

From the paddock: Kangaroo management in western NSW



Kangaroo management is a critical part of building a healthy environment and sustainable communities across Western NSW. Hear about best practice, available tools and from farmers with first-hand experience in this issue.

About kangaroos in NSW

Kangaroos are central to the Western NSW story. They are one of our most iconic native animals and feature heavily across the landscape. However, balanced against this cultural status is the damage they can cause to the environment in unsustainable numbers.

Groundcover is key

In Western NSW maintaining groundcover is critical to preventing soil erosion and maintaining the diversity of annual and perennial species.

It is essential for landscape health, biodiversity and sustainable production.

To achieve this, land managers need to control grazing pressure from domestic stock and unmanaged herbivores like kangaroos.

Hence managing total grazing pressure (TGP) is simultaneously one of the biggest challenges and most significant tools land managers have to build drought resilience and improve the condition of the land.

Managing kangaroo grazing pressure

Kangaroos can easily swell to unsustainable populations and significantly add to the total grazing pressure of a region.

Previous management strategies relied heavily on ad-hoc harvesting to control kangaroo and goat populations

However land managers are increasingly looking to tools such as water point control, fencing and strategic management to better control grazing pressure from herbivores.

This resource focuses on how land managers are approaching this issue.

About the kangaroo predictive tool project

Understanding and planning for grazing pressure at the property or paddock scale is key to managing semi-arid rangelands in preparation for drought and long-term landscape and economic resilience.

To help landholders address this issue, Western Local Land Services is leading a project to develop a prototype tool to help understand local kangaroo populations and better manage them.

The project is aimed at helping landholders better understand the movement and density of kangaroos at the local scale, as population estimates are currently only available at the harvest zone level.

The key work in this project involves:

- contracting researchers from the NSW Department of Primary Industries to develop a proof-of-concept model for predicting kangaroo density and resource use by kangaroos at a property or paddock scale
- testing the predictions of the models on a minimum of five properties in the Western region of NSW
- developing a range of communication tools to share the results of this work.

The proof-of-concept model could be further developed into a tool that primary producers could use to predict the movement and local density of kangaroos (and potentially other generalist herbivores).

This project is supported by Local Land Services, through funding from the Australian Government's Future Drought Fund.

Working with the community

Western Land Services is working closely with the Western NSW community to make sure that the predictive tool is relevant to their land management needs.

Landholders are represented on the project's advisory group and we are working with the community to test the model's predictions on five Western NSW properties.

In this document the five project participants share their experiences of managing kangaroos and landscapes for drought resilience.

Find out more

If you are interested in finding out more please contact Fiona Garland, Team Leader — Kangaroo Management (fiona.garland@lls.nsw.gov.au or 0467 731 824) or visit the latest project update resources below.

Kangaroo management advice

www.lls.nsw.gov.au/help-and-advice/growing,-grazing-and-land/kangaroo-management

Kangaroo Management Taskforce website

www.kangaroomanagementtaskforce.com.au

Kangaroo management in NSW

www.environment.nsw.gov.au/Topics/Animals-and-plants/Wildlife-management/Kangaroo-management

www.lls.nsw.gov.au/kangaroos

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The impact of boom-bust kangaroo cycles

Leon Zanker lives 160 km north east of Wilcannia and has one big message.

“Kangaroos need to be managed — they are our national icon, but if we don’t control their numbers when we need to, we are affording them the biggest disservice,” Mr Zanker said.

Mr Zanker has witnessed four large kangaroo booms in the 40 years he has lived in Western NSW and the impact when the season dries up. Each cycle has been bigger than the one before.

“The single biggest issue is the cyclical die-off of millions of kangaroos when the country is in drought and can no longer support their numbers,” he said.

“Kangaroos boom in normal times and when drought hits, millions of animals die by lingering starvation.”

Farming in Western NSW

Mr Zanker has lived in Western NSW for over four decades, originally moving to the area as part of his family’s South Australian family farming partnership.

This dissolved around five years ago and now he operates the property as a single unit.

The farming enterprise is predominantly cattle on flood overflow country, with some dorper sheep and rangeland goats. This mix is the result of adapting to suit the markets, industries and seasons.

