

Burke and Wills 150th Anniversary  
**Land and vegetation 150 years later**



**One of the aims of the Burke and Wills Expedition was to discover the unknown centre of the continent and to unlock its potential for pastoralists.**

Today's pastoralists know that to sustainably manage a grazing enterprise in the semi-arid rangeland requires active management, with quick action when seasons change. To be successful as a land manager in far-western NSW, you need to exercise ruthless decision making, have a keen eye for the more subtle changes in condition and the landscape and sometimes be blessed with a little luck.



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## Observations of the Western Catchment

While Burke has been widely criticised for his lack of records on the expedition, Wills did record the surprising variety of landscapes in his diaries. He described the vast contrasts the land offered, from “as good grazing country as one could wish to see” to “dusty clay flats so arid and barren...one might almost fancy himself on another planet” (Murgatroyd, 2002, p137).

Wills also recognised that a lack of water was going to have an impact on how much development could take place in this semi-desert part of the nation. While their expedition followed a wet period that created favourable conditions, he still considered the countryside too dry to be sustainable.

## Today

As we know it today, there is no argument that the far-west of New South Wales can be an inhospitable landscape. Much of the open woodland that Burke and Wills encountered has thickened and to thrive in the Western Catchment takes good planning and active management. Today’s land managers need to deal with many challenges, from the effects of imported grazing animals to feral animals, invasive native scrub, soil erosion and weed infestation.

## Managing total grazing pressure

The Western Catchment is mostly semi-arid rangeland. The climate is highly variable, properties are large in comparison to higher rainfall areas and the landscape can respond in seemingly unpredictable ways.

The condition of rangeland vegetation is often a result of heavy grazing pressure from feral and native herbivores as well as domestic stock. The control of total grazing pressure, especially goat impact, is a critical first step to improving groundcover and implementing sustainable management practices.

Total grazing management principles include the control of access to water, particularly where domestic, feral and native herbivores are highly mobile or difficult to muster. The skill of estimating pasture growth, in terms of how many stock it will carry and for how long, is also fundamental to managing Western Catchment rangelands, where land managers are now advised to graze only 30% by weight of key perennial pastures and should aim to maintain greater than 40% groundcover.

Responsible land managers also regularly rest pastures to improve their composition, so perennial pastures and other long-term groundcovers can set seed and replenish.



*These selectors at a shearing shed near Birrie Creek, in the Brewarrina area in 1890 did not have access to the information today's graziers have to help them manage effective stocking rates. (Courtesy of Bourke Historical Collection, Bourke Public Library)*

The Western Catchment Management Authority (CMA) supports property managers with strategies such as controlling total grazing pressure on their properties. Their efforts are partly in response to the environmental disturbance that occurred more than 100 years ago when overgrazing led to the extinction of many native plant and animal species, as well as the loss of soil that will never be replaced. In the eyes of some, over grazing, erosion and other factors have shifted this and other rangeland regions to a permanently less productive and less diverse state (Freudenberger, Hodgkinson, Noble, online).

## The Fergusons

About 250 km north-west of Bourke, Duncan and Chris Ferguson run 25,000 hectares of country at Myrnong Station, near Wanaaring. The Fergusons won the primary producer category of the 2009 Western Catchment Environmental Care Awards.

They are one of a number of landholders who have put in place total grazing pressure management strategies that have seen improved pasture growth and soil health, with a more pleasant environment for their family to enjoy, while also saving them money in the way they manage their property.

Training in grazing management techniques and holistic management has helped them shape the way they manage their property, including the economic and environmental outcomes they want to achieve. The management of their stock depends heavily on grazing charts, which they treat as their bible. During the dry years from 2001 to 2006 they made further changes to their management strategies as a result of the lessons they learnt when they destocked.

They saw the effects of regrowth of groundcover on their property and later decided to run goats rather than

sheep because of their browsing habits. With the support of the Western CMA, they have been able to fence the entire perimeter of the property, as well as install internal fences to control stock.

"I see the scrub we have here as nature's way of building soil to replace what's been blown away over the years," Chris wrote on her blog, *A Goat Catcher's Pilgrimage*.

"We don't have to look hard here to see it happening, it's all around us. So from a philosophical point of view, we're endeavouring to work within a natural system rather than against it."



*Duncan and Chris Ferguson*

## Introduced animals

The horses that Burke and Wills travelled with were among the first hooved animals brought into the Western Catchment. Unlike native animals, who have padded feet which many believe are better suited to the soil, animals with hooved feet can cause damage and soil erosion, while their appetite for vegetation has caused a reduction in some native animal populations due to competition for food.

Burke's enthusiasm for the landscape was often overstated for the benefit of his patrons and prompted farmers to set off with flocks of sheep in search of the finest sheep grazing country. Soon after the Expedition, the area also experienced two decades of greater than average rainfall, from 1865 to 1885. This gave pastoralists a false impression of the area's capacity. European settlers and their livestock soon entered the Catchment and stocking rates doubled between 1879 and 1882, peaking at 15.4 million in 1887 and 1891. Over stocking soon led to over grazing and, coupled with the spread of the European rabbit into the landscape, these factors caused long-term damage to the land.

