



The Kelly Family at Rugby Station

Restoring natural assets and protecting perennial pasture for long term profitability

Part of a wider research project investigating the benefits of regenerative agriculture.

May 2024



Acknowledgements

This case study explores the holistic benefits of a regenerative approach to farming. It is one of six case studies prepared as part of a wider research project investigating the benefits of regenerative agriculture.

Soils for Life's contribution to the project is the development of case studies, which provide insights drawn from a diverse mix of Australian farmers.

Soils for Life gratefully acknowledges the generous contributions of the Kelly family.

About Soils for Life

Soils for Life is an independent, not-for-profit organisation that works across Australia to support Australian farmers in regenerating soil and landscapes, to build natural and social capital, and transform food and fibre systems.

Front image: Belinda Kelly at Rugby Station.
Image source: Courtesy of the Kelly family.

For further information
info@soilsforlife.org.au
www.soilsforlife.org.au

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Published by Soils for Life
Canberra, ACT, May 2024
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About the Case Study Series

This case study series explores the holistic benefits of a regenerative approach to farming. This case study is one of six that are part of a wider research project investigating the benefits of regenerative agriculture.

It is important to ensure that farmers' perspectives are heard, valued and used to inform research findings and outputs. And so, these case studies have been developed by interviewing each farmer to understand their perspectives, their context and their approaches to new practices. This was done in order to understand their views on the benefits of a regenerative approach to farming.

These case study farmers were selected following an expression-of-interest process calling for farmers who self-identify as 'regenerative.' The project did not include any new on-ground testing or analysis of existing monitoring data by Soils for Life.

Farm Facts

Location

Bordering Wiradjuri, Gundungurra and Dharug Country | Rugby, NSW

Climate

Warm summer, cold winter

Average Annual Rainfall

724 mm (recent, 1993-2022)

Agro-ecological Region

Temperate cool-season wet

Property Size

3,000 ha

Elevation

574 m

Social Structure

Family owned and operated

Enterprises

Mixed farming enterprise with prime beef and wool production, some first cross lambs

Landscape

There are two primary landscapes: a granite landscape of hills, rises and valleys with rock outcrops, and a less fertile, sedimentary landscape of sandstones, shales, and slates. Clearing and fires have left only scattered trees, including box species and kurrajongs, and a few of the original grasses.

Soils

Red and yellow texture-contrast, acidic ([Kurosols](#)), neutral ([Chromosols](#)), and sodic ([Sodosols](#)) soils occur on the slopes and lower in the landscape with shallow, stony soils on the crests and deep sands in the drainage lines ([Tenosols](#) or [Rudosols](#)). Red and yellow sandy earths ([Kandosols](#)) occur in the sedimentary landscape.^{1,2}

¹ [The Australian Soil Classification](#) (Isbell and NCST, 2021).

² Soil Landscapes of the Goulburn 1:250 000 Sheet (Hird, 1991).

The Highlights

Practices and strategies

- Long term engagement with a private agronomy consultant
- Electromagnetic mapping to understand salinity
- Annual or biannual phosphorus application to establish and maintain perennial grass species
- Active protection of humus through grazing management
- Development and implementation of successive biodiversity and revegetation plans for three decades
- Building biodiversity and protecting natural assets through revegetation, nature corridors, tree lanes and tree guards across the property
- Enhanced water infrastructure and soil erosion mitigation to enable a “clear water” principle across the property
- Strict animal welfare standards

Observed benefits³

- Creation and preservation of top layer of soil
- Increased biodiversity across the farm
- Capacity to pass the farm onto next generation in an organised way
- Water retention and clear water flows
- Holistic benefits of revegetation and building biodiversity
- High productivity and animal health
- A profitable family business now and into the future
- Financial benefits of supply chain management
- Achieving enhanced biodiversity and carbon sequestration

Monitoring progress

- Keeping meticulous records of pasture improvements
- Responsible Wool Standards monitoring and reporting
- Population monitoring of plants, animals, birds, reptiles and insects
- Monitoring successive biodiversity and revegetation projects across the property.

³ These benefits are based on farmers' observations, except where noted otherwise. No additional testing or analysis has been undertaken for this case study.