“Prior to the 2017-2020 drought we were a breeding operation, however the drought was so severe that we completely destocked, and now our operation is more a mix of breeding and trading stock.”

The impact of kangaroos

The Australian landscape has changed much since first contact, with the ecology and landscape now able to support much larger numbers of booming kangaroos.

“There is much more water in the landscape now and far fewer apex predators,” Mr Zanker said.

“Farmers are also much more conscious of retaining groundcover by agisting or reducing numbers much earlier.

“Combined this means kangaroo numbers can quickly grow to have a devastating impact on the land.”



Leon Zanker, Western NSW landholder



Image: Alain Louvel

Kangaroos are the biggest source of unmanaged grazing pressure on Mr Zanker's land.

"In 40 years we have seen four irruption cycles where they breed up in good seasons and then crash in drought," he said.

"Each was bigger than before, with the 2017-2020 drought seeing the highest peak in kangaroo numbers prior, and then the biggest crash as the country rapidly moved into drought."

Mr Zanker destocked his property relatively early while there was still groundcover, however ongoing excessive grazing pressure from kangaroos continued to have a dramatic effect on the landscape.

"It was sad, the country was like a moonscape from kangaroo pressure and then they died with much suffering.

"We were pushed into drought earlier due to kangaroos. Ideally we would control the population in line with our declining feed and water resources."

One of the goals of Western Local Land Services' kangaroo predictive tool project is to support more adaptive and effective kangaroo management in an effort to minimise landscape degradation and the extent of kangaroo starvation cycles.

The animal welfare costs

Kangaroo booms leading up to and into drought have an enormous animal welfare cost and can be confronting to people managing the land, as Leon explains.

"Farmers are conflicted when it comes to kangaroos; we don't own them yet have to look after them.

"We care for animals and are legally and morally responsible for the welfare of our livestock.

"However by default we are left to manage thousands of dying kangaroos when the cycle busts – we simply don't have the resources to manage this issue.

"The more we can understand the boom-bust cycles, the better we can avoid this suffering."

Mr Zanker is one of the landholders working with Western Local Land Services on the predictive tool project looking at modelling and weather forecasts to act preemptively to manage populations leading into drought.

"The work on the kangaroo predictive tool will support a more balanced approach to managing total grazing pressure; to manage for the future, not the past."

Management in drought

In rangeland environments, Mr Zanker sees drought as nature's way of spelling this country.

"We don't fertilise the soil in the wider rangelands country, however grasses and decomposition can do this.

"Ideally we would keep some groundcover moving into drought cycles to let the country rest and support this dynamic.

"Overgrazing means there is no vegetation to break down and improve soil biology, and it then takes a lot longer to recover."



Image: Lachie Gall

Kangaroos can also make management harder in drought. During the last drought there was much work in removing kangaroos stuck in the boggy ground tanks.

Mr Zanker would still do regular water runs, but as he'd completely removed his domestic stock, the job was now pulling dying kangaroos from ground tanks so they wouldn't contaminate the water when it eventually rains.

"There was no joy in the task at all; pulling out dying kangaroos to remove and shoot them was gutwrenching."

Coming out of drought and current state of play

During the 2017-2020 drought, Mr Zanker estimates that the kangaroo population on his property was reduced by up to 80 per cent, mostly through starvation.

While 2020 and 2021 were good years, the population was coming off a very low base and numbers, so has not yet seen a spike in growth.

"Things are in balance now, but my gut feeling is that numbers will begin approaching unsustainable numbers in around 12 months and we will need to bring in a commercial shooter.

"Right now there is no need — there is a good balance in my country now."

Key points

- **More water, fewer apex predators and the desire to retain more groundcover create ideal conditions for kangaroo numbers to boom in good seasons.**
- **Kangaroo welfare issues are significant when drought hits.**
- **We need to manage more proactively and adaptively to avoid these extreme booms and busts in kangaroo population cycles.**
- **Leon believes in working with commercial kangaroo harvesters to manage kangaroo numbers when necessary. Using trained, professional harvesters ensures the highest humaneness and that these animals are utilised rather than wasted.**

A two speed environment

Fowlers Gap Research Director, Keith Leggett, has a unique perspective on managing country in a rangeland environment.

Having previously worked in Zimbabwe, Botswana and Namibia, his African experience gives him a framework to compare and contrast the landscapes.

