Learning from experience

Conversations with family farmers from the woodlands of southeastern Australia

Sustainable Farms

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Based on interviews conducted by Natasha Fijn

Introduction by Natasha Fijn, David Lindenmayer and Michelle Young
Conclusion by Natasha Fijn and David Lindenmayer
Chapter introductions and additional material by Natasha Fijn

Sustainable Farms

An initiative of The Australian National University

Published by Sustainable Farms, 141 Linnaeus Way, The Australian National University, Canberra ACT 2600.
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Website: www.sustainablefarms.org.au

ISBN: 978-0-646-81159-8

Printed on FSC certified paper manufactured from mixed sources. Printed by University Printing Service, Canberra.

Citation: Sustainable Farms (2019). *Learning from experience: Conversations with family farmers from the woodlands of southeastern Australia.* Sustainable Farms, The Australian National University, Canberra.

Front cover photographs: Eastern blue-tongue lizard (D. Michael); Kangaroo grass (J. Englart CC BY-SA 2.0); Zebra finch (L. Boyle CC BY-SA 2.0); 'Towong Hill Station' (N. Fijn)
Back cover photograph: Cattle near remnant patch of box-gum woodland (D. Blair)

Contents

Introduction:
Eight stories from farmers involved with Sustainable Farms

Natasha Fijn, David Lindenmayer and Michelle Young

The eight stories in this book are from farmers connected with Sustainable Farms, an interdisciplinary project at The Australian National University (ANU) that is working collaboratively with farmers, Landcare, NRM agencies, industry groups, and policy makers.[1]

Seven of the farms that feature in this book are dotted across the South West Slopes region of New South Wales, an area that has been particularly heavily modified by agricultural practices. The eighth farm is just across the border in Victoria, in the Upper Murray region northwest of Mount Kosciusko. These landscapes were formerly dominated by temperate eucalypt woodland but 85 per cent is now intensively grazed, cropped and cultivated as agricultural land.

Six of the stories are from farmers striving in different ways towards more sustainable management of their land and farming enterprises. They are seeking to find a balance between productivity and biodiversity, and to retain or increase the natural capital on their properties. Their narratives describe their application of ideas and concepts on the land, through trial-and-error over many years, often across generations.

These stories highlight not just the positives, but also the times of hardship, or past decisions that resulted in degradation of natural capital. The farmers' knowledge of the long-term, intergenerational history of their properties and farming enterprises provide insights into past practices, and how they now approach the balance between the productivity and biodiversity of their land.

The final two stories are from farmers whose experience on the land has inspired them to directly support the Sustainable Farms project in an effort to build knowledge of the intersection of biodiversity, productivity and mental health in the farming community.

The aim of this book is not to convey one philosophy or particular approach toward sustainable farming, as no one person has all the answers. Each property is different, and the individuals, families and generations interviewed for this book varied in their approaches to living productively on the land. From the diverse stories in this book, we hope that others might glean ideas and strive for more sustainable farming practices on their land.

The first Europeans to settle in inland New South Wales had the mindset that they needed to cut down or ring-bark trees to make way for the grazing of livestock. This resulted in the clearing of almost all of the large canopy trees, apart from a few scattered remnants. The key eucalypt species that still remain in the temperate eucalypt woodlands in our study region include: white box, yellow box, grey box, red box, Blakely's red gum, and red stringybark.

In more recent decades, many in the farming community have recognised the need for such trees to be present in the landscape. Many tree planting projects were initiated in the late 1980s and 1990s, often through the grassroots Landcare movement. The few areas of box-gum grassy woodlands and scattered large trees that remain on farmland now provide crucial wildlife refuges, particularly for bird species of conservation concern, such as the superb parrot, regent honeyeater and swift parrot.

Yellow box (Eucalyptus melliodora)*, Gundagai NSW. (Photo: T. Boyer)*

Sustainable Farms

The foundation of the *Sustainable Farms* project is 20 years of long-term research by field ecologists from The Australian National University. As part of a number of programs of long-term monitoring, these researchers have repeatedly gathered field survey data from approximately 270 farms over an area extending from northeast Victoria to southeast Queensland. This has created a robust body of knowledge about the benefits of different management approaches for supporting biodiversity on agricultural land.

In 2017 the Sustainable Farms project was initiated with a generous funding donation by The Ian Potter Foundation. The intention of the project was to support biodiversity and the management of carbon on farms across the South West Slopes by providing farmers with access to the knowledge to support their decision making about the management of natural assets on their farms. Natural assets here refer to land, water, carbon and biodiversity. The key concepts behind the program were to continue to translate the knowledge generated from the long term monitoring studies while at the same time leveraging the ecological data sets to answer a series of questions about the relationships between managing natural assets on farms for biodiversity, profitability, and mental health and wellbeing. The basic premise of the project is that a farm that is well managed environmentally will also be more profitable, resulting in individual farmers having an increased sense of wellbeing.

For Sustainable Farms there is an important connection with an earlier project run by The Ian Potter Foundation – the Potter Farmland Plan. The Foundation utilised key farms in western Victoria as an educational tool to demonstrate to farmers that with good 'whole-of-farm planning', conservation and production could be complementary activities on the land.[2]

Sustainable Farms is taking a similar 'on-ground' approach to develop a network of farmers interested in improving the condition of their natural assets, financial resilience and general wellbeing. Many of the farmers in this book are collaborating with Sustainable Farms to make their farms available for field days to demonstrate enhancements to natural assets, such as the establishment of shelterbelts or re-engineered farm dams. At these events, farmers share their knowledge with their peers, and land managers can get information based on the latest science directly from ANU researchers. There are additional resources on the Sustainable Farms website, including podcasts and videos.

The farmers

The farmers whose stories are presented in this book are all connected with the Sustainable Farms project, either through their participation in the ANU long term monitoring or through their generosity in donating to the project. The latter includes Marion and Kent Keith, who very kindly donated their farm 'Ballanda Park' to the project. John Mitchell made this book possible by very generously donating the funding for the research and production. Both John and the Keiths have contributed significantly to the Sustainable Farms project and are passionate about promoting ecological research and sustainable farming practices within Australia.

The six other farmers in this book are a sample of the many who have participated in the long-term monitoring studies in the South West Slopes region over the past 20 years. During that time, the ANU field ecologists built strong relationships with farmers in the region, particularly those who are interested in sustainable farming practices. Many such landholders have been active in tree planting, fencing off remnant patches and other Landcare initiatives on their properties. They have provided the field ecologists with access to sites on their farms for regular monitoring to assess the size and diversity of reptile, bird and mammal populations.

The ANU field ecologists who conducted this monitoring in the past are now continuing this work for the Sustainable Farms project. They live and work in the South West Slopes – Sustainable Farms has offices in Wodonga, Wagga Wagga, Gundagai, and Cowra. They keep in touch with farmers about the scheduling of the surveys on their properties, how the surveys are going, what species have been recorded on the property, and the biodiversity trends that are evident from the monitoring results. If asked, they offer advice on managing the biodiversity or habitat on the farm.

The interviews

The following chapters are edited transcripts of interviews conducted by anthropologist Dr Natasha Fijn. Natasha visited each family in person, sometimes accompanied by members of the ANU Sustainable Farms team, including Michelle Young (Project Director), Dr Mason Crane (Senior Ecologist), and Professor David Lindenmayer (Ecology Director). Natasha asked questions to initiate discussion, and prompted landholders to describe the practices they employ on their properties. Farms were visited on more than one occasion and for a number of hours each visit. Many of the discussions were held at the kitchen table, or whilst driving around the property to view tree plots, dams and riparian plantings. Natasha used an audio recorder, and supplemented the audio with still images and video recordings.

One of the aspects of the farms explored for this book was whether there had been an inter-generational shift in the approach to farming, or whether the property had undergone some form of succession from one generation of landholders to another. We tried to gain the perspectives of the farmers' spouses and families, to have a mix of older and younger generations of farmers, and sought to gather a range of opinions and approaches. Many farmers juggle multiple tasks on their large properties, so this project required individuals to set aside valuable time to share personal information on their approach to farming and about their family histories.

Each chapter begins with some brief background information about the family and their farm, followed by a first-person account of the farmer's approach to land management. The text has been edited for structure and flow, but most of the wording is a direct transcript of the audio recordings. The questions (indicated by italics) were usually asked by Natasha Fijn.

Chapter by chapter

Chapter 1 features the Graham's property, 'Bongongo', which is located near Adjungbilly, northeast of Gundagai. The Grahams have been a large, influential farming family in the district for generations. His children attend the neighbouring Bongongo Public School, and Paul works with the school and Landcare on riparian planting projects on his land. In his father's time, the property was typified by many dead, ring-barked trees. Paul has transformed this by planting thousands of trees and establishing new restoration projects on the property each year.

Chapter 2 features the Johnson family, Sam and Claire and their adult son Sid. Sam and Claire are starting to step back from active farm management, with Sid increasingly involved in the online marketing of their meat products. They graze cattle, pigs, and more recently sheep, near Murringo, east of Young. All three have input into the approach to grazing. Their management focus is primarily on the health of the soil and grass cover. They employ regenerative grazing practices, moving their livestock between paddocks frequently.

Chapter 3 focuses on a woman's perspective on nurturing animals and the land near Yass. Bimbi Turner has spent her life farming, in conjunction with a professional role as a Mothercraft nurse. She and her husband Kim have owned 'Silverdale' for eighteen years, working hard to control weeds and feral animals on the property. Bimbi still regularly takes to horseback to ride the paddocks, observing the sheep and the property. She is just as passionate about ensuring the welfare of her sheep as she is about maintaining a healthy, functioning landscape.

Chapter 4 is a story about good outcomes through overcoming adversity. The Hopkins family, who live east of Junee, has been through two devastating fires. These catastrophic events provided John Hopkins with the chance to re-think where fencing should be placed and spurred him to fence off corridors and to revegetate riparian areas. He related how the view from the kitchen window of trees, and the sounds of birds on the farm helps him immensely during tough times.

Chapter 5 features an energetic, ambitious couple, Tony and Vicky Geddes, who live north of Holbrook. They have clearly delineated roles on the property, where Vicky manages what she describes as the 'engine room' of their farm, that is, the sheep, while Tony manages cropping and off-farm assets. The chapter focuses first on Vicky's perspective on managing a relatively large farming enterprise, followed by Tony's inter-generational perspective of remaining on the family farm and trying to retain his family's conservation values. Tony's grandmother was a strong champion for the restoration of habitat for birds and passed this on to her children and grandchildren and even to her son-in-law, Paul Trevethan (Chapter 6).

Chapter 6 is a somewhat different story, in that Paul Trevethan is concerned not so much with degradation of habitat on the land in the past, but about what is happening now, through new technology and cropping techniques being implemented by the next generation. Paul is reluctantly stepping back from his management role, with decisions now being made by his sons, but he is finding the changes confronting and the obligation to back away difficult.

Chapter 7 features Kent and Marion Keith. Kent worked for the CSIRO Division of Wildlife Research for 26 years, collecting and surveying Australian fauna. Kent gives an account of a bygone era of research into Australia's native mammals. This experience influenced how he later managed multiple grazing properties, promoting not only distinctive cattle breeds, such as the Belted Galloway, but also providing a diversity of habitat for birds, mammals and reptiles.

Chapter 8 features John Mitchell, who lives at 'Towong Hill Station' on the Upper Murray River system. Despite a tumultuous succession process on the property, John's persistence and determination have resulted in considerable financial success. For John, an education in economics and finance has been important for his survival as a farmer. John Mitchell tells his life history and how he has overcome personal setbacks to successfully manage 'Towong Hill Station' in the long-term. His story is a good example of how wise financial management of a property, in conjunction with investment in off-farm assets, can lead to a sustainable farm.

The locations of the family properties featured in this book are shown in the map above. Chapters 1 'Bongongo' (Graham); 2 'Windermere' (Johnson); 3 'Silverdale' (Turner); 4 'Allawah' (Hopkins); 5 'Yallock' (Geddes); 6 'Dunoon' (Trevethan); 7 'Ballanda Park' (Keith); and 8 'Towong Hill' (Mitchell).

Long term monitoring in the woodlands

The Ecology Director and founder of *Sustainable Farms* is landscape ecologist Professor David Lindenmayer from the Fenner School of Environment & Society at ANU. David is widely known for his leadership in conservation and wildlife ecology. He has managed an extensive long-term biodiversity monitoring network in the woodland regions of south-eastern Australia for over 20 years, which has resulted in a huge array of scientific insights. Drawing on the learnings from this long term monitoring, David and his team have written books and other publications specifically designed for landholders, including *Wildlife on Farms: How to Conserve Native Animals* (2003); *Woodlands: A Disappearing Landscape* (2005); *What Makes a Good Farm for Wildlife?* (2011);

Planting for Wildlife: A Practical Guide to Restoring Native Woodlands (2011); *Wildlife Conservation in Farm Landscapes* (2016), and *Restoring Farm Woodlands for Wildlife* (2018). These are available from CSIRO Publishing or as eBooks.

The ANU team conducts research at different scales, providing insights into animals' responses to particular environments and how this can then be managed at small through to large scales. On a farm level, for example, the ecology team can assess the likelihood that a given bird species will favour a particular kind of woodland remnant and whether actions such as additional planting of trees, or fencing of remnant vegetation, will increase the likelihood of their occurrence. The results of long-term research show there are particular kinds of management that can improve environmental conditions and help recover some of the biodiversity on farms. For instance, in relation to bird life, beneficial management activities include: (1) controlling weeds and pest animals; (2) halting or reducing levels of firewood and rock removal; (3) restoring areas of native vegetation by establishing new plantings, and (4) reducing grazing pressure in key areas such as plantings.

The following are just a few examples of the interesting findings from this long-term monitoring work on farms across the South West Slopes of New South Wales. We hope these provide an insight into the value of long-term work, and how the co-operation and participation of landholders in scientific research leads to better understanding of how their land can be managed for biodiversity.

Sustainable Farms senior ecologist Dr Mason Crane checking a nest box. (Photo: D. Florance)

❖ A study on the effects of remnant vegetation and tree planting on birds was a result of years of surveys on 46 different farms in the South West Slopes region. The study found that retaining remnant native vegetation is crucial in providing suitable habitat for bird species. Farms that had high levels of bird biodiversity had a combination of replantings, scattered paddock trees, native pastures and small patches of remnant woodland. Some species, like the brown treecreeper, are more likely to occur in remnant vegetation than plantings. Conversely, species such as the scarlet robin and rufous whistler respond well to plantings.

Reference: Cunningham, R.B., Lindenmayer, D.B., Crane, M., Michael, D.R., MacGregor, C., Montague-Drake, R. and Fischer, J. (2008). The combined effects of remnant vegetation and tree planting on farmland birds. *Conservation Biology*, 22, 742-752. https://doi.org/10.1111/j.1523-1739.2008.00924.x

❖ Another study examined the biodiversity benefits of restoring vegetation on farms and how this restoration can be undermined by livestock grazing, particularly uncontrolled high-intensity grazing. Grazing modifies the leaf litter layer, altering the suitability of habitat for birds and reptiles, especially those that nest or dwell on the ground. The advice to farmers is to maintain and repair fencing around revegetated patches to reduce grazing pressure. The width of the plantings is also important, as wider plantings provide more habitat and supports more species of birds and reptiles.

Reference: Lindenmayer, D.B., Blanchard, W., Crane, M., Michael, D. and Sato, C. (2018). Biodiversity benefits of vegetation restoration undermined by livestock grazing. *Restoration Ecology*, 26, 1157-1164. https://doi.org/10.1111/rec.12676

Reptile species found in the woodlands: Olive legless lizard (Delma inornata)*; Southern rainbow skink* (Carlia tetradactyla)*; Box-patterned gecko* (Lucasium steindachneri)*; Spotted-back ctenotus* (Ctenotus orientalis)*; Eastern stone gecko* (Diplodactylus vittatus)*; Southern spiny-tailed gecko* (Strophurus intermedius)*. (Photos: D. Michael)*

❖ Sustainable Farms senior ecologist Dr Mason Crane conducted his PhD studies on scattered paddock trees in the agricultural landscapes of the South West Slopes. He found that populations of the squirrel glider persist in highly modified agricultural landscapes, including those used for grazing and dryland cropping, and that scattered trees of box gum woodland were particularly valuable for that species. The large, mature old trees provide hollows that are used by the squirrel gliders as den sites and are particularly important for foraging. These scattered trees are susceptible to being cleared for cropping and irrigation. There is also a lack of regeneration of the old trees, particularly as a result of intensive and prolonged livestock grazing.

Reference: Crane, M., Cunningham, R.B. and Lindenmayer, D.B. (2014). The value of countryside elements in the conservation of a threatened arboreal marsupial *Petaurus norfolcensis* in agricultural landscapes of south-eastern Australia – the disproportional value of scattered trees. Reference: PLOS One, 9, e107178. https://doi.org/10.1371/journal.pone.0107178

Squirrel glider (Petaurus norfolcensis) *(Photo: D. Florance)*

❖ Several of the farms featured in this book were involved in research that sought to answer the question: 'Is it most ecologically effective and cost-effective to spend limited funds increasing the size of patches of restored areas or improving habitat condition of restored areas?'. This is an important consideration for many farmers when planning a restoration project, weighing up the funding required as well as the loss of potentially productive grazing or cropping land. The research showed that any kind of restoration of habitat was positive, whether it resulted in an increase in the size of a woodland patch, or led to the establishment of an understorey in old growth woodland. The team found that the longer restored areas were left to mature, the more suitable the habitat became for bird species such as the white-plumed honeyeater, the yellow-rumped thornbill and the superb fairy-wren. The noisy miner is an aggressive native honeyeater, which excludes other species of native woodland birds. One surprising finding was that the enhancement of areas of vegetation resulted in a reduction in populations of the noisy miner.

Reference: Lindenmayer, D.B., Blanchard, W., Crane, M., Michael, D. and Florance, D. (2018). Size or quality. What matters in vegetation restoration for bird biodiversity in endangered temperate woodlands? Austral Ecology, 43, 798-806. https://onlinelibrary.wiley.com/doi/full/10.1111/aec.12622

Superb fairy-wren (Malarus cyaneus) *(Photo: B. Green)*

Blue cadastral boundary of the 'Bongongo' property. (Map produced by D. Florance)

Paul and Rachel Graham at 'Bongongo': Annual regeneration projects

'Bongongo' homestead is located near Adjungbilly, northeast of Gundagai. Paul Graham grew up on the farm with eight siblings, many of whom still work in agriculture in one form or another. As the youngest of nine, Paul has remained in the family homestead through amicable succession planning with his siblings. The property has been divided through succession, and Paul has 1580 hectares at 'Bongongo', along with another property, producing beef, lamb and wool. Paul and Rachel Graham's children are now the fifth generation to live on the property.

With government incentives to engage in conservation projects and in collaboration with local Landcare facilitators, Paul has gradually taken on larger and more challenging restoration projects over the years, gaining confidence in what he can achieve. Paul puts new fencing in place and buys thousands of plant stock each year for his riparian and wetland restoration projects, amongst others.

The Adjungbilly Creek runs through the property and alongside the neighbouring Bongongo Public School. Paul and his siblings attended the school, and two out of the four of Paul and Rachel's children are still students there, along with 16 other children. Since 2010, the Adjungbilly Creek Project has undertaken planting along the watercourse to limit soil erosion and improve habitat for the Booroolong frog and the Macquarie perch. Every year, the school students pitch in to lend a hand with tree-planting. The ANU has been involved in this project, collecting data on the response of birds, frogs, reptiles and mammals to the restoration of the riparian zone along Adjungbilly Creek.

'Bongongo' has shelterbelts and the Grahams have implemented targeted management activities for soil erosion. In particular, 'Bongongo' provides an excellent example of riparian and wetland area restoration for species-specific management. The Grahams have fenced off permanent watercourses and tributaries to minimise sediments and nutrients reaching the main watercourse.

'Bongongo'

The drive in to 'Bongongo' is beautiful, descending down from a winding road along a ridgeline that looks out over layers of undulating hills with patches of bush and green pastures, before passing the tiny Bongongo Public School. Paul is keen to pass on his story, despite the time pressure of the many jobs he needs to do on his two farms. Rachel is present briefly, but has errands to run, so soon leaves to drive to nearby Gundagai.

Paul shows Natasha Fijn three framed elongated black-and-white photographs of the landscape at 'Bongongo' in the 1930s.

Paul: The first settlers in the area ring-barked all the trees and you can see all the dead timber in the photographs. All those trees are non-existent now. The creek was very bare and eroded, more so than it is now. My great uncle and father planted willows up through there and now we're pulling the willows out, 15-metres each side, and putting natives back in. The view from up on the hillside, you can see that it is pasture intermixed with native trees.

I was one of nine with four brothers and four sisters. One is a vet/farmer, one an accountant/farmer, one is a professor of medicine – he owns country and leases it to my brother – another brother farms in the Riverina. All my siblings are tied up with agriculture in some way or another. One brother is on the neighbouring property, another up the back and my cousins are up the road. My brothers and sisters worked together growing up but we've all been farming on our own for the past 20 years (since 1998). Everyone gets to express their own abilities in that way. My brothers have been involved as part of the Adjungbilly Creek conservation project too.

That's quite a big portion of land in conservation terms.

Yes, it has meant that corridors next door to each other are joined together. It's been good to collaborate towards a similar cause.

Rachel: The brothers learnt from their father and uncle before him about how to manage the land.

Do you think your parents influenced your siblings' perspectives on the land and towards agriculture?

I suppose by spending time on the land with our parents outside, it grows on you. My siblings would like to spend time at home at any stage, whether they were studying at university, or whatever, they would love to come back to the farm. They liked the healthy environment, open air and freedom – they weren't afraid of hard work though – it would make everyone happy. My father was a conservative farmer you could say, but he looked after the land and it looked after him – well before the influence of Landcare.

View from a natural spring of the creek (mid-ground) with tree blocks and corridors on the hills in the background. The right hand section of the photo is of the same landscape as appears in the black and white photo below. (Photo: N. Fijn)

View from the hillside with eroded creek banks and ring-barked trees in the distance. An image of one section of an elongated black-and-white photograph from the 1930s. (Supplied by Paul and Rachel Graham)

Note the ring-barked trees on the hillsides and no tree corridors beside paddocks and along the creek. (Supplied by Paul and Rachel Graham)

Still seeing to the stock on horseback in the 1930s, with a willow planted alongside the creek in the foreground. (Supplied by Paul and Rachel Graham)

Rachel: Paul's uncle, Fred Graham, was an advocate for rabbit extermination – he was on the Rural Lands Board. He had a lot to do with that in this area. He was like Paul is today [in terms of looking after the land].

So did he own the land before your father?

Paul: We still use his wool brand because he was a pioneer in establishing this place. My grandmother died when they were still only young, so my grandfather got out of the farming partnership because he had five little children and couldn't manage in the bush, so he went to Sydney.

Rachel: Uncle Fred didn't have any children. Bill [Paul's father] and his brother Bruce used to come here in the school holidays from Sydney and would work on the farm for him. When Fred died of leukemia at the age of 50, he left the farm to the two nephews who would help him. They had terrible times with the probate and then the wool bust. The nephews really paid for the property in their own right.

Paul: Like all farms, there's a history for why you're here, you're really just the next generation's custodian. If you take that into account, you look after the land better, so the next generation can make a living from it.

When did you take over the management of the farm?

I came home to the farm in 1983 after doing a sheep management and wool classing course, and after working in the wool industry for a bit. I managed another property for the family for eight years, before we went through succession planning. Mum and Dad were getting older. When the farm was to be split up, the others already had their separate homes. I am the youngest and I wasn't married at the time, so my parents said I could live here in the cottage. Rachel then became my wife and the rest is history.

Did your father love being on the land here?

Yeah, he loved it with a passion. It was coming back here to the farm from hospital visits in Sydney that got my father going again. Once he got out of the ambulance and smelt the fresh air, he improved and got his memory back. He liked to go and check on the shearing and check on the land. He helped us plant trees but the plantings he did were willow in his day. They used to plant willow

sticks to hold the banks together. They did a good job with that but in the long-term they're not part of the environment, they're not native vegetation. Sadly, they even planted black willows and they sucker, blocking the creek.

Succession planning seems like a difficult process.

It could be difficult but with our family we communicate and look after one another, we respect each other's way of going about agriculture. The alternative is no good for anyone. It's an aspect that can cause bad health and ill feeling. It needs to be done at a young age and it is healthier moving forward too. When land becomes a smaller module, people can consolidate their ideas and once they've got their sights set, then they can put it into effect. When it's a big holding and you're only focusing on one aspect and there's pulling in different directions then it's not good for the farm. Different families have different [succession] traditions and there's no one model that fits all.

Bongongo Public School is located amongst poplars on a rise to the right of the photograph, and the 'Bongongo' homestead is near the bend in the road. Pine plantations cover the hills in the background. Tree corridors and scattered trees are integrated with pasture. Photo taken from Two Rail, 'Bongongo', 27 May 2010. (Supplied by Paul and Rachel Graham)

Do you think the kids will want to continue farming?

I think they've got it in their blood. The little ones very much so; the older ones become a bit uninterested but as they mature, they become more interested again. One day it'll be time for me to move on and let the new ideas come in.

Was this a big property?

On this place there are now six separate holdings with six major families and other people working under them. Back when I was a kid, my father had 14 employees. A lot of the people that worked here when I was a kid worked here throughout their life. We'd all go to school together as kids. Now we have had to cut the labour down and we contract out a lot of work. If we're only using machinery once a year then it's more feasible to bring a contractor in for haymaking, shearing, sowing, super-spreading, contract fencing, or dipping. A lot of the jobs are outsourced now.

Forestry

In a 2008 newspaper article Paul is quoted as saying:

> '… the headwaters to the Murray-Darling catchment and the Shaking Bog wetlands are the heart, acting as vital filtration'… 'Land and water is a gift and we are only the managers for a short time. We need to treasure it and look after it' (Tumut and Adelong Times, April 15, 2008).

How about the neighbouring forestry plantations that I saw when I was driving in?

Radiata pine is not native to this country – they've been brought in here and require high rainfall but we only get 30 inches here. Forestry has tied up some of the best agricultural land in Australia. Forestry buys up any farm that is for sale and many never make it onto the market. Neighbouring farmers should be given the opportunity to buy the land to keep it as arable land, rather than the properties getting sold straight to forestry.

None of the country is suitable for pines – it's taking up good soil and the pines absorb a lot of water. We have much less water runoff on our land than we did in the past. A Sydney company bought a farm nearby with 50 hectares of swamp, which is the start of the Shaking Bog Creek, a tributary of the Adjungbilly that runs through this property [and a source of water for the Murray-Darling catchment]. They contour ripped all the native vegetation down – thousands of

acres of the catchment. When they came to the swamp, they got graders to bank it up in order to get the trees out of the water then they had great big pines growing there and we started to have no water running down into the creek.

I jumped up and down and had 200 people turning up at the community hall here. We fought them black-and-blue. It got pretty nasty. I got accused of bringing in choppers, writing graffiti on bulldozers, and tying myself in front of trees. We met with lawyers from Sydney and told them our farmland was the heart of the creek system. One lawyer said 'I couldn't really care less, we're going ahead and doing it'. I replied, 'You know when your heart stops? Well you die. That's what is happening to this creek'.

When we had the 200 people from the surrounding district coming to the public meeting, they came up with 46 creeks and tributaries over the previous 20 years that had stopped flowing due to the pine plantations taking up all the water. The gigalitres of water taken out of this catchment by pines would be enormous. We had public consultations but they didn't take anything we recommended on board.

When did much of this forestry start happening?

In the 1960s but the big steps around this valley were in the late 1980s: Red Hill Station was 26,000 acres and Nanangroe Station was 18,000 acres of farmland converted into forestry. Red Hill Station had 12 permanent workers on the property. All the houses were taken away, then the land was bulldozed and ripped to plant pines. The forestry workers remain in town and commute out here, they don't live here.

The start of the forestry would have been during your father's time farming the land. I guess the effects of forestry were cumulative over time.

He never saw the benefit of growing radiata pine on the best of the high country soil in Australia. The extent of the forestry is huge now. Most farms here have forestry on their boundaries. The pine forest isn't habitat. We have council weed inspectors and will get a notice to control weeds immediately if there are too many weeds, which is how it has to be, otherwise it can become a feral mess. If we didn't manage our land properly then we would be sued and then marched into the courts, but then the government doesn't manage their own forestry land for

noxious weeds and feral animals. Forestry doesn't care when blackberries, briars, deer, pigs and goats become a problem. The wild dogs are moving down from the mountains and down into farmland. We trapped 14 this year. The feral animals and weeds are a problem extending from forestry.

Changing farming practices

Farming practices and types of pastures have changed. Now we're growing a lot of grazing crops. There's more technology in the preparation of the soils, although there are a lot more chemicals involved. Whether that's a good or bad thing, it depends upon the chemicals I suppose. Previously, the old technique was to plough the land four or five times to keep turning it over, harrowing it down and working the country into a seedbed, now you spray and then you don't disturb the top humus layer of the soil. That technology over the last 35 years in agriculture has been a dramatic change. In the old system, if you ploughed the paddocks, the top layer of soil would flow down into the creeks and head out to block up the Murray system. If you bare the country like that, you end up with eroded country.

Do you make hay on the farm?

No, haymaking takes too many nutrients off the country, so I try and source the hay from elsewhere. We do make early silage but then you still have moisture in the ground, so grasses can come back up to cover the ground during summer. With hay you're taking too much out of the land, too late in the season.

The stocking level depends on what you can grow and how much rainfall there has been that year. Sheep are a lot more profitable, but if you just ran sheep on this country, you wouldn't do it any justice because they are such close feeders to the ground, you'd make it bare. By having a balance of cattle and sheep, we rotate the paddocks with different kinds of animal grazing the pasture. The hill country still has native grasses, which are more responsive to summer rainfall.

Since 1970, through pasture improvement, soil management, making paddocks accessible, rotating smaller paddocks and better overall stock management we run double the livestock. We've learnt how to feed and utilize better grass per hectare. You learn by observation, noting what needs to happen with the soil or grass. It takes practice that is learnt over years. People have managed the pasture differently

over the generations, they've learnt from both good and bad experiences, what the best ways of stocking the country is at a particular time of year.

Wellbeing

I get a buzz out of the projects. It's good for my mental health – it clears my head and makes me feel good, which is good for the health. You end up with actual results at the end of it. The picture of the results from your efforts is out there in front of you. I think the same with the animals, their condition and happiness. If they're chewing their cud, or lambs are running around the dam kicking their legs out to the side and head-butting each other, they're telling you that they're having a good life but if you go into a paddock and the cow's eyes are sunken and its head is down then you know you need to do something about it because you're not managing them properly. Likewise, if the creek is full of algae, faeces, not flowing properly and the trees are looking half-dead with only a few green shoots, that's telling you that there's something wrong with the creek. The major thing that a person has to bring to a farm is an ability to observe. If you haven't got good observation skills then you'll never be a good farmer.

