Recovering Eroded Land in SA's Pastoral Lands

WILLOW SPRINGS

OWNERS
Brendan, Carmel, Michelle and Christopher Reynolds

LOCATION
Central Flinders Ranges

PROPERTY TENURE
Pastoral Lease

ENTERPRISES
Sheep, Cattle and Tourism

The Reynolds family has owned Willow Springs since 1952. Brendan and Carmel took over management in 1985 and in 2018 passed the property's sheep, cattle and tourism enterprises to their children Christopher and Michelle.

Aerial view of structures in Red Plain paddock. Water flows from the bottom of the picture towards the top right. Streams from culverts are intercepted by a bank which holds water in a sump. Overflow from the sump is directed to one side of the bank then towards another bank below. Banks around gully-eroded land in the middle area divert water onto gentle slopes where flows can spread out and move slowly down towards the watercourse. Eroded areas have been battered and ripped with bulldozer tines to slow flows and increase infiltration.

Culverts in the road concentrate water into a narrow stream that races downslope, causing erosion.

In 2011, the Reynolds' joined an 'Ecosystem Management Understanding' (EMU™) project. They used satellite imagery to map the property's landforms and drainage; habitats; productive capacity; sites of cultural, social and historical importance; and areas of concern such as erosion and poor production. Areas for land rehabilitation works were identified and prioritised using the maps, observations from a low-level fly-over of the property and discussions with EMU project consultants and staff.

The 'Red Plain' paddock was chosen because it is one of the property's most productive paddocks and had the greatest potential for improvement. There was a significant area of bare land that shed water and had no productive value. Culverts in the road adjacent to the paddock were channelling runoff, accelerating its velocity and making it more erosive. It was considered that intercepting, diverting and spreading runoff would slow flows, improve infiltration of water into the soil and grow more plants.

Sumps in front of diversion banks have been ripped to hold water, slow it down and allow it to soak into the soil.

Overflow from the sump flows via a wide, level sill at the end of the bank (foreground).

Runoff is diverted away from gullying watercourses by diversion banks above and to the sides of the gullies.

The erosion has been battered off and ripped to encourage infiltration of water and regeneration of plants.

View of catchment looking from downstream towards the headwaters of the watercourses.

The road is in the mid-ground. The sparse ground cover reflects the drought conditions from 2017 to early 2019 when this photo was taken.

A number of structures were designed and constructed, and other works undertaken to slow runoff, divert it away from eroding areas, spread it over a wider area and enhance soakage of water into the soil.

Considerable ground work was undertaken by EMU™ staff to inspect the land, identify and peg the location of works. Levels were taken to ensure structures had appropriate falls for their purpose. Banks were designed with a two degree fall to ensure that water flowed in the desired direction. Spillways were built as flat channels to carry wide and shallow flows. The structures were built using a D8 bulldozer and a grader.

Debris traps have been made in watercourses in two places to help slow and spread flows in the watercourses. One was made using wire mesh to form a cylindrical barrier that trapped sticks and leaves while allowing water to pass through the barrier. It was pegged down with iron droppers to ensure it did not float on top of flows or be washed away. The other was made from old fencing material, positioned around a tree in a watercourse.

During the planning and installation of the works, the Reynolds' worked with project staff and learned how to take levels and techniques for spreading and slowing water flows in small areas. They can now use their own grader to divert and spread runoff from tracks and bare patches onto adjacent land where it can infiltrate the soil and promote plant growth rather than be lost from the land in fast-flowing streams. They are able to 'read' the landscape to identify areas where small structures can be used to prevent erosion occurring. However, they stress the importance of having good technical advice and the right contractors for major works to achieve the desired outcomes.

There have been no major run-off events since the earthworks' construction for the Reynolds' to witness the benefits of the works. However, they are very happy with and willing to show people what has been done. Information about the works is on display in their accommodation area and interpretive sign on Stokes Hill overlooking the 'Red Plain' paddock. They are looking forward to receiving good rains to reap the rewards of their work.

Debris traps constructed from mesh (above) and old fence material (below). Leaves and sticks have collected above the cylindrical barrier. Widening the breadth of the flow through the barrier has levelled out the watercourse downstream, which previously was a series of small ruts and channels.

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Written by Mary-Anne Young, Primary Industries and Regions SA, with the assistance of SA Arid Lands NRM Board staff. June 2019.

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