“I initially left Australia for an Africa research job for two years, which eventually became two decades,” Dr Leggett said.

“When I returned, Western NSW was an appealing location as I still wanted to live and work in an arid environment.

“Fowlers Gap is almost identical to the landscape around Namibia, with ephemeral rivers, similar rainfall and vegetation mix.

“The only difference is we have eucalypts in NSW, and no large mammals of the African landscape.

“But there is still the same competition for limited resources when the season dries off.”

The history of Fowlers Gap

The 39,000 hectare Fowlers Gap Research Station can be found 112 km north of Broken Hill.

Its history as a research and education facility traces back to the late 1930s when the newly established Soil Conservation Service identified the land as a site for field studies on vegetation regeneration and soil stabilisation.

Its ownership and focus has shifted over the subsequent decades, and is now leased in perpetuity from Crown Lands by the University of NSW (UNSW) with a mandate for education, research, training and, until recently, pastoralism.

The property has been traditionally managed as a grazing enterprise, usually running around 4,000 sheep. In 2022, it was destocked completely and is now managed fully for conservation.

The two speed rangeland environment

Dr Leggett sees the rangeland environment as working in one of two phases – rainfall and aridity.

“When seasons are good, there is little competition for feed and water,” he said.

“However when the country is drying out there is conflict for resources.

“The 2017-20 drought was one of the largest we’ve seen and the impact was huge.

“Around 90 per cent of kangaroos on the property died during this time and there was a lot of landscape degradation from grazing from kangaroos, goats and sheep.”

Even as the storms returned, the kangaroo’s mobility and resilience meant that any emerging growth was quickly removed.

“We saw a 40 mm storm on one corner of the property towards the end of the drought, which attracted all of the kangaroos in the area desperate for feed.

“All up, this was around 16,000 kangaroos.

“They wiped out the vegetation and nothing seeded, so the land had all the vegetation stripped in a very short period of time, from which it did not recover.”



Returning to balance

When the drought broke in early 2020, there was substantial rain and growth but nothing to eat it.

“We had destocked and the local kangaroo population had virtually died out so the country was in a position to recover,” Mr Leggett said.

“We did see a lot of big migratory red kangaroos move in, but they moved on after six weeks or so to follow the green pick south as we had begun to dry out again.”

Kangaroo numbers are building back up again, with around 4,000 animals on the property now.

“Kangaroos can double every two to three years depending on the availability of grazing; they are very good at reproducing,” Mr Leggett said.

The need for management

Kangaroo population growth is an environmental issue that needs to be addressed, said Mr Leggett.

“There are around eight times fewer kangaroos in Queensland due to the effect of wild dog predation,” Mr Leggett said.

“NSW doesn’t have this pressure, and access to water is no longer a limiting factor, so as long as there is something to eat they will continue to grow in number.

“Some form of selective management is essential.

“The Kangaroo Predictive Tool which is currently being developed by Western Local Land Services and NSW Department of Primary Industries will be a very good assessment process to guide management.”

Key points

- **Access to water and limited wild dog predation mean that kangaroo numbers can continue to increase to unsustainable levels during the good seasons and decrease slowly during dry times.**
- **Kangaroos can double in population every two to three years, depending on favourable environmental conditions – they are very mobile and have a very high reproductive rate.**
- **Their mobile nature can slow the vegetation recovery after drought, through migrating to areas with rainfall and emerging vegetation.**



Custodians of a brittle environment

Graham Turner lives between Broken Hill and White Cliffs and wouldn't want to be anywhere else in the world.

"I grew up here and love the thrill of working in an ever changing environment — I've lived and worked away but ended up circling back," Mr Turner said.

"You love it, but it can be hard in some years.

"At the end of the day though it's quiet and the sunset is always beautiful."

Kangaroos and the Turner farming enterprise

The Turners run a rangeland grazing enterprise, running a combination of wool merinos, dorpers and harvesting rangeland goats.

Kangaroos have a huge impact on their land, particularly in dry times.

"When things dry off, kangaroos have a big impact on groundcover and our water resources," he said.

"I still want them as part of our property, but they need to be maintained at a more stable level.

"I see them the same as livestock; unsustainable numbers will always lead to bad animal welfare and environmental outcomes.