Driving around the farm

Paul drives the farm ute, pointing out different regeneration projects to Natasha.

Where do you source all your native plants from, and how many have you planted?

The local Landcare nursery in Tumut. I order about 1,500 trees a year. I've been planting trees for 30 years, so that's about 45,000 trees – but then about 70 per cent survive.

We have some big canopy trees left on the farm but the scattered trees are slowly dying off – beautiful big old trees. A big 100-year-old tree up and died only last year. It may only be another 10 to 15 years before we have none. It tends to be individual trees, if we had them in clusters they would reproduce. Since 2006, a lot of the big old trees were starting to die. My theory is that in the really lush years, between the dry periods, the stock didn't have enough roughage in the lush pasture, so they chewed the stringy bark trees and ring-barked them. The sheep need some stubble to get fibre into their diet. Mistletoe in the trees has knocked back a fair few. If we don't plant trees now, we're going to have no large canopy trees in the landscape at all.

Fenced off tree corridors with lone canopy tree in the paddock where livestock have camped underneath. (Photo: N. Fijn)

Have the theories changed much in terms of fencing and size of areas to be set aside for restoring habitat?

In the early days of fencing corridors, you would put in a fence beside the creek that would fit only one tree. Now you need to fence 15-metres from where the bank starts with a corridor of three rows of trees. People put time and effort into putting together good contracts that explain what is required within each project to conserve the area properly. The trees really need to be 15 to 20 years old and in clumps, with corridors joining them together, and then they'll be at their healthiest.

Natasha and Paul stop at another area that is part of one of Paul's projects for the year. The land is sloped, with some native vegetation leading down to a dam.

This project is from my own funds. The paddock is fenced off and all this area will become trees because this area has a natural spring leading into a dam. If we keep stock off this area, it will mean there will be water available year round. If stock enter, they pug the boggy area up and wreck the natural water system. The water has been coming off the hills and causing erosion here too.

Three lines of trees will go up the fenceline. This area will have long grasses and trees, holding the biomass together. The stock walk along the fenceline taking the ground cover away, so there's nothing left to hold the soil together when it rains. I get the kids to pick up rocks to spread them across the bad areas to slow the water down. The fenced area will also bring separate corridors of trees together, linking the corridors.

Do you have a different project that you're working on every year?

Every year I think, 'there's a problem with erosion', or 'here is where we should concentrate this winter'. We put a fence in, put in deep rip-lines and sow some trees in August then keep the stock out. If we lose a water source then the Local Land Services (LLS) provide funding for a new water source [such as a trough or dam]. We particularly try to initiate projects to keep stock out of the dams and big, eroded gullies. We leave clumps of timber on the hills, which is important for warmth and shelter for the animals. A lot of places, soaks for example, you need to be planting on the top of the ridges. Sometimes an area is planted as a windbreak, for erosion control and adding to the amount of shade. We may open the gate to a revegetated area in the summer, to provide some shade, but if we leave stock in a treed area for too long then they'll ring-bark the trees.

Paul drives through a paddock and cattle start to follow the vehicle, expecting supplementary feed. He indicates a large flat area where community cricket events are held for charity, to help people out with mental health issues and depression.

Rachel's brother took his life when he was still only a young adult. His schoolmates came and helped us [with the preparation of the pitch] to help with people who were struggling. We have events in spring, once it is mowed and beautifully watered. The hill becomes the grandstand for people to look down on the match, using the natural features of the landscape.

How long have you been holding charity cricket matches?

We've been holding matches for six years now, I think. We've raised a fair bit of money over the years, but we didn't do it to raise money really, it was for people to get out and about. Most of the time there's someone in each team that is suffering from depression, or life has been a bit tough.

Yearly regeneration projects

On a second visit, Natasha stops by the local Bongongo Public School. The school principal shows her some of the plantings the children have been undertaking along the Adjungbilly Creek, which runs through the Graham's property and behind the school. Natasha then heads down to 'Bongongo', the neighbouring property.

It's nice that there is such close engagement between you as the landholder, with the local Landcare and the local primary school.

Certainly. The next generation are very keen, more so than when I was at school. I went to that primary school in 1967. There was one schoolteacher with 40 kids [now only 18]. We were never taught about the environment, so the education system now is good in that way. We used to go down to the creek and swim in the summer when it was hot, chasing ducks and catching tadpoles because there was no air conditioning in the classroom. Back in our days, there wasn't a fence and the creek was our school boundary. The swimming lessons would be down in the creek.

View from Bongongo Public School, looking towards Paul Graham's brother's property and the Adjungbilly Creek meandering into the distance. (Photo: N. Fijn)

Is there a species of native perch in the Adjungbilly Creek?

Yes, we have the Macquarie perch, and the Booroolong frog in the Adjungbilly Creek, two nearly extinct species and this creek still has them here.[3] The ANU went all through our country and monitored where the species are found, which resulted in funding to fence creeks off, re-vegetate areas and build alternative stock-watering points. The funding came through the coordinator with the Riverina Local Land Services (LLS), Cherie White – she's very proactive. We're blessed to have someone so good. I think she received an award last year, as coordinator. She'll work out what we need to do and where the monetary resources need to go. The Adjungbilly Creek Catchment funding from Local Land Services and the NSW Environmental Trust has been supporting the project work for five years now and it's made a big difference. We're very lucky to have a good facilitator. She expects each farmer to be proactive and she helps us to put submissions together.[4] We conduct projects each year to fence areas off, to increase the quality of the habitat and to keep the rare species going.

School children walking along rip-lines with tree guards prepared for native plantings, restoring the riparian zone along the Adjungbilly Creek. (Supplied by Rachel Graham)

The Booroolong frog (Litoria booroolongensis). *(Photo: D. Florance)*

Finances and assets

Without the funding I wouldn't be able to do such large projects. It ultimately increases the asset value of the land while conserving it. If you've been receiving these portions of funding to do these projects then in the long-term it is increasing the value of the property. To me it's a no-brainer. Your asset base is increasing with money being supplied to make the environment better. Your farm investment is ultimately worth more by having the farm fenced off with tree lines, in comparison with a farm of 1000 acres that has been stripped bare and is gradually becoming a dust bowl. Someone who has planted their farm out, considered different healthy soil types, put in tree lines and laneways, fenced off creeks, put in different water sources, well then that 1000 acres is worth four to five times the original value; whereas ol' mate with the dust bowl would have land worth a lot less than that. At the end of the day, by keeping your farm healthy, your investment is growing.

Some people are a bit naïve and think that they deserve this money to get these kick-starts. I'm grateful for the funding. At the end of the day, it makes my farm more efficient and my asset is consistently growing. Farmers need to look at the big picture because it's a great incentive – it makes the asset more sustainable, profitable and valuable. No one gives you money to fix a tractor or a pump but here the government is giving us money to fix the erosion and the whole water system.

Two of the farms I had, I have now sold. On one of the farms, we did an enormous $200,000 project one year. It was very rundown when I bought it and we put a lot into the land to get it going again. My business partner in the farm had to get out for personal reasons. I couldn't afford to buy him out, so we had to sell, but we sold the property for three times the amount we had bought it for only five years before. It was beautiful looking up the valley at all the new fencing, the laneways and gateways and those regeneration projects were a helpful selling point. It comes down to a financial decision. I've got a new project at Tarcutta, as I bought up a couple of rough blocks. I've been fencing, planting trees and developing the place.

Landcare

How has your involvement with Landcare changed over time?

When I was originally involved with Landcare 30-odd years ago, it was tiny and we would go to the nursery to get trees to plant. The sale of Telstra allowed money to come into the system, where there was a 50/50 contribution towards projects. Coordinators were assigned and we started a Landcare network. I was heavily involved in that. It's changed over time with changes of government. Landcare has come a long way. In the early days, the funding was word-of-mouth. Now you have to sign and abide by a legally bound contract. The contract outlines the works I'm undertaking and how much money is received as grant money. The facilitator works out the area of sustainable grazing. This year I've got three separate projects underway.

I come up with such plans every year and submit them for funding. They then give me an estimation of the vegetation required and where the rip-lines should go. Previously there was none of this detail. They even tell me specifically what kinds of trees to plant from the local Landcare nursery in Tumut. They know what is best suited for this woodland area. I like that they detail such things, as it takes some of the decision-making burden away from me. They've come a long way in terms of efficiency. We do the fencing and planting ourselves, which is one of the more pleasant aspects at the end of the day. The funding pays for 50 per cent of the fencing materials and then we put in the rest and put the additional labour into the fencing.

Paul Graham inspecting tree guards in the riparian zone of the creek. (Photo: N. Fijn)

How do you make time in between all your other work?

I just factor it in as part of the jobs to do for the year. I plan for the project to happen now [June], in the winter, until about August before it starts to become too hectic in the spring. With the first project we're undertaking this year, we're fencing off a big part of the Adjungbilly Creek. At this stage it's still all one paddock, so dividing the paddocks will take the livestock away from the creek and stop further erosion. The second project for this year we'll subdivide a paddock into three paddocks with a flow-in creek in one and a dam in the others. Currently, the sheep are making a tracking line where they follow each other and when the rains come it washes the soil away. In the third project, we're fencing off a dam.

What advice would you give for efficient implementation of these kinds of projects?

Start on a small scale to gain confidence, don't become greedy about what you can achieve within the time you have, and do it well. You're not stupid if you make a mistake with a project. My father would say "you're only stupid if you make the same mistake twice". You feel self-worth and a good buzz from watching everything grow. Go for a walk through the habitat in a couple of years and you can see the difference. Next time you can take on a slightly bigger project and then

after 30 years, well then you're not afraid to have a real crack at it. I don't think there's a year in the last 30 years that I haven't taken on a conservation project.

Willows

Paul and Natasha pause at a heavily eroded corner of the creek, where the planting of the willows and constant grazing of the grass have had a detrimental effect on the banks of the creek. A task for Paul in the near future is to remove black willow stumps and any new ones that have suckered.

With the riparian zones along the creeks, people started to realize that there was erosion and so they planted willows. Then what happened?

The creek bed changed dramatically from about five or six years ago. It's still a healthy creek but a large amount of sediment has built up. During a flood, an old willow might topple over and take all the soil with it. When a willow falls, it tears out the bank and blocks up the creek. During heavy rains, the water starts eating into the bank where the willow was previously. The creek makes a diversion because debris has built up and the whole creek system subsequently becomes altered.[5] Planting close to the water was a good initial means of stopping erosion but it's better to have the trees three to four metres out from the bank, so the roots are coming over but not so that the old trees will topple into the creek.

The creek has moved at least 15 metres here in my lifetime. We used to swim right here. We used to dive in because it had a deep swimming hole. The erosion wouldn't have happened like this if the black willows weren't here. We have to get an excavator in and poison the black willow stumps to get rid of them all, otherwise they will sucker.

You can see the amount of grassing-up, or re-vegetation, along the banks without the stock in here. The school kids helped with the plantings down toward the bridge [adjacent to the school]. Our kids also help put the cardboard protectors around the trees. Now we plant natives and fence them off to revegetate the banks. The vegetation also acts as a shelterbelt and a filtration system. We take the stock out and then it is the grasses that hold the soil together because they're not grazed; otherwise the bank washes away.

Willows influence creek flow and cause heavy erosion on creek bends. (Photo: N. Fijn)

Corridors and springs

Paul and Natasha stop at a fenced a dam, where Paul has planted a corridor connecting with another, previously established corridor.

This is the year to join corridors, so that we have an area that shelters the stock and provides habitat for birds. There's a natural swamp that's sending water into the dam. We're in a dry period at the moment but the dam's still quite full and there's even water running out of the dam. We're now protecting that spring because if we allow stock to go in there all the time the stock will pug it up and wreck the quality of the water, so we've fenced it off and will plant trees above the swamp as a filtration system and the other corridor of trees as a windbreak. We're lucky to have springs seeping out of the hillside.

Next year we'll put in another corridor in the gully that is going up the hill in the distance. We're trying to link all the corridors together. I have a long-term plan over a number of years. I look at an aerial map and I see there are no trees in an area, so I plan corridors of vegetation.

Paul and Natasha drive to an adjoining tree corridor that will link with the newly established corridor that leads down to the dam.

This corridor has been in for about 18 years. [A wallaroo disappears into the trees.] You wouldn't see that wallaroo if these trees weren't here. We try to leave the old timber in amongst the trees. People sometimes think they're losing too much good grazing country and end up bringing the fences in too close. If you give the trees enough room, you get rewards in terms of the long-term investment in years down the track. It just takes patience to see the benefits.

Have there been instances where you thought you shouldn't have done something?

In the early days, for sure. We had trees in that row [Paul points to a row of trees in the distance] that didn't establish one year. What I'll do is go back there and replant eventually, but other projects have taken priority. The trees over there [he points to another block of vegetation], those plantings were a particular approach Landcare was promoting 15 to 20 years ago, based on having corridors with two layers of vegetation. Whichever way the prevailing wind was coming, the wind was meant to hit the shrubs first, the medium trees and then canopy trees towards the back. It's indicative of the different theories that came through Landcare. Now we plant more randomly in order to create a mosaic of habitat.

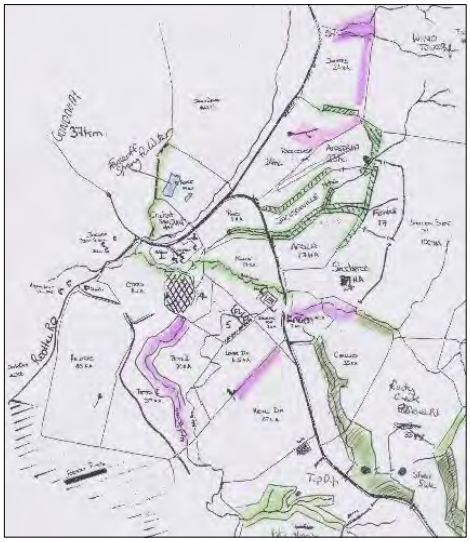
Newly ripped soil for tree plantings for the next project is visible at the right of the photo. A corridor with two layers of vegetation is prominent in the distance. (Photo: N. Fijn)

Paul Graham leaping from a well after cleaning out the weed that has accumulated. Note the long, ungrazed grass and wetland plants growing in the fenced-off area. (Photo: N. Fijn)

Paul and Natasha drive past a trough in a paddock, then up to a fenced off area up on a hill. Here, the grass is long and stock have been kept out of an area where there is a spring with a soak flowing down the hillside. The frogs are croaking loudly near the well that has been formed at the site of the natural spring.

I want to show my alternative water source. We put this in about 12 months ago. The water quality in the creek is beautiful now because it has been locked off from stock. We put a trough in down the hill on the flat. I fenced off a hectare and a half up on the hill here and you can see that the water is still seeping out from the side of the hill [even though NSW was currently experiencing drought]. We put a well where there's a spring then ran a poly-pipe down and it resulted in crystal clear water running into the trough down there for the stock. We don't even need a pump. This is a natural way of looking after a water source. Dams become pugged and the water becomes stagnant with faeces and urine in it. It's no good having stock in the river systems either. They not only spoil the water for humans but as an aquifer for the fish and other species. A pipe leading to a trough gives a nice fresh source of water and is much better for the environment.

Returning to the house, Paul highlights the projects he's undertaken, or is planning to undertake in future, on a sketch of the property that he uses for project planning.

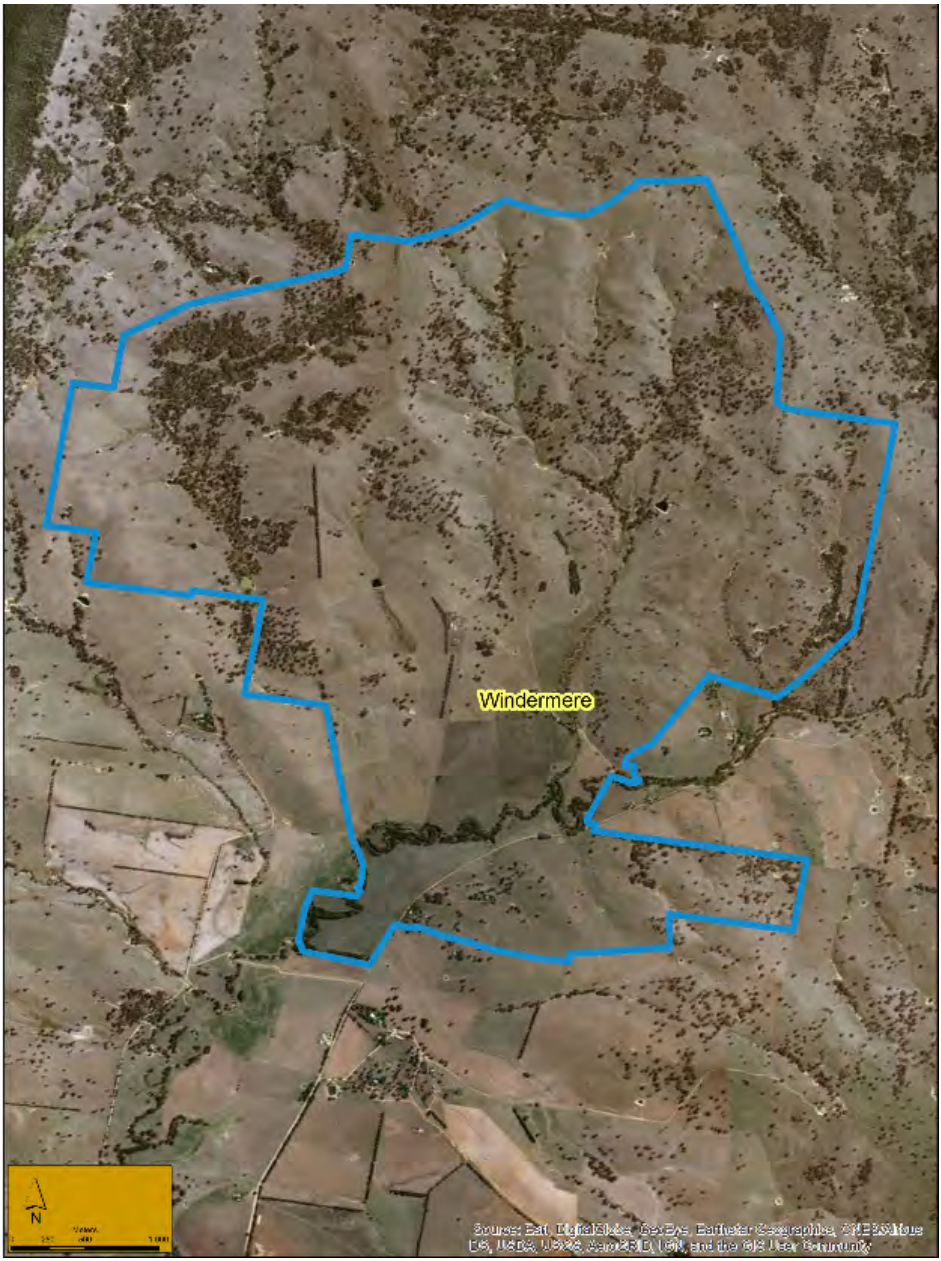


Above: Paul Graham highlighting the different tree corridor and dam restoration projects on a map of 'Bongongo'. (Photo: N. Fijn)

Left: Detail of the map in the picture above.
Purple: future plantings along riparian zones within next three years
Pink: current dam-corridor project
Green: past corridor plantings 2000-2017
Blue: the fenced off spring for fresh water.

I have these photographs up on my wall in the office because it forces me to make decisions early. It may look fine when it's all green, but I look at the photos when I'm on the phone and it makes me sell – so that I don't over-stock. The only parts of the landscape that were green during the Millennium Drought were the trees – so the trees were very good for my mental health.

'Bongongo' during drought in 2006. (Supplied by Paul and Rachel Graham)



Blue cadastral boundary of the 'Windermere' property. (Map produced by D. Florance)

The Johnson family: Regenerative grazing for healthy pastures

The Johnsons have experimented with different forms of mixed farming practices over the years. In 2002, when Sam and Claire took over the management of the Johnson family property at Murringo near Young in NSW, they had already experimented and worked out how to manage a smaller farm. They were ready to implement their ideas on a larger scale at 'Windermere'. Now their adult son Sid is on board, as the fourth generation on the 1500 hectare property. They have adopted a regenerative farming philosophy, based on reading books on holistic management by the Zimbabwean ecologist and pastoralist, Allan Savory. They rotate their stock frequently, often daily, with moveable fencing and changing paddock sizes.

At present they graze Angus cattle and heritage breed pigs but are about to reintroduce sheep, which were destocked during the Millennium Drought in the 2000s. They have established butchering and smoking facilities onsite, employing three additional full-time staff to assist with the planned grazing and butchering. Growing, butchering and selling pigs while establishing new marketing techniques were part of Sam and Claire's succession plan, in an attempt to make room for the next generation. They sell their prepared meat direct to customers online and at the farmers markets in Canberra, a two-hour drive away.

At 'Windermere', the Johnsons have implemented shelterbelts, riparian restoration, management and enhancement of native and mixed native pastures and management of wooded pastures. In particular, 'Windermere' provides a good example of management and enhancement of pastures and wooded pastures. Many of the improvements to the natural assets on the farm have been achieved largely through regenerative grazing management.

Driving through the gate into 'Windermere' farm there is a stand of beautiful ironbark trees with dark trunks. Natasha Fijn is accompanied by Mason Crane, the Senior Ecologist based in Gundagai for the Sustainable Farms project. They drive past a windmill and sheds, before reaching a classic long, low farmhouse with a wide front veranda. Through the front door, the kitchen is warm and welcoming with a big round table, evidently the social hub of the old house. Sam and Claire sit down over a cup of tea, while their son Sid ducks in and out occasionally, then leaves with three other workers to get on with moving the pigs for the day. The family are energetic, conveying a joint confidence about their farming philosophy.

Family history

Did you both grow up in farming families?

Claire: Yes we both did. I grew up at Coonamble, north of Dubbo, a bit more west than here. Trees wouldn't grow there, the few trees we had were along a little creek and up on a hill. There was a bit of cropping but mainly sheep and cattle with native grasses. It was actually a beautifully fertile place – there was no need for fertilizers, even when they were handing out free fertilizer. Now it is all cropped and the few trees that were there aren't there anymore. It's changed dramatically but it still has a beautiful view of the Warrumbungles.

Natasha: Was it quite a change adjusting to this landscape around here?

Claire: I was used to seeing in the distance and it took me a long while not to see that distance. The trees grow larger here, whereas the trees that grow there are quite stumpy. We're fortunate here to have undulating country because anywhere that's flat tends to get cropped.

Sam: This is my family home. My grandfather bought the place in 1923. The farm has shrunk quite a bit over the generations.

How did your grandfather first come to be here? How big was the property originally?

Sam: Originally about 6000 hectares with other leased land. My grandfather's father was involved in the wool trade, as buyers and scourers and he did quite well. This place was a wool growing property predominantly, merino sheep, with a few cattle on the lower flat country. We bought in the 1920s but it was already cleared, probably in the 1850s or 1860s after the gold rush around Young.

Why did you change to cattle?

After Claire and I married in 1985, we moved off the farm, mainly through my frustration with my father and his management. We had another small farm on the other side of Young where we were for fifteen years. It was far more intensive and we learnt direct marketing there, before farmers markets came along. We came back here in 2002 and I went into partnership with my father. We had sheep then but the big Millennium Drought came along, so we made the decision to sell all the sheep in about 2005. We had already learnt quite a bit about holistic

management and grazing strategies. We came back knowing what we could achieve, in terms of mobbing animals together and moving them.

What did your father think of these different kinds of management strategies?

Claire: In the end he was very good and open, although initially he wasn't. By the time we came back, he knew what we wanted to do in terms of grazing.

Sam: He had seen what we had been doing on a smaller farm. At that stage, we were trying to get ground cover back on the surface of the soil in order to effectively take advantage of any rainfall. We'd stopped sheep breeding and the wool market was terrible and so the numbers didn't stack up to run sheep.

Claire: You didn't like sheep either.

Sam: I'd grown up seeing what I had thought sheep had done to the country. I had been through dust storms and drought in the early 1980s. I thought sheep were the ones causing the damage to the soil and the amount of chemicals involved with sheep, with drenching and lice control. I had enough of all that.

Early tree plantings during a long drought, before regenerative grazing practices were implemented (1982). (Supplied by Sam and Claire Johnson)

Early tree planting

Mason: One thing we noticed coming up the driveway was that big row of ironbark trees. Are they 30 or 40 years old?

Sam: Yes, my mother planted them in the 1970s. The Forestry Commission used to give farms 25 free trees a year and she planted lots of trees. When she came here, there were not many trees around the house, so she planted a few around the garden and then expanded to planting elsewhere on the farm. Those ironbarks were some of the early plantings and they're lovely now. The ironbarks have done very well there because they usually end up being planted on a gravelly ridgeline.

Natasha: What about the trees along the creek?

Sam: We have done quite a lot of tree planting, starting with my Mum and when we came back in the early 1980s there was the start of Landcare and tree planting was popular. It was an initial conservation effort and a response to all the over-clearing that had been done. My mum and I planted several tree lots and then Claire and I fenced off areas along the creek. My brother did some. He and his wife were very keen on planting trees. Nowadays we're not planting as many because there's more natural regeneration with the change in grazing management.

Did your father engage in conservation management initiatives?

Unlike a lot of farmers, my father retained a lot of the native grasses on the country. In his early days, he tried some other grasses up on the hills but didn't have much luck, so he decided to use the native grasses and supplement with hay. We're gradually growing more native grass than we ever did.

Are there still active Landcare initiatives in this area that you subscribe to?

Claire: I think Landcare is too much about planting trees and fencing things off, rather than on the grazing. I keep thinking, 'All you need to read is the Alan Savory book and it's all in there'. He started the idea of holistic resource management.[6] I've just been reading his book for the third time and his ideas just blow my mind. We were part of a support network of farmers who participated in the Savory courses.

A line of ironbarks at the entrance to 'Windermere'. (Photo: N. Fijn)

Sam: A lot of theories have something to offer, whether it was early organic farming, or permaculture. Particularly from a grazing point of view, it was only Savory who was able to point out that the plants, animals and soil are one ecosystem and they all function together. His book was a real light bulb moment. I had come from a grazing farm and I had seen how bad the land had become.

So the principle is that you look after the soil and groundcover by moving the stock frequently?

Claire: It depends upon the recovery of the plant. The seasons are different, so in spring you try to move the stock through quite quickly to take the tops off, in order to keep the grass growing and to stop the vegetation going into senescence, while making the most of the sunlight. This time of year [winter] you're moving very slowly, taking the dead stalks off to prepare the ground for spring growth.

Trees along a riparian zone. Note that this photo is of pasture during winter and in the midst of a drought. (Photo: N. Fijn)

The impact of kangaroos

I had the impression that cattle were quite hard on the land with their hooves.

Sam: I think that's a myth.

Claire: Every time you move the cattle, you observe what their footprints have been doing. Nothing is hard on the land – it's the management that's the problem. Basically, it's a matter of the timing, of when the animals are trampling the ground and when they're not. We have daily moves, so the plants are with the animals for a day and then there's no disturbance for 89 or more days. If you're trying to get biomass back into the system, cattle are really good at smashing the grass down.

Mason: What are your thoughts in relation to the terrestrial ecology – the birds, marsupials and reptiles – do you think regenerative grazing will look after everything?

Claire: I think it will. What we can't figure out is where kangaroos should fit into the ecosystem. We've had to put up a kangaroo fence to stop them from coming onto our pasture. We sold the land to National Parks in 2008. It's never had livestock on it and now it's bare. It looks shocking.

Sam: We were forced to put up an exclusion fence, which we didn't want to do because it was very expensive. They were eating out the back half of our place. It's five foot high with electric fencing and we've had to cull the kangaroos we caught on our side. It's taken us a year to reduce the number to where we can get the grasses growing again. No one really takes any responsibility for the kangaroos.

Mason: The kangaroos do have a big impact. There are no predators around here anymore. What do you think about farming or harvesting kangaroos?

Sam: Around here kangaroos are thriving. I often thought it would be nice to have harvested kangaroo on the menu but the demand is not there from the consumer. The social attitude is a disaster on the land. National Parks are not allowed to harvest, or cull, or manage them, so as a result they're degrading the landscape. It's not a case of kangaroos, or no kangaroos, but in managing them.

Natasha: You mentioned that land was sold to National Parks. What was the reasoning behind that?

Sam: My family sold that as a succession plan, as inter-generational transfer. National Parks was interested in it, so we sold about 1000 hectares to them. I was keen not to have more flogged-out sheep country and to increase biodiversity, but until they can manage the kangaroos it's become worse and increasingly degraded. I drove out there recently and felt sad about what has happened to the land. The actions of National Parks in spraying their increasing weed burden is an example of treating the symptom rather than dealing with the underlying cause, which is the overgrazing of the grassland by kangaroos.

Wallaby in the long grass. (Supplied by Sid Johnson)

Mason: Some of the smaller birds and reptiles can't handle the heavy traffic of frequent grazing. I am wondering whether the method could be tweaked to better accommodate burrowing marsupials?

Claire: If you're aware of a species then electric fencing can allow you to miss a bit of pasture. There are times when we leave a section, for the quail for instance, so that there's some tall, dead grass for them to escape into. You don't want your place looking like a bowling green, as it needs variation. With normal set grazing patterns you have country that never sees an animal and then you've got country that's been nibbled away at all the time – the grass either has partial rest or no rest at all.

Sam: A few people may see the degree of disturbance from the pigs and disapprove, as farmers like to be able to drive everywhere over a smooth paddock. From the point-of-view of growing grass, however, the disturbance from the pigs does mean that there is more variation in the topography with more wind protection. I think the disturbance is good, as long as it's not continuous, or repeated too soon. It's not like someone cropping 100 hectares of the same monoculture. If the pigs are in a paddock, there will be intense impact in a small area, so there's a lot more variation in the landscape.

The next generation

Did your children go to the local school?

Claire: We have a son and two daughters and they all went to the local high school and then went to The Australian National University. Molly, our youngest, went through the Fenner School [of Environment and Society], while Sid and Annabel studied law. Sid and Annabelle went to Sydney. Sid said 'no more' to Sydney and came back here.

Were you pleased?

Sam: Surprised.

Claire: It was Easter and I said, 'Sam and I can see ourselves here for another ten years but no longer than that. If there's no one else here, we'll have to sell the place.' I don't know whether that sowed any seeds in his mind but he was getting

pretty disgruntled and then one day he just turned up, so that was great. He's been here four years now.