As is the case in this Catchment of fluctuating seasons, these good seasons were followed by a severe drought period in the latter years of the 19th Century that saw

millions of sheep perish and both sheep and rabbits chewing the grass to bare soil and dust. Sheep numbers dropped to a low of four million by 1902.

Rabbits, kangaroos and goats have contributed significantly to the effective stocking rate and total grazing pressure on pastoral holdings in the Catchment over the past 150 years. Sheep numbers also fluctuated as the price of wool has peaked and dipped at various times.

When it became recognised that drought periods were a natural occurrence in the Western Catchment, stock carrying capacities were reduced. Since 1900, sheep numbers have averaged 7.1 million, which is in keeping with the Western Lands assessed carrying capacity of 7.2 million.

Today's land managers have access to all-weather roads, large transport trucks, even mustering by helicopter, which means they can more easily move or totally remove stock during dry periods to avoid long-term damage to the land. They also have access to better technology and modern communication techniques that allow them to manage their properties remotely and to access more reliable weather forecasting and climatic risk management information to help them plan ahead and cope with the natural variability of the seasons.

## Goats

Goats arrived in Australia with the First Fleet in 1788. Their small size, appetite for a wide range of plants and their ability to provide both meat and milk made them very convenient to carry compared to cows. Domestic goats either escaped or were released and soon established feral herds.

Conservative estimates suggest there are about 2.6 million feral goats in Australia today. While about 1.2 million are harvested annually, in semi-arid areas such as in the Western Catchment, goat densities can be as high as five goats per 100 ha.

At Naree, 160 km north-west of Bourke, Debbie and Paul Kaluder have seen a significant improvement in the condition of their land and the extent of native vegetation since they began effectively managing the feral goat population. With the support of the Western CMA, they fenced off 500 ha of scrub country in 2009 to create what is effectively a large goat paddock. There are three yards for trapping goats into the area, where they are held until there are enough goats to be trucked off the property. Goats trapped in two other trap yards nearby are also moved to the holding paddock.

Debbie Kaluder said the nature of the country made it difficult to trap goats, particularly during wet times. "This was land we couldn't ride through because of thick

invasive native scrub," she said. "It was an area the goats liked to retreat to. But the first thing we noticed after erecting the fencing was that the perennials and the native vegetation started returning. In the long term we could have a paddock with controlled stocking where we could see the invasive native scrub slowly dying in its own life cycle and the native vegetation growing back."

As sheep and cattle farmers, the Kaluders are constantly evaluating what groundcover they have and how much stock feed lies within the grasses in their paddocks. Unlike early settlers to the region, they understand the pressures on the land and constantly adjust their stock numbers to match their available pasture.

"If you can take your stock out of a paddock before the grasses get too low, when the rain comes, the country responds so much quicker. The land also hangs on for longer when it starts to get dry," Debbie said. "Farmers have traditionally been in this game to sell livestock but you have to change that thinking and look at what is in your paddock, not just the condition of your stock. This is a fragile ecosystem and if you tip the scales too far one way, one particular species is going to dominate."



*Debbie and Paul Kaluder at their goat yards on Naree*

## **Pest control**

### **Pest Animals**

Gaining control of pest animals such as goats and rabbits is crucial to implementing grazing management actions.

Actively controlling pest animals is an essential part of good land management in the Western Catchment. Unmanaged feral goats, pigs, foxes and rabbits can contribute to a significant run-down in the natural resource base then takes time to recover and regenerate from seed after a drought. The impacts are seen in a decline in pasture and livestock productivity, water quality and soil stability, as well as an increase in

contagious disease that can spread to domestic stock, native animals and even to humans.

Feral animals also cause native flora and fauna to decline, particularly when acting as competition for limited food sources for native species. Pigs, foxes and wild dogs also have an economic impact on agriculture through lost production, particularly with lambing losses, while foxes prey on many native animals including the endangered yellow-footed rock wallaby.

### **Pest weeds**

While weeds were not an issue for Burke and Wills, introduced weeds have become a major obstacle throughout the catchment over the years. But landholders, the CMA and organisations such as the Livestock Health and Pest Authority are working together to coordinate their efforts.

On the banks of the Darling River, north of Menindee, Graham Collins of Viewmont is one of 14 landholders who are working to control mesquite on their property. Mesquite is an aggressive, introduced weed and one of only five species in the Catchment to be identified as a "Weed of National Significance". He has killed thousands of plants on his property over the past 12 years. Now his actions mean he is no longer fighting plants up to 15 m tall, but concentrating on treating re-growth and small, isolated plants instead.

"Mesquite is not good to anyone," Mr Collins said. "It spreads very quickly and we have found it eight kilometres away from the Darling River where it started. The stock won't graze it where it's thick and the thorns drag on the wool. Every acre that isn't productive means you're losing money."

The CMA has been undertaking education campaigns to identify mesquite infestations, map the problem areas and provide funding for ongoing pest control. This is important as each seed pod can contain up to 20 seeds and the seeds can remain viable for decades.