"We are custodians of a fairly brittle environment, so the damage they can cause is immense."

Unsustainable kangaroo booms and the experience of drought

A number of factors have led to periods of booming unsustainable kangaroo numbers.

"Historically water was a limiting factor to keep the population sustainable and prevent environmental degradation; their numbers simply would have been kept in check by scarce water availability," Mr Turner said.

"Water is virtually permanent in the landscape now, so the only check on their population growth is vegetation. Their numbers will keep growing and grazing until it is gone, hurting our native grasses and shrubs as well as our pastoral operation.

"There are also no higher level predators now to reduce their numbers."

Positive seasonal conditions leading up to 2016 meant a disaster when drought started to creep into Western NSW.

"The kangaroo populations advanced the drought six to 12 months."



Western NSW graziers Abby and Graham Turner.



Kangaroo management

The Turners use a number of management tools to control unsustainable kangaroo populations.

“Our kangaroo management is a little limited with the tools at hand,” Mr Turner said.

“We’ve excluded water points, but have found they can still travel huge distances to chase groundcover and green pick.

“During the drought we also used shoot and let lie culling permits in an attempt to avoid the worst environmental and welfare outcomes, but the effect was minuscule compared to natural wastage.”

Graham’s preferred control method is to utilise commercial harvesters to ensure the highest humaneness in the process and so as to not waste this resource.

“Shoot and let lie is a huge waste of the meat and leather. It’s a very palatable meat and the leather is terrific.

“Unfortunately harvesting alone wasn’t enough to prevent the boom leading into drought in 2016.”

Key points

- **Kangaroos need to be managed.**
- **There is no silver bullet and many facets and environmental factors need to be considered. Pick the tools that suit your land.**
- **There is huge potential to use technology to support harvesting, such as thermal imaging cameras.**
- **The resource being produced in Western Local Land Services’ kangaroo predictive tool project could be a game changer for landholders wanting to know where, and how many, kangaroos are grazing on their properties.**
- **A healthy kangaroo industry and market forces will support on ground management.**

Kangaroo management - Issues of overpopulation

Nick Hilder lives 130 km east of Broken Hill; his family moved to the region in the late 1990s having previously farmed in South Australia.

The country varies over the property, from scrub to open areas with Mitchell grass and clover, to the north of the property there are hills with a number of watercourses.

“I was born and bred into this lifestyle and wouldn’t swap it for anything,” Mr Hilder said.

The Hilders stock the country conservatively to help protect the land and its native vegetation.

“Our farming enterprise runs merino sheep and hereford cattle,” he said.

“We like to see the country looked after as much as possible – an overpopulation of any species is a problem.”

The kangaroo issue

The mobile nature of kangaroos can pose problems for the landscape and the Hilder’s family farming operation.

“It’s disappointing when we lightly stock a paddock, and then hundreds of kangaroos move in after a thunderstorm,” Mr Hilder said.

“They will move in literally overnight and travel from an 80 km radius to eat out a paddock, and all of a sudden you are on the back foot with your grazing management.”

This means that paddocks that get storms don’t always get the chance to recover their groundcover.

“Their mobility has a massive effect on the landscape; they can concentrate and disperse easily.

“With large populations in the wider region and plain wire fencing, their local numbers can boom on our property in the blink of an eye.

“Our property boundaries a 150,000 acre national park to the south which makes controlling the area’s kangaroo number to a consistent level very hard.”

Kangaroo management

The Hilders work with two commercial harvesters to help control numbers on their property, but this has had a limited impact on kangaroos.

“Commercial shooters can only do so much and their impact on broader kangaroo numbers is minimal in a boom,” Mr Hilder said.

“The other side of this is that it is becoming increasingly hard to find full-time shooters.

“The fluctuating commercial kangaroo market and pricing over recent years have meant shooters have had to get second jobs and are not necessarily able to work consistently.

“There are a limited number of full-time professional shooters and they are in demand. Ideally you’d have them on your property four or five nights a week when kangaroo numbers are high.”



Nick and Jakira Hilder, with sons Fred and Darcy.



Nick believes a developed and stable commercial kangaroo industry and market would support effective management.