Landscape and Soils

Rugby Station is located two km north of Rugby Village and 150 km north of Canberra in the Southern Tablelands region of New South Wales. The region typically experiences hot summers and mild to cold winters, with no distinct wet or dry season. Five Mile Creek runs along the south boundary of the property, eventually reaching the Lachlan River to the west.

The soils have either formed on granite or sedimentary geologies or on materials derived from these. Red texture-contrast (abrupt increase in clay), acidic soils (Kurosols) have formed in situ higher in the landscape, and yellow acidic (Kurosols), and neutral versions of these soils (Chromosols) occur on the mid and lower slopes. Similar soils occur in the sedimentary landscape, with the inclusion of sandy, texture-contrast, sodic soils (Sodosols) and red and yellow sandy earths characterised by a gradual increase in clay down the soil profile (Kandosols) lower in the landscape. Shallow, stony soils on the crests and ridges and deep, quartz-rich sands in the drainage lines (Tenosols or Rudosols) occur in both the granite and sedimentary landscapes.

Vegetation is mostly dry sclerophyll forest of eucalypt species, including yellow box (*Eucalyptus melliodora*), white box (*E. albens*), Blakely's red gum (*E. blakelyi*), with some red box (*E. polyanthemos*) and red stringybark (*E. macrorhyncha*). Kurrajongs (*Brachychiton populneus*) are also present. Due to extensive historic clearing for agriculture, only scattered trees remain in many areas and the once common species of spear and kangaroo grasses (*Austrostipa* spp. and *Themeda triandra*) are now wholly or partly replaced by wallaby grass (*Rytidosperma* spp.) and microlaena (*Microlaena stipoides*). The property now has 50% native and 50% introduced pasture species.



Image 1. Shallow, stony soils are found on the tops of ridges and hills in this farming region. Source: the Kelly family.

Meet the Kellys

For the last 35 years, Michael and Belinda Kelly have operated Rugby Station, a profitable farming business on 3,000 ha in south-west NSW. The Kellys have run sheep and cattle in the region for six generations and they are determined to leave their land in good condition for the generations to come. Their dedication to caring for the land is reflected in Belinda Kelly's title as Biodiversity and Sustainability Manager at Rugby Station. In her role, Belinda is carrying on the work of protecting natural assets and revegetating the landscape.

In 1989, Michael and Belinda began working with a private agronomist, Mark Lucas, which they credit as one of their 'most important decisions.' Mark continues to visit the farm four times a year for full property inspections and to offer ongoing professional advice. In the early days, the property and surrounding region had a 'rising salt level problem,' and the farm was 'full of weeds and not growing anything very nutritious' for livestock - mainly couch grass. The decisions that Belinda and Michael made in the early years have shaped their positive trajectory. An electromagnetic map of the property was made to help them better understand the drivers of salt scalding. From this they decided to focus on increasing fertility in their soils, introducing perennial pastures and improving biodiversity across the landscape.

Michael and Belinda's two children, Alex and Georgie, are now adults. In 2016, Georgie returned to Rugby Station, and was later joined by her fiancé, Adam, to begin to take on the 'challenges and joys of the whole operation.' Together, the Kellys have aimed their attention towards mitigating the impacts of climate change through their farming practices in recent years. They believe that with their meticulous approach to growing perennial pastures and their efforts to enhance biodiversity in their soils, flora, and fauna, they are doing what they can to withstand the effects of more adverse and extreme weather.



Image 2. A sunset at Rugby Station. Source: the Kelly family.

Practices and Strategies

Establishing perennial pastures

Rugby Station has expanded considerably over the past three decades as the Kellys have acquired adjoining land. With the support of Mark Lucas, they developed a method for putting in perennial pastures 'productively and successfully' and have applied the same method dozens of times. Their approach to establishing perennial pastures across their country involves a painstaking, measured process, 'putting in pastures slowly, one paddock at a time.' Their landscape is 'very rocky and steep,' made up of 50% granite and 50% slate, with 'very light soil.'

