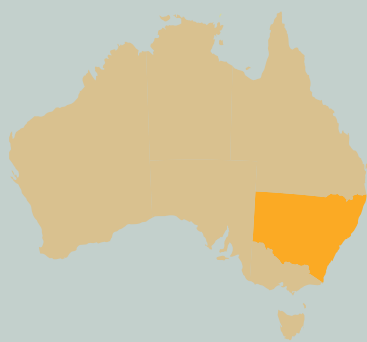


# INNOVATION PROFILE



## BUSINESS SNAPSHOT

### LEASE HOLDER

David Pollock and Frances Jones

### PROPERTY NAME

Wooleen Station

### PROPERTY LOCATION

700km north of Perth, 200km inland from the coast, WA

### SIZE OF PROPERTY

153,000 hectares

### BRIEF ENTERPRISE DESCRIPTION

Previously a sheep station which has been destocked for land revegetation. Main enterprises are now tourism with pastoral and environmental education programs, and opportunistic cattle trading.

### NUMBER OF PEOPLE WORKING IN THE BUSINESS

3 people working in the business (2 full time equivalents)

### AVERAGE ANNUAL RAINFALL

210mm

### WHY THIS IS A PASTORAL ZONE INNOVATION

Pastoral soils are fragile and can be easily eroded in heavy rainfall events. This innovation helps maintain the soil structure and conserve water to allow perennial plant growth.



## Erosion Control with Envirorolls

Wooleen Station has been run by second generation pastoralist, David Pollock and his partner Frances Jones for the past 6 years. The property is situated in Mulga shrub lands in the Murchison region of Western Australia. The Murchison and Roderick Rivers run through Wooleen Station, which includes 5,000 hectares of grassy flood plains. Water runs off the land into Wooleen Lake and the surrounding heritage listed wetlands.

Up until 2007, the property experienced land degradation after many years of overstocking. At this time there was widespread soil erosion and a general lack of vegetation and pasture diversity.

As a strategy to restore the landscape, David and Frances chose to destock the whole property in 2007. They have a long term view of rejuvenating the land to sustainable limits where livestock can be reintroduced into a more resilient landscape.

Given the impact of soil erosion, David and Frances have implemented some innovative management techniques. This innovation profile outlines the unique design of envirorolls and how they are used to control erosion at waterways on Wooleen Station.



Figure 1: An established enviroroll after being installed for 3 years.

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## WHAT WAS THE MOTIVATION TO CHANGE?

High volume rainfall events are common in the Murchison region, often causing waterways to overflow and water being wasted downstream. The accelerated water run-off had degraded the soil structure, reduced vegetation growth, and created deep gullies at Wooleen Station.

After destocking Wooleen Station, David and Frances began an Ecosystem Management Understanding™ (EMU™) project with Hugh Pringle to restore the landscape and recover its grazing potential. They identified erosion in natural water courses was a significant issue on the property and needed to be reduced.

The first enviroroll was trialed at Wooleen Station in 2005. After success in reducing erosion and slowing down water flow, David and Frances have since installed more than 20 envirorolls on the property.

## HOW DOES THE INNOVATION WORK?

The enviroroll is a roll of wire mesh placed across a waterway or drainage line. The wire mesh collects leaf litter and sediment and slows the water flow.

The innovation is initially constructed by rolling out a 60 metre length of septic tank mesh so it lies flat on the ground. One corner of the mesh is folded over to create a cylinder which is secured by wire. The rest of the mesh is then rolled and frequently secured with wire (see figure 2).

To make the roll a consistent size, David counts the squares in the wire mesh and secures the roll at the same number of squares each time.

The roll is approximately 1 metre high and should span across the width of the creek or waterway. Rolls can be joined together to make it longer. On flood plains, rolls can be made smaller to have a height (diameter) of 0.5 metres

Once the enviroroll is constructed, it is anchored between vegetation on a creek or waterway which holds it in place.

As the water flows through the enviroroll, leaf litter becomes trapped and sediments collect at the base of the mesh. The buildup in organic matter promotes plant growth within the roll and forms a line of vegetation across the waterway.

Once sufficient vegetation is established across the waterway, the rate of water flow is reduced and water can move laterally either side of the enviroroll during heavy rainfall events. This helps distribute water across the flood plains and naturally controls erosion.

“The whole idea is to slow the water flow in the drainage lines so it spills over the landscape and does not cut the already badly incised drainage system deeper. The base level of the landscape is already substantially lower than it should be after many decades of erosive forces from accelerating run off” said Greg Brennan, Rangelands Development Officer at DAFWA.



Figure 2: Constructing envirorolls at Wooleen Station.