Professional harvesters are skilled in their trade and regularly undergo testing for accuracy and species recognition. They also need to remain current in all aspects of compliance and food handling safety.

“Commercial harvesting can be a useful tool in managing the population, but it needs to be able to support a good number of professional shooters who can mobilise and work when they are needed.

“There is great value in having a good relationship with a professional kangaroo shooter and working together to make it worth their while.

“They need to be able to find and harvest enough animals for their business, so work with them to help achieve this.”

Key points

- **Kangaroos will travel large distances to find feed after thunderstorms.**
- **Commercial shooting is a useful tool, however is limited by the availability of full-time professional kangaroo shooters.**
- **Work with commercial shooters to identify and control kangaroo numbers when needed.**

Managing total grazing pressure

Sam Le Lievre has lived on Deerina Station, Louth for 50 years, representing four generations of Western NSW farmers in his family.

His son Hugh (10) and daughter Sophie (8) are the latest in this line.

For the last few years Sam has been managing the enterprise as a cell grazing operation, managing total grazing pressure to improve the country's groundcover and natural resource base.

Cell grazing in a rangeland environment

Sam runs predominantly wool merinos and cattle. He is also breeding rangeland goats 'behind the wire', meaning they are managed as livestock in his rotational grazing system, contrasted to a less strategic goat harvesting approach.

"We've been working the property as a cell grazing operation for a couple of years now, regularly moving the animals between paddocks that are two to three-thousand acres," Mr Le Lievre said.

"In previous years I spent a lot of time transporting goats, so got to visit other properties and see how set stocking could impact the land.

"Goats can damage groundcover in set stocking.

"The property is fairly fragile and scrubby, so we were keen to use rotational grazing as a tool to repair the land and manage the scrub.

"The land is responding well, with much stronger groundcover."

The property uses goat-resistant 1.1m fencing to manage grazing, which Mr Le Lievre estimates also keeps out 95 per cent of kangaroos and allows him to manage total grazing pressure on the property.

"I had kangaroo grazing pressure in mind when setting up the infrastructure, but didn't know how effective it would be," he said.

"It has certainly reduced their numbers and means we can now effectively rest areas from grazing pressure and let them recover."

The impact of kangaroos

The biggest impact of uncontrolled kangaroo grazing pressure on Deerina Station was that the country couldn't be successfully rested – a key principle of cell grazing management.

"The whole system is based on an impact and rest dynamic to improve groundcover," Mr Le Lievre said.

"Fortunately the fencing infrastructure on the property has reduced kangaroos significantly to a more manageable level.

"I don't mind a few kangaroos and certainly don't want to see the countryside without them, but they need to be controlled and not en masse."

Controlling grazing and recovering from drought

"Farmers aren't presently equipped with many tools to control kangaroos," Mr Le Lievre said.

"We use goat-proof fencing, which has been effective, and am lucky to have a local kangaroo shooter to use when numbers build up."



Sam Le Lievre - representing four generations of Western NSW farmers.

The country is recovering well following the drought and managing total grazing pressure.

“It is terrific to see the country recover – with not that many mouths to feed, the land can recover and there is much better coverage of perennials and herbage.

“Rotational grazing, in turn, has allowed it to go to seed and establish.

“Native saltbushes and uncommon native grasses are returning, and the country doesn’t dry out as quickly.

“During the drought, we also had a large amount of sand deposited on the property, covering scalded areas and leading to groundcover when the rain came.”

The welfare issue

Mr Le Lievre also sees better kangaroo management as a way of avoiding unnecessary suffering when seasons dry off or drought sets in.

“They have no pressure from wild dogs, so Mother Nature is often the default control when their numbers get too high for the landscapes to support.”

The results can be thousands of kangaroos starving in dry times.

“As a farmer it breaks your heart to see animals suffer, whether they’re your stock or kangaroos – no one wants to see that.

“It’s not just about stopping them eating grass and degrading landscapes; it’s about avoiding the lingering starvation of thousands of animals.

“Kangaroo management is just trying to avoid that.”

Key points

- **Controlling total grazing pressure can improve groundcover, species composition and the natural resource base in rangeland environments.**
- **Goat proof fencing will also control kangaroo grazing pressure.**
- **Effective kangaroo management could help limit kangaroo welfare issues in drought.**



Image: Peter Elfes