*Graham Collins of Viewmont has killed thousands of mesquite plants*

## Invasive native scrub

In the time before Burke and Wills travelled through the Catchment, burning was a technique used by the area's Aboriginal inhabitants as a hunting technique, as well as to encourage regrowth of perennial grasses and healthy soils. Research has shown that traditional burning practices offered a useful, conservative model for living in and managing a highly fire-prone environment. These cooler, well managed burning techniques were not as devastating as the bushfires that occur today.

After the Expedition travelled through the Western Catchment, sheep were introduced in large numbers. They ate the native grasses, allowing the shrubs to outcompete native pastures leading to a landscape that is out of balance. Today's landholders are faced with how to manage invasive native scrub (INS), a serious issue affecting large areas of central and western NSW and rangelands elsewhere in the world.

Native plants in NSW (listed under the Native Vegetation Act 2003) that have either regenerated thickly following disturbance or encroached on vegetation communities where they didn't previously occur, are classed as INS. The encroaching and dense regeneration of native trees and shrubs impacts on farm production, communities and the environment.

Controlling INS is central to land management in the Western Catchment. Prevention and intervention are often needed to maintain a balanced mosaic of open pastures, woodlands and denser areas. Today's landholders use a combination of methods such as chaining, mechanical pushing, spot treatment and raking to manage invasive native scrub and restore native perennial pastures. However, the costs of time, fuel, labour and/or machinery make INS management an expensive exercise for land managers. CMA incentives and INS research programs are helping land managers achieve their INS objectives.

West of Bourke, the CMA supported Peter and Lee Johnstone at Conlea. The Johnstones received funding in 2007 to chain turpentine and hop bush in an effort to re-establish approximately 2,000 hectares of native perennial grass. The project has been successful to date, with good regeneration of native species, including woollybutt, mulka, bottle washers, wire grass, tall kerosene grass as well a mixture of native forbs.

The Johnstones have been able to manage grazing in an attempt to build up enough bio-mass to fuel a cool burn. In the same way that the Indigenous communities used a cool burn, they hope conditions will also reduce the number of INS seedlings regenerating and allow regrowth of the native perennial grasses.



*Fencing projects such as this one at Conlea have helped re-establish native perennial grasses*

As well as assisting land managers to undertake INS management on their properties, the Western CMA is supporting research and demonstration projects to learn more about this problem and ways to solve it.

Four demonstration sites have been established throughout the Western Catchment. They are farm-scale sites where pre-clearing vegetation conditions have been recorded and various strategies are trialled with continuing monitoring and information on their progress regularly shared with other landholders at field days and through publications.

The Western and Central West CMAs have managed a research project focused on the Cobar Penneplain region. It culminated in the publication of a best management practice guide called *Managing Invasive Native Scrub to Rehabilitate Native Pastures and Open Woodlands*. The program was coordinated by the two CMAs, in collaboration with the NSW Department of Environment, Climate Change and Water, a range of research organisations and the landholder community.

## Coogee Lake Station

Burke and Wills passed through Lachlan Gall's property Coogee Lake Station on their Expedition 150 years ago. At the time, their view was that the land had grazing possibilities, but Burke was so busy on his trek north that he did not truly appreciate what the countryside had to offer.

Coogee Lake is a significant ephemeral lake in the Catchment and refuge to a diverse range of birds and animals, including five threatened species, three migratory bird species and seven listed marine bird species. As it receives water on a semi-regular basis, it is an extremely important habitat for the thousands of waterbirds who use it for breeding and feeding, including threatened Freckled Ducks, Snipes and Egrets.

As a responsible landholder and a farmer who is happy to work in collaboration with the CMA, Lachlan Gall has received Government support for six projects in the past decade – ranging from fencing Coogee Lake and the floodplain to ripping rabbit warrens and installing watering points.

Lachlan Gall believes that, ignoring financial issues, the main challenge facing today's pastoralists is managing a sustainable grazing enterprise in a region with low and irregular rainfall. Mr Gall's observation is that today's graziers face three main problems that weren't an issue for early explorers: uncontrolled total grazing pressure, feral animals and both exotic and native weeds.

"The limiting factor to survival 150 years ago was lack of water, nowadays it is lack of pasture, which is a function of low and irregular rainfall," he said. "But there is one thing Burke and Wills had that we don't - plenty of manpower. Modern pastoralists manage to achieve so much with very little assistance. Large properties are usually run by a single family unit, and sometimes projects don't get started or take a long time to finish because there is a lack of labour."



*Coogee Lake is an ephemeral wetland which can be an important habitat for waterbirds and other species*

But Mr Gall stresses that skill is needed today in looking after the pasture – something that was not recognised by the early pastoralists who flocked to the area on Burke's

promise of "as good grazing country as one could wish to see" (Murgatroyd, 2002, p137).

"Managing a property and a business in such a tough environment is a gamble at the best of times," Lachlan Gall said. "When things are getting tight, quite often doing what is best for your business is not necessarily good for your land resource, and vice versa, and these opposing needs have to be reconciled by the manager. Landholders need to make the most of every opportunity presented by a rainfall event, because it might be the last rainfall event for quite some time, but they must also recognise when pastures need a rest, otherwise drought recovery will be very slow from a low base."

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