How do you think your practices differ between generations?

Claire: My father came visiting quite often when we first came here and he really regretted not knowing about all the newer grazing methods. He loved the new ideas, yet he was a set-stocker [grazed over a long period of time] and I don't know how he didn't kill himself with all the chemicals. He was very traditional but he really embraced what we were doing here.

Sid has read Alan Savory's book a couple of times and has certainly embraced his grazing methods. He wouldn't be farming now if we were traditional farmers.

Sam: Sid has the same principles as we do. I think he accepts the knowledge that goes with regenerative farming, so I don't think he'll need to repeat past mistakes to learn the ecological lessons. He won't go down the path of set-stocking. There is also a push from the consumer side that wasn't there previously.

Now that Sid is taking over the management, is he the one wanting to graze sheep again?

Sam: Sid and Claire are driving bringing the sheep back. I said to Sid, 'I'm not really that interested in running sheep. If you want to do it then go for it, but don't think that I'm going to get excited by it'. Although I am actually getting a bit excited because we're integrating them as another species. After we took the sheep off, we had recruitment of sweet briars. The sheep were controlling the briars as seedlings. At a certain level the briars are actually quite good for providing an intermediate layer of vegetation in the grazed landscape but the sheep will now control further spread of the weed. I would be interested in running goats too. A multispecies aspect is good because they each bring something different to the landscape. We're learning to integrate them back in with the cattle because we want to graze them all together, otherwise it'll make too much work for ourselves. The cattle are good for bashing the tall grass down, which allows better access for the sheep.

Sam (standing), Claire (with Kelpie) and Sid Johnson. (Photo: N. Fijn)

Workers on the property

How do you designate your different roles in terms of what to do on the property?

Claire: Sid's the manager but he's really only taken on that role in the last six months. He wasn't interested in the land here when he was a child, so he had a lot of learning to do, but then he's done a lot of work in marketing and has strengths there. I take care of the management of the animals in that I'll do the grazing charts and oversee the pig mating then I'll pass that information on to him about what needs to happen. Sam does maintenance or bigger projects, for instance, there's another water system going in and there's more building to do. Each Tuesday we have a meeting down at the shed with the three other people that work here full time. We figure out what's happening for the week but Sid is now designating the jobs for the workers.

Mason: So there are three workers in addition to you three working full time?

Sam: Butchery days there are seven of us working here.

Claire: Sam and I are trying to step away. One of the great failings is the [older] generation don't step away; everyone's micro-managing and it just makes people cross. As long as we have a role, that's great. We'll always be living here but if we need to butt out, then we have to just butt out.

Sam: Sid was interested in coming back but we didn't have to step aside immediately in order for him to be supported by the farm because it had developed to a stage where there was an income here. One of our aims was to support incomes for our children, while supporting ourselves at the same time. That's when some farms get into trouble when there is only one income and the parent has to step away to allow income for the next generation.

Mason: It's a credit to you both to be able to employ that many people on the farm.

Claire: That's one of the aspects we feel is important: to give people employment. We've been lucky to be in our position, so we've got to share it. That's one of the failings of some other farmers who have got rid of a lot of labour on the land. They see it as not making a profit but I think it's very unfortunate.

Sam's father felt having people here was important. When we first moved here, we didn't employ other people. I think Sam's father was disappointed about that at the time, so it's good that we've changed our approach. We can only employ other people because we sell directly to the market, if we were selling to the commodity market we couldn't employ other people. Doing the processing and marketing allowed us to have other incomes: instead of paying the butcher we became the butcher, instead of paying the marketer we became the marketer and kept the income onsite.

Natasha: Is it hard to get young people to work on the farm?

It hasn't been that easy to find people that would suit what we do. The paddock-to-plate concept has meant that young people think, 'I could get involved in that'. There's the positive method coming out of regenerative agriculture that wouldn't otherwise be in farming. They like the idea of getting out of the city but often just don't know how to go about it. Without a family background in farming it's a

pretty big learning curve. We're pleasantly surprised that we're able to generate these salaries. Once the workers become skilled up, it takes the pressure off us and we can share the load a bit more. If farmers got rid of the labour then there would be no one left in rural towns.

Farming free-ranging pigs

So do you have pigs and cattle now?

Sam: Yes, pigs and cattle but we're starting back with having sheep again. We've just bought some pregnant ewes and the first lambs will be born by the end of the year. It's only a small mob at the moment because we are experimenting with how the stock will work together. It's good to start small.

Free-roaming pig, shelter and windmill with tree corridor behind. (Photo: N. Fijn)

When did you start farming the pigs?

Sam: We bought pigs in 2010 and started selling them in 2012.

Claire: Prior to that we were in the commodity market trading cattle but it wasn't really what we wanted to do. We didn't want to raise lovely animals and then sell them off to feedlots.

Sam: When we decided to go back into direct marketing on this property, our first step was to produce pigs because we knew from past experience that pigs would be

a good animal to build our brand, as a form of produce. Free-range pigs are chalk-and-cheese in comparison to intensive pigs, so our product really stands out, whereas a lot of cattle in Australia are finished on grass [not fattened in feedlots]. In many respects it was pork that got the *Boxgum Grazing* brand out there and then we added the beef afterwards. With the pork, it was easier to differentiate our business from other commercial ventures. For the first three years we used a local butcher in Young to cut up our beef and pork. The butchery here was built in 2015 when Sid returned to the farm. Without his return to the farm we probably wouldn't have proceeded with the butchery.

Claire: One other aspect is that we have the pigs for the different effects they have on the ground. When we just had cattle (and kangaroos) we felt like we had come to a bit of a standstill in relation to grazing improvement. The pigs improve the microbial biodiversity of the soil because they produce a different kind of manure, and it's the same with the newly introduced sheep. I think now that Sid's managing the place, it's not going to stop there, because he's been thinking about chickens and goats. Each animal brings in a different kind of manure. As a business, the pigs are the least sustainable, in the sense that you have to tap into the grain industry with the supplemental feed. The cattle and sheep can just subsist on grass, sunlight and rain, which down the track may become a significant factor, the way the grain industry is heading.

How do the pigs forage differently on the pasture?

They have a high capacity for disturbing the soil and they're bringing in nutrients through the supplementary feed in their dung. Part of the beauty of bunching animals and moving them is that they're not living on their own dung and you're not asking them to stay on that pasture and being repeatedly exposed to pathogens. With the intensive industry, they move animals into a situation that is unhealthy, then they spend their whole time trying to keep the animals alive through medication, but they don't change the unhealthy situation. The antibiotic use in the intensive industry is phenomenal but the pigs are unhygienic and living in their own muck. That's why we move the pigs and because the disturbance is good on the ground. The mob as a whole is very healthy and they're not degrading the land.

Mason: Do you use drench? Or vaccines?

Claire: No, we haven't used them for the last few years. Our neighbour has an intensive piggery. When we first started with the pigs they said 'Use our pigs because if you bring new pigs onto the land, you'll bring diseases and shut us down', so we did take on their pigs, straight out of the piggery. We moved away from those pigs because we didn't like their carcasses and they didn't have as much vigour as our black pigs have now. But they were still performing. We were bringing pigs straight out of an intensive piggery, putting them in a paddock and they were fine. All they needed was a good environment to live in. We tend to go in with the opinion that we haven't got everything worked out, it may not work as we thought it might work, but we can just make changes and it will work in the end.

Pig amongst a diversity of grasses. (Supplied by Sid Johnson)

Moving the pigs

Sam and Natasha go to observe the free-ranging pigs being moved to new pasture. Sid and three other workers drag portable shelters, supplementary feed boxes and lift water tanks by tractor to a new grazing paddock that has just been cordoned off with electric fencing. The lively pigs are called over to the new area. They run over and begin noisily foraging together as a group, burrowing into the soil with their snouts.[7]

Sow with her piglet. (Supplied by Sid Johnson)

Natasha: I guess the pigs would have taken a bit of trial-and-error, knowing when to move them, within the restorative grazing system.

Sam: We had the principles that we brought across from grazing cattle: bunching and moving, it's the same principle. We knew that we didn't want the pigs to remain in a set area, like some pig farms are, so everything has to be portable.

Mason: How many different litters do you have in there – there seems to be a variation in sizes?

Sam: Probably about four litters because we usually have about six weeks variation between the youngest and oldest. We need to stagger the selling of our pigs as we sell directly to markets on a weekly basis, so need an ongoing supply of meat. About 50 piglets is a nice number to run in a team. There are four groups, so about 200 piglets at any one time.

Sam pointing out where the pigs had been grazing beneath the scattered trees. (Photo: N. Fijn)

Natasha: Do they use the shelters [small sheds] much?

It's their shelter in bad weather but then in summer we'll give them a wet area under a shade house, or we put them in amongst the trees. Once you have 40 to 50 pigs in the shelters, they become toasty and warm, so they're fine with the cold and frost.

Do they consume the weeds?

Yeah, but they particularly like high protein grasses. Once the annuals grow up a bit more, they'll get into that. We supplementary feed all the time, so that they have enough feed. The pigs will come through this area again in about 18 months but we try to not repeat the grazing at the same time each year.

Pigs foraging in the grass, with tree corridor in the background. (Photo: N. Fijn)

Grazing strategies

Sam: In 2003 it was very dry, part of the Millennium Drought. We started to split the country up and change our grazing patterns as soon as we came back here in 2002. There were dust storms coming off the neighbouring paddocks but dust wasn't forming on this side of the fence with the better ground cover [refer to photographs below]. It was fantastic to see the grass species returning once we had stopped overgrazing the pasture. We took the photographs because we were pleased with how lovely it was that all the native perennials had started to appear.

Early positive results from the change to regenerative grazing practices, with bare-looking hillsides in the background. (Supplied by Sam and Claire Johnson)

Comparing the neighbour's paddock on the left with the Johnson's paddock on the right. (Supplied by Sam and Claire Johnson)

Do you try to promote native grasses?

We no longer need to plant grasses but shift the species by changing the management of the livestock. We don't specifically focus on any particular species of grass but rather the functioning of the landscape. Whatever comes up is what we have to work with. Most peoples' approach would be to spray weeds, like

Paterson's curse, but we never did any of that and we don't have any Paterson's curse on the flats now. We try to improve the condition of the surface of the soil instead.

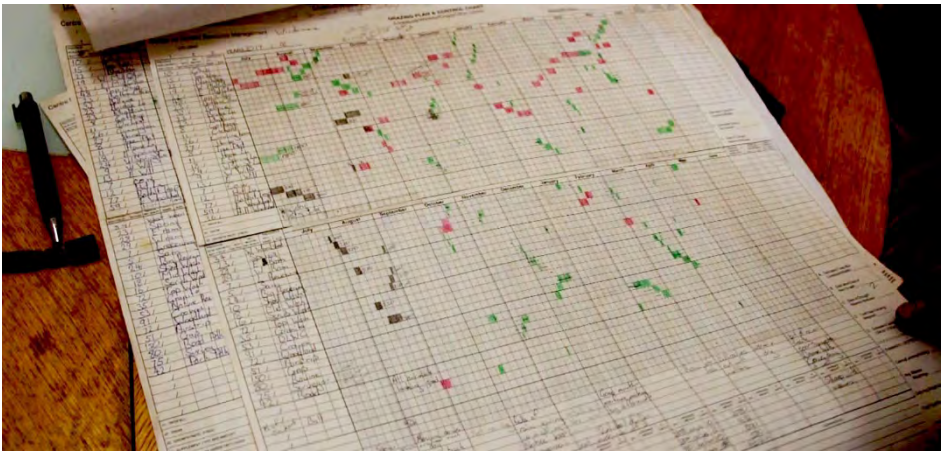
Is soil an important factor with your approach to grazing?

Once you have the soil covered and you're feeding the soil with plant matter and plant roots, keeping the microbial life intact, the whole biological activity in the soil comes to life again. You can spend a lot of money running around with fertilizers, but you may as well work with the grass species you've got and let them develop. Other species then come in as the structure of the topsoil and its ability to absorb and hold rainfall improves.

Grazing charts

Sam pulls out charts with highlighted squares.

Claire has always managed the grazing. We know how much forage is being taken off an area at all times. It's not just hit-and-miss. The different mobs are colour-coded and then they're allocated into different paddocks. We can go back to other years and when they've been in each specific area. We plan out how much feed we think we have and record once the stock have been in each area. People are very prone to routines, so it's a method to deliberately stop ourselves from becoming too routine-bound. Other farmers tend to apply the same rotations year-after-year.



A detailed spreadsheet of the movement of livestock to different pasture. (Photo: N. Fijn)

How much selection do the animals themselves have?

The animals are at reasonable density, so they do tend to graze a little more non-selectively than they otherwise would. They graze all the plants, rather than favouring one species. If the animals are allowed to select too much, it can be a negative factor on the plants because certain species can become overgrazed and then, once grazed, it is the re-growth that is sweet and so an animal will tend to favour the plant repeatedly. It means that individual plants become knocked out of the environment and you lose diversity through the selective grazing. No plant can tolerate over-grazing beyond a certain point. In Europe with a more benign climate, you can get away with grazing plants right down to the ground more than in the variable climate that you get here. We really need to control the amount of exposure the plants get to the grazing of the animals here in Australia. Grazing animals are good for grasses up to a certain point, but then after that they're detrimental.

Rainfall and drought

Is much of the battle having enough water?

No, not really. We knew when we came back here that because a lot of the land was non-arable and had never been cropped, there was a reservoir of native perennials, which would work quite well – not terrifically fertile and productive but good for our situation. That was what attracted us to farming this land. We knew that going into old cropping land and trying to re-establish grasslands would be a lot harder. The rain is pretty good here, as there's not heavy seasonality in the rains. You get scattered rain pretty much throughout the year.

If we are heading into a long-term drought now, will you change your strategy?

You never know you're going into a drought until you're in it. We try to plan well ahead, four to five months ahead. If you get to a situation where you've got a lot of animals and no feed, you've been asleep at the wheel. If we look as though we're going into a drought then we respond straight away by de-stocking.

Do you have areas in reserve, or containment areas?

We don't set aside specific areas for drought, we set aside time. If you thought you had feed to carry yourself forward for six months but then the likelihood of rain

diminished, at that point you'd start running out of feed. In order to avoid that, you've got to either bunch mobs together or reduce numbers, so that the new reduced numbers can get through the feed slower.

Our haystack is on the paddock – we don't cut any hay at all. We make use of effective rainfall. If you're getting rain but not growing grass on the ground, because you don't have the species, or you have bare soil, runoff, evaporation, then you're not making use of the rainfall. If the land only responds in spring because all you have are winter-active grasses, then you're planning for a more benign climate than we have here. In a highly variable climate you must have a mix of species, both for the cool and warm seasons, in order to capture any rainfall throughout the year and turn it into green grass. Here, we're quite fortunate in New South Wales, we average 40 to 50mm a month, or 650mm a year, so that means we should be able to grow grass at any time. We had good rainfall in November and more rainfall in February, so those two events allowed us to grow enough grass on that amount of rainfall. Whereas, other people, two days after some rain, they're blowing dust.

What strategies did your father employ previously?

He cut hay and stored it. We would spend all summer cutting and carving hay. For about 100 years the lower paddocks were cut for hay. Local people still can't believe we're not growing lucerne. It was force of habit. I thought if we had produced such a bare landscape during the 1982 drought then it was nothing to be proud of. That affected me greatly. The problem here wasn't the animals but it was the way they were managed. To cut hay is an extraordinarily expensive way of farming. Many people are still beguiled by a paddock of green lucerne but if you look directly down into the paddock, it's bare and doesn't produce as much feed as you think.

Between 2002 and 2010 there was a series of years of very low rainfall [during the Millennium Drought]. We were able to get great feedback from other [holistic management] people and we were able to support each other. We were all experimenting with new ideas and it meant that we weren't on our own. The rest of the rural community were very depressed and not being very proactive. We went on farm visits and did some training up in northern NSW. We feel like holistic farm management has withstood the test of time and is still one of the

most positive and practical systems out there. It gives managers control and understanding of what is happening in the environment. The mindset is that you're responsible for what is happening on the land, so there's no blaming anyone else, like the government, or banks, or whatever. If you've ended up in a bad spot then it's the management decisions you've made along the way.

Other independent advice is hard to find because most consultants work for agribusinesses that make their money through selling their products. They have a fundamental conflict of interest, as they are employed to sell their product. This leads to a deficit in original thinking and a lack of interest in ecology.

Pigs resting in the shade of a gum tree. (Supplied by Box Gum Grazing)

Succession

Was there any conflict with siblings over who would take over the land?

They say that families split up land quicker than anyone. Claire and I moved away and then my brother took over management with my father, who was semi-retired. There was a blow-up about succession, but every generation goes through that, unfortunately. I was about to re-train to become a teacher but I ended up staying on the farm. We leased the place and my siblings eventually wanted out, so that's part of the reason why we sold some of the land to National Parks.

It is hard that the value is tied up in the asset of the land but I really don't see a way out of it. That's part of the reason why we have intensified the land use, so that we can generate more income from it by doing the marketing and processing. The real estate value of the land is beyond the productive capacity of the land. It's a problem because the land then becomes an issue between the generations and between siblings but it's also the family home – there's emotional connection. There's no easy way of solving the problem, to be fair and equal. The children gravitate back to the farm. There may be a livelihood, but if the farm were not there then they may be more likely to have a career independent of their family. There's no template with how to deal with succession.

Sometimes the ancestors can rule you. With new knowledge you don't want to be heeding what the ancestors did. When we first came back we had a lot of old photos of the ancestors on the walls but we took them down because it felt heavy-handed beyond a certain point. We popped them back in the cupboard and said 'You've had your turn'. They were just doing the best they could at the time but I think it's much better to look forward. We're part of a broader movement now.

Moving the cattle

Sam and Natasha watch Sid and a couple of other workers moving the weaners.

These younger cattle need as much protein as they can get. We also have a small group of about forty, the ones that we are drawing from for market. They're given favourable treatment – a big area with no pressure. They graze through quickly and take the tops off, like licking ice cream. We push the cows to graze the older grass, they don't need condition at this stage but once they drop the calves, they will have to be in better condition.

Have you planted the large, scattered canopy trees in these paddocks?

We planted little clumps that are easy to fence off. In more productive areas, where we didn't want to take out too much pasture, we put in individual scattered trees to provide shade. We try to create some habitat and shade throughout the paddock to retain an open woodland structure. I like the fact that we can have open woodland, plus an agricultural business within the ecosystem. Previously, we planted too densely and ended up with a lot of bare soil underneath. I look at the lines of trees now and feel the plantings were too dense and wish they had been spread across the landscape more, but then you wouldn't want only scattered trees and no clumps either. We do need some clumps for the bird species.

Initially when you plant a tree on bare land, you think 'Is this just a waste of time?' but then I've learnt that you need to envisage what it's going to look like in 200 years time. It would look fantastic. I see that as a nice legacy and hope it will inspire someone on this land in generations to come. I think it's showing a shift in philosophy that you're willing to invest in something in the long-term.

The butchery and direct marketing

At the butchery, which is near the house, everything is white or metallic, sanitized and clean. Huge tubs are used to brine sides of bacon in a mix of water, salt and brown sugar. Claire is lifting legs of ham out of the smoking oven and onto hooks to cool. Large carcasses hang from hooks in the cool room.

How many varieties do you have in the markets?

Fresh cuts of pork, beef, bacon and smoked ham. A café takes the whole legs. We provide picnic hams, slice some for the markets and some for cafes. If we have any sausages left over from the markets then we freeze them and give them away to the food recyclers in Young and they give them to food charities. We give away sausages at the local school, or in the village for local fundraisers. It's just like a butcher's shop really.

How did you start direct marketing here?

Sam: We started direct marketing again in 2012 and used a local butcher for perhaps three years. We then built the butchery and skilled ourselves up.

Claire Johnson taking ham out of the smoking oven. (Photo: N. Fijn)

The farmers markets in Canberra seem to be a positive aspect, as the public feel like they're buying locally.

Sam: It's a good situation in that it brings together people that are interested to know where their food comes from. Rather than having to go out and find the producer, 5000 to 6000 people come by our stall on a Saturday morning. When we were direct marketing prior to the farmers markets, we built our own networks by word-of-mouth, which was also effective but it's not the same as being available to that many people.

Claire: The markets are great because they do put you in front of all those people but it's asking people to turn up every week. There are some very loyal people – it can be terrible weather and they still turn up. We want to use the internet to place

goods at peoples' doors. More and more products are coming through the post and landing at peoples' doorsteps, so we're trying to plug into that.

With the internet, people have paid for the product before they receive it. We used to drop off a box of chickens but we'd need the person to be inside with the money. It would take us forever to do the deliveries, now it is already paid for and all boxed up. The boxes have a woollen lining, so that it's got a [shelf] life outside and we can leave it at the door, or wherever they've asked us to leave it when they ordered online. All we've got to do is get people engaged and away it'll go.

Part of what we do is the farming experience with open days [and demonstration days]. We put out a weekly newsletter about what's been happening, or what native birds are around. We're trying to connect people to their food.

Sid, are you involved more of the marketing side of things?

Sid: Well, there's no farm-specific marketing skills, it's just marketing. You have to know what people want to hear about farming though. You have to leverage the asset out of the farm. I do the marketing through a website, a blog, Instagram, Facebook, a newsletter, all that sort of thing.[8]

Claire: At the moment we have a weekly newsletter and we put up a photo. I write it then Sid re-writes it.

Sid: You can't just expect people to buy produce – you need to be able to say why the product is better than other peoples'. Traditionally, you just sold the product to the commodity market but if you're selling direct to customers, you can't expect it to work without marketing.

Claire: I quite enjoy selling and interacting with the public. That was the part I missed when we came back to the farm here initially and were back in the commodity market.

Often you don't know where products are coming from overseas. I can see where there would be a demand for produce direct from the farmer, if people know where the meat is coming from.

Claire: Absolutely, we get quite a lot of people wanting to educate their children at the farmers markets, so that the kids know the source of their food.

Sid: It works both ways, if farmers have to sell based on what they're producing then they'll produce to a higher standard. If you sell it to an agent and the animal ends up at a feedlot then you don't care as much about what the product looks like.

Sam: The big guys, like with the free-range eggs, have started to direct market in the same way saying, 'This is the grower we're using', but it becomes marketing spin. The authenticity is the element that they can't replicate, so that's our strong point. People want to know more, so the farmers markets are good in that respect because it puts us in front of people that are interested in buying direct from the producer, whereas when we first started we had to build the network from scratch.

The EPIC farmers market

It is 7:30am at the large Capital Region Farmers Market at Exhibition Park in Canberra (EPIC). It is Sid's week to come in and sell the meat produce at the markets. He has his cousin and a friend helping with serving the steady stream of customers. He chats to Natasha while turning sausages, which he is cooking up as meat samples for passers-by.

Do you stay in Canberra for the night, or do you drive from the property?

I stay here but Mum and Dad drive over. It's not so bad, I got up at 5am this morning, but Mum's an early riser and she'll get up at 2:30am to come here, which really is no one's definition of morning! We each only work one market day every three weeks, so that makes a difference. This is the busiest time now, between 7:30 and 8:30am in the morning. The market officially opens at 7:30am but then you get people coming earlier.

How are you going with the drought?

We'll be okay. A lot of the talk [in the media] about drought annoys me at the moment because no one is talking about the shitty management of the land and long-term thinking. Farmers tend to be a conservative bunch. Most people need hay in a good year but if it's a bad year then they're in trouble. The old ideas are pretty entrenched. It is changing, particularly with vegetable growing, with a lot of younger people coming into the market. You can get an acre block and grow a lot of veggies and make a decent living. Old ideas about cropping are far more entrenched. Hardly anyone wouldn't use chemicals for cropping – that's why organic grains are so expensive.

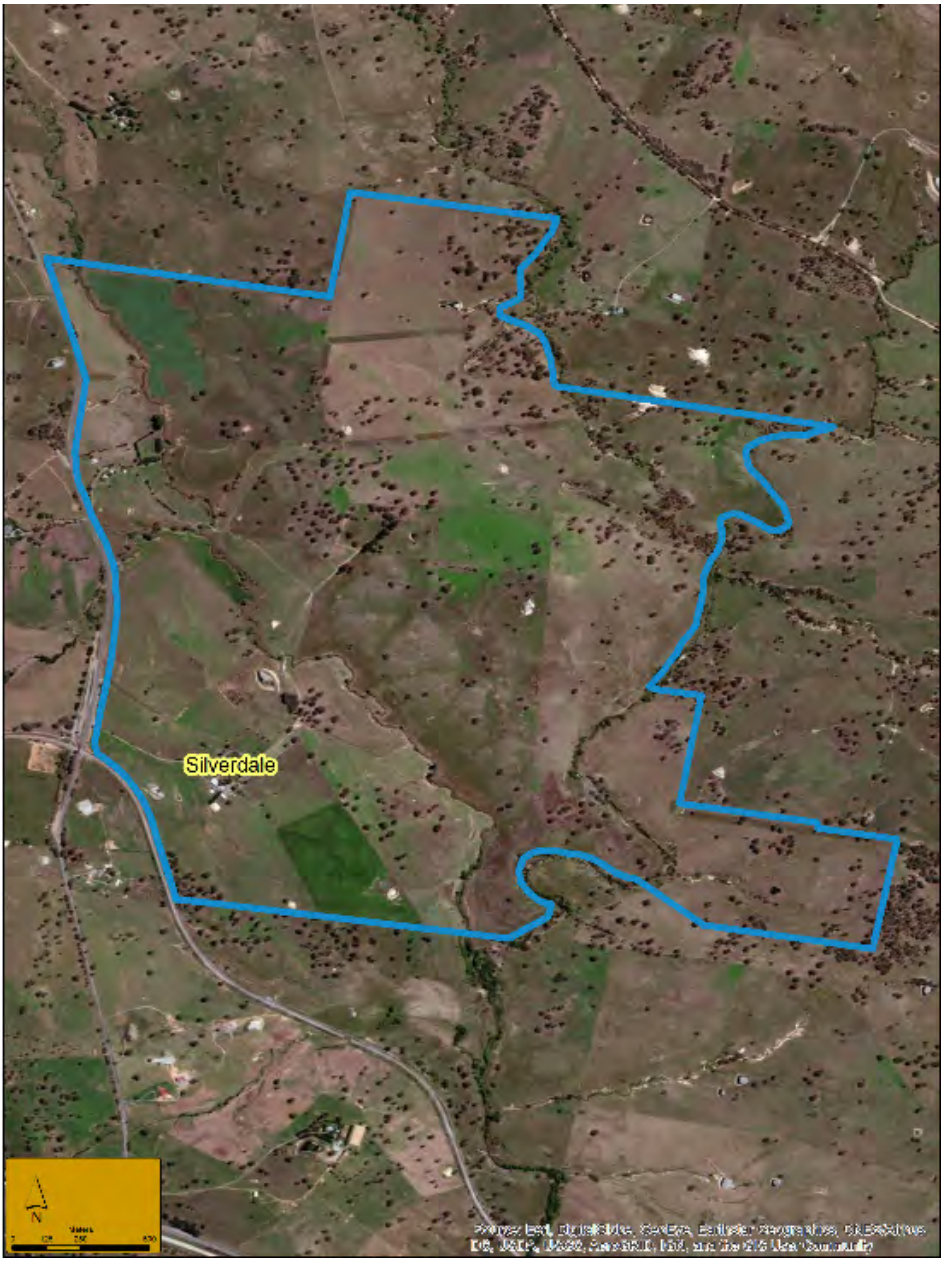
Sid Johnson checking the meat products, selling direct to the customers at the EPIC markets. (Photo: N. Fijn)

Do you enjoy this side of the business?

It is quite enjoyable actually. I don't look forward to it the night before I have to get up early. I've been doing it for four years now. Our internet deliveries are slower, but then we haven't done too much marketing on that front yet. We're looking to put some produce in wholefood stores soon too.

What are your marketing plans for the future?

It depends how things take off. I think the farmers markets have a natural ceiling because only a certain number of people walk through the markets. We'll keep coming here because it is a great outlet but we can't just keep doing this. I think it will be in the deliveries directly to the customers, or going through the stores, but we're not sure how that will go just yet.



Blue cadastral boundary of the 'Silverdale' property. (Map produced by D. Florance)

Bimbi and Kim Turner: Nurturing animals and the land

Bimbi and Kim Turner live on a 1020-acre property, 'Silverdale' near Yass. While, bringing up two children, Bimbi worked both as a sheep grazier and a Mothercraft nurse, and her husband Kim worked for what is now the Local Land Services. Kim later moved into local government and is currently a councillor within the Yass Valley. More recently, they have intended to scale back their responsibilities, but both still lead busy lives, including opening up their extensive garden to the public for charity functions.

Bimbi grew up on a sheep and cattle property and rode horses to check on the sheep from an early age. Her nephew now manages the sheep, but she still observes how they are faring, while out riding with her sister. She and Kim also work hard to combat weeds and feral animals on their property. They initially bought the property next door but moved into the old homestead on 'Silverdale' 12 years ago, while their daughter has since moved with her family onto the property next door. Now Bimbi has the opportunity to pass on her love of the land, the sheep and horses to her grandchildren. On her frequent excursions into the paddocks, she often takes binoculars to watch wedge-tailed eagles in their nest.

Since 2002, 'Silverdale' has been part of the long-term Box Gum Grassy Woodland Monitoring Project, research in conjunction with the ANU and Landcare. Bimbi and Kim have planted corridors of trees and revegetated erosion gullies but have also set aside a stewardship paddock, which is monitored by the ANU ecology team for biodiversity, so that the area can be compared with an adjacent set-stocked control paddock that is more heavily grazed.

The Turners have planted shelterbelts to reduce livestock exposure across the farm, and have also worked on enhancing their farm dams. Riparian and gully erosion has been controlled through livestock management and passive regeneration of vegetation in specific areas. 'Silverdale' is part of a grazing study that investigates the effects of different grazing regimes on farm biodiversity.

Natasha Fijn and Michelle Young, Director of the Sustainable Farms project, drive off the highway and turn onto a driveway with a sign for 'Silverdale'. The driveway winds through the house garden. In the midst of a downpour they hurry under a trellised entranceway covered with wisteria. Inside the 160-year-old house, old photographs and paintings line the walls in the hallway. Natasha and Michelle sit down with Bimbi and Kim in the comfortable kitchen.

The classic Australian homestead with a wide veranda at 'Silverdale'. Note the young trees near a dam in the foreground and an older stand of canopy trees to the left. (Photo: N. Fijn)

'Silverdale'

Bimbi: We graze sheep here. My nephew runs the property now, but he has only been doing that in the last two years. He leases it and runs it very well. We still own it and we still do the shearing. Kim and I manage the weeds and the feral animals. We lived on the property across the road, and moved here twelve years ago. We've had the property for 18 years. We've practiced farming very differently from the previous owners, who just didn't move with the times I suppose. We used to move sheep across the road from one property to another but the road became busier and busier and we used to have to get the police out every time – drivers were ignoring warning signs and driving straight through the mobs of sheep.

