country: Walbanga
Size: 102 ha
Participants: Andrew Bullock
& Justine Isemonger
Project updated: May 2023

This project aims to restore Lorrina's natural hydrological processes for improved environmental, aesthetic and production outcomes.

The vision for the property is to rehydrate and regenerate Lorrina for improved landscape function and beauty, and to regenerate the land for future generations.



Above: Rock weir (foreground) and log-sill weir (background) during the first flow-over event following construction. The rock weir provides backwater to the downstream side of the L4 structure.

Right: Construction of the rock weir and log-sill weir.



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Key project points

Construction works aim to address historic stream erosion and incision by raising the bed level of the stream by between 0.5-1m. This will slow the flow of water and encourage the spreading of flows across the landscape.

These works will improve the landscape's capacity to retain and store water, and in turn improve nutrient cycling, vegetation growth and landscape productivity.

The on-ground works will also support improved biodiversity, aesthetic and recreational outcomes.

The landholder is supplementing the works by fencing riparian areas and revegetating to support the site's long-term restoration.

Problem

- Lack of trees on the property has contributed to the decline of the small water cycle on the property and has decreased soil stability (making the property more vulnerable to erosion).
- Lack of fencing around flow lines and dams has allowed entry of stock and caused water fouling & erosion.
- Soils across the property have been damaged by a long history of over grazing, land clearing, cultivation and compaction.

Solution

- To ensure the property supports itself and to regenerate the land (leave it in better condition than it is currently).
- Restoration of riparian area and revegetation of paddocks to improve soil fertility and carbon capture.
- Increase water for stock by repairing and restoring Brushy Hill Creek and property's dams.
- Provide the basis for a landscape rehydration farm plan.

Above: Log-and-sill weir construction of top log weir.

Right: A series of rock weir structures along Brushy Hill Creek. Soon after completing the work the area received 50 mm of rain over two days. The pools filled up and a gentle flow began through the new rock riffles.

Services provided

Mulloon's Principal Landscape Planner Peter Hazell, Landscape Planner Jack Smart and Field Officer Max Brunswick recently completed construction of a suite of landscape rehydration infrastructure works at the property, including:



On-ground works

Site survey conducted and construction and earthworks supervised to ensure a quality project outcome. Landscape rehydration solutions included:

- **Fencing:** exclude stock from Brushy Hill Creek and tributaries to remediate damage caused by stock accessing creek line and protect newly vegetated area. Fencing redesign to increase the number of paddocks, centralise troughs (minimise piping & pumping costs) and reduce grazing pressure of set stocking
- **Earthbanks & contours:** the purpose of these is to slow water and discharge it out onto paddocks to reinstate overland flow patterns.
- **Water reticulation:** Solar pump to improve efficiency of pumping system from dam to header tank, make water supply for stock more reliable
- **Revegetation:** a mix of native trees, shrubs and grasses planted along riparian areas and paddock bounds to restore small water cycle, increase biodiversity, provide shade and bird habitats, provide wind shelter and improve aesthetic value of property.



In-stream structures

Stabilise eroded banks, redirect flow from unstable headcuts, provide road and stream crossings, provide a recreational pool and enhance the aesthetic value of the property.

- **Log-&-sill weirs:** to raise stream bed and water level along Brushy Hill Creek and in turn stabilise eroding banks while facilitating water capture into the landscape to extend pasture growth and support riparian vegetation
- **Rock weirs:** of a smaller scale than the log-and-sill weirs to manage the head drop between log-and-sill weir structures. These act as a series of riffles to slow water movement and create pools.
- **Rock groynes:** to diver flows away from an active headcut and back into the meander channel. This will greatly reduce flow velocity and consequently erosion.
- **Rock baffles:** to trap sediment and aid rehydration and restore a recharge zone
- **Access crossings:** two upgrades on existing crossings, two new crossings requiring improvement.





Top: Cattle previously had unrestricted access to Brushy Hill Creek which damaged riparian vegetation and contributed to erosion.

Above: Creek crossing before construction works.

Top: An active headcut along a tributary of Brushy Hill Creek as a result of erosion and high velocity flow.

Above: Upgraded creek crossing after restoration works.

Below: The Lorrina property on the NSW Southern Tablelands. The next stage of supplementary works will increase fencing and native vegetation on the property to protect flow lines from stock and increase biodiversity.



Video link

<https://youtu.be/9RQ1zwlmnDs>