'We chose the worst paddocks first ... paddocks where the salt was causing a major problem and we pastured them. It takes about three years. You've got to get the country so that there's a seed-to-soil surface contact area.'

Belinda Kelly

The Kellys always ensure they have good enough fences to keep livestock out while establishing pastures because they are 'terribly fragile when first put in.' New pasture needs at least 12 months to mature, but 'you can put a light graze over it after about three months.' The pasture mix depends upon the soil type and fertility that it is being sown into. Another factor is the pasture mix the Kellys are aiming to achieve in relation to the rest of the property.

Because the country is very rocky and steep, there is an 'enormous body of native grass species still left in place,' with an approximate mix of '50% introduced and 50% native.' With her commitment to building biodiversity, Belinda is aware of the value of native grass species and sub-canopy and canopy layer plants and the importance of having food sources for the broader food web beyond their livestock.

Application of inputs to establish perennial grass species

The Kellys have a 100% ground cover policy and over many years have seen a 'massive increase in topsoil as a result of their approach to management.' Rugby Station is located in the lower inland slopes of the Great Dividing Range in a region that is very low in naturally occurring phosphorus. According to Belinda, 'our ability to meet the needs of the growing grasses requires phosphorus and we don't have it in our soils. Naturally it's not there, it is not stored.' Phosphorus is commonly cited as one of the most limiting nutrients to pasture production in NSW, and from their earliest consultation with Mark Lucas, the Kellys were advised to pursue an approach involving 'an application of single super' as fertiliser to assist in establishing new pasture. According to Belinda, 'superphosphate does not actually grow grass, but it drives the growth of clover, which brings nitrogen into the soil and encourages the growth of perennial grass species, such

as microlaena.' Microlaena (*M. stipoides*) is a tufted perennial grass that produces year round green growth and is a quality feed highly digestible for livestock. Belinda feels that this has 'been one of our most significant practices across all of our property.'

The Kellys believe that annual or biannual applications of phosphorus are essential in their farming context and they 'don't regard superphosphate as a chemical,' although they recognise that other people do. Additionally, their process of establishing perennial pasture also involves a 'minimal application' of glyphosate early on to 'enable the grasses that are there to get a knock back so that there is a seed-to-soil surface contact area for our new seed, which is always a very fine seed.' Belinda states, 'we only ever use one round of roundup before we put in a perennial pasture and then we don't do anything else.' Once the perennial pasture is established, they have 'no need to treat their pastures with other chemicals.'