This area is what we call a safe area for rainfall. I think this valley is one of the best properties in the Yass district, as far as the fertility of the soil. Yass is considered to be one of the better areas to graze. We consider ourselves graziers not farmers, because we graze animals, we don't farm crops.

Kim: This is an interesting part of the world because it's where the limestone country, the original Great Barrier Reef, meets the volcanic country. This side is

red soil, that side is limestone, so we're on the cusp. We've got the benefit of the underground water from the limestone, which is crystal clear and delicious.

Bimbi: We have eroding limestone banks full of fossils. International palaeontologists come here and a professor from the university used to bring students out to look at the fossils. A company has approached us three times to open it up for mining, and each time we have said 'no'.

I call it God's little valley, but we digress. My father came from the Riverina to this area in the 1920s, and I grew up 20 km from here in the Burrinjuck hills – different topography, but good grazing country. Dad always said that this was the best area. After we'd looked at the property across the road and when we were looking to buy, Dad rang me and said, 'What did you think of it?' I said, 'Oh Dad, the fences are falling down. I wouldn't even be able to cook a dog's meal in that kitchen. The woolshed is too small, you'd have to stand outside to throw fleece'. He said, 'For goodness sake, you don't farm the house, it's the best dirt, just buy it.' He was quite emphatic and of course he was right.

Kim: This is one of the best bits of dirt in Yass.

Bimbi: We did buy next door, and we haven't looked back.

Bimbi Turner sitting at the kitchen table with maps of 'Silverdale'. (Photo: N. Fijn)

Succession

As an adult, I only really had two arguments with my father. He had a good-sized property and there were three of us. I said, 'Dad, I would really love to have part of the family home because it's a beautiful property' and he said, 'Well, you're not having any of it.' My father was a very prim and proper man but I stood there and replied, 'Just because I'm not a boy Dad, doesn't mean I don't love the land' but he couldn't see it. I added, 'Well hang on Dad, who was with you growing up in the sheep yards, riding around on horseback and doing the rabbiting?'

When I left school, before I went and did my training as a Mothercraft nurse, I always worked with dad. He'd temporarily forgotten that his sister ran the property when he was away during the Second World War. During the war, a lot of sisters or wives took over the running of properties but as soon as the brothers or husbands came back, the women were back to the kitchen.

Natasha: Was part of your father's reasoning related to dividing up the land?

If he'd divided it three ways there wasn't a living for three separate families, but we had that conversation because he still had the mentality of, why would a girl want it? By the time he'd seen me running our first property for a while, he actually understood where I was coming from. He was never a man who dished out bouquets, but I think in a way he was proud of what I was attempting to do. He would call to say, 'Do you need help?' or 'We're getting rid of this piece of machinery, do you need it?' I accept now that that's the way it is – splitting up the property three ways wouldn't have made it viable for anyone. We love it here and can still visit where I grew up any time. I am always grateful for the advice and support I received from my father and brother over the years.

That seems part of the problem with succession is that land does get divided up, making the land less productive, or biodiverse, so it is complex.

I've seen properties divided up because the sisters want their financial share every year, drought or no drought, and the surviving one can't do it. I would rather have happy families. Kim and I worked hard, but then when my mum died it gave me the ability to buy this property next door.

Kim went through a stage of wanting to sell up and move into town for retirement, and I said, 'That's not happening.' We need to keep swinging some

gates and spraying some weeds, it keeps us going. The number of graziers who retire to the coast with their purpose in life gone and drop dead six months later. We're lucky that our son wanted to stay here, and then it's gone full circle and it's now our daughter who is here.

When we were just about to sell the block up the top, which my daughter now lives on, one of the agents we were using was about to list the farm to sell to overseas investors. I walked in to his office and said, 'I'm taking it off the books.' Fortunately our daughter bought it, as it's really important to me that we hang onto it as a family property, to retain a sense of community in this area.

The next generation

[The phone rings]. That was my nephew, he rings when he's coming to the farm. He's just coming to check on the stock now.

Kim: I worked a nine-to-five job with the Local Land Services. It used to be called the Pasture Protection Board. I worked for them, so I experienced the very best managers and the very worst managers in the district. I experienced a number of droughts, where the same people kept coming back in need of assistance. If anyone was drought affected, I would look at what they were doing and think, we shouldn't do that.

Bimbi ran the farm. She did everything. When I retired she said, 'You're coming back to the farm'. I do as I'm told!

Bimbi: It's not because I'm dogmatic, it's just because I have a passion for it! I love sheep and I love wool.

Our son, who is a landscape gardener, was working in Sydney. It was during the drought and I was feeding out at the time. I was just going into the next paddock and wasn't quick enough closing the gate – the sheep were lost with two mobs becoming boxed, while chasing the feed trailer. He just happened to ring as I was trying to sort the mess out. 'How are you Mum?' I was in tears (which I don't do a lot of), but I said, 'I can't handle this!' Within three days he rang and said, 'I'm coming home'. He came home for the next four years, which was absolutely brilliant because he helped me do so much. He could do the fencing; he could help me with the watering system; he could help me with stock and just get everything working more efficiently.

During the drought, Kim had farmers and graziers coming in to the office at 4:30pm and sitting there and saying, 'I cannot pay my rates, I cannot feed my family'. We always tried to keep our work stresses separate. So our son coming home was good and he was keen to take over the management of the farm. He got really involved with the sheep and we participated in lots of field days together. The succession was all starting to happen and then he got married. He's got a gorgeous wife, who grew up in the Eastern suburbs in Sydney, who was never going to be a farmer. They moved to Canberra and he commuted out here for another two years, but then he said, 'I'm going to miss too much of my family growing up, if I'm commuting here every day. I think I should go back to landscape gardening'. So he did, which was great, as they now have a very successful business.

By that time Kim had come home and needed to realign his career. We thought we might sell part of the property – not very much, but we didn't need another house. My daughter called one day and said, 'Mum, why don't we buy it?' Her husband is a banker but he's a country boy. She said, 'We won't be in Queensland forever', so we handed it over to them when they were ready to take it on. I still run cross-bred sheep on 100 acres and I still know what's going on because of my nephew, who is efficient and conscientious and keeps me well informed.

An affinity with animals

When you were growing up, did you have a connection with animals? What made you resonate with farming? Was it about being in the outdoors?

I didn't work the land because I wanted to do something different from other women – I did it because I love wool and sheep. Don't tell me sheep are stupid just because they're a mob animal, they're not stupid. They are some of the most intelligent creatures. If you see a sheep on the wrong side of the fence, you must put that sheep back with the mob it came from, because they fret. They have a mob mentality and have built a relationship with a particular group of individuals within the mob.

I grew up on a 3500-acre, hilly sheep property with 1000-acres of the country heavily timbered. The property sat at the foot of the mountain ranges. I had parents who were outdoor people and Dad loved his sheep. I can remember little

things, like going out with him when we would have pulled a lamb [from a labouring ewe]. We'd have the ewe and lamb in the back of the truck and would take it back to the shed. He said, 'I'm not sure whether the lamb will make it, but we'll put it in the little paddock and we'll give the ewe some oats and water.' He had a very soft way of dealing with the sheep. When it came to animals he said, 'You've got to think like a sheep, or when you're working dogs, you've got to think like the dog. When you're on a horse and you want to take it up to something, you've got to think, is that going to be frightening for the horse?' I always remembered those things and thought 'That's what I want to do too'.

I was home schooled by mum for the primary years. Dad would come to our schoolroom and say 'I need the kids' and we'd go mustering, drafting or whatever. He was emphatic that we could not go to the Killing Tree, where he butchered our own meat. That was definitely not for the girls, which I respect.

Sheep in a paddock with scattered canopy trees. (Photo: N. Fijn)

Does it get trickier if you've got thousands of sheep to be nurturing one individual?

I will always say that most graziers are more sustainable because if you don't look after the land, or your stock, you won't have many. On a stormy morning, or when it's pouring with rain, you'll say to yourself, 'What is that ewe doing on the top of the hill when it's lambing?' Sheep will often go to the top of a hill because of the threat of predation, so that they can see what's coming. If the ewe has twins, she doesn't have time to lick and warm the first one up before she drops the second one, so the first gets exposure. We quietly go out and check and if you find a problem you bring the ewe and lambs in. You try and lamb in a paddock that's got good grass and timber coverage, so she can lamb and then eat without roaming too far away.

Did you always ride horses with the sheep?

Yes, my parents were both good, keen riders and we all grew up mustering together on horseback. I always rode until about 10 years ago when Kim bought a quad bike to use for himself. I didn't use the quad bike for a long time, but then I just slowly started using it. My sister only lives five kilometres as the crow flies away and at shearing time she would ride her horse over and would help me muster the sheep, so there were always two of us mustering on horseback. I still ride and there's nothing I like better than plodding along behind a mob of sheep.

Often you'd be drenching the sheep after they'd been shorn. The best aspect was to take a mob of sheep back when it's dark – sheep don't bleat at night, that's why people can steal them – walking along behind a mob of sheep when all you can hear are their hooves and the horse plodding along. A quad bike doesn't give you that kind of feeling. We'd come back with the dogs in the dark and that's what I have always loved doing. It's just beautiful to be out on a horse under the moonlight.

There's a laneway that goes through this property. Our daughter lives on part of the neighbouring property with her family and the laneway goes straight through from woolshed to woolshed. If the forecast says it will be a clear night, we can bring the sheep back safely. Good laneways are very efficient.

Bimbi Turner with her beloved horse at 'Silverdale', with regenerating trees in the background. (Supplied by Bimbi and Kim Turner)

It sounds like you have an affinity with animals. Do you think that links in with conservation practices?

Definitely. I have a much better affinity with animals than I do with humans [she laughs]. I was lucky that I was brought up by a father who was 'greenie' before it was fashionable. He was a grazier, a returned serviceman, but he had a real passion for the environment and what was around him. He respected that we were custodians of the land for future generations.

If you overstock a paddock, you're going to lose the indigenous species of grasses and shrubs and lose the individual animals that rely on them, whether it be butterflies, or birds. So to me it's the whole, it's not looking after either your animals, or the land. That's why we've always been very conscious here about using phosphate. If you use too much phosphate, you can put too much nitrogen into the ground, disrupting the micro-organisms in the soil and the native pastures. If you look after your property, look after your animals, look after your land, then you don't see the bulk of the topsoil being blown away. You can't control nature, but you can make decisions before nature makes the decisions for you. This place is not heavily stocked, you probably noticed as you drove in.

Growing up on the land

With the grandkids, we take the binoculars out and find lizards. We don't put any pressure on the kids but they are keen on nature, which is lovely. It's a tough life, but it's lovely. I love the fact that we can hand these ideas about nature on. I do think if people take on anything in agriculture, it doesn't matter what, that if they've got the land imprinted on them from a young age, then they have more of a passion for it.

I can see different things from someone who hasn't grown up on a property, because that practical logic was instilled in me: about where you might put a gate, or where you might put stock to lamb.

I'll tell you a simple example of the need for a lifetime of practical experience on the land. When we bought this property, there was a dogleg in the fence line. There was an acre of the neighbour's paddock within this dogleg. Looking at it, I worked out why it was fenced that way. I said to the solicitor for the sale of this property at the time, 'Is that going to be a problem?' He said, 'No, because it's been fenced like that for 90 years.' Anyway, the neighbour sold and they sold to somebody who did not grow up on a farm. He saw this bit of land out there and he said, 'That's my land, I want it back.' I said, 'Well do you understand why it's been fenced like that? It's because the old folk knew that if you fenced directly across, stock are going to come across the creek and cause erosion going down into the gully.' The fence was falling down before he bought it, so we later re-fenced it on the existing line, just as the old folk had previously fenced it.

The neighbour recently came onto our property in the rain with the tractor and pulled out the fence we'd put up and he put up a new fence, straight across, so he got his acre back. What has happened ever since is that we've had his cattle continuously coming onto our place. They decide to go down into the gully for water and they can't get back up because there's a cliff, so the only way they can get out of there is to push through the flood gate – exactly what I said would happen! If you have that knowledge and you understand what stock do, which I think I do, then you understand there is reasoning behind the way things were put in place.

Growing up on the farm, learning through observation over time, it would become instilled in the fabric of who you are as a person.

It's the little things. A telling sign if you're worried whether you've got enough feed in the paddock, and it's a day that's not too hot or too cold, is that the sheep are all lie down on a hill or in the shade with full tummies. But if they're wandering around, backwards and forwards, then they're hungry, looking for food. Watching the activity of your stock will often gauge how much feed there is.

A woman's perspective as a grazier

Running the shearing shed in the early days was interesting. I can remember a particular run-in with a shearer. We always raised poddies [orphaned lambs]. You get to know your poddies and they know you. Shearers don't like shearing poddies. Because they are pets they often don't want to lie down on their posterior, they'd rather have a cuddle and shearers will get cross with them. I had one poddy who was a big fellow, a cross-bred wether weighing about 120 kilos. I just happened to go into the shed while one of the shearers was having trouble getting him in the right position and he jumped on his head. I blasted him, and said 'You will not do that again!' He walked out of the shed and went away for 20 minutes, but he came back and said, 'I apologise for doing that.' I said, 'I don't ever want to see anybody doing that to any sheep again'.

When truck drivers come to pick the stock up, I'm dead against the electric prodders that truckies use. There's been two occasions where they've got out holding one, and I've said 'Please don't use that'. They've immediately replied, 'Who's going to load the sheep then?' I reply 'I will,' because we've designed the yards so they will flow into a truck easily. It's the attitude that's the problem.

I was the only woman at Bookham Agricultural bureau workshops for a long time. Often I'd go to a workshop and you'd have the speaker saying, 'I know you guys do the right thing. You get in the race there and you drench this, then you fellows do it like this…' I think that was actually a compliment. They were treating me as an equal, as one of the fellows, one of the sheep producers.

The wool market

I was wondering about a particular hardship that you might have gone through as a grazier. Was there a time where you thought, this is too difficult, or too hard?

When the bottom fell out of the wool market, and I would think 'We've got all this beautiful wool, why isn't anyone buying it?' That is hard because you've put all this work into good quality wool. I think one of the biggest challenges at workshops was in getting people to understand that you actually represent a business, a product, therefore we should be pushing that product.

People talk about the environment and going green and all of that, well the fabric they should be wearing is wool. We don't use untold amounts of water; we don't use lots of fossil fuels; we don't use plastics and the wool comes from a sustainable source, living sheep! We want people to buy our wool, but often graziers are not wearing it, they wear polar fleece instead. I've just been teaching my granddaughters to knit. They get given woollen jumpers and skirts every year. I think it's important, if you're going to produce wool, you've got to wear wool.

Most of the time, I have to say, I'm the sort of person that will go out and I'll sit on a rock, and I'll say, 'How lucky am I? Look at these lovely sheep.' To me it's been a privilege to be part of being a grazier.

A fenced tree plot. (Supplied by Kim and Bimbi Turner)

You've got to have a passion; you've got to have the love. Just simple things, for example, if freshly shorn sheep are out and a cold change comes through then they'll suffer from exposure. I'll go out at night and just check that the sheep are moving, because if they're not moving they can tighten up. A person working for a corporate business wouldn't tend to check on the stock at night. I'm a great believer in maintaining the family farm.

Sustainable grazing

What do you do when there is a drought? Do you put the stock in a containment area?

We overstock these two front paddocks, to let the rest of the property relax. They are known as sacrifice paddocks because you really are sacrificing that paddock, but you're preserving the rest of the property. When they're in sacrifice paddocks there's a higher risk of mortality with individual animals because they're much closer together. A really important thing when feeding, is to always feed in the same place, so that if there is contaminated feed brought in with weed seeds in it, it only ends up in one area. If you've got them in a small paddock, then when the drought breaks, we rehabilitate that paddock by re-sowing the pasture.

Michelle: What challenges have you had to overcome to farm sustainably?

The use of chemicals, because you want to get rid of all the pests, both on your stock and on the ground, but you've got to weigh up how much you're going to use, and how sensible you're going to be about using different chemicals. That doesn't stop us using chemicals, but you've got to be mindful about what you're using. What has changed is having the research tools and information, like a chemical course, where they tell to you about wind speed and when is the best time to use chemicals, and how you go about selecting the right chemicals. I didn't know all of that before.

What changes have you seen as a result of putting in tree plots?

Particularly in paddocks where you've got lovely trees, you put stock in to lamb and you have a much higher percentage surviving because it's sheltered. If lambing rates increase over five or ten years then that's a significant result. You have much better protection of your pastures because you don't lose topsoil, you don't lose your seed. There's a lot more bird life. Aesthetically, it looks better too. If I can use the word, to me the paddocks look 'happier'.

A tree-plot with shrubs and some large canopy trees in the background. (Photo: N. Fijn)

Even when I ride along, I can see there's not the bareness in the landscape. Because we've got the tree lines in, it's got a warmth about it – certainly the paddocks are actually warmer in winter. You can see the difference in the pasture because it's protected. It doesn't burn off, or dry out as quickly, because the hot winds can't get to the grass as much and blow the soil away from it. I've always felt very strongly that you've got to revegetate the landscape.

Conservation and restoration projects

At the house, there is a small parrot in a cage, partially covered with cloth, underneath the wide veranda.

My nine-year-old granddaughter lives on the property next door and we'd just been in to town to see her perform in a hip-hop concert. A vehicle came flying towards us and they'd gone speeding through a little mob of birds on the road and left an injured one. We stopped and picked up the injured parrot, brought it back and of all things put it in a cat trap. We've got it on the front veranda now, nurturing it back to health. We thought it was a superb parrot but when my granddaughter went home and looked up her bird book, she said it's not a superb but a red-rumped parrot. We can't put it back into the wild yet because it can't fly properly and it may never be able to fly again. If it becomes strong enough we'll just release it into the garden.

What do you find interesting from the long-term ecology research results? When information is conveyed to you, what do you get out of it?

Really, it's the variety and the numbers of the birds and plants. The very first time they came out, Dan [Daniel Florance] was excited because he'd spotted little eagles as he drove in. We didn't realise little eagles were rare or threatened. It's nice to think that we've got them here. We now have two nesting pairs within half a kilometre of the homestead.

Since 2009 we've had a Stewardship Paddock and a Control Paddock next door, so we monitor what's going on between the two paddocks. The stewardship paddock has not been planted – it's just native, as it is. We're thrilled with the results in comparison to the control paddock. I noticed the other day we've got quite a lot of little eucalypts coming up, so I'm going to suggest to my nephew that we fence that off, because on the first of March he will put sheep in there for a period. If it's a lean year (like this one), stock will eat the little seedlings and I don't want them to. There's quite a variety of wildlife in here, particularly different species of kangaroo.

Bimbi Turner standing beneath canopy trees in the Stewardship Paddock. (Photo: N. Fijn)

Had there been any regenerative work done on the property when you bought it?

No, no revegetation, or sustainable practices. We started riparian planting eighteen years ago when we bought the property. We've planted 12,500 trees since we've been here. There are native tree lines, which go for several kilometres. There is another native tree line right on top of the hill, which works as a windbreak for two paddocks. There's another revegetation area in a triangle, and it goes right along a ridge and joins up to another one. They're all connecting with each other so that native animals have safe passage. We also fenced off native trees that were already established to encourage self-regeneration.

One of the first things we did down here was we got on board with Greening Australia and the Catchment Management Authority [now Local Land Services]. We fenced off two of our main waterways on this property. There's the Limestone Creek, which runs right through the length of the property, and that's almost like the border between the limestone and the basalt rock. We fenced that off so we were encouraging the right trees to grow, and we did a lot of planting of natives. We've got tree lines, but we've also put in triangles in the corner of paddocks.

Bimbi Turner pointing out a tree line (marked with black pen) on a property map. (Photo: N. Fijn)

In relation to conservation, to me one of the most important things was something my dad said to me years ago, 'You don't just plant one tree. Nature doesn't plant just one tree because it regenerates by blossom or seed or whatever, you put groups of trees together. We were commenting on how Christmas beetles had infested various trees, and he said, 'Yes, but Bimbi if you look, there's one isolated tree and they've stripped it and killed it, but if they're planted as a group of trees, the beetles will take a bit from all of them and they'll survive. If you've got isolated trees they'll just concentrate on one and kill it'.

Maps would be helpful with planning what you're going to do in the future.

Absolutely. I have small drawn ones with all the paddocks marked out. I used them when planning every day. The property basically goes north and east from the homestead. There is Limestone Creek, which is a permanent creek, Derringullen Creek and then we have Gallop Creek.

Extended gardening

Natasha: Do you garden as well. Is planting the native vegetation on the farm an extension of gardening in a way?

Bimbi: I don't know if you've noticed when you've been around other farmers and graziers, they often do have gardens. My personal reason is that, particularly during a drought, you need to come back to an oasis for your own wellbeing. During the Millennium Drought, I would be out for five, six hours just feeding out and checking stock. It was soul destroying. Yet I could see the birds in our garden. I often feel for people that don't have a garden. It's equally hard if you don't have the water and you can't keep it alive, but we use our groundwater here. You've got to have the green, to come back to and have some comfort. The sounds and scents in the garden relieve tension.

Kim: Before we moved here, the fencing was right up to the house. The only trees here were a walnut and fig tree out the front and the big olive tree. Otherwise it went straight into the paddock. There was no transition between the security of home and the disaster of farming – straight out of the front door onto the farm. It's a difference in mentality: their view was falling fences, suffering sheep, and the pastures were a total disaster, all because they didn't have the opportunity a garden provides to get the brain into a better place to start the day.

The homestead at 'Silverdale' with the garden in full bloom. (Supplied by Kim Turner)

Bimbi: We pulled out the basket, crack and jack willows, although not the weeping willows which we left. We will get rid of some weeping willows if they become too abundant in the creek bed, but they are good fodder in the drought. I can remember as a kid, Dad would go out in the truck and lop off huge branches and drop them in the paddock for stock to eat.

There's always a trade-off in locking up areas for revegetation. Unfortunately you're also locking up weeds, and you're making a habitat for foxes and rabbits. But you're also making a protected habitat for birds, lizards and wallabies. We love our wallabies. We don't kill animals just to kill animals. We do it to protect the pastures, the stock and the ecosystem.

One day we were going for a picnic, we went over the hill out the back and a little wallaby came charging up and nearly jumped in the back of the truck, it was so frightened. Three men were down in our creek with dogs and guns. Well! I'm a reasonably passive person, but on this occasion I was not. I got out of that truck and I went down there yelling. I said, 'you have just shot that wallaby's mate and they mate for life! You have no right to shoot here'. That's what makes me so upset – their attitude was: it's moving, so we'll shoot it. My philosophy is that we

are mere custodians for the next generation – we're just looking after the land. Sure we pay to buy it, but we're looking after it. We've got to hand it on better than when we took over the management.

Fighting ferals

Only yesterday my sister and I were out riding with the horses and we spotted some St John's wort along the creek. She said, 'What weeds do you have?' and I rattled off ten different weeds. She said 'Have you got that many?' I said, 'Yes but we've got them under control'. When I actually stopped to think about the noxious weeds we've got, it was quite mind-blowing. But with weeds, like blue thistles and Bathurst Burr, I chip or pull them out rather than spraying them. It keeps you fit! It's very satisfying to bring back a loaded truck full of weeds. In the winter we burn them because it is the only way to destroy the seed.

We're part of a group called Feral Fighters. I got involved in that very early on. Three times a year all the neighbours get together and we all bait for foxes at the same time. You ring all the other neighbours who don't wish to participate just to make sure they've got their dogs tied up. Foxes kill a lot of native animals and young lambs. We have thirteen neighbours, some participate in the Feral Fighting and some don't.

Driving around the property

Bimbi drives Natasha around the farm, explaining points in the landscape along the way.[9]

Do you have an aquifer under the property?

Oh yes, we've got a bore – we've got a jolly good aquifer. The water that comes out of the bore is a lovely blue colour and you can drink it, it's beautiful. We catch all the rainwater off the roof of the house, the woolshed and all the sheds and use the water for our home and the cottage, which we rent out to tourists.

We're down here by the dam because you can see young trees between the cottage and the creek line, which we're trying to grow into scrub. We've killed all the blackberries. We wanted to put some shrubs back in to suck up some of that moisture to stop it being so boggy. And you get better grasses growing as a result. We're driving over what used to be lucerne paddocks. That's why it's got a lot of thistle because the seeds stay in the ground for years.

They stop at a dam near the homestead.

We've got that boat, which is a little rowboat and I bring the dogs down here for a swim every so often. And you can hear the birds.

Do you feel it's good for your wellbeing?

Absolutely. I love coming down here to just sit and chuck sticks in the dam for the dogs. It's peaceful and I get satisfaction from seeing the trees. When we bought the place there were no suckers or saplings on the property. Aesthetically it's pleasing. It gives shade for species to grow underneath and shade for the animals. There's usually a wallaby around here somewhere.

I love the stand of older trees. One of the things that appealed to me about the property was this nice stand of trees. I would look through the binoculars from our other property and think that it was such a nice property across the road!

Bimbi and Natasha move on to a line of trees.

This corridor is thirty metres across – it's basically a native corridor. I'm hoping it will just self-seed and thicken up. This was all done with the Catchment Management Authority). These treelines were planted with two storeys, so we put in grevilleas, bottlebrushes, acacias and eucalypts, so there were different levels. There's no point in just having all trees, you've got to have understorey because different birds like the understorey. The wattles have self-seeded, so we know that we're going to have continual growth. I like seeing the parrots – I like hearing them.

This is a lovely paddock. It's a nice clear paddock. It's got a nice dam at the bottom with the she-oaks [*Casuarina spp.*], which are specimen trees. This paddock is a good lambing paddock because it's got good timber and undulation, so the stock can get out of the elements easily. In summertime, the sheep sit under the she-oaks and come out grazing when it's cooler.

We're still in what we call a 'green drought' because there's not a lot of nutrition in the grass. What we need is some more of these native grasses. This is a mixture of native and introduced pasture. We have a lot of natives, like *Microlena*, kangaroo grass, red grass, so the recent bouts of rain will help those grasses at this time of year.

Bimbi Turner near the dam with an island in the middle. The water in the dam is low, due to the lack of rain during the winter months. An upturned rowboat is on the left. (Photo: N. Fijn)

Bimbi and Natasha enter an area that has been set aside for regeneration and is being monitored as part of the ANU long-term ecology project.

The stock come in here for a short period of time, just to eat it enough to stop the fire-risk, but not enough to denude the paddock, so we've always got good ground cover in here. It's here in perpetuity, so it's got to stay healthy in the long-term.

A rocky outcrop provides good habitat for reptiles. There is a swampy area at the base and a permanent creek below a rocky hillside.

This is what I love. This is the sound of summer – the cicadas and the birds. This is a really special area. There is natural regrowth because we don't overstock this paddock.

Do you re-assess the tasks that need doing periodically? There must be so many potential projects.

To be honest, Natasha, it never stops. You are always looking and thinking about something else that needs to be done on the property. We're always looking to see where we can improve to stop erosion, or weed infestation, or whatever. You don't ever switch off. It's just an ongoing process.

Wedge-tailed eagle (Aquila audax) *taking off from a lone canopy tree. (Photo: N. Fijn)*

Bimbi takes Natasha to a place where she often comes with her grandchildren to observe a wedge-tailed eagle nest with binoculars. A bird-of-prey flies out as the vehicle goes down an embankment.

Was that a falcon, or an eagle?

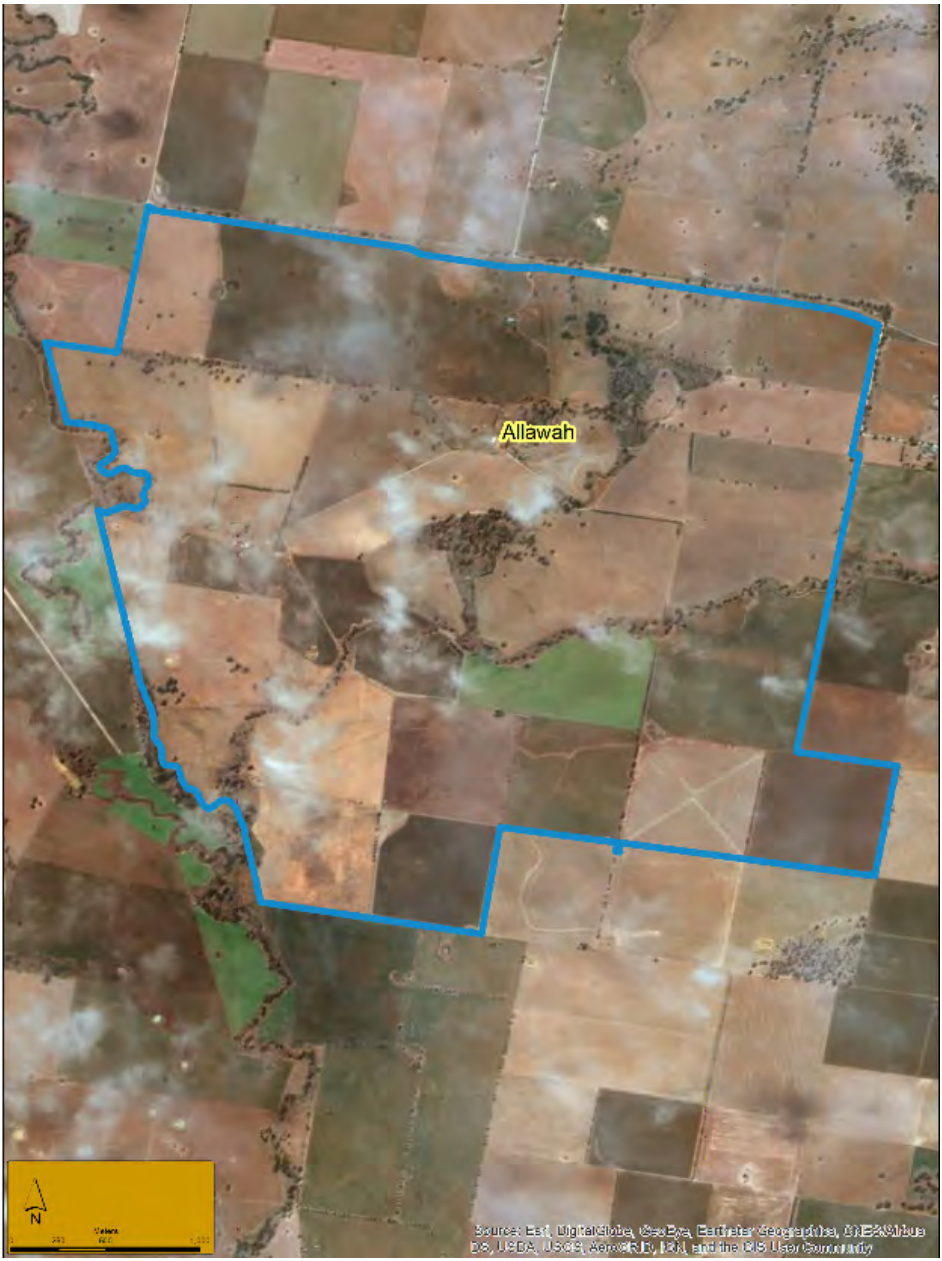
Probably a little eagle, because it's within its range.