## KEY FEATURES

The key features of this innovation which make it different to other erosion control methods are:

- The structure is a uniform, continuous line with no weak points in the roll.
- The enviroroll replicates natural vegetation in waterways and encourages further growth.
- It cannot be eaten by domestic or feral animals, as with a hay bale option.
- It slows down water but the impact does not reduce its effectiveness.
- If the roll kinks, it doesn't impact the effectiveness of the enviroroll.
- It is a better alternative to shade cloth which has high wear and tear, needs to be replaced regularly and often looks unattractive after a certain time.
- Promotes vegetation growth while reducing the grazing impact and accessibility of cattle and kangaroos as the plants germinate.

## WHAT ARE THE KEY BENEFITS?

The environmental benefits that have been observed at Wooleen Station from implementing envirorolls are as follows:

- Reduced erosion in waterways as the rate of water flow is slowed down. The envirorolls replicate a natural wetland system and allow the turbidity to settle.
- Reduced erosion of waterways also reduces the impact on vegetation and promotes vegetation growth. This in turn acts as a natural erosion control mechanism by holding the soil in place.
- Increased pasture growth on flood plains.
- Better management of water in high rainfall events, which account for approximately 50% of all rainfall events at Wooleen Station.
- Increase water quality throughout the whole system.





Figure 3: A waterway on Wooleen Station before an enviroroll was installed.

## KEY RESOURCES REQUIRED FOR THE INNOVATION

The following materials and resources are required to construct and install envirorolls:

- Septic tank mesh, 60m long and 1.4m high
- Fencing wire, to help secure the roll
- Labour, approximately 1-2 hours per enviroroll with 1 or 2 people

## POTENTIAL CAUTION AND RISK

David passes on the following words of caution when constructing and installing envirorolls.

- Choose a flat area to install the enviroroll, preferably not in a gully.
- Try to mould the enviroroll to go with the shape of the land and hug the creek line where possible.
- A large wide open space is needed to construct and install the enviroroll, given the length of the wire and the bend that occurs with rolling.
- It is much easier to make the enviroroll where it will lie. If not possible, they can be constructed elsewhere, cut and rejoined on site.

## WHAT COULD BE DONE DIFFERENTLY NEXT TIME?

By implementing this innovation, David and Frances have learnt how achieve the best results. Next time they implement envirorolls they will:

- Carefully pick a location to install them which will have suitable vegetation to secure it in place and maximum impact.
- Not place them too close to plants that they want to nurture, as there is sometimes a level of immediate disturbance and turbulence that can uproot less established trees.
- Avoid placing them in areas where water will sit for long periods of time as they will rust prematurely.
- Avoid placing them where they could roll away or shift out of place. For example, a sandy creek line with water.

“Everybody said they’d wash away, so originally we put starposts every metre or so. But now I don’t put any starposts, I just put it somewhere it will wash up against a tree or bush. I had one in the Murchison and I was there watching it while it had, in places, 2 metres of water over it, and I thought it was lost, because I hadn’t tied it down at all. But it only moved 30 centimetres on one end. They seem very disinclined to move at all, I don’t know why. They do shudder a lot, perhaps that’s the key” said David.

## LOOKING FORWARD

David and Frances intend to make more envirorolls for the waterways on the property. There is a strong environmental education angle with tourism and actions at Wooleen Station. They are now engaging school children, Scout teams and the Department of Environment and Conservation to help fund and make further envirorolls.

Figure 4: An established enviroroll trapping leaf litter and slowing the flow of water at Wooleen Station.



## COST BENEFIT ANALYSIS

The main costs of an enviroroll are the materials and labour. David says the materials have cost him approximately \$550 plus freight.

It is difficult to put a monetary figure on the observed benefits; however improvements to the environment will lead to increased productivity for future livestock enterprises at Wooleen Station.

## FURTHER RESOURCES

For more information on Wooleen Station or reducing erosion in waterways, see the following resources:

- Wooleen Station website [www.wooleen.com.au](http://www.wooleen.com.au)
- Australian Story 'Half a Million Acres', ABC TV <http://www.abc.net.au/austory/specials/halfmillionacres/default.htm>
- Rangelands NRM Western Australia [www.rangelandswa.com.au](http://www.rangelandswa.com.au)
- EMU™ [www.emuproject.org.au](http://www.emuproject.org.au)

## THE FINAL WORD

"The Roderick river flowed clear for the first time in living memory" said David.

Bestprac acknowledges the contribution of David Pollock and Frances Jones in the development of this innovation profile.

To view more innovation profiles, business cases and videos of innovations in the pastoral zone, visit the Bestprac website [www.bestprac.info](http://www.bestprac.info)