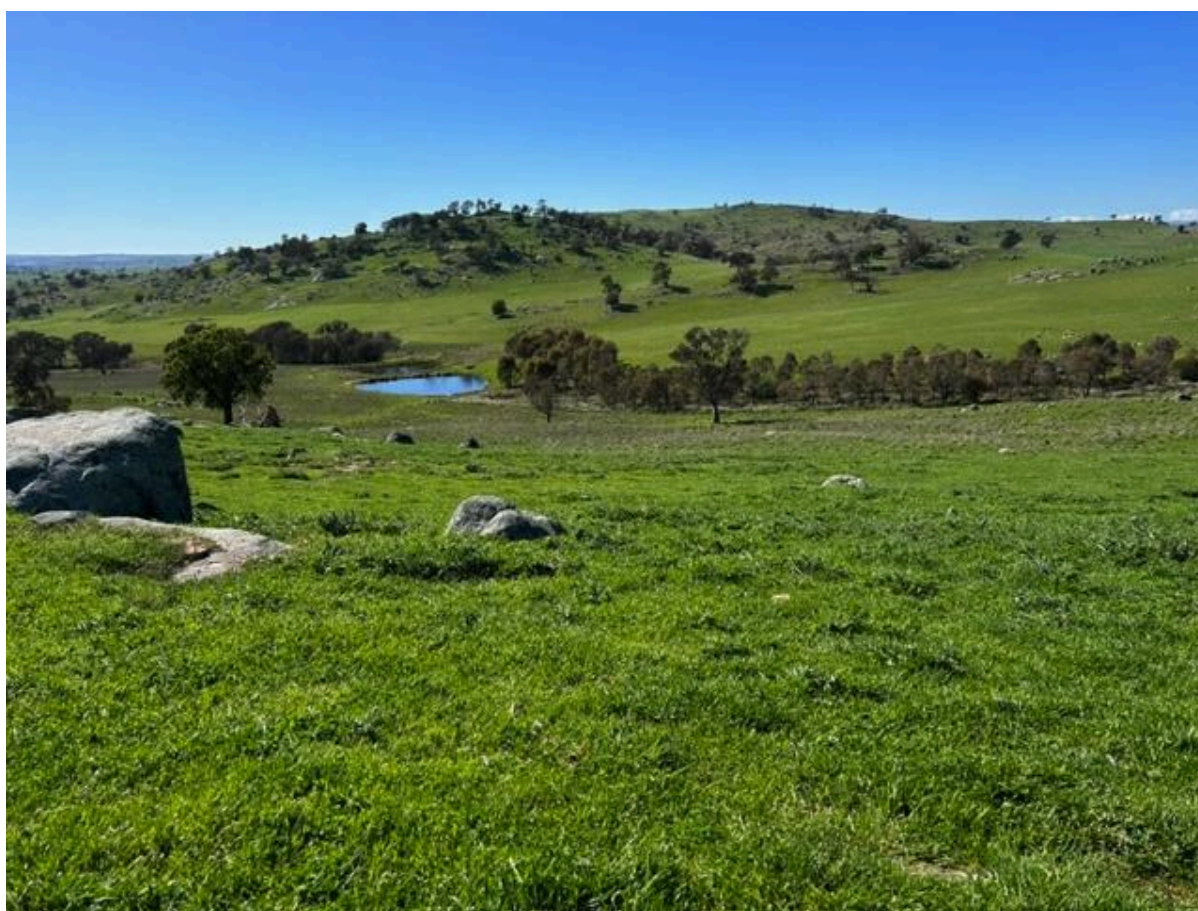


Image 3. A view of perennial pastures at Rugby Station. Source: The Kelly family.

Managing stock to protect the soil surface

A lot of the decision making regarding stocking rates at Rugby Station comes back to protecting the soil from damage, especially looking after the soft, porous top layer. The Kellys do this by selling their livestock 'before we lose our mulch' and leaving their perennial pasture species long enough to recover after grazing. They recognise the

important role of litter - the layer decaying plant matter at the soil surface - for soil fertility, water retention, preventing erosion and providing nutrients to growing plants.

‘That layer ... that is sitting on top of the soil is our protective blanket. It is the cation exchange driver and the thing that drives carbon capture. The microorganisms are the driver of the carbon capture, and we must protect them from the heat, the cold and the wind.’

Belinda Kelly

Conserving natural assets and native revegetation

The conservation of natural assets and native vegetation management has been a central focus for the family for many years. After the children were educated, Belinda undertook further study and embraced the formal role of Biodiversity and Sustainability Manager on the farm. The Kellys have been developing an extensive network of biodiversity corridors across 3,000 ha, beginning in 1993 by planting tree lanes, which have now evolved into ‘15 km of corridors.’ Belinda notes that these are not all completely fenced-off, but that most are ‘now connected by flight path,’ supporting a thriving diversity of bird species. The Kellys planted the final 10 ha five years ago. This new area of protected vegetation includes two creeks that join together to ‘eventually end up down the Lachlan.’ Planting 3,000 additional diverse plants ensures that the ‘central part of the property is a hub for the beneficial insects to go out into the paddocks.’

Rugby Station doesn't naturally grow very many sub-canopy species, as it is a grassy box woodland, with more canopy, shrub and ground layer plants. Belinda regularly installs tree guards to protect new self-seeded trees.

‘We have a lot of tree guards. As soon as I see a tree coming up in the paddock or on a roadside or anywhere at all, I go and put a guard around it and give it a 10-year protection.’

Belinda Kelly



Image 4. Belinda Kelly with a sapling at Rugby Station.
Source: the Kelly family.

Water infrastructure and soil erosion mitigation

The Kellys are 'extremely aware' of the importance of clean water. This has been one of the driving factors informing their decision making process 'right from the beginning in 1989 when they had their first electromagnetic map done.' Belinda didn't want to see any degradation further down the Lachlan River system as a result of their farming practices, so Michael and Belinda established a principle that 'they are not to add anything to the water system and that all water that leaves the property must be clear.'