Bimbi drives to a headland to look down at the neighbouring farmland when a wedge-tailed eagle flies out from a lone canopy tree and circles into the sky above, searching for prey down in the valley.

Well, that was lucky seeing that wedge-tailed eagle circling so close.

Yes, that was amazing!

Wedge-tailed eagle nest perched in a large tree growing in a gully. (Photo: N. Fijn)



Blue cadastral boundary of the 'Allawah' property. (Map produced by D. Florance)

John Hopkins:
Disastrous fires and new beginnings

John and Nicole Hopkins run 'Allawah', a property near Illabo, east of Junee. The property is 1040 hectares and is representative of farms in the region, in terms of producing various crops and wool. John inherited an interest in cattle from his father and continues to breed Simmental stud cattle. John's parents initially moved to the Riverina region of New South Wales from Victoria, where he grew up observing birdlife on dams.

Nearly three years after the Hopkins moved to 'Allawah', a fire swept through and the family lost three thousand sheep. They experienced further misfortune when a second fire raged through 16 years later. John and Nicole were both working on the property and had young children. Through quick thinking and forward planning, John managed to save most of the livestock from the fire, while Nicole protected the children, in the bathroom of the house. After the first fire, John's father re-built the farm infrastructure in their previous locations. The second time around, John took the opportunity to start from scratch. He changed the layout of the fencing and paddock sizes to work in with different soil types and natural waterways. Every year John put in shelterbelts and corridors, enhanced the environment around dams, restored riparian zones to provide habitat for wildlife, and nurtured the large canopy trees that managed to survive the fires.

John and Nicole have been active in their local farming community, including volunteering for the fire brigade, participating in community events and in local Landcare, often hosting field days. The property has been part of the ANU long-term ecological research surveys since 2002. The surveys have found an increase in biodiversity and threatened species, such as the superb parrot, flame robin, scarlet robin, diamond firetail and brown treecreeper. There have also been specific research studies on the property, such as monitoring the impact of the noisy miner population on other species.

The Hopkins have a focus on protecting existing natural assets. Substantial amounts of revegetation have been undertaken to protect and enhance these assets. The property has established shelterbelts, riparian restoration and management, enhanced farm dam management, and remnant enhancement and management. In particular, 'Allawah' provides excellent examples of enhancing existing remnant vegetation, of fenced restoration, and management of riparian areas.

Natasha Fijn assists Mason Crane with an early morning bird survey on the Hopkins property before going to learn about the family's efforts to increase biodiversity. They pass Nicole on their way in to the property. She is driving cattle along the roadside verge, so that they can find grass. As it hasn't rained recently, the cows are running out of feed and it is still the middle of winter. Big, old gum trees shelter the entrance to the house and yard. Large sheds with farm machinery and several grain silos for feeding the stock are out the back.

Entrance to the house and yard at 'Allawah', showing an old building used for horse tack, beneath big, old gum trees. (Photo: N. Fijn)

Background to the property

How many generations have your family been farming?

John: We're the sixth generation. My kids are the seventh generation. My whole family has loved animals and wildlife. Where I grew up, there was habitat that was already in place – red gum country in Victoria. I was particularly interested in the watered areas. I used to grab any opportunity during the school holidays to paddle around in a leaky old wooden boat, making bird boxes and putting them in trees, inspecting them and observing the birds with binoculars. We had colonies of cormorants and an array of different waterbirds, as we do here when the dams are full. For instance, spoonbills nest here and a pair of whistling kites.

How did you come to move up here from Victoria?

I had four sisters and we needed to diversify. Unfortunately, both my parents have now passed on. I took over the management from my parents around 2003, having already worked in Western Australia, Victoria and in the United Kingdom. There wasn't a lot of tree-planting going on before we came here in 1987. Along with the sheep and cattle, we have a cropping program of oats, barley, canola and wheat.

Have you always run a stud?

We're one of the original and now oldest Simmental of the studs in Australia. My father was a founder of breeding them here – the breed originated in Switzerland and Germany. We export bulls and have sold cattle into most states in Australia. The cattle stud is a great love of mine, as is the Simmental breed. The Simmental make fantastic sires, particularly in cross-breeding programs. If I weren't still in the seedstock industry, I would certainly still have a Simmental composite herd.

Why do you still crop?

It's a prominent area for barley grass. We need to turn the soil over because we can't find pastures that give enough longevity. We have experimented with many different types of crops and pasture bases, and are slowly winning. The pastures wear out and we end up with weeds; to clear the weeds up we need to put the soil into a short cropping phase. With cropping we seem to be forever using chemicals and locked into a vicious cycle. Our livelihoods depend on it at this stage, so we have to use chemicals.

Two fires

We've been burnt out twice. We got burnt out in 1990 and again in 2006.[10] The first fire was three years after my parents moved here. We didn't have a good feel for the land yet and we had to get the stock fences back up quickly, so Dad decided to re-fence exactly where the fences had been previously. Everything had dropped and burnt. Dad didn't do a lot of planting here at first because we were too busy recovering from the fire.

John and Nicole Hopkins. (Photo: K. Hulm)

How long did it take for you to recover?

I don't think I will ever fully recover. I am always extremely nervous on bad fire danger days. The second fire sixteen years later gave us a blank canvas to rebuild on. I had time to think about what I would do if I had my time all over again. The first fire was not quite three years after we arrived, so we didn't quite understand the property as well as we did when the second fire came through. I was away at college, so Dad just put the fences back where they were. I would be moving stock

and would think, 'It's a pity the fence doesn't follow that soil type', or 'Why have we got paddocks that are split by a creek in the middle?' When we were burnt out the second time, I was then able to implement some of those thoughts I had. We re-fenced in a different pattern. I've incorporated creeks into one paddock, not two, put laneways in, changed water points, fenced to different soil types, and fenced off revegetation sites.

What happened to the canopy trees in the fire?

We lost a lot of big, old canopy trees. Weeks later I would see a big gum tree and a little plume of smoke still coming out of the top of it. It didn't matter how much water I put on them, I couldn't put the fires out. Once they were alight inside like that, they were gone.

Did you increase cropping after the fires?

I'm trying to decrease the cropping. We had the place humming along with great pastures and I had to re-do all the pastures after the second fire. I'm positive that the soil is still recovering from the fire. We're only now getting yields from crops that we had previously. When poly-pipe for water troughs has melted well under the ground – that's a pretty hot fire – the microorganisms in the soil would have been killed as well.

Did the fire come through very quickly?

It was heading south of us but with a wind change we suddenly became the centre of the hot spot.

Canopy tree killed by fire but with new plantings in the background on the Hopkins' property. (Photo: K. Hulm)

John Hopkins showing Mason Crane a map of the areas on the property affected by fire. (Photo: K. Hulm)

It's surprising because the landscape seems so open here. Was it a very hot, dry day?

The grassfire just raced through with the wind. It was a stinking hot day, over 40 degrees with 100 km per hour winds. It was ridiculously hot, so much so that I had been working in the yards and I couldn't touch the metal fencing. At lunchtime I came inside and called it quits. I had everything ready in case of fire with the fire units all set up and the tractor out of the shed. I was blessed to have decent dogs, so that helped to get the stock out of the way in a hurry.

How did you save the house?

I protected the house with two fire units. I'm a Vice-Captain of the local fire brigade. Every fire you go to around this district, everyone turns up – it's the most fantastic community in that way. At the time I couldn't work out why there was no one was turning up to help me fight the fire. I didn't realise that we were right in the middle of the fire, while the rest of the community were on the outskirts fighting it. Mates were trying to come to help me but the police had set up roadblocks and wouldn't let anyone through. It was a terrible feeling thinking, 'What have I done to the district to deserve this? No-one's coming to help me', but it turned out it was just the circumstances.

Would you stay on the property to defend against another fire?

Absolutely, to save as many stock as I could. You have to have a well-organised plan set out in case of such fire. Unless you've been through it, you can't understand the impact it has. You wouldn't wish it upon your worst enemy.

Did any of the stock die in the fires?

The first time we lost 3000 sheep. The second time I managed to get most of them out of harm's way, except for a calf, a ram and a few stragglers. It's all about having a fire plan and knowing where you're going to put your stock in case of an emergency. With the second fire we were alerted to the fire's approach by a friend to the east. I knew then that at the pace it was traveling and with the strong wind, we had to implement our fire plan. Luckily I moved the stock straight away, because that's how our stock survived. The next door neighbours were heading to the fire front. They didn't get to the fire in time, so turned around for home and as they were driving back through their front gate, the fire was licking at their heels. It was a horrid day.

It makes me understand more about why people choose to stay on their properties.

We've got a brick area and Nicole had a bath full of wet towels. I suggested that she should stay in the bathroom with the kids. At the other house on the property, things left out on the porch got burnt. I managed to put out any strikes around our clothesline and in our garden.

Burnt stump surrounded by young regenerating saplings in an erosion gully. (Photo: N. Fijn)

Blackened logs remaining after the fires, surrounded by regenerating saplings on the banks of the erosion gully. (Photo: K. Hulm)

Afterwards, it was a re-build process and it took many years. We went from the devastation of the fire, straight into drought, so that didn't help matters – although I think the locust plague was one of the hardest things I've been through. I had hay reserves across the property in seven different locations and we lost all of them in the fire. One day you've got plenty of feed and everything is rosy, the next day, the stock may have avoided being burnt but they're starving. The sheep weren't used to grain rations, so they had to be on a slow-ration build. It was pretty horrific. Looking back, you think 'I don't know how I got through all that', but you do. Once I got through it, I crashed. My father was unbelievable and friends were wonderful in terms of their support. I don't want to see another one though.

So that must be devastating spending all those years building up the property and then for that to happen, twice.

We had already planted thousands of trees and they were just really getting going when the second fire struck. It burnt many of them to a crisp. The whole place

was blackened. All of the understory –- the acacias, wattles and she-oaks – were wiped out completely but the yellow-box and pink flowering ironbarks have managed to come back. I have been dumbfounded about how resilient they are. The fire was just devastating. So we started again. I don't know whether I would have it in me to rebuild this place a third time.

Working with Landcare and funding initiatives

I'm interested in how the land has changed over time.

When we came here there was hardly a tree on the place. There were only the occasional trees dotted along fence lines. With the sheep, if we had a cold winter snap, we'd start losing lambs, due to a lack of shelter. I started planting trees and I liked the idea of integrated pest management.

In the 1990s, we and three or four of our neighbours originally started Landcare here. We've taken every opportunity to utilize any funding that's available – we can't afford to do such large projects on our own. We've collaborated with Landcare and previously CMA [Catchment Management Authority] programs. If there's an area that's not been planted, then I might use it for dual purposes, such as storing hay. There's funding for stock containment areas during drought. We applied for that as soon as the funding was available, so that we could get our stock off the pastures in tough times and to prevent the topsoil from blowing away. That has worked well.

The success of projects really depends upon the Landcare facilitator for each area. If you have someone just sitting at a desk, shuffling paper around and not going out to talk to farmers, then people don't take up conservation projects. We had an absolute champion as a facilitator for our area. She was very enthusiastic about it all and she helped me to become more enthusiastic about projects too. I have too much going on outside to be mucking around with filling in paperwork. She was terrific about saying when she was going to be coming past. She'd say, 'I've got this form with me and we can fill it out together'. It made the administrative job not as big as I thought it would be and then the proposal stage was done. To have another driving force that is engaged and enthusiastic is very important. It was a shame that the funding wasn't consistent and she ended up moving on to a more permanent teaching job.

Sheep near a regenerating erosion gully (and another dead, blackened tree). (Photo: N. Fijn)

Do you initiate planting projects on an annual basis?

I try to do one project every year. Originally I put plantations in for shelterbelts before I started fencing in larger areas. We're starting to fence in creeks and riparian areas more now.

How important is it to have the external infrastructure there for conservation projects?

Without government support I wouldn't have been able to do anything at all after being burnt out and then during the drought. If I don't do a project one year then that's another year lost in terms of being able to see the wonderful outcome. No one lives forever and I want to see the results within my lifetime.

Long-term ecological surveys

You've been engaged with the ANU ecology surveys for so many years.

If I have five minutes, I like to catch up with Mason to find out what he's observed during his survey on the property. I'm just busting to find a squirrel glider! I like to hear whether there is something here that's a bit rare. I also like to have someone who comes to visit that has more knowledge on the subject than I have. I can stand and talk cattle all day to people but not so many farmers want to talk about birds.

Mason: We'll be doing a full audit and intend to set up motion sensor cameras, so we'll be able to detect the gliders. I predict that you will have gliders but I'm not sure whether they'll be sugar or squirrel gliders down by the creek. There were a lot of zebra finches, superb parrots, yellow-rumped thornbills and weebills.

We never used to see zebra finches. There are treecreepers and all sorts of birds that we never used to see.

We didn't see any flame robins but there seem to be less around this year.

We've seen a few around. I always say 'Here comes winter' when we start to see flame robins. Currawongs come out from the hills when there's a cold spell. The galahs have been building nests already. To me, that's not a good sign – I think it'll be a dry finish to the year.

The importance of observation

Natasha: How is farming in terms of your general wellbeing?

One of the reasons I farm is because I love being out in nature and seeing the conservation work we've done. The process is very slow, trees and shrubs grow slowly here, but the rewards are just fantastic. The wellbeing for your own health, the feel-good part of it is great. My father used to have an expression, 'Farming is three things: common sense, hard work and observation' but he also said, 'All three are as important as the other'. It is amazing to me how many people are not observant enough and what they miss seeing in the landscape.

So do you regularly drive around your property and observe what's going on?

Just recently, before the little bit of rain we just had, there was a turtle leaving the dam out the back. He was leaving and going *up* the bank. The creek was not that far away. It made me think that it will be interesting to see whether the creek is still flowing. I was wondering why he was leaving the dam; maybe the turtle was leaving because the dam was so low.

There was another occasion during drought. Sometimes, if I want to take my mind off things, I go for a wander around our main dam if I happen to be nearby. I had a shovel with me, because we do get a fair few brown snakes. I saw a hole in the ground and saw something scaly, so I chipped away at the hole with my shovel. Little baby turtles were hatching out of the top of the dam wall, which was

rock hard. It was a major drought and the dam was completely dry. I picked up three or four of the emerging baby turtles. There were heaps of them but I just took a few to show the kids. The girls were little then and they took them to show-and-tell at the primary school. When they brought them back home, that afternoon we released them into a dam *full* of water! That dam usually takes days to fill. It's incredible how nature can time such things.

A dam without much water at all during a winter drought (Photo: K. Hulm); Murray River turtle (Emydura macquarii)*. (Photo: D. Michael)*

Conservation projects

John needs to get out to feed the stock. Natasha and John get into a vehicle with a trailer of grain towed behind. John drives along the unsealed road. He whistles to his dog on the back of the ute to go and round up the cattle moving along a side road. The dog silently moves them forward with minimal whistles from John.

We need to go and help Nicole with the cows grazing on the side of the road. They are now a long way off, because they've meandered up a side road. They are all stud cows with their calves.

Last year we had a tough autumn and were hammered by frosts. In June-July there were only three mornings when I got up and there wasn't frost blanketing the ground. It just annihilated everything, including trees and pasture. The grass has only just got going but then we didn't get much rain, so we haven't had a decent spring. We couldn't cut for hay. We made the canola crop into hay but now we're buying in extra hay, grain and pellets.[11] We usually carry fodder reserves to have on hand when we need it, but now we've almost used it all.

Sheep approaching John Hopkin's vehicle for supplementary pellets, beneath a corridor of eucalypts. (Photo: N. Fijn)

Natasha jumps out and open and shut gates, while John drives in and out of numerous paddocks, feeding pellets to the hungry sheep. They pause occasionally for John to point out a revegetated area, a riparian zone or fenced corridor.[12]

Did these larger trees survive the fire?

In the fenced off areas around the creek we lost a lot. If you walk along the creek, you find holes six to eight feet deep where the fire has burnt the trunk, through to the root structure right under the ground. After the fire a lot of the younger trees sprouted multiple trunks and they've taken a while to grow back – the whole understory was burnt out. There are plenty of remnant trees left in the ground though. On a different subject, these revegetated patches are not all good. They've become havens for foxes – they come out and grab a lamb then duck back in and hide. One day I came here and there were about seven fox pups playing outside the den. Much as I hate what the foxes do, it was worth seeing.

John pauses at a regenerated area, where birds are calling amongst the trees.

I'm trying to link corridors of trees in with the riparian creek areas. The girls and I planted here in the school holidays. This is one of the more recent projects we've done. We need to look after the old trees before focusing on planting the new ones. After the fire, when there was a grant available, I applied to protect the older trees. I don't like how people plant a lot of new trees but then they will cut down a very old canopy tree because it happens to be in their cropping line, or let the stock chew the bark off and ring-bark it, ultimately killing it. It is the old trees that provide habitat for the wildlife. A wood duck just flew out of that tree over there – that just shows that wildlife use them!

With the old scattered trees, the sheep camp under them, the nutrients from the dung builds up and the stock end up causing the trees harm. People often fertilize or create rip lines right up against the butt of the trees, or plough roots up during sowing. You don't get much yield around a tree and it slowly kills the tree.

A patch of revegetated trees as a haven for threatened bird species. (Photo: N. Fijn)

Nest box in a large canopy tree. (Photo: K. Hulm)

I fenced these big canopy trees off last year (it was my latest project). We did further planting in between the larger canopy trees, such as kangaroo grass. Now they're fully protected from the stock. Even if some do still die, at least there will be tree hollows and nest sites for the brds. I would also love to put in some more scattered trees in the paddocks but to guard them from cattle is cost prohibitive without a large amount of additional funding.

I see there are some nest boxes in there.

Yes, Mason put the nest boxes in as part of the surveying. Every time they mentioned nest boxes I'd say, 'Yes, give me more!' It's all good research and provides habitat for the birds. If you fence in the self-germinated young eucalypts, you can see the difference without stock pressure. Where stock can get to them, the regenerating trees won't have much chance of surviving. The other eucalypts within the fenced area have a lot more hope of surviving. We did this fencing about three to four years ago. There is understorey but then there are big gums with hollows in there as well. I wanted an extra buffer from the neighbouring property and it's also reducing erosion in the creek.

John and Natasha pause by a rocky outcrop.

See this rocky knoll? I'm going to fence it in. I plan to plant trees and vegetation all around this area. Any trees that you can see on the property are basically what I have initiated over the years. I don't have additional funding to support me every year. It's often hard to justify putting aside the dollars to put a fence up and to put some trees in, and it may be taking up productive land. I like to think it is valuable in different ways though, in terms of integrated pest management and as provision of shelter for the livestock once they mature. We've been able to achieve great results. I would like to have all the creeks and riparian areas protected right throughout the property in the future.

Do you feel like this will be part of your legacy?

Absolutely, it's part of me. People ask me whether I'll move on but I think it's taken such a lot of energy to create these areas and it's only now that I can really enjoy them.

Health and wellbeing

John and Natasha return to the house and continue the conversation. John and Nicole's 13-year-old daughter has returned from boarding school for the school holidays.

If you were to give advice to farmers wanting to conserve areas on their property, what would you say?

I would say, start putting things in place as soon as you can so that you can enjoy the benefit of the work. Look for grants that are out there, look for advice to do the job properly and don't cut corners with the fencing. Put gateways into fenced off areas, because animals do get in, or you may need to get in yourself for weed and vermin control. If you have other people that are interested in conservation and can join in with your excitement about projects, then that helps.

Do you think it is in the national interest to promote healthy farms?

If you're looking after the land, the water run-off that ends up in the rivers is cleaner. One setback is that I can't let people come onto the land to enjoy the fenced-off areas because of the legalities of it all. I would have liked to organise walking tours through the place but it's not going to happen because of problems with insurance. When the dam is full, it's quite something with all the water birds

here. I always enjoy hosting field days [for Landcare or the ANU]. I get pleasure out of showing people what we have done.

So do you feel better when you look out at the land?

Totally, it's my office. We were moving stock the other day and I came across a flock of zebra finches. Ten years ago we never used to see them and I saw a flock of about 70 of them flitting around on the ground in front of me. I saw some hooded lapwings yesterday and those mountain ducks – not many people see mountain ducks in this region. We usually have two or three pairs here. If you just observe what is going on around you, it's quite extraordinary what's going on.

John Hopkins at the highest point on the property. Note the tree corridors between cropped paddocks. (Photo: N. Fijn)

[To John's daughter]: Can you remember the fire?

No, I was only one or two years old.

John: Your sister may remember a bit more. We don't want to go through that experience again. The fires have affected me psychologically, scarred me forever. I'm terrified about leaving the property in summer. We rarely take summer holidays because of it, which is not very fair on the kids. I always write a fire plan

out and if I ever do go away from the farm I tell the person minding the place and our neighbour where to put the stock in a hurry. If you've been burnt out before, then you start to become paranoid. If I can take a break, I am hesitant to. People have said to me, 'The fences are there to keep your stock in, not you'. I am aware that I need to get over this worry about fire.

The next generation

John [to his daughter]: You help me plant the trees don't you? [She nods.]

We're really frost-prone here, so in the early stages we need hardy plants. I know which plants will survive, so I like to choose the species from the nursery myself. We have a system. The plants come in trays. We work out the ratios, pop them out and put a number of each species aside then replant them so that the species are all mixed up. The girls will carry the trays. They're not to look so that they pick individual plants randomly, or sometimes we put them in a bucket to mix them up.

When you look at the property in 20 years, you'll be able to see how all the vegetation has grown up.

The kids have hit an age where they're starting to switch on to conservation aspects. We'll be driving around and they'll pipe up and say, 'Dad, we planted those trees'. In relation to the last plot, the girls wanted to plant the trees themselves. I couldn't help myself saying, 'Make sure you tamp them in properly'. The section they planted probably came up the best. Next week, I've lined up more planting during the holidays.

Humans are visual animals. Perhaps there's something about trees looking nice in a landscape that contributes to wanting to plant them.

Having planted a lot of vegetation, it is interesting to see the progress of the trees growing up over the years. The next-door neighbours then start to see the growth happening and the 'feel-good' of seeing the trees. Previously, you would look out and none of the vegetation was there, only a couple of big gums left on the landscape. It was just a flat, cold plain. All the trees on the neighbour's creek weren't there previously either. How much more character does the landscape have now? People put a lot of effort into planting gardens but they don't plant out their farm. I guess you're either interested in trees, or you're not.

A gate into a relatively new, fenced off area to provide a corridor between two paddocks. (Photo: K. Hulm)

Maybe it starts from key experiences in childhood.

Anyone who had a cubby house in a tree, or has climbed a tree, will appreciate them, won't they? In school grounds now, you can't climb trees and everything kids play on has become plastic.

We used to get the odd black wallaby here, which was wonderful. We never used to have a kangaroo on the place but we do now. We had a hand-reared, tame kangaroo here that had become quite quiet and it would graze in the bull paddock. If anyone was coming in to shoot foxes, I would say 'Don't shoot my 'roo'. I raised kangaroos as a kid, so I can't shoot them myself.

Birds seem particularly important to you. Where do you think that stems from?

Birds are terribly important to me – I just love birds. I got my love of nature from my Dad, from his father and my uncle. My father could mimic quite a few different bird whistles. Dad was an exceptionally busy farmer and always took on

more than he should, but he would stop to show me a plover nest, or some other bird. He was always flat out and busy working but he would always have time to observe birds. He'd hear a bird, pull up and we'd have a quick search for the nest. I have seen how important the old trees are to the nesting birds we have here and how everything interacts. That's why we don't have cats on this place. You can see there are blue wrens on the lawn, just over there.

Big canopy tree in the horse paddock near the house. (Photo: N. Fijn)

It's a nice view of the mountains, paddocks and lines of trees from your kitchen.

The trees along the creek there – my father planted them. We planted bottlebrush along with iron-barks [eucalypts] and they brought in a lot of wildlife. Those plantings were in the early 1990s when my mother was still alive. She said 'You'll ruin the view'. My father and I said, 'They're not going to block the view, they're way down the paddock.' She was right though – that is exactly what happened. They do block some of the view of the hills but then there are gaps in the plantings from some not surviving. We get hot October winds coming in off the hills, so the layers of shelterbelts were put in to break the force of the wind, which

they do. Later in the year, the winds come from the other way and that's where the two devastating fires came from.

I'm upset that the fire took out so much of the understorey vegetation. We had so many species of wattle, native hop bush and all sorts of species – they all got wiped out in the second fire. It's hard replanting them beneath established trees in this dry area, as the competition is so great. There are still dams with silt and ash in them, polluted from the fires. One day everything is cruising along well and the next day you're in a disaster zone. I had to worry about 2500 sheep and 200 head of cattle with nothing to eat. Luckily, adrenalin kicks in and you have to nut it out. It took years and years to get the place back in order but I learnt huge lessons from the fires.

[John to his daughter]: Well I guess we had better get moving. Do you want to come and help to get those cows off the road?

New vegetation in fenced off corridor. (Photo: K. Hulm)

Blue cadastral boundary of the 'Yallock' property. (Map produced by D. Florance)

Tony and Vicky Geddes: Juggling family values with farm improvement

The Geddes' 1151-hectare family farm, 'Yallock', is located north of Holbrook. With a lot of energy and hard work, Tony and Vicky juggle a diversity of businesses, on and off the farm, as well as their family life with their primary school age kids. They divide their farm enterprises: Vicky focuses on lamb and wool, while Tony largely focuses on dryland cereal and oilseed crops (within a predominantly sheep and cattle farming area). After the Millennium Drought, they decided to put more energy into the sheep enterprise on 'Yallock', and Vicky has managed to expand the herd considerably.

Tony is the third generation to live on the farm and has an appreciation of birds instilled by his grandmother Beverley Geddes who, with her husband Ian, bought the property with barely a tree in the paddocks. They were only able to run a small number of livestock, due to the land being overrun by rabbits. All three generations have been active as Landcare members and in other local community groups, which has meant that they have kept up to date with new farming ideas, research and technology. Recently, Tony and Vicky have been focusing particularly on the enhancement of dams.

The property has been part of ANU long-term ecology research since 2002, with data collected on birds, reptiles and frogs. There has been an increase in bird diversity, including threatened species, such as the turquoise parrot, black-chinned honeyeater, regent honeyeater, speckled warbler, varied sittella, flame robin, scarlet robin, hooded robin, diamond firetail, and brown treecreeper.

'Yallock' provides examples of restoring and managing existing woodlands, farm dam enhancement and establishment of shelterbelts, and is a good example of woodland management and conservation in an agricultural landscape. The farm contains a large patch of remnant woodland that supports a range of threatened and declining species. Tony and Vicky have protected this remnant by fencing it and have also planted shelterbelts and individual scattered trees. They have fenced off additional remnant areas from production. 'Yallock' also has large areas of native trees, mostly spotted gums, planted as part of a forestry trial. These also provide habitat for threatened species.

Mason Crane and Natasha Fijn drive for over two kilometres across the property, up a long driveway before reaching a spacious yard with sheds. Contract shearers are working in the shearing shed, while the shorn sheep stand in holding pens outside. A friendly three-legged Labrador and a kelpie greet them at the house, built in the early 1950s.

The Geddes

Natasha: Where did you grow up?

Vicky: I grew up in the northeast of Tasmania. My Dad managed one of the big 40,000-acre early-settlers' properties. They then bought their own farm in Pipers River and farmed wool and beef amongst all the wine growers.

Holbrook was settled a bit later. Like a lot of Australia it had reasonably open grasslands and access to feed at certain times, so they jammed on stock and overgrazed the country. Then there were the encroaching rabbits on top of that. The people that settled this part of Holbrook didn't like trees, so everything was ring-barked and cut down.

Tony's grandfather, Ian Geddes, was Scottish and his grandmother, Beverley, was from Melbourne. They met in London during the war. They bought this place while Ian was jackarooing, still learning how to farm here in Australia. He did a bit of research on areas with reliable rainfall and decided this area was where he would like to live. Since the Geddes moved into the district, they established a reputation for ameliorating the landscape, reflecting the sort of people they were. Tony's grandparents bought this property in 1950. They bought nearly 6000 acres of land – a large but degraded landscape.

The first thing Tony's grandparents, Ian and Bev, knew they had to do was to get rid of the millions of rabbits. They put in new fences, employed rabbit trappers and had rabbit drives. As soon as they removed rabbits from parts of the country, they started putting trees back into the landscape. They had a lot of staff but Bev would go out rabbiting and the whole family were keen on planting more trees.

Mason: The trees are some of the oldest examples of tree planting around this district. Didn't they collect the seeds themselves, because nurseries weren't selling them yet?

They would collect seed from around Australia. Bev would germinate the seedlings herself. There are trees planted across 'Yallock' that are not endemic to here. Some people may dislike that, but they were planting 50 to 60 years ago trying to bring the trees back. In a relatively short period of time, the land went from barren wasteland to a highly productive farm with increased biodiversity.

The drive in to 'Yallock' from Four Mile Lane. (Photo: N. Fijn)

Natasha: Wouldn't the rabbits just re-invade the property?

They would clear them and then put in a rabbit-proof fence. They progressively moved across the farm. They got about halfway and then a fire swept through in 1952 and wiped out all the fences, so they had to start all over again.

The grassfire started on the railway line, a massive front that swept east. It razed everything around here. There are very few old buildings left in this district. The house that was here was weatherboard and it had a breezeway between two buildings. Ian managed to save the house initially, but a spark set a nearby peppercorn tree alight and then the breezeway. Ian was fighting the fire on his own. He tried to push the breezeway over with a small tractor but they ended up losing the house. The homestead was completely burnt. They had just shipped the Geddes family chattels out from Scotland. Initially, the locals said that Ian and Bev wouldn't survive as farmers, the couple supported the community to rebuild

after the fires, so from that time on they were accepted as part of the community. They were always very community minded.

Over a period of time they cleared out all the rabbits. They were trying to heal a devastated landscape. They implemented ripped contour lines for drainage and experimented with early rock phosphate to heal the land. It was incredibly bare, with lots of old rabbit warrens – great holes in the landscape. There was massive erosion because it was so bare.