'Right from the beginning we've been very aware that whoever gets the water after it has fallen on our place is important and that we are part of an interconnected ecology.'

Belinda Kelly

Each year the Kellys spend a significant amount of their allocated budget on soil erosion mitigation and water infrastructure to support this aim. Active strategies include building new contour banks to manage surface water flows and reduce concentrated water causing gully erosion (important because of their steep country), and filling in gullies and creating new dams when they purchase new land. There are now

approximately 90 dams on the farm, which are cleaned out on a regular basis. All of this means that 'when water actually gets into a creek, it's not muddy.'

Strict animal welfare standards

Having spent their lives involved in rural business, Belinda and Michael are well-versed in many aspects of animal breeding and welfare. The Kellys have been committed to high animal welfare standards for many decades. The genetics of their merino flock focuses on plain-bodied, high-growth rate and high fertility ewes. The couple began to participate in the Responsible Wool Standards (RWS) program five years ago aligning their business with best practice global standards in the wool industry.

Monitoring for soil and landscape health

Over the last 35 years the Kellys have made a series of plans for revegetation and landscape health. These plans have been successfully implemented over time, including the establishment of biodiversity corridors, tree planting and weed control. Belinda's 'whole of ecology' focus has resulted in close population monitoring of plants, animals, birds, reptiles and insects.

'I've got a record of sightings of different things ... and I have a number of target species that I'm interested in. I make sure I write down or if I can get a photo, I'll do that. But I suppose there's a limited amount of time in which I can do recording.'

Belinda Kelly

The family has a bird journal with detailed recordings of the bird species sighted on the property going back to 1964. The journal was started by Michael's aunt and Belinda is carrying this monitoring practice on, recording all unusual sightings.

The Kellys have kept records of all of the pasture improvements they have undertaken. Each paddock 'as we've bought it and done it up has been meticulously recorded.' Five years ago, the Kellys joined RWS. Being part of the program propelled them into having four monitoring sites that are now monitored every year, and the Kellys deliver an annual report to RWS on their findings. The program incorporates information from the producer, and takes it 'all the way through to the consumer and ensures protocols are met all the way across the supply chain, from soils, biodiversity, animal practises, human interaction, child labour.'

Observed Benefits⁴

Soils and landscapes

Perennial pastures, topsoil preservation and carbon cycling

The Kellys have seen a significant increase in topsoil through their approach to establishing and maintaining perennial pastures in areas that were previously degraded. Diversifying pasture and prioritising livestock health has allowed the Kellys to be 'good soil managers.' Belinda believes diversification has supported the 'carbon sequestration cycle that enables the microorganisms to do the nutrient release, which enables the carbon capture to happen.'

High productivity and animal health

The Kellys maintain best practice animal health standards, which has observable benefits including high-growth rates, high fertility, and high-quality/quantity wool production. Their ewes on average cut 6.5 kg of wool, with a weaning percentage of 125%.

Biodiversity and co-benefits of revegetation

Biodiversity corridors are now an integral part of the management of the property, offering habitat for native flora and fauna. Belinda recognises that supporting biodiversity and protecting trees on the farm allows them to mature and offer a range of benefits that will contribute to farm productivity over the long term. Trees - whether shelterbelts or individual paddock trees - serve as vital tools for livestock protection, erosion mitigation, and wind-speed reduction across the pastures. Their significance extends beyond these functional aspects, as native trees play a crucial role in supporting diverse wildlife populations and aiding natural pest control on the farm.

The family have been fortunate to obtain several government grants to support their efforts in planting tree lanes. They saw early on the value 'that we could get for our business and for the long-term sustainability of the landscape through putting in corridors.'

'Biodiversity corridors create that opportunity for natural systems to function fully with the protection of not being eaten by stock, and allow the survival of really beneficial fertilising insects and things like that.'

Belinda Kelly

⁴ This section presents the benefits of practice change from the farmers' perspective. It is based on the farmers' observations, and in some instances their own interpretation of data and test results. The project did not include any new on-ground testing or analysis of the farmers' data by Soils for Life.

Water retention and clear water flows

According to Belinda, the flow and volume of water in the landscape has stabilised over the years, which she mainly attributes to increased levels of groundcover and perennial pastures, as well as the 'water holding capacity of the carbon.' Belinda has observed how water is 'now seeping down and slowly seeping out of the landscape over time and creating wet banks and wet environments all the way down and staying within the soil profile.'



Image 5. A clear flowing stream at Rugby Station. Source: the Kelly family.

Farmer and Farm

A profitable farming business now and into the future

The Kelly family is aware of the historical legacy and 'multigenerational benefits' they have inherited from their forebears. The primary driver of business decisions on Rugby Station has been the long term financial sustainability of the property and a desire to ensure the viability of the enterprise for future generations. Running a successful business has offered them the opportunity to expand. The Kellys believe that they have put themselves into 'a position where we're able to offer the next generation an opportunity to manage the land well.' The family have achieved their goal of securing a good livelihood and passing on the land through a succession plan that will ensure ongoing family ownership of the property.

Financial benefits of supply chain management

Their recent involvement in the RWS program has been financially beneficial, with ‘real financial gains’ from long-term compliance with industry best practice. This was the ‘first time we’ve ever seen a direct financial benefit from being involved in these programs, and that was great.’

Satisfaction from enhancing biodiversity and carbon sequestration

Belinda has become increasingly focused on what can be done to help tackle climate change and she gets personal satisfaction from supporting thriving ecosystems. She believes there are multiple benefits from protecting and enhancing biodiversity across the Australian continent, and is dedicated to communicating the benefits of biodiversity and motivating other land managers to act.

‘Climate change affects all people, and we can contribute to a better environmental outcome. Those managing land have a great opportunity to save species by recognising the land they manage as habitat for biodiversity.’

Belinda Kelly



Image 6. A view of a biodiversity corridor on Rugby Station. Source: the Kelly family.

Looking to the Future

Michael and Belinda Kelly are still busy on the farm, however they intend to pass on the reins within the next decade. They want to ensure the business remains profitable and also that there is a fair and balanced succession plan in place. Planning for this needs to take into account the different career trajectories and unique interests of their two children. With their daughter Georgie now working on the property with her husband and their son Alex focused on a career in molecular biology, the question of equity will continue to be important to clarify. Belinda suggests this is because 'from a farm business point of view, when you are transitioning from one generation to the other, you have to put yourself into a position where you are supporting both your children.'

After 35 years of farming, Belinda has become a passionate advocate for farmers and she wants to see better outcomes for farming communities. She would like more Australians to recognise that farmers can play a significant role in addressing many of today's global challenges, most obviously biodiversity loss and climate change. These days the Kellys are very concerned by the impacts of climate change on their farm and on the agriculture sector generally. They consider climate change to be one of the most significant challenges they face. Belinda notes that in the last five years they have seen a 'maximum summer rainfall instead of a winter rainfall, and we are getting much hotter periods during the summer and then extreme storm activity and significant flood activity.'

As Belinda sees it, the financial security of farming families is key to incentivising and enabling farming communities to 'be green,' and to enable climate mitigation and adaptation.

'You can't be green if you are in the red, and if you can't feed your own family. You can't feed your own land and you can't return the nutrients that it requires to produce the grass that then turns around and lays down the carbon and creates the environment in which we can contribute as soil managers to a better outcome for the world.'

Belinda Kelly

The Kellys are interested in how to support better communication of the good work that farmers are doing. They feel that wider Australian society should value the contribution of farming communities more. They also don't see government funding for farmers as a social burden because the wider benefits for the country are clear - whether they are improving the natural environment, building biodiversity or improving livestock management practices. As Belinda says, 'I think that's actually a contributing factor to a bigger picture of where we can really contribute as a society, and it gives the sense that everybody is helping towards a better outcome.'

References

Hird, C. (1991). *Soil Landscapes of the Goulburn 1:250 000 Sheet map and report*. Soil Conservation Service of NSW, Sydney.

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