The native grass country was starting to be developed in the 1950s. They would disc-plough the land. There was one particularly wet winter with a massive flood. Before the Geddes arrived, all the topsoil washed off the hills and ended up on Four Mile Lane [the access road to the property]. The road was no longer passable because of all the topsoil covering it. There are exposed banks that are still healing from that episode. We have a paddock called Creek and it is still subdivided into market garden sized plots because they used to grow potatoes there. There was another flood and on that occasion potatoes washed down onto Four Mile Lane again. After those experiences, Ian put away the plough and turned to other methods.

Scattered trees with extensive areas of bush adjacent to the property. (Photo: N. Fijn)

Ian and Bev Geddes set the tone for how the land has been managed since. They were birdwatchers, travelers and loved the landscape they lived in. Our kids have the Geddes [bird] twitching bug where they're interested in birds. Granny [Tony's grandmother Bev] would tell them about the different birds. I think that aspect has been passed on to our kids, but whether they become active farmers, I don't know.

Intergenerational farming

The next generation followed Ian and Bev's example with the tree planting and amelioration of the land. They've always looked at where the next technology is coming from. There were step changes: trees went into the landscape; they did a lot of erosion control to stabilize the country; they used fertilizer early to create more biomass, which helped to hold the country together; then once the direct seeding techniques came about there was a push to put perennials, such as *Phalaris*, into the system.

Roger and Marg, Tony's parents, pushed to plant trees back in the landscape, so about two thirds of the planting was undertaken from the 1980s until the early 2000s. They were incredibly active in Landcare at the time, learning all the new ideas about biodiversity on farms and putting them into practice here. When the new direct seeding technology came in, they embraced that early on. When the land opens up, it becomes raw and hard to slow down the erosion process. They realised the soil around here doesn't like being disturbed through being turned over by a plough, because it would upset the soil biology. Because the top soil horizon is so thin, if the top layer is lost then it is very hard to recover the fertility of a paddock.

Natasha: When did you take over the management of the farm with Tony?

Tony came back to the farm in the late 1990s and ran the farm with his Mum. I came here in 2003 and we took over the running of the farm in 2004. Tony's mother helped us transition for a couple of years. Tony has always been in lock-step with his parent's culture. As a couple, we have taken the family's conservation history into account, but then it is hard to warrant farming the land unless it's productive. This property has high land value, it needs to be able to support us as a family and it needs to be able to earn its keep. As it is our career, we want it to

be the best in terms of a business. We thought the farm had a lot of untapped productive potential, so we cannot afford to abide by the previous generations' expectations at all costs.

Mason: There seem to be three related families that are striving towards sustainability on their farms in this district.

Yes and that inspiration primarily came from Bev. The four childrens' memories of conservation were through practical experience, they lived it day-to-day. Their children planted trees, helped put up fences and ripped the rabbit warrens. They had a functional memory of engaging in conservation – they lived and breathed it. The grandchildren have a slightly different view, but they have retained a love for the environment, recognizing the importance of trees and birds. The importance of biodiversity was impressed upon them.

Ian and Bev bought all the grandchildren a beautiful set of binoculars as soon as they could identify 30 birds, either by sight or call. Granny [Bev] ended up living in a lovely house in the hills behind Holbrook and the grandchildren remember her rescuing sugar gliders and a whole range of marsupials. A possum would nest up toward the back of the bush block. When they would come to stay, Granny would take them out with the torches to see the possum. They are all incredibly successful, highly productive and driven farmers but they have been exposed to these underlying conservation values in the fabric of who they are.

Natasha: Was it hard for you coming into this particular family culture?

It was because I tend to be more hard-nosed businesswise. I don't come from a family that is as conservation minded. Within our family, whether the animals are wild or native, we have respect for them though. Dad would shoot animals, but his ethic was if you shot something, you ate it. I grew up rescuing every broken-winged crow or magpie. We run a huge number of livestock but I know I have a moral responsibility to give them the best quality of life we possibly can.

Encroaching wildlife

Ian and Bev locked up areas of native bush that we can't develop. It wasn't an official zoning but they put those areas aside and designated that they should not be worked on. Now they have become a refuge for exploding populations of kangaroos and wombats. We are in a situation where we have to share the

environment, but there are wombat holes in places you wouldn't expect and they can pose a danger. You make the land more accessible and conducive for wildlife to live here but this does bring them into conflict with the productive side of the farm, so within the next 10 years we will need to figure out how to live together better.

Mason: All large to medium mammals are increasing, right across the eastern slopes. From our studies there is evidence that kangaroo, wombat, wallaroo, euro and wallaby populations are increasing due to greater tree cover from tree plantings. There is a question as to how to manage these populations in the absence of a natural predator in the ecosystem.

Farmers tend to shoot kangaroos if they are posing a problem. Wombats are seen as slightly different. It gets to a tipping point where they are viewed as a pest though. We might drive out and see a kangaroo family of five, and the next year there's ten and then they have increased to forty. We used to wear the fact that the kangaroos would come out of the bush block to about five paddocks deep and adjust the stocking rate accordingly, but as the cover of the trees mature they are proliferating and encroaching into the productive, cropping parts of the farm. There's now no restriction on water and feed for them. At Granny Bev's house, she would say that the kangaroos knew when springs had opened up and they would dig down to get the fresh water. There are some cranky farmers that don't like any native wildlife on their farm but their presence is part of the beauty of being on the land.

With regard to this Sustainable Farms project, in terms of sustainability it's not just about maintaining the land as it is. We recognise the damage that has happened in the past and how it needs to be rebuilt. It is about owning the damage and trying to rectify it.

It's about land stewardship. If you believe that you're just here as a custodian of the land, whether you see it as a custodian for your family, or the land in a broader sense, it is about not doing harm and continuing to improve the land. 'Improve' is a funny word because people aren't necessarily going to do the right thing and there are plenty of lessons in history where what people have done to the land hasn't been great.

Farm improvement

There hasn't been one conservation activity on the farm where there has been an economic cost to the production system: more trees in the landscape mean better shelter for the livestock, or biodiversity for insects. From the 1950s with no trees, to 30 years of tree planting and direct drilling, there was a massive shift in the approach to the land. Two generations of Geddes tackled the obvious stuff and you could see the dramatic changes. There is still tree planting, drainage line management and old fencing that needs replacing but I can't see the need now for a dramatic step change.

Water quality and how water is managed in the landscape is our next big thing, both production and conservation-wise. Water is a problem this year, which is a first indicator of how it is going to become when the weather becomes hotter and drier through climate change. The conservation landscape is going to change in terms of water management. That's why we're focusing on dam projects in the future, which we've been discussing with Mason, where we fence the dams off, plant them with native vegetation, and have only one access point for livestock.

There's a tension that you can't be a high input, highly productive farm and still try to maintain conservation outcomes. There is some give and take, of course, but it is about understanding aspects that we definitely won't forgo. Certain trees may not fit with Tony's cropping program, but we would never remove paddock trees and we leave dead timber in our paddocks. We forego production in the root zone and drive around the paddock trees. It's family culture that the dead timber is to be left for the lizards and creepy-crawlies. We wanted to be highly successful farmers and chose a farming system that is interventionist and high-input but we also want to do that in harmony with the biodiversity in the landscape as best we can.

In terms of conservation, because we don't burn the cropping paddocks, there's no burning pressure on the scattered paddock trees or the remnants that are retained. Because cropping grows a lot of dry matter early in winter, it allows us to nurture our perennial pastures and graze less heavily at this time of year [winter] when it is vital for the pastures to replenish their energy. If sheep constantly chew the pasture, it decreases how much feed is grown. With cropping, it lets us look after

some of our grazing pasture. It's the same logic as locking livestock up – it's so that the pasture is protected and won't be grazed too heavily.

Vicky's sheep enterprise

In a subsequent visit to 'Yallock', Vicky takes Natasha for a drive around the property, while rain pours down.

How do you keep separate working roles in relation to the farm?

When I first arrived on the farm, it was underperforming and I knew there was a lot of potential to improve the scale of production if I put time and energy into the farm. If we were going to have two chiefs, we needed to decide how we were going to stay out of each other's patch. We wanted to be equal partners in the business with some autonomy in the decision-making, so we broke the business up into separate enterprises. We talk through decisions together but at the end of the day I get the final say on the sheep, Tony on the cropping.

We set the business up with the enterprises having a hierarchy, the sheep are the kingpins, so when push comes to shove, we know that cattle trading is not our core business and they are the first enterprise to be shed when there is any pressure on the pasture, such as during drought. Our biggest resource is the land, in order to grow grass, so protecting our pastures is important.

Vicky Geddes on a quad bike after checking the sheep. (Photo: N. Fijn)

We run a high-geared, high-input grazing system that centres on getting maximum productivity from the land. We work on the theory that to do that and to get a return on our investment, we need to look after the soil and the pasture. We have a high stocking rate, so we also need a lot of trees on the farm to provide them with shelter for protection from storms (like this one right now) during the winter and from heat in the summer. We have about 15,000 sheep, so my enterprise ended up being the engine room on 'Yallock'. At the time people thought we were mad switching to mostly sheep from cattle, because everyone has cattle around Holbrook. Their reasoning was that cattle are easier, don't need a lot of labour and are gentler on the country.

Is your strategy to be on top of the game with current research perspectives?

I work on the principle that I like to understand the science, so that I can make my own decisions rather than just having a prescriptive recipe. I have gained a reasonable level of understanding of plant and animal physiology and soils. I feel like farmers need enough knowledge to be able to question what they're being told by visiting consultants and experts. I come from a science background and read up on topics. I put an analytical mindset to everything.

The importance of healthy soil

Thinking about diversity, we love the time of year when all the spiders put their silk out over the pastures and blow through the air – those kinds of things we don't see here for much of the year. On the way to the school bus, we used to drive past farms that would be covered in the morning with a silver sheen and the silk would be caught up in everything – it was just beautiful. With a change of ownership and subsequently insecticide applied everywhere, you can't see the silk covering the pasture in the mornings anymore.

We're high input and high productivity but in some parts of the ecosystem, we try not to be too interventionist in our approach. If you spray insecticide at a particular time of year then it's meant to get rid of 95 per cent of the population of redlegged earth mites, which supposedly has wonderful benefits for your clover productivity for the next five years. Even though there may be a big economic cost to having redlegged earth mites in the system, but we just won't use the

insecticide.[13] We like that our soils and pastures are full of bugs and worms. We try to promote the biodiversity in the soil.

Once the pasture is in place, you can have months where you have creepy-crawlies, like cockchafers, but then the system settles down and we don't tend to have ongoing problems. I don't like that insecticide goes into the waterways and kills invertebrates and reptiles, like yabbies and frogs. We have significantly changed the landscape, but for me part of conservation is also providing an environment for all sorts of invertebrates and the healthy cycling of the microbes in the soil. We intervene enough in other parts of the ecosystem, so insecticides are one of the aspects where we try to let the system find its own balance.

We work on the principle that if it is a healthy environment and the system is in balance, not only will it give us profits in the short-term but that the resource is improving, or at least not degrading. We want to leave a healthier landscape, just as every generation of Geddes has done before us.

Tony's perspective on the farm

Tony takes Mason and Natasha for a drive around part of the property, while Vicky drives out on a quad bike to tend to the sheep. Tony speaks about their joint goals to be the very best at what they do.

The best steps forward in ecology and sustainability are when we've had improvements in economic sustainability as well, so for us the two go hand-in-hand.

They stop beside a large block of fenced-off bush with a few canopy trees outside the fence.

Behind here is one of the larger 30-hectare blocks of native forest.

Mason: That's one of our research sites and is one of the oldest long-term survey sites.

You can see how the kids have built a teepee out of wood in there. This patch of bush was never cleared. My grandparents decided not to develop it and retained it as a bush block. In terms of mental health, we'll head up here with the kids to cook up a sausage, see a kangaroo or two and a dozen birds. It is fantastic having this remnant here just for that.

Tony Geddes at the edge of a 30-hectare bush block. (Photo: N. Fijn)

During the last survey I saw two turquoise parrots here.

It's nice just hearing the sounds. Compare the bush with the nude landscape in the paddocks. If you're out on a hot summer's day, it can become pretty oppressive. The same during a freezing winter, it becomes depressing. This paddock has been sown in *Phalaris* grass but there's a strip of fallen timber beneath these trees. You can see how some were ring-barked in the first half of the 20th century. The timber was here when the fire went through in 1952 and we've never cleared it away. The sheep camp here and it is a lovely shady area within the paddock. People may think it's messy but I'm never going to clear it away.[14]

Natasha: So were you taught about bird species by your grandmother?

Yeah, my Granny and my Mum, but really it did stem from my grandmother.[15] We used to camp, bushwalk and climb mountains with Granny and Grandpa originally, but then Grandpa died when I was only six. We always bushwalked with binoculars – that was just part of it – and we would learn the different birds in each area. Granny would participate in any bird survey that was happening at the time. It's just rubbed off. I can get pulled up by some of the little brown birds but I can identify most of the birds around this place. Granny's property behind the next ridge was beautifully quiet with only the sounds of birds in the trees.

Originally they started planting just single trees along a laneway or ridgeline but over time we've learnt to plant in blocks. We've also realised that we can't have too much stock in amongst trees without them eating the bark and ring-barking the trees. There's another block that Grandpa set aside and we've never put stock in there and now the vegetation is very dense – mainly tea tree.

So have you left that because it is part of your grandparents' legacy, or is it because your views align with theirs in that regard?

I am their legacy and that's why I want to do it. This pasture we're driving over, for example, I would probably increase the fertility but leave it as native pasture, which would give a greater diversity of species. I suspect it will all become [the introduced grass] *Phalaris* in time though, because Vicky doesn't have that same legacy.

The scarlet robin (Petroica boodang) *population has been increasing on farmland. (Photo: D. Florance)*

Returning to the farm

Did you always think you would come back onto the land?

I did agricultural economics, which is really a business degree with agricultural examples. I wandered around the world for a couple of years, wondering what I was going to do with my life. Dad rang up one day and said, 'If you want the farm, come home now'. I had a serious think about it and realised there wasn't anything else I would rather do.

Were you interested in the farm when you were growing up?

Yes, I was interested in it, more so than my brother. I've always loved the bush and loved the land. It took a while before I realised that I wouldn't move on to anything else though. My parents had someone managing the farm for ten years, while Dad was busy running a supermarket and Mum helping out on the farm when she could. Once the manager left, Dad basically said, 'It's now or never, mate'. In hindsight, I was probably always going to come home to farm but I just didn't know it yet.

Tony Geddes describing how he and Vicky decided that it would be economically more profitable to focus primarily on sheep as the main farming enterprise. (Photo: N. Fijn)

Economic reasoning[16]

Vicky and I were starting out. We were fairly well educated and thinkers. We looked at some graphs of the profitability of different enterprises. We realised that one farming enterprise was not necessarily profitable over another. There was also the fact that only the top 10 per cent of farmers were making any money. The bottom 30 per cent were just wearing down their capital and weren't making an economic profit. As the joke goes, a farmer wins the lottery and someone asks, 'What are you going to do with it?' and the farmer will say, 'I'll just farm a bit longer'. Sitting on a big asset you can do that. You can owe the bank for 20 years before you're out of farming. There can't be a reliance on the weather or stock prices – it has to come from the way the farm is managed. There's always variability but if you're managing everything well then you're not slowly losing equity.

We realised that to be successful farmers with the resources to look after the land we had to be in the top percentage of farmers. We looked at the enterprises and thought about the ones we could potentially do really well. The best sheep were a lot more profitable than the best cattle. We decided to focus on sheep. We started buying sheep that people were selling. That enabled us to bring in good sheep genetics when the value wasn't driven by the quality of the sheep and when they were at a discounted meat price. Even if a farmer had the best sheep in the country during the drought it was still only at the value of the price of meat. We were able to buy New England sheep that paid for themselves only three months after we had bought them.[17]

We still trade in a few cattle but Vicky manages that because she's the one with her finger on the pulse of the grazing management. We went into the drought with 200 ewes and 600 cows and came out of the drought with only a few cows and 8000 ewes. The cropping came as a bit of an after-effect. Feed was worth a lot, so we thought, 'let's start sowing crops for feed'. The cropping was a protection for the pastures after our experience with the drought.

Do you waver about your decisions when it's hard, when there's drought?

No, it's a variable climate where we live. This winter, I think, 'Do we really have to feed all winter?' but then that's just part of the life here. Prices are tougher than

weather. You can go through economically tough times when you're living on hope and capital and that's probably tougher than a drought. I say that now, but then the 2007 drought was significantly worse than anything we had experienced before and plenty of farmers I know said, 'I haven't got another one of those in me'. We were working 80-hour weeks for eight months. We had every animal in stock containment pens, getting fed and watered every second day. It took a long time to recover from that.

It seems that out of adversity, during the Millennium Drought for example, farmers were forced to change their strategies and develop better management.

It does make you think harder. Coming out of the winter, the grass that was on the ground was young leaf and it just dried up into dust, so by mid-October even though there hadn't been any livestock on it, the ground was bare. The land was just stubble so the first rain meant that all the moisture just blew away. There was no way we could put stock on land like that. As soon as we had two inches of rain in February, anything we could grow was worth a lot of money, so we just picked a bare paddock, jumped on the tractor and started sowing as fast as we could, so that the next time it rained the soil wouldn't all wash down into the creek. That's how we started cropping. With cropping technology now, we've got a disc-seeder where we can leave all the grass there without continually burning the stubble.

From an ecological viewpoint and an agricultural viewpoint, the farm has 'improved' out of sight. When I was a kid, there were football oval-sized patches of bare ground, only sub-soil with no topsoil left. We've got a back block that was ploughed up and lost the top layer of the soil. It has taken a couple of generations for the top layer of soil to come back. It's not hundreds of years though, it's decades.

One problem in relation to dams is: *Where are we going to get our water from in the future?* As agriculture becomes more efficient, less water will come off the land and into river systems. Our dams aren't as efficient as one central storage body with troughs. Direct drilling has dramatically changed the landscape. We realised that *Phalaris* was good for salinity, not just the planting of trees. But now we have *Phalaris*, we don't have water run-off anymore, so the next problem is how do we fill our dams?

Fenced off corridors of natives with a paddock sown in Phalaris. (Photo: N. Fijn)

The grandparents' legacy

There was a period where the farmers hated trees – they were a weed that kept growing. They spent their life ring-barking trees and they overstepped the mark, until there were virtually none left. We inherited a patch of country that was very bare and full of rabbits. Between the two properties – this place and my uncle's property next door – they had 7000 acres with 300 sheep and 50 cattle and it was over-stocked, with no wombats or kangaroos. We now run 15,000 sheep and a few cattle with plenty of wombats and kangaroos on the property. Sometime in the 1950s, the staff on the farm were all sitting having morning tea when someone was out the back and saw a kangaroo, he rode back home to tell everyone about it. Everyone, including the children, saddled up and rode out to see the remarkable sight of this lone kangaroo.

I liked the story Vicky told me about your grandmother giving you a pair of binoculars after you had identified a certain number of native bird species.

Tony: Yes, I still have them. Both my grandparents lived in the city but had a country upbringing of sorts. Granny grew up riding horses around the Macedon Ranges in Victoria. That gave her the country-girl outlook on life and then she married a crazy Scotsman, who had decided on a whim to go farming in Australia.

Grandpa put the place into sections of rabbit-proof fencing and then they would rip up all the rabbit warrens. They employed a permanent rabbiter and a pack of dogs.

Do you have rabbits here now?

Oh, maybe as many as 15 but just around the house and sheds.

Did your grandparents enjoy farming life?

Granny only died last year. She said to me not long ago, 'If I had known how hard we would have to work, I wouldn't have done it'. They thought they would come here, buy some sheep and have a nice lifestyle. Having worked that hard and became who they became, Granny added, 'But I'm glad we did it'. There was a huge improvement in the condition of the country in their time. My grandparents were planting trees and shelterbelts here decades before the emergence of Landcare. They did this through a love of nature and the observation that the land here had been over-cleared within an inch of its life. The choice to leave bush remnants was in recognition that it was good to have a little bit of wild left in the landscape. That's who they were – they believed in conservation.

Corridors of trees beside a cropped paddock. (Photo: N. Fijn)

Government incentives

If there were more government incentives, would farmers be planting more?

The early settlers got every bonus from the government they could. They were paid to cut down every last tree. When the last remaining paddock trees were dying, people realised they needed to do something about it. Before Landcare became more prominent, Holbrook had a 'Trees on Farms' group that was developed in the 1980s, recognising that we had a problem of a lack of trees in the area. There was the 'Decade of Landcare' where there was a realisation about problems with the land, such as salinity coming out of the soil, so the community got together and tried to solve such issues.

In the 2000s we had the Millennium Drought and the Landcare money dried up. Once people got used to being paid by the government to put fences and trees in, even though before the Landcare incentives farmers were putting them in off their own bat, there was no longer the same incentive to continue doing the same level of revegetation that they had been. There is still some money out there, people are still doing tree planting and we still need vegetation in the landscape, but a lot of trees have been planted already.

I guess it also comes down to having some finances to spare.

In the last ten years there has been a pull-back in relation to trees being planted. I'm trying to remember the last time we put tree-guards in. We haven't done a lot in the last ten years because things were tight since the drought. You really need to know your planting regime 8 to 12 months in advance. The really important work has been done but we realize that we do need to get out there and do more.

Engagement with science

There are two different kinds of knowledge system going on: the intergenerational knowledge passed down from your grandparents and parents and then there's the institutional knowledge from researchers and current science. The ANU long-term ecology group have been doing surveys on this land since 2002, that's 16 years.

The presence of the ANU research work has had very little impact on me in a day-to-day sense. Other research within cropping areas has been a bit more intrusive, where I might have to drive around plots. A lot of the research will take a long

time to filter down to general practice, so the best way to stay connected with research is to be involved in a practical sense. The initial instigation of the surveys would have been through me, but my grandfather was also involved in earlier agricultural research. Because of our strong connection and ongoing family involvement with Holbrook Landcare, the organisation was the initial connecting point for the ANU ecology research on the property. Being involved means we have a direct link to cutting-edge research – the thought leaders, that's what they are.

We go out of our way to be associated with people who are leading change. Farmers are taken to be a conservative bunch of people but then we're in a very risky business and we've taken incredible gambles every year. Farmers spend half a million dollars sowing a crop without even being sure whether they'll get anything from it. In certain areas they're taking very big risks, while in other areas they become very risk-averse and conservative in response. I would say our family is conservative but then we also try to be at the cutting-edge and taking risks in relation to development. I run the cropping enterprise, so to know how to grow a 6-tonne per hectare wheat crop in 600-700ml of rainfall, I need to take examples from people further afield, growing crops in Victoria, not from the cattle graziers around here.

Third generation on the farm

Have farms been divided up into smaller and smaller blocks?

Well it's not happening around here. I'm third generation and the first generation had bought enough land. They split it so that two of the sons inherited the land and other siblings went elsewhere. My generation, I got the farm and other siblings were helped out through off-farm assets. Maybe in some areas the land is being divided up but around here the farms are being built up again.

How many people do you employ on the property at the moment?

We have two people full time, a couple working part-time and another contractor employed full time for a couple of weeks at present. Dad had a lot of off-farm assets as well. My mother, three siblings and I inherited those assets and I'm managing them all. When Vicky moved here, I had the cattle enterprise humming along. Vicky took on the sheep enterprise. She did the research and took it from

strength-to-strength very quickly. Vicky works on the farm full-time, while I'm really working full-time as a businessman at the moment.

I will always stay on this land because I know it so much better than any other land I would buy. It takes time to learn how to read the land well. I know every rock on this farm. We changed some fences around recently and it was hard for me because the old fences were there for 45 years. It was hard to get my head around because they were somewhere different. My grandparents built this house, I was born into this house and have basically lived here all my life, but if it no longer makes sense to my life and as an asset I'll sell it.

What would you do?

I wouldn't actually want to do anything else because I love farming. I don't have an expectation for our boys to keep the land if they're not interested in doing so though.

Blue cadastral boundary of the 'Dunoon' property. (Map produced by D. Florance)

Paul Trevethan:
The end of an era

Paul Trevethan has been farming since 1978. The Trevethan family now have four properties with their main focus on cropping. In 1988 Paul and neighbouring farmers formed one of the first Landcare organisations in New South Wales. He and his wife adopted Potter Farms property management, implementing a ten-year plan to make their farming practices more resilient. Paul became very involved in the conservation movement during this time. He was chair of the Murray Catchment Committee and the NSW State Catchment Management Coordinating Committee. Paul was increasingly drawn away from work on the farm to participate in more and more advisory bodies. He and his wife Joan put in olives and developed a fish farm, in addition to their existing enterprises of wool, prime lamb, and a range of dryland and irrigation crops. In 2013, Paul and Joan won the ABC Rural/Kondinin Diversification Farmer of the Year Award. In previous decades, they had won the NSW Farmers Bicentennial Conservation Farmer of the Year and the McKell Medal for conservation farming.

In this interview, Paul focuses on 'Dunoon'. He thinks of this property as a flagship farm and used to enjoy demonstrating the sustainability measures that had been achieved, particularly in relation to contour banks and grassed waterways for the control of erosion, decreased salinity through strategic plantings and the revegetation of hill country to promote biodiversity. The family's farming business is now in a process of succession, where the next generation is taking over farm management, implementing new technology, infrastructure and equipment to increase cropping yields and livestock productivity. Paul is finding the succession process difficult and struggling with an intergenerational difference in approach to farming.

The natural asset features on 'Dunoon' are the extensive revegetation, such as shelterbelts, farm forestry and biodiversity plantings, fenced remnant woodlands and large patches of box gum woodland. The property provides refuge for populations of the threatened pink-tailed worm-lizard, squirrel glider and many species of threatened and declining woodland birds, such as the grey-crowned babbler, diamond firetail and superb parrot.

Paul lives 25km away and has driven to meet Mason Crane and Natasha Fijn at 'Dunoon'. Mason conducts some monitoring at revegetated sites around the property, while Natasha travels with Paul in his vehicle. They drive past green, cropped paddocks to the grazed, undulating hill country. Paul periodically stops to point out various projects he has undertaken over the past 36 years.

Early days of a conservation movement

My views have changed over the last few years. I became more interested in conservation through my mother-in-law, Beverley Geddes.[18] She loved the land and was an avid birdwatcher. I had a bit of a bent for the environment, so I would sit down and talk with her about sustainable farming practices. She was more interested in the sheep and cattle, whereas our focus was more on cropping. She was very quiet in a way but commanded respect from people and I was really influenced by her. She was a lovely person.

I'm not from a farming background. I was born in Sydney and came into farming in the 1970s, basically because the woman I married, Joan, grew up on a farm. I thought life would be better for us both if we acquired some country. I gave up a job with the Shell Company in research and development. We went farming, while initially I supplemented our income by teaching agriculture at TAFE and at a secondary school.

My wife's brothers inherited their parent's property, so the land was handed on to them. That was back in the day when the sons inherited the family farm and the daughters were compensated through other means. Joan and I had a bit of money to kick-start us but we had to work hard. It was difficult making tough financial decisions, while trying to conserve places by locking up the land, but I can see now that we weren't losing that much money by fencing some of the land off.

This place, 'Dunoon', came onto the market in 1982. At that time, we already had two smaller places at Jindera and Burrumbuttock. After buying a fourth property closer to Corowa, the financial commitments stretched us a bit too much, so we ended up selling the two smaller farms. When we bought this land, it had been cleared and subsequently grazed and cropped for quite some time.

'Dunoon' experienced problems with soil erosion because of its undulating country and soil type. Trifluralin is a herbicide for controlling grasses and other problematic weeds. Its early use was part of the advent of wider herbicide use in the early 1970s. But in order to incorporate the herbicide, it required farmers to work the country a lot. Ploughing the land led to a breakdown in soil structure and, on hilly country, to erosion. When Joan and I bought this place, there were already some significant gullies, possibly caused by the use of Trifluralin, as well as

overgrazing by rabbits and livestock. We had a fair bit of thinking to do about how we were going to manage this country and make it better.

The impact of the rabbits in combination with the cattle and sheep meant the land was often bare at critical times. The top layer of soil would flow down into the dams or even wash out from the cropped paddocks across the road. As a result of ripping the rabbit warrens and the introduction of myxomatosis and calicivirus, we don't have much of a problem with rabbits now.

We also had problems in patches with dryland salinity[19] and the land becoming waterlogged in higher rainfall years, due to the terrain, loss of vegetation, and the particular soil type. We decided to focus on tree planting on the ridgelines and any country that wasn't agriculturally productive. We put in agro-forestry blocks, including spotted gums, but we interspersed them with other species, so that when they were selectively harvested there would still be some habitat for wildlife. We became interested in increasing biodiversity, influenced by David Suzuki,[20] and we were also concerned about greenhouse gas emissions.

A flock of grey-crowned babblers (Pomatostomus temporalis). *(Photo: D. Smith)*

In 1986 we started some remedial work through the Soil Conservation Service. We built contour banks, grassed waterways and what they called 'gully control structures', which are essentially dams. These measures meant we could hold more water in the landscape. It was about that time in the mid-1980s, both in government (State and Federal) and within communities, that there was a movement away from the government making recommendations on its own. I had only just started in the game, so at the time I wasn't sure which direction I should take. I just thought at the time, if I could patch up some of the country, the situation would be better.

There were also a lot of changes within community groups. Probably one of the most significant was the advent of the Landcare movement in Victoria in 1986, instigated by Heather Mitchell and Joan Kirner.[21] Joan Kirner was the Victorian Premier and Heather Mitchell was the head of the Victorian Farmers Federation.

Did you get involved in Landcare in this area quite early on?

We started New South Wales Landcare here! A neighbour, who lives on the flat over there, and I. Between us we had a water drainage problem and the issue of salinity associated with rising water-tables. In 1988 we called a public meeting and as a result of the meeting we formed the West Hume Landcare Group, which was the first group in New South Wales to start of its own volition – it was community driven from the start.

Were there people employed to advise and facilitate at that time?

We could get funding for a coordinator, who was really good.

A lot of farmers were planting native vegetation in the early 1990s, so it seems as though the grassroots initiative took a few years to really take off.

Yes, it was gathering momentum by the early 1990s. There were a lot of changes within the conservation movement between about 1980 and 1995. In 1989, an alliance formed between the green movement [Australian Conservation Foundation] and the farming movement [National Farmers Federation] with Landcare as a key outcome. The Murray-Darling Basin Commission was given a fair bit of money to address the problem with water flows during that time.

In 1988, Joan and I won a farming conservation award in New South Wales and were granted a round-the-world trip. Part of the schedule was to visit the United States where they were holding a big conference on soil conservation. At this conference, we heard an Australian accent and it was Bob Junor, who was then the Commissioner for the Soil Conservation Service in New South Wales. We mentioned to him that we were working on a community project in relation to drainage, that we were concerned about salinity and that water was ponding in the landscape. Coincidentally, his agency had been working with the New South Wales government to develop the Total Catchment Management program. I then became very much involved in that.

Another program that was operating in Victoria around this time was The Potter Farmland Plan.[22] The Potter farming system focused on property management planning. It had several steps, one was looking at the property from a holistic point of view: looking at soil types, topography, where the wet areas were, where the rocky areas were, where there was timber and how you would set up an ideal landscape to look after both production and the environment.

We felt as if we were participating significantly within the environmental movement. At one stage we had planted 80,000 trees. We had tree-planters following behind tractors so that we could plant a lot in one day. The rock celebrity, 'Angry Anderson', was challenging the community to plant something like two million trees in one weekend. We had a property management plan in place, so we had the confidence to say, 'Righto, we want 15 hectares planted in trees'. When we heard of a program like that, we went and got the land ripped and then they brought a lot of people in to participate in the planting. Projects like that might be daunting for some people but they were according to the principles and plans we had set up as part of Potter Farm management.

This was our flagship farm. One year we had 1500 people coming to look at the conservation measures on the place with busloads of university students and so on. The Minister for Agriculture, Forestry and Fisheries with the European Union visited two farms in Australia and 'Dunoon' was chosen as one of them. Prime Minister John Howard's Commonwealth car bumped over this rough track during the Minister's visit.

ANU vehicle parked on the fence line while Mason Crane locates a survey point within the 15 hectare block of regenerating trees. Note the dam with contour ridge below. (Photo: N. Fijn)

Would you have a management plan every year?

Back then we didn't have the computer technology to do overlays. We would start with an aerial photograph and mark on the property boundaries and paddocks. The next layer would be the physical features: where the rocky outcrops, ridgelines, or swampy areas were. The final overlay would be where you were going to pull up the fences and replace them, particularly to fence off the wet areas on the place, and where we intended to fence off rocky outcrops that were not suitable for cropping machinery. We would work towards this goal over a 10-year period.

This was during a period that was quite wet and the water would stream out of the hillsides and cause lower areas to become waterlogged, so we planted a lot of trees to soak up the water that was oozing out of the hillsides. It was also a time when we were looking to undertake significant plantings on the hills, as recharge zones for salinity. I would spend a lot of time filling in erosion gullies and patching up where damage had been done to the land in the past. To the credit of previous owners, they did leave some trees in the rockier parts, probably because it wasn't worth putting that land into production. In some places, we planted rows of trees

and then left strips in between (or alley farming), so that the gaps were wide enough for a helicopter to spray the weeds, like Paterson's curse or thistles, whilst leaving the native grasses in place.

The structure at a community level of Landcare and then the government bodies, such as the Local Land Services, seems complex for the general layperson.

Originally, with the legislation of Total Catchment Management in New South Wales, they set it up to have two different levels, the regional catchment and state levels. They soon recognised that Landcare was one of the most valid mechanisms to physically conduct their programs. At one stage I was the chairman of the Murray Catchment Committee and also the local Landcare group, so I was very active at both regional and community levels. Soon after I represented inland New South Wales on the state committee. I chaired that for three to four years, as well as a subcommittee where I was chair of the state assessment panel, deciding on funding and allocation of conservation grants. At the time, I was often away from home for one or two days a week, so Joan was running the farm and bringing up four children. I would then come home and work my backside off to try to keep up with planting and spraying the crops and catching up with sheep-related tasks.

Why did you become so heavily involved, was it to instigate change?

I wanted to promote action and see the funding allocated in the right places. I remember being invited to speak at a Landcare Australia dinner in 1996. I said that, if we hadn't done what we aimed to achieve by the turn of the century, Landcare would have lost momentum [The 'Decade of Landcare' was from 1989 until 1999]. I probably put too short a timeline on it, but it wasn't too long after that when we started to see Landcare groups folding.

I had started to feel that we needed to take conservation to another level because farmers had run out of the easier projects. You end up running out of farmers who still have projects to do after a period of time. In addition, part of the agreement was to keep stock out of these regeneration areas for at least five years. There was a need to develop a contractual arrangement where it was a more conscious business decision on the part of the two parties.

About 18 years ago, [the turn of the century] I got out of it all. Joan and a good friend of ours at the time said that I had better make up my mind whether I was

going to farm, or keep going to Sydney and Canberra week after week. I realised that I couldn't keep imposing that way of life on my family, so I wrote a letter to the Minister and resigned.

I think the later Catchment Management Authorities created a lot of administrative activity without generating the on-the-ground activity that had been experienced through Landcare as a grassroots organisation. Instead of letting the local Landcare groups determine what they wanted done, the new authorities ended up being a lot more prescriptive. As with my concern with farming practices, the nature of Landcare has now been taken over by a new paradigm. The past role of the Catchment Management Committee, in association with Landcare, has now been subsumed by the Local Land Services (LLS), who have a lot of different roles, many of which are tied up with agricultural production.

What's happening on our farm is being mirrored at regional and state levels. There used to be a sense of community with farmers sitting on advisory boards and they were interested in what other people were doing in relation to biodiversity and soil conservation. There's not that same sense of ownership and involvement with the new arrangements.

Pasture with scattered trees. Fenced tree plot to the left with a large bush block behind. (Photo: N. Fijn)

Paul Trevethan beside a fenced off block. (Photo: N. Fijn)

Tree plots and restoration projects

What percentage of the land on this property is cropped versus this undulating, rocky ground?

About 50 per cent would be cropped. The rest is either grazed by sheep, or set aside as conservation land. This place naturally encouraged sheep, cattle and cropping as enterprises with the diversity of the landscape. If we experienced feed shortages, we could let the sheep in through a gate for three weeks to graze on the regenerating areas, or we could let the sheep in the forestry area to shelter from adverse weather conditions.

There were federal and state programs available to fence off country and allow the vegetation to regenerate. There is an 11-hectare block that was fenced off in about 1995. It was part of a 'Save the Bush' project and they gave us $1500 to put a fence around this rocky area. Soil Conservation staff also assisted with the direct seeding.

Paul shows Natasha to a fenced off remnant.[23]

The fenced block of trees is behind Paul Trevethan, while the paddock he is standing in is both grazed and cropped. (Photo: N. Fijn)

Some of these wattles have just came up in the last couple of years. It's really thickened in recent times. This is the kind of thing we were trying to do and we achieved it. I'm concerned that in the future the fence may be pulled down and the sheep would be permanently allowed to graze all through it, in which case you wouldn't get the new vegetation coming through, the benefit as a windbreak would be taken away and the contribution to biodiversity would also be lost.

That treed block over there was like this grassed paddock before we fenced it off. It will naturally regenerate within the fenced area.

Paul and Natasha drive back down the hill, heading for the flatter cropped paddocks.

So do you have a series of dams here?

Yes. There are a series of five dams here with contour banks and grassed waterways directing water into them. The idea was that you didn't have to protect your contour banks but you did have to protect grassed waterways with fences because water would travel faster down the slopes. These systems take quite a bit of maintenance – you can't just put a fence around areas and then walk away. Weeds are a particular issue in fenced-off areas and often have to be controlled by hand-rogueing or a portable sprayer.

How did you get involved in the ANU long-term ecology research on the land here?

I think David Lindenmayer approached people through the regional Catchment Management Committees, perhaps around the year 2000.

Did your children get involved in planting when they were growing up?

They did, they were there when we were out planting. Perhaps they had to participate in it all too much and became sick of it.

Mason knows what I mean because he would have seen the changes that have been happening over time, having surveyed on the land here for so many years.

Mason has finished sampling the different plots. He points out a creature that looks like an oversized earthworm but is in fact a reptile, a worm-lizard.

A pink-tailed worm-lizard (Aprasia parapulchella) *found by Mason Crane at one of the survey sites. (Photo: M. Crane)*

Changing ideas

When Natasha returns the next day, Paul is fixing a fence with the help of Kate, who has been a full-time employee for many years. Paul and Natasha stand and talk on a newly formed vehicle-access road, with timber that has recently been felled on either side.

Has the employment of people been replaced by new technology?

The advent of technology has replaced labour in the cropping industry. The replacement with bigger and better equipment had already started in the 1980s but has really become more widely adopted in the past decade. This shift has not been as evident with the livestock because it is more of a human-animal relationship.

In the mid-1990s, we planted farm forestry and these felled trees are just the remnants of it. We put the plantations in to control the water table up on these rocky areas and to get some timber from them further down the track. They've just been harvested 28 years later.

Photo of 'Dunoon' with the pine plantation on the hillside, during the Millennium Drought, November 2004. (Supplied by Paul Trevethan)

While the bulldozer was here to knock down the pine trees, they also knocked down some of the native canopy trees. All this area will be burnt and put back into production. The question is: How much is it going to cost to put it back into production, or would it have been better to leave as native pasture?

There were some pine plantations that had to go but it is upsetting me that spotted gums, melaleuca and a range of other gums are being removed to open the area up. That hurts me [Paul puts a hand to his heart]. The other aspect is the removal of the standing, dead trees that were habitat for raptors and parrots – the birds use those big old trees for nesting. A fellow was out here with a chainsaw cutting some fallen timber the other day. He said to my son, 'Do you want me to cut that old tree down to get firewood out of it?' My son said, 'Yes.' The other bloke saw the look on my face and said, 'Hold on, your dad is standing here and I don't think he wants me to cut it down.' I then replied, 'No, I would prefer it if you left the tree there'. Thankfully, that old tree is now still standing there in the paddock.

New laneways

My son has been putting in new laneways, such as the one we're driving on, but I'm worried about erosion and I can see the soil starting to erode here. If I saw this kind of thing happening previously, I would try to re-direct the water away from it. They have been bulldozing the contour banks to allow cropping machinery through the area too. It's the episodic weather events I am worried about, as with climate change the rainfall events will become more intense. We would try to retain water behind contour banks and channel it into a dam, now it won't flow to where it was intended but will just run down into this newly graded vehicle access route.

Where there were two paddocks with a waterway in between, the fence has been removed to make it into one bigger paddock for the larger cropping equipment. What hurts me now, is that three aspects I worked hard on building up on this land are now being undermined: removal of contour banks; putting in laneways that don't take erosion-risk into account, and bulldozing vegetation that was planted 25-30 years ago for biodiversity and to control the water-table.

A newly-formed access road with recently felled trees and a contour bank in the foreground. (Photo: N. Fijn)

My older son and I did have a good level of communication about the farming in the past but sadly that communication is not as good as it used to be. Perhaps the boys think it's time for me to hand the farm over to them and the best way of signaling that to me is to just go ahead and make changes themselves. I don't even have the confidence now to fill out an agricultural census form, because I no longer know the areas of crop that were planted last year and on which place. In the early days when the boys first came home, they would forward me their spreadsheets of which paddocks they were cropping and where. My sons will communicate with each another but I'm now often bypassed in the decisions they come to in relation to the management of the land.

When I was away on holiday three years ago, my son built a laneway straight down the hill and fenced it on both sides with no gate at the bottom. The sheep walk up and down it and I'm sure it will end up being an erosion gully. My

method would have been to fence it off, so that the sheep couldn't camp under the trees along the laneway and we would only use the laneway when the stock need to be moved from one paddock to another. The trees are now what you would call 'the living dead' because there will be no new trees coming up to replace them with the sheep continually camping underneath them. With the strategies put in place by property management planning we would have identified the need for a fence and a gate at the bottom to keep the stock out.

Succession

How long have your sons been working on the farm?

The eldest son for 12 years and the second eldest for 18 months. It was agreed that Joan would ease out of working on the farm when our oldest son returned. Joan was a terrific worker. Besides bringing up four kids, she would be driving the truck during the harvest and would be out there working the sheep and cattle, as well as taking on a host of other farming tasks.

How are you negotiating your succession planning with four children?

Apart from the two boys on the farm, we have two other children who are employed on the Gold Coast. It is hard to work on the basis of equality because the nature of the farming business is capital intensive and cash poor. If two of the boys are farming, then the other two have to recognise that the ones on the farm are working hard with less money to spend. We need to have some sense of equity though. Changes in federal government legislation have made it confusing with changes to superannuation. It's had a big impact on farmers who had some of their land tied up in superannuation.

Are you trying to leave most of the management decisions to your sons?

We're in the midst of succession. There is only so much control I have when I'm at the time of my life when I'm supposed to be handing the management over to my sons. A lot of people say that agriculture is characterised by cranky old blokes, who should have left the farm and let their children get on with it. Maybe that's what I need to accept and I should just move on. I think the height of where we had got to with the farms and family was about three years ago, soon after buying our most recent property and completing the first stage of the succession plans.

Changing attitudes

How do you think your sons approach is different in comparison to your perspective?

There are several things that have happened with farming in general. It has become harder to make money and the terms of trade have become more challenging. Cropping and wheat returns haven't kept pace with inflation. We used to have a philosophy of setting land aside for biodiversity and, in more recent times, mitigation against climate change. Well, younger people don't seem to be as interested in those ideas. It seems that their focus is directed towards a generation of income and that if you devote too many resources to the greater community good then you could go broke.

Not having grown up on the land and through my own time at university in Sydney, my attitudes have developed differently from my two sons, who went to a different sort of tertiary institution where they were mixing with people from further out west, who farmed with big equipment. They went to an agricultural university, which taught them about practical, hands-on experience, not so much about ecology and conservation. It meant that our style of property management became not so important to them. Land out west is good, flat cropping land. There, you need have to think about the five years out of eight that are ordinary by capitalising on the three good years. Here, we have more even rainfall, so the nature of agriculture is different from the cropping areas further west.

Young people now would often prefer to sit on a tractor where you use satellite technology to call up the paddock and have it on a computer screen. You look at the direction the crop was sown last year then you just nudge 20 to 100 mm off the line you sowed the previous year. It is easy and logical to have the mentality that the longer the runs you can get and the wider the cropping equipment you have, the more efficient you're going to be. Often people choose to sit and look at social media on their mobile phone and don't pay attention to a lone tree, which catches on an expensive piece of equipment and it's a lot of money to get the equipment fixed. That tree then gets a mental cross on it and next year that tree is not there anymore. The technologies that have developed are acting against what I (and a lot of other people) had put in place with our farm management plans from the late 1980s until the early 2000s.

View from the highest point on 'Dunoon' looking south towards the Victorian border. (Photo: N. Fijn)

Paul and Natasha pause at the highest point in the area, at a trig station, and look out across the plains with green paddocks and scattered trees dotting the landscape far into the distance.

We lease some cropping country and then we also have some good cropping country over the other side of the hill. You can see the Murray River in the distance and Victoria is just beyond there.

Do you think it's easier to put in more sustainable farming practices if you're not cropping and are grazing the land instead?

Yes, it would be, provided that stocking rates are managed within the capacity of the country. When sheep weren't making so much money, it didn't cost you so much to set aside the land. However, now that wool and lamb prices are good, the farmers say to themselves: 'Can I afford to have that land set aside in trees when it could be converted into improved pasture?'

Do you think intergenerational continuity means that the land is less likely to be subdivided into smaller, less productive properties, as is the case in some areas?

I am happy that I have a couple of boys who think farming is worthwhile and that they wanted to come back on the land. We have a fish farm but the boys aren't interested in taking that on at all, so we will have to make a decision about whether to subdivide that area off, which goes against my principles. We have built up some critical mass in that we now have four farms, but I had to sell two

out of six of them along the way, which was hard. I wasn't born onto a family farm, so whilst it was a difficult decision, it was a commercial one. The other three places are flat land and irrigated, so they're different. It is this place, 'Dunoon', where I feel like we're going backwards in terms of sustainability.

New technology

There seem to be two factors at work here that aren't compatible with one another: the push for new and better technology and better efficiency in terms of production and then there is the counter to that of trying to retain the integrity of the land.

You often don't achieve ecological goals by bringing in big equipment. From 'whole farm planning', which is about trying to get areas that I would have regarded as not agriculturally productive land to regenerate, to now, where the boys are actually knocking out trees and trying to bring the land into production, while costing a lot of money in the process. I feel like this place is going backwards from a biodiversity perspective. I'm concerned about the health of the land. You haven't got a business if you can't survive economically but I think it would be better to go out and buy additional cropping or grazing country, rather than trying to convert marginal land into agricultural productivity around here.

We drive over the recently bare ground that is now cropping land and was recently native grasses with scattered rocky outcrops.

Have you heard of a Reefinator? [*Natasha shakes her head*]. My son went up to Armidale and saw a guy smashing up rocks there and how he's got some good pasture growing. I haven't seen it working here because I really don't want to see it destroying the rocky outcrops. There used to be rocky ridges around here. What reptiles and invertebrates they didn't kill while doing the Reefinator work have now been compromised through lack of habitat. The other aspect is that a rock is like an iceberg because there's often more rock just under the surface. In time, when the soil erodes away, more rocks are going to emerge from underneath.

The boys are pretty pleased with this new technology but I just have a different attitude. I don't think they're going to get a very big return on the investment they've put into converting it into land for improved pasture. They've now sown some of this area into oats, but hardly anything has come up.

I'm seen as too old, too critical and too cautious. I have made my own mistakes in the past. I brought people in to build contour banks that turned out to be too high. We started an olive grove that we spent a lot of money on and they're still standing there not making money. I suspect the recently harvested pine trees will be revenue neutral at best and more likely a loss. There's a saying, that you should 'let them make their own mistakes', in other words not hold the next generation back.

Corridors of planted trees with a clearly visible contour bank. (Photo: N. Fijn)

Wellbeing

Did you have some hard times working on the farm? How did you work through adversity previously?

The first year we bought this place we struck the 1982 drought. I had done my budget and thought that we were going to be okay. Joan and the boys were away – we had three children under three at that stage. I was driving around looking at the property by myself and all of a sudden the realisation came to me about the state of our finances. I went back home and thought about taking my life. It was early days in farming, I had only been in the business for three or four years and we were pretty well in debt. I thought, 'The main worry I've got is finance. There's only one person that's going to get me out of it and that's the bank manager'. I made an appointment that Monday morning. I explained the situation to him and he said 'You've got problems but it's not just farmers. You should take

a walk through Albury with me some time'. The tough times had filtered down through the rest of the rural community too. He said, 'You need to go back out and do the best you possibly can to come through this season and I'll do the best I can to support you financially'. I've stayed with that bank ever since. I was so thankful to that bloke. He saved my life I think.

Working on the business

What do you think is the key to survival on farms in the long-term?

I think there's a difference between working *in* the business and *on* the business. A lot of traditional farmers are very good at working *in* the business, that is getting out there and doing a hard day's work. To me, part of a hard day's work was working *on* the business, getting into the office and working on cash flows, looking at your equity position, realising early enough whether you're going to be in strife, realising when not to go ahead with capital expenditure. If you've got someone working full time, you don't go out and spend a lot of money on equipment when financially stretched, but focus instead on jobs that require labour. When you owe a lot of money on a property it certainly hones your financial skills. Whenever I was away, working on committees, I would be sitting in an airport, working out finances on the back of a boarding pass. Having the bookwork in order and being able to present it to financiers is a big advantage. There was a lot of work *on* the business as well as *in* the business.

I've started to form an opinion that there are a few important factors in the success of farming: 1) Where you choose to do it; 2) What you choose to grow; 3) What sort of management systems you apply to the land; and 4) How well financed you are to withstand adversity (such as the current drought).

You now have four different farms - was that in order to have enough land to remain farming?

We felt we needed more land to accommodate two sons who wanted to be on the land and keep ahead with the finances. We bought the most recent farm only four years ago and that added another 385 hectares and 900 ML of water. Banks will still look at you as long as you have an equity that is respectable, the prospect of adequate cash flow and a demonstrated capacity with management skills.

Paul's concluding remarks

One big thing for me is the aesthetics. It's much nicer to look out at a varied landscape than if it were all bare country. In many cases, a farmer won't just want productivity; they will also want areas where they can take the family for a picnic, or a pleasant walk on the property. Coupled with this, we also have a bigger responsibility with greenhouse gas abatement and global warming.

I think a lot of farmers have a green sensory node behind their eyes. They just like looking out at a beautiful green landscape. It's about aesthetics and seeing the fruits of the land growing and responding. Whenever I did some fencing work here and I looked out at the landscape, I always found it really uplifting. That's why I was feeling so challenged with fencing today, when it's just recently been bulldozed and the land looks decimated.

The environmental movement with Landcare at the forefront was a generation, perhaps 20 years, 1985 to 2005. I have the feeling that it was a narrow period of intense activity that I was very much a part of. What we did on this place definitely made the land more sustainable and more resilient in the long term.

You have wisdom to pass on from being on committees in combination with having worked on the land for so many years. Do you think it is important to pass on knowledge gained from one generation to another?

I get told that 'things have moved on', or that it was a different era when these measures were applied. Through connecting with the *Sustainable Farms* project, I hope that people will become more aware of the need for such practices. I do think this should be the time for younger people to take over. I wouldn't like to be remembered as an obstructionist. I understand that the next generation has to make a quid out of the land; but I feel nearly at the end of my tether with some aspects of the changes that are going on here. I am pessimistic and anxious about many things. I'm so disappointed with what's happening to some parts of this land, but I also realise that there is a necessary changing of the guard.

Blue cadastral boundary of the 'Ballanda Park' property. (Map produced by D. Florance)

Kent and Marion Keith: Wildlife expertise and cattle grazing

Kent Keith worked for CSIRO Wildlife Research for 26 years, embarking on expeditions to remote locations such as the Coburg Peninsula in Arnhem Land, Macquarie Island, and the Sepik River in New Guinea. Kent was passionate about his job, where he was part of a unique era of research on Australian wildlife, gathering important baseline data on birds and mammals, while making a significant contribution towards the Australian National Wildlife Collection. He worked in areas where there was dengue fever and encephalitis, and he contracted malaria in New Guinea. Part of the job entailed exposure to a large number of chemicals. In 1979, at the age of 50, a doctor gave him only two years to live unless he gave up his job. He did so, and lived into his eighties.

Kent turned his attention to grazing and breeding cattle. He and his first wife, Noel, bought 'Ballanda Park' near Boorowa. Kent no longer used chemicals on the land, allowed native vegetation to grow back, and preserved corridors of vegetation to conserve the wildlife he loved. Noel was diagnosed with leukemia, but with medical support from Ian Prosser, a haematology specialist at The Australian National University (ANU), she survived for ten years. Noel requested that her part of the estate should be put toward funding Professor Prosser's medical research, so Kent and Noel formed the Keith Family Research Endowment Fund.

A few years after Noel passed away, Kent met Marion through their mutual interest in cattle. In their retirement, they now live on what was Marion's family property, 'Burnbrae'. Marion has been engaged with caring for others for much of her life. She decided that the property at 'Burnbrae' should also go towards the Keith Family Research Endowment Fund. Recently, they decided to donate the proceeds of the sale of 'Ballanda Park' towards the Sustainable Farms project. As part of the ANU long-term ecology projects, research officers periodically visit the Keith properties to survey for wildlife diversity, an element of continuity with Kent's earlier days of surveying wildlife.

Natural asset improvements at 'Ballanda Park' include farm dam enhancement and sustainable management of on-farm water, as well as the construction of deep dams across the farm to ensure water security and quality. Livestock exclusion fencing has been put in place for passive regeneration, as well as revegetation through strategic grazing across the property. A Voluntary Conservation Agreement has allowed for the protection and recovery of remnant vegetation and wildlife.

Note: Kent Keith passed away in January 2019. These interviews were conducted in 2018. For ease of reading, the present tense is used throughout this account.

Marion and Kent Keith at 'Burnbrae', January 2018. (Photo: L. Harley, ANU)

Wildlife Service Days

Kent and Marion Keith are now 'retired' in their eighties, yet they still graze over 300 cattle. It is not yet winter but the land is already dry from lack of recent rain. Kent has been quite ill but is well enough today to be able to talk to Natasha Fijn. Their cottage is modest, a typical rural Australian home, but Kent is not the typical grazier. Kent sits within reach of his cup of tea, and Marion assists by finding various items Kent would like to show from his wildlife collecting and surveying days.

Kent: I have always been interested in the land and conservation. Every opportunity when I was a kid, I'd take a mate with me and we'd go into the bush. We used to do a lot of bushwalking in southern Queensland. I walked every creek and river over many years and got to know the trees. I started off with Queensland Forestry, then the Queensland Museum. When I left grammar school, if you were an old boy there were a myriad of jobs available in solicitors' or accountants' offices. I didn't want to work in an office. I went and saw Queensland Forestry and they offered me a cadetship. My first job was looking after a million hoop pine seedlings in a big forestry nursery. I would have to get up early in the

morning and hose the frost off the trees before the sun got to them. If the sun hit the frost then they were dead.

I had been to talk to a curator at the Queensland Museum to see whether there were any jobs. I received a letter from the Curator saying the Director wanted to see me. He gave me a job. I became a cadet preparator of specimens and trained four nights a week at a college. I trained as a preserver, collector and preparator for the natural history part of the museum. David Fleay was a renowned naturalist and I got to know him at the museum.[24] I developed an appreciation of live animals and Australian wildlife from him. The two fellows who trained me were a few years older than me but had young families, so I thought there wasn't much hope of advancement in the job.

There was an advertisement in the paper with the CSIRO Wildlife Survey Section in Canberra to investigate the Australian ibis as a form of grasshopper control. I wrote a letter to them saying that I didn't have a degree but I reckoned I could do the job. They flew me down from Brisbane for an interview and gave me the job.

The entrance to the property at 'Burnbrae'. Kent and Marion Keith have observed many visiting native bird species between the gate and the house as the trees and two dams provide good habitat. (Photo: N. Fijn)

The wildlife service

How long were you part of the CSIRO?

I was employed with the CSIRO for 25 years. I came down in March 1954 when Canberra was only 23,000 people [compared to approximately 390,000 in 2018]. I started working on rabbits in the Albury-Wodonga area. My first job was to collect blood for Frank Fenner.[25] That was my introduction to the ANU, through my involvement in the research on the development of myxomatosis [with the intention of controlling the rabbit population]. Every month, over a three-night period, we had to shoot and collect 300 rabbits. The boys liked the idea of this at first but even if it was teeming with rain, we still had to shoot 300 rabbits.

Were you initially employed to focus on the ibis?

The ibis project came a few weeks later, working on the Macquarie Marshes and I went further afield to western Queensland too. Ibis congregate in large numbers, especially if there's a grasshopper plague. Nobody knew anything about their feeding habits or anything else, so we needed to collect baseline

Were the ibis causing problems?

No, the grasshoppers were, so we were looking at the ibis as a potential bio-control method and how to move ibis into a different area.

Photograph of a wandering albatross (Diomedea exulans) *taken by Kent Keith on Macquarie Island. (Photo: N. Fijn)*

Marion has retrieved different sized black-and-white photographs from boxes in the office. They are laid out on the kitchen table and Kent moves on to tell of his time in the Sub Antarctic, on Macquarie Island.

Macquarie Island

In November 1955, the boss said, 'Would you like to spend a year at Macquarie Island with the Antarctic Division?' I was on the boat seven days later. Once you're on the island, there's no phone or mail service or any form of outside communication.

I took hundreds of photographs. I had been doing some photography work, as well as printing negatives for the Antarctic Division. I was taught photography by staff at the Courier Mail (newspaper) in Brisbane and asked them to tell me the best camera to take to Macquarie Island. They recommended the reflex camera. I could use it in all weather and had the use of a darkroom once I came home. I managed to get a photo of a wandering albatross feeding its young in July, in the middle of winter. The theory up until then, for centuries, was that the adult flew away and left the young enough food to last right through the winter.

A framed photograph taken by Kent Keith of a wandering albatross feeding its young in July 1966. (Photo: N. Fijn)

My job was as biologist for the year, mainly to make an inventory of what species came onto the island and what left the island. Birds, penguins, seals came and went but there had been no previous long-term picture. I had only 14 other human faces to look at for 12 months. We had second-hand army and air force clothing. A friend of mine was to be the biologist at Macquarie Island the year after my stint. He asked me what kind of training he should do to prepare. I said, 'When you get undressed at night, wet your clothes, wring them out and put them in the fridge. When you get up in the morning and you're nice and warm, get under the table and try to get dressed into your frozen clothes. If you can do that without complaining, then you're fit for the job!' You couldn't carry enough dry clothes if you were out and about for a week or ten days. You put your dry clothes on at night and your wet clothes on during the day.

I got used to the cold climate. There wasn't much variation between day and night, so you acclimatise very quickly. If we were running around at a temperature of 5 or 6 degrees Celsius, after a month you were running around in shirtsleeves.

Kent and Marion Keith sharing a laugh. (Photo: L. Harley, ANU)

Arnhem Land

What kind of work were you doing in Arnhem Land?

I was at the CSIRO's Division of Wildlife Research, focusing on Australian fauna. We had two American zoologists on the Arnhem Land expedition – they were experts on native rats. This was where a lot of the original rat specimens came from. The Chief of the Wildlife Division gave me the job of organising the expedition, the two American zoologists and five of us. We stayed for six weeks surveying the fauna at Coburg Peninsula, northeast of Darwin, which hadn't been surveyed for 50-100 years.

On a later trip, two of us wanted to get onto the South Coast of the Coburg Peninsula, in the area known as Two Hills Bay. I had been looking at some stereo photographs of the area. I phoned the owner of the lighthouse to see if he could get us across the coastal reefs. He said 'Yeah, I can get you in there. It will be very clear-cut what time and tide we go in on. Once you're there, you'll have to stay until the right tide until I can get you out again. It will be at least a fortnight.' We managed to get in over the reef by boat and he dumped us on the beach at Two Hills Bay. We camped on the beach that night. The next day there was a beautiful set of crocodile footprints about 3 ft. 6 [1m] apart. We moved camp a bit further away then!

Was David Attenborough filming a series up there around that time?

He was there in the mid-1960s, doing a series on Aboriginal Art. We spent a lot of time with him and some Aborigines up there, collecting the bark from the trees. There was David Attenborough, the cameraman, the sound recordist – a total of five of us spent three weeks together recording. Every bit of painting that was done, David bought for his own collection.

I listened to an audiobook of David Attenborough's 'Life on Air: memoirs of a broadcaster' (2002). He relates a story about being given a sacred didgeridoo, or yidaki, used in ceremony and how it represented a significant snake ancestor.

Yes, we just about had to strip the inside of a Cessna [a small plane] in order to get it [the yidaki] in the plane, it was so long. It was a marvelous piece, very symbolic. No Aboriginal woman was allowed to see it. It was covered up then unveiled during the big ceremony that we attended.[26]

David bought a lot of paintings. The artists would say 'We've got to stop painting to go and get some bush tucker', so David would give them some cans of meat and they would sit back down and keep on painting. One final night was at Maningrida. We were due to fly out the next day. I had been looking for a painting but had no hope of competing with David. We were packing up and a fellow came to the back door with a small bark painting. David had already packed up, so he said, 'See Kent, I know he's been looking for one'. After buying the painting, I said, 'What's the story behind this painting?' It was the totemic history of the tribe. You should have seen the look on Attenborough's face! It turned out to be a prized piece.

Marion retrieves one of Kent's traps. It is easy to distinguish, painted a bright yellow with a number on the side.

We had only one type of trap in Australia, a North American one. I decided I needed a different kind of trap. We found someone in Victoria who was repairing caravans and he came to see me. I told him what I wanted – the size and dimensions – and he built this trap for me. We should have taken a patent out on it. He made tens of thousands of these and they're all around the world now. I can say it was designed in my lab.

Did you find any unknown species?

With bandicoots, we extended their range to the outer-end of New Guinea. We located the New Holland mouse at Port Stevens. There's also a paper about a naked-tailed rat in New South Wales.[27] I was measuring hundreds of skulls and it dawned on me that there were some that were different from others. The rows of molar teeth were parallel. I would have never picked that up unless I had been handling hundreds of skulls.

Collaboration with the ANU

At what stage did you become involved with the ANU?

Right from the beginning of my work for the CSIRO we were collecting for Frank Fenner. Not many people now have had as long an association with the ANU as I have had. I knew Frank Fenner right up until his final years. He was a wonderful fellow.

An ANU survey site with Cassinia scrub in the background. (Photo: N. Fijn)

Because of my training as a collector, we used to have requests for wildlife from the School of Tropical Medicine in Sydney and they used to come to me. That's how I came to work on dengue fever in North Queensland. They wanted someone who could identify the birds and collect blood samples.

Ian Marshall, from the ANU, was working on insect-borne diseases and put together a team to travel to the Sepik River in New Guinea. The direction from my chief was that if the ANU wanted to go bush, we were to drop whatever we were doing and go with them. I ended up going on five trips to the Sepik River.

Did you ever catch one of the illnesses?

I think I contracted malaria in New Guinea. There was also an outbreak of encephalitis on the Murray-Darling floodplain. We were posted into the field within days of the outbreak. They closed highways and no one was allowed to go in there, except us. Some scientist thought yellow fever was a buffer for it. The Commonwealth Government didn't want to inoculate against yellow fever. Five of us on the team were inoculated, but the Commonwealth would have nothing to do with it. There were photos in the press of us risking life and limb.

Chemicals

I ended up with chemical damage in my lungs. I lost 30 percent of my lung capacity, which I could never get back. I gave the CMO [Chief Medical Officer] a list of all the insecticides and pesticides I had been using as part of my job and he said, 'If you stay in the job, you've got two years to live. If you get out in the fresh air, you might last five. You better go home to your wife and decide what you want to do.' I decided to get out [leave the CSIRO] and get into the fresh air.

Did you find out the cause?

I never found out. People have died from the hothouses, but no one wanted to know because of lawsuits. A thoracic specialist said to me 'Have you ever smelt formalin? If your answer is yes, then you've already done damage to your lungs'.

Is that when you took up being a grazier?

We had a small place at Hall, 100 acres with a few cattle. My first wife [Noel] and I decided to move to 'Ballanda Park' when I left work. I said to the CMO, 'I'll prove you wrong' and that was in 1979. I was crook for ten years though. If my wife used hairspray and I had a whiff of it, I would be in bed for a week. I was lucky to be alive.

Do you think the CSIRO functions differently now?

Oh yes, it's completely different now. With the early Wildlife Division, we were trying to gather baseline work. Once they felt that had been achieved, then they started to branch out into specialised areas.

We had the best days. With the job with the ibis, if I wanted to take a look from the air, I could go along to the local airfield and charter a plane, then tell them to send the bill to Canberra with no problems whatsoever. I was in Arnhem Land and had to meet up with the team at the ANU. They didn't know what flight I should take to get in there, so they gave me a receipt book that few people had seen, which meant that I could just write the cost of an air ticket to charter a plane anywhere in the world. They trusted you. If they didn't, you wouldn't retain a job like that. We took a lot of flights around the Northern Territory, Northern Queensland and New South Wales. I felt like I had the best job in the world.

Grazing Cattle

Natasha is taken by Marion to a hill in what she calls the 'Gator, a small buggy that allows Kent and Marion to observe the cattle and feed out without having to walk far. The belted Galloways know the sound of the 'Gator well and approach us lowing and looking for food. The bull is impressive and has a ram in tow that often follows him around the paddock.

How did you make the transition to being a grazier?

It was a hobby when I was at Hall, entering the local shows with my stud cattle. When I became sick from the chemicals I bought the two properties, one about 10km away 38 years ago, the other 20 km away 34 years ago. I used to come through Yass, Boorowa and Cowra as part of my job. I noticed there were more prosperous graziers around Boorowa than anywhere else.

Why do you think the properties around here prospered so well?

It is good country and you can do so much with it. There used to be a good 20 to 30 inches [500-750 mm] of rain a year (not this year). We could survive on pasture growth with half the amount of rain in a year. I would come to the property from Canberra on the weekends to run 500 head of cattle. It used to be a dirt track from Yass.

Galloway cattle approaching the 'gator, expecting Marion Keith to feed them. (Photo: N. Fijn)

Belted Galloways in a paddock on 'Burnbrae' with trees along a riparian zone. (Photo: N. Fijn)

When did you and Marion meet?

Marion is my second wife. My first wife died of leukemia. Marion and I were married four or five years later. Marion had this place, while I had two properties [a few kilometres away, including 'Ballanda Park'] on either side. One day I needed a hand with the cattle and she offered. After a day's work, I said 'I like the way you handle the cattle' and so we got together!

Have you both mainly grazed cattle?

Marion: I've always loved cattle. During the war I used to go out and stay with my uncle and ride the draught horses. I didn't want to go to school. I wanted to be outside with the animals – I've always loved animals. My family had dairy cattle up on the North Coast. I'm a trained Mothercraft nurse [in early childhood care]. I did a lot of work in homes all around the country. I always wanted a country job, if I could. I was always out in the country amongst cattle and horses. My parents were in Newcastle and my father wanted to get back on the land because he had been on the land. I went looking for a small acreage but we ended up with 46 acres. We found this place here. It's a lovely area and I've been here for 41 years now. We came here in 1977 but my mother died in 1982, which was sad because she really loved the place. My father died of dementia in 2001, so he was here a lot longer, but he also thoroughly enjoyed being here. I ended up with a job at the local pre-school, so I had a job and the cattle here, while caring for my father. We decided to stay on this place because it is between the other two properties.

Marion: We don't crop. We're graziers, not farmers. We only have cattle. We get upset with people calling us farmers because we don't plough the land. It's a great lifestyle. We do have someone to help us with the cattle now because we can't do the yard-work ourselves.

Kent: I no longer have enough strength in my hands to punch the ear tags through the ears any more. We still feed out, observe the stock and move around the cattle ourselves. Old age has crept up on us. I used to spent time with my uncle during World War II. He had a dairy farm south of Brisbane. He had a dairy stud and at 13 I used to keep all the records of the cows for him. I've always been interested in the history of cattle and the breeds from different parts of the world and how they

adapt to specific areas. We've had mainly Galloways, which are a Scottish breed. I had a herd of highland cattle too, British Whites, the only herd in Australia.

Galloway cattle

What breed do you think is best suited to this landscape?

Marion: We keep the Galloways because they're foragers. They eat in amongst the Cassinia and bits and pieces [of scrub]. We're the only ones in the area with Galloways that we know of.

Kent: Black Angus are the breed the overseas market wants, so that's what most graziers have. If you're going to have cattle, you might as well have quiet cattle. If we get a wild one, it doesn't stay here long, we move it through the sale yards.

Why cattle and not sheep?

Kent: The cattle don't crop the grass as low and can forage on longer vegetation.

Marion: Like Kent, I think they're less work. I had less prior experience with sheep, apart from mustering them with horses as a child. When we came here I used to hand milk a cow but we would have too much milk. I used to take fresh milk in to the people I cared for in town. Marion: Some people flog the country and knock trees down by coming too close to the trees while cropping. We've lost a few big [scattered] trees in the paddocks but they were pretty old. We planted wattles and gums here [at 'Burnbrae'] in 2005 and we would come over from the other property at the time to water them, but it was dry and hard to get the water to them. Only 75 survived but the wattles have grown well. We've only got bore water and it's very salty, but we're lucky to have it.

Did you apply some of what you had learnt in the CSIRO as a grazier?

Kent: I was working with a team on a German baron's land, four generations on the property, 1000 square miles divided into two paddocks. He had magnificent Herefords. At 83, the baron came riding up to our camp one day on his thoroughbred with leather leggings on. I said 'I want to congratulate you because these are the best Herefords I've ever seen anywhere in Australia. They're just magnificent. You must have been buying the best bulls available to get a herd like this.' He stopped, looked at me, and said, 'It's been 20 years since a stud bull came on this property, ever since the stud master forgot how to use his knife.'

A dam with scattered paddock trees on 'Burnbrae'. (Photo: N. Fijn)

His words were very true. The general theory is that if a bull has a good bit of paper behind it, registered from a society, it must be good, but that's rubbish. We haven't brought a bull onto this place in 16 years and bred our own. He was dead right. There's a big difference between a bull in a show ring and a bull in a paddock – they're vastly different animals.

Managing the land

Have you experienced years of drought? How did you manage through dry years?

Kent: We destocked and brought feed in. I used to grow lucerne and make bales of hay. At 3a.m. in the morning I used to go out to make the Lucerne, then one day I woke up and thought 'Kent, you're an idiot!' That day I sold all my machinery for making hay. From then on I just phoned up, got the hay delivered and put it in the shed and wrote the cheque. It was a lot easier. If you're making hay and it rains, then you end up with a whole lot of bailed hay that is virtually useless. It's a lot of money to make the hay but [if spoiled] is not worth feeding out. By buying the hay in, you only buy good hay and don't have to worry about

the weather. It was the smartest move I made. We've had no rain this month, so pasture drops off quickly. We'll be feeding out hay early this year.

What makes healthy land? Is how you work similar to graziers on neighbouring properties?

It's the way you look after it, moving stock from one paddock to another, so that you don't flog the land. Everyone seems to have their own particular way of handling their property. Most people have all their cattle on one property but we've always had cattle on three, or even four places. We've bought good, but run-down, properties. Through hard work we've brought them up to standard.

Do you feel attached to the land here?

We lived at 'Ballanda Park' for a while, but decided 'Burnbrae' should be the property for our retirement. We have good help to allow us to stay in our own home, good community services. They pick me up in a car and take me to the hospital, wait for me to see the heart specialist then drop me back here again. MercyCare can organize to pick up groceries too.

Spotting wildlife

Kent and Marion wonder whether Natasha bumped into their pet wallaby near the back door, having stayed the night in the cottage at 'Burnbrae'.

Kent [to Natasha]: Did you see the tame wallaby out the back? We've got a female swamp wallaby. She had young in her pouch last year, which is out and about now and she has young in her pouch again this year. Two weeks ago we had three of them at the house at once, even this morning. They sometimes disappear for a month or so, but they come back again.

Marion: The wallaby was just out near the tank but she's gone down into the paddock now. Mrs Wallaby loves to come and trim the rose bushes.

Kent: We had a wombat here recently. The wombats are on the increase around Boorowa. Fifty years ago there were virtually none in the area. After the big rabbit eradication, with masses of poison bait, the wombats probably dropped back then. There used to be quite a few koalas here 60 odd years ago, but there are very few now. They say that goes back to the rabbit poisoning days as well. Koalas get down onto the ground and eat the poison, or dogs get them.

Birds seem so evident but it's harder to see the nocturnal marsupials and reptiles.

That's why mammalogy in Australia lagged behind for so long because most of the mammals are nocturnal. Very few of us were looking at mammals 50 years ago. I made a list of birds out at 'Ballanda Park' with 125 different species on the list. From the road, up the driveway to the cottage, we had eleven native species of bird nesting last year in that small area alone. I was at 'Ballanda Park' in the shearing shed and could hear a lot of squawking going on outside, so I raced out the door and saw half a dozen magpie geese flying up the gully. Magpie geese are from the Northern Territory but they're breeding in the Riverina now. Another time I saw brolgas flying up the gully. On the dam here we saw twelve pelicans. At the house dam, we saw a black swan too. You see some odd birds turning up.

Marion: A lot of different birds migrate through here, heading for the mountains or up north. We were out doing some fencing and turned around to see a line of pelicans sitting on the dam wall. We turned away to continue our task and when we turned back, they had gone – we don't even know which direction they went.

Do you see any dingoes?

Not here, I've seen a wild dog out at Taylor's Flat ['Ballanda Park']. Dan Florance and Dave Smith from the Sustainable Farms project [ANU] have got some images [from the motion sensor cameras] of red-necked wallabies, swamp wallabies, goannas and lizards. They'll use honey as an attractant this week.

Two images taken by the same remote sensing camera triggered during daylight: a swamp wallaby and a fox, June 2018. (Photo provided by D. Smith)

Dave Smith fixing a remote sensing camera to the lower branch of a large canopy tree. Kent Keith pointed out how all the surrounding saplings were from this one large tree. (Photo: N. Fijn)

A visit to Taylor's Flat

Kent, Marion and Natasha drive to 'Ballanda Park' at Taylor's Flat. Research officers Dan Florance and Dave Smith, as part of the Sustainable Farms project team, have rung Kent and Marion to say that they will be setting up more motion sensor cameras and checking survey sites that morning. The old house at 'Ballanda Park' is now deserted but still retains some of Kent and Marion's possessions. Marion has prepared a thermos of tea and some cake, sets up some outside furniture, before sweeping up some of the leaves that have blown onto the concrete. After a few minutes, Dan and Dave turn up. Dave shows Kent some still images of some small nocturnal marsupials from the remote sensing cameras. Kent, Marion and Natasha follow Dan and Dave in a separate vehicle as they drive around and inspect some of the survey sites.[28]

What was your reasoning behind these plantings?

You need windbreaks and sheltering places for cattle. I put a dam in soon after we bought the property. I haven't cut down even half a dozen saplings in all these years. The place is covered in wattle, which looks great but other graziers hate it because they want nice, clean-looking paddocks with not a thistle on it. The wattles break down in a few years, adding compost to the ground. It doesn't take wattle long to break down at all. There's a lot of Cassinia here, which is a native plant. Everybody hates it, except me. The grass grows right up to the base, whereas with a eucalypt, there's always a bare area without grass. Although the hill may look like it's covered in Cassinia, the cattle can still eat the good grass growing underneath. When winter comes, the frost will stop the grass growing, but we have grass still growing underneath the Cassinia for another six to eight weeks.

When I came here 30 years ago, there was Cassinia on the hill with a few saplings poking up through the scrub at about 6 foot, now there's an area of stringybark trees that are 30-40 metres high. In another 50 years they will be mature canopy trees. That means a lot of habitat for the birds, marsupials and everything to live in. I really hope that someone will look after the place for years to come.

I guess that takes quite a philosophical shift to leave that scrubby vegetation?

Well I like the native vegetation, marsupials, birds and everything else. If I can make it better for them then I'll leave the vegetation. Now it's come a time to let the property go, it's a great opportunity to work with the ANU. With the boys [Dan and Dave] going out with their research surveys, I couldn't ask for anything better.

Kent Keith talking with Sustainable Farms Senior Research Officer Daniel Florance about the locations of the survey sites on 'Ballanda Park'. (Photo: N. Fijn)

In a way you've come full circle, having done the research in the past and now it will be continued on through the ANU.

Yes, as you say, it has gone full circle.

What did you do initially to bring a property up to standard?

We increase the quality of the fencing. This place had hardly a fence standing. Instead of spending a lot of money on commercial fertilizers, I used the animals' own manure. When manure would build up, we smashed it up so the dung would become incorporated into the soil.

What did you do in relation to the dams?

When we bought the place we needed water for the cattle, a lot of water. I brought specialists out to do a farm plan for me, marked the best spots for dams, then went ahead and built them. We put in nine dams here. The first thing I did whenever we bought a place was to decide whether the land needed contours and dams. With sheep you could get away with a puddle because sheep don't drink a lot of water but that's no good for cattle.

Kent Keith holds a photo he took of the dam when initially established, 1990. (Photo: N. Fijn)

At the dam, which can be viewed from the house, a mixture of introduced and native vegetation species was planted. (Photo: N. Fijn)

Philanthropy

Kent: A doctor looked after my first wife [Noel] for ten years. We found that, if he wanted to do some extra research, he had to find his own funding. There wasn't government or hospital money to do further research. My first wife then requested that her half of the estate should be put into medical research. After she passed away, I then set up the fund to further medical research. Later on, Marion and I were having a cuppa' with the Prof. [Prosser], when Marion said, 'Well I'm a Keith now, I would like my part of the estate to go toward medical research as well.' Now everything we own will eventually go into furthering research.

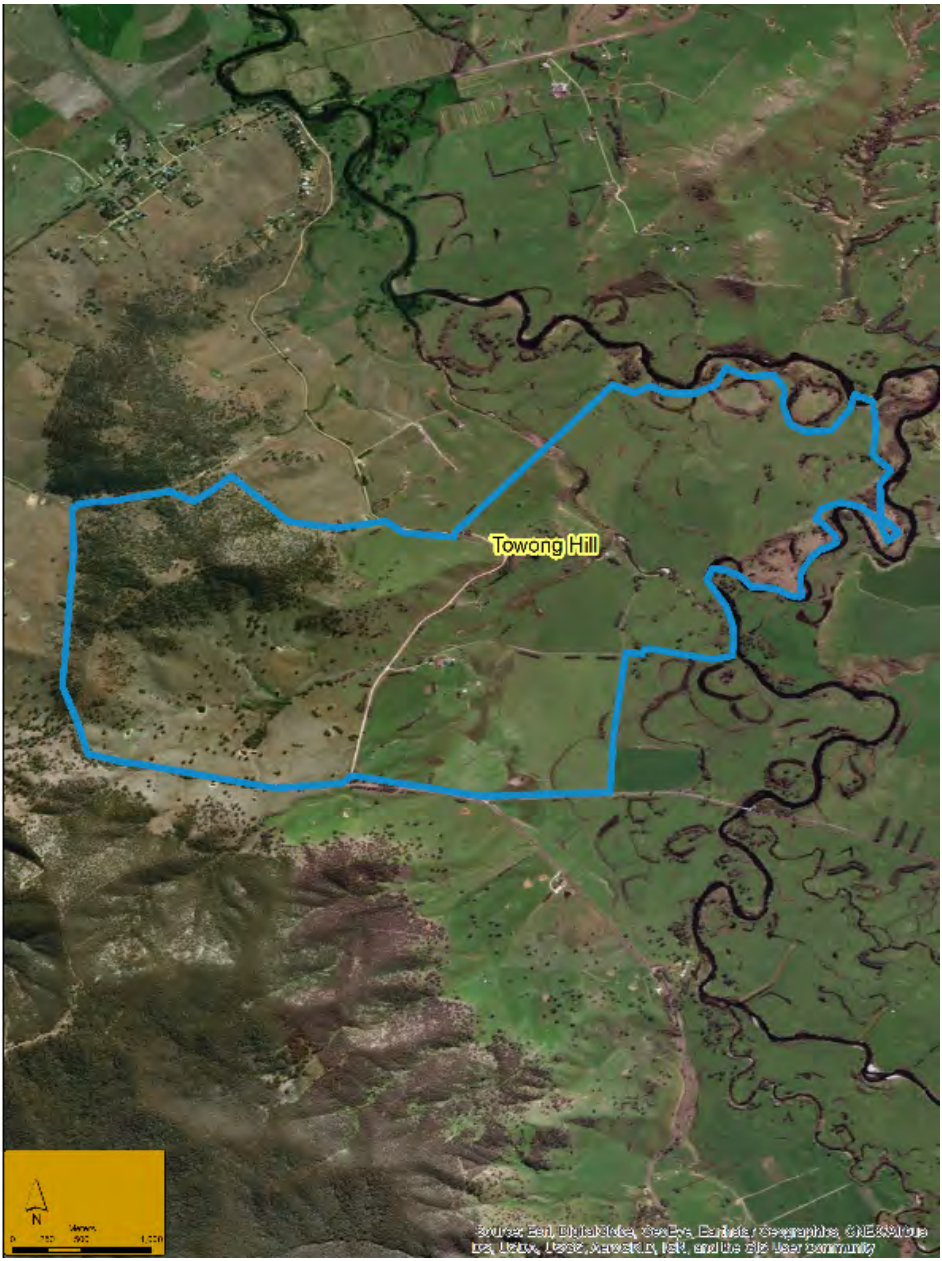
I'm getting to the stage now that I can't do the work I want to do. Age has crept up on me. We've decided to move the place on now [to gift 'Ballanda Park' property to the ANU]. We could have just sold it, put it on the market, someone could buy it, look at the scrub and bulldoze it all, bringing it back to grazing land, which I wouldn't want.

Aerial view of conserved bushland at 'Ballanda Park', Taylor's Flat. Note naturally regenerating scrub (Cassinia) in the foreground and grassy area beyond. (Photo: L. Harley, ANU)

I've been attached to the place, here at Taylor's Flat. I didn't want to disturb such a beautiful bit of country that's so natural. We made corridors and put those onto the title of the land, giving them to the NSW government as tree reserves for mammals and birds. We did that in the 1990s. We worked in with Landcare and they supplied money for fencing and helped us to fence it off. They came back in 8-10 years to see how it was going and used the conservation area as a role model for others to follow. The corridors can't be touched because they're part of the title on the land. That's in perpetuity with the NSW Government. I am hoping that parts of it will be set aside as bigger areas, so that whoever buys the land in the end, they can't interfere with it too much. We've got patches of old growth native forest that have never been touched. It means that people can't just come in and chop those trees down.

Was that part of the reason why you wanted to buy this land in the first place?

I was thinking of the birds, the fauna and everything and that it was the ideal place.



Blue cadastral boundary of 'Towong Hill' property. Map produced by Daniel Florance.

John Mitchell:
The importance of good financial management

John Mitchell's ancestors were influential settlers in rural Australia, particularly along the Upper Murray River. His father, Thomas Mitchell, was a prominent politician in his time and his mother, Elyne Mitchell, a beloved Australian writer, particularly her classic *The Silver Brumby* series.[29] Both parents were keen skiers. They competed in ski competitions internationally and later regularly skied in the nearby Snowy Mountains. John grew up on a beautiful property, 'Towong Hill Station', in an idyllic, yet remote setting.

In many respects, John's approach to managing the property has been very different from his famous parents. When John's elder brother died in a car accident, John's father expected him to farm the land. John was determined, however, to go to university and to study finance and economics at The Australian National University (ANU). This proved to be an excellent foundation for his future management of 'Towong Hill', when he took over the property after the death of his father. Some of the first initiatives he implemented were a decreased stocking rate, improved infrastructure including new fencing and, instigated by his mother, the planting of tree plots throughout the property. During a fraught process of succession, in 1999 the property was subdivided. John retained 890 hectares and the historic homestead.

For many years John battled with severe depression and financial troubles but through applying his accumulated knowledge of economics and finance, he successfully managed the farm and homestead, while investing in a large portfolio of off-farm assets. Now, at the age of 64, John is giving back to the community through philanthropy, including the establishment of research fellowships and scholarships at The Australian National University. In 2017 John was granted an Honorary Doctorate from ANU, followed by an Order of Australia (OAM) in 2018, for his philanthropic contributions to tertiary education.

'Towong Hill' has lines of shelterbelts planted by John and his mother Elyne Mitchell 30 years ago, which provide important shade for livestock and habitat for wildlife. There are also large, old canopy trees, patches of remnant vegetation and rocky outcrops on the surrounding hillsides. The riparian areas, including the Upper Murray River, are a significant natural asset on the property, providing important habitat for birds, fish and reptiles. Birds of conservation concern sighted on the property include the crested shrike-tit, varied sittella, flame robin, scarlet robin and little eagle.

'Towong Hill'

> 'Added to all the achievements, there was the continuing tree planting project and I dreamed that the tree-plots would be something for which grandchildren and, God willing, great-grandchildren would remember John – and me'…
> 'Somehow it is the trees - river redgums that have already grown three or four feet – that seem to me to be the monuments that will stand in years to come, our repayment, our love, to this land, and our gift to the future.'

Quote from Elyne Mitchell's book, 'Towong Hill: Fifty Years on an Upper Murray Cattle Station' [30]

> 'On an abrupt point at the end of a long ridge that runs from Porcupine Hill right out on the flats, the house on Towong Hill is built, not fifteen miles from where the river emerges from the bush and with the blue foothills still stretching their fingers out on either side. The paddocks lie both up and down the river, over the hill behind, and on the last narrow strip of green below the scrub and rocks of Mount Elliot.'

Quote from Elyne Mitchell's book 'Speak to the Earth' [31]

David Lindenmayer and Natasha Fijn visit John Mitchell at 'Towong Hill' on a fine winter's day. The Federation-style homestead is situated on a promontory with a wonderful view out over the valley floor below. John invites them inside the grand house, where the long, ornate dining table is in keeping with the wooden doors, windows and fireplace.

John: I haven't had a boring life. It's been fairly colourful. Nothing is expected of you if you come out of a housing commission. With such high profile parents, every time I put my foot over the line, I would be booted like one thing, as everything was expected of me. Dad turned a big fortune into a small fortune. He was the third generation to inherit wealth… the third generation is the one that loses the wealth – shirtsleeves-to-shirtsleeves within three generations in Australia.

The first Mitchell to arrive in Australia was in 1812. He gave his two sons a down-payment on a station near Tangambalanga. The fortune began out of the first economic crash of 1842. My great-great-grandfather and uncle paid off a massive amount of land north of Albury [James Mitchell, Tabletop, New South Wales]. My great-grandfather bought Bringabong Station in 1871, then subsequently bought Khancoban and Indi Station, between the two rivers [Indi River and Upper Murray River]. My grandfather was the youngest of three and so he inherited Indi Station. A partnership between Peter and Walter Mitchell bought Towong Station in 1897, which was then 17,500 acres [7,000 ha].

View from near the entrance to the 'Towong Hill' homestead, looking up the valley toward Khancoban, with three tree plots visible along a laneway. (Photo: J. Laffan)

Natasha: When was the house built?

The house was built in 1902 on granite, so there are no cracks in the foundation or brickwork. The foundations were put down well and are still in reasonably good order. My grandfather picked the site. The station had its own orchard and vegetable garden but now I'm here by myself. I no longer have chooks but the old fruit trees still have some fruit on them.

In 1921, the top part of the property, 12,000 acres, was taken for soldier settlement. My grandmother took her two children, my aunt and my father, to England in 1925. They had seven years of education in England, while she lived in a hotel suite with chambermaids in Central London. The hotel suite, the chambermaids and the fees at Cambridge University for her two children and so forth ultimately cost another 12,000 acres of land.

The Mitchell homestead at 'Towong Hill Station'. (Supplied by John Mitchell)

I wasn't close to my father and he was hard on me as a son. As a prisoner of war during the Second World War, he spent 187 weeks in Changi and went through a Japanese torture chamber. He became a public angel, a home horror. The abuse he received in Changi, he turned on his wife and two sons. His tongue could cut the heads off a herd of camels.

Natasha: It's interesting that there are two elements, of education and then the connection with the land.

Dad was no farmer – he was a politician. My father inherited 'Towong Hill' debt free in 1932 when he came back from Cambridge University, aged twenty-five. He stood for the shire council straight away and was elected. He was shire president in 1934 at the age of twenty-eight. It was a pretty tough gig. It was the height of the depression, ratepayers couldn't pay their rates and he had to run the shire.

My father and grandfather had a pretty good racehorse stud here. My grandfather bred a horse called Trafalgar. He won the Caulfield Cup by four lengths, the Cox Plate by five lengths and was heavily backed to win the Melbourne Cup in 1924.[32] The bookmakers got together, went over to the jockey and said "We'll pay you 10,000 pounds to pull the head of Trafalgar" and the jockey did, [he] confessed it on his deathbed. Trafalgar's [direct] progeny never did any good in races but some of his grandsons and granddaughters did. My dad's managers didn't do the horse stud any justice. They let the stud slide and in 1959 dad sold it. My mum was devastated that the horse stud was sold.

Elyne Mitchell described her initial feelings about 'Towong Hill Station' as a place, in her book 'Towong Hill: Fifty Years on an Upper Murray Cattle Station' (1989):

> A prophecy emanated from the river and the dark valley floor. It gave me an absolutely intense feeling that the land was reaching out to me, taking me, claiming me – that in time I would become part of the whole vast land of mountains and valley, bush and floodplain, but that the land would be in my trust and that I would care for it all the days of my life.'

Natasha [reads the quote out to John]: Did you feel that way too, or do you feel differently about the place?

Mum was a bit naïve in a way. She came here when she was twenty-one and basically only went to Melbourne to see her mother, or went skiing at Thredbo. Some of the people working on the place, who my mother wrote about fondly, were actually stealing from the place. She wasn't that worldly-wise and it took a fair while for me to explain to her that the banks were a business, they weren't a charity. I started off by being too trusting too, but I've become a bit more cynical.

I guess a hard aspect out here would be the social isolation, particularly for your mother during the war years.

She had one servant, I think, to cook and do a bit of cleaning, but on weekends she would just want to hear somebody's voice. She got around that by going out with the sheep with the manager and did a few things around the farm. She also read and read and basically wrote and published two books, *Australia's Alps* and *Speak to the Earth* [closely followed by *Soil and Civilization*].[33] Because I'm Elyne Mitchell's son, I find her writing quite confronting when reading some of her books.

Looking out over the valley floor from 'Towong Hill' homestead. (Photo: N. Fijn)

Weren't large homesteads like this a bit like a small village with a number of families living on the property, sometimes throughout their lives?

The face of the land has changed in the last 50-55 years. These large homesteads were places that required a lot of work and labour. Staff wages have shot up when indexed against the price of cattle, sheep or wool. It's the same story with Great Britain, where large estates have been cut down by generational appropriations, which results in a small amount of land with enormous buildings on them – hopelessly overcapitalized – the same for this place.

The buildings here were built for 17,000 acres, 120 years ago. Most of the buildings are redundant and totally under-utilized. I only have one person working on the place with his wife. They are a pensioner couple. I provide him with a cottage and a bit of firewood, cover the electricity bill and so forth, which is an absolute bargain in terms of the work he puts in. There are no others that live

on the place. The old service quarters and cook's quarters have been shut down because they're redundant. There are two cottages that are leased out to families who work in the area.

There are still two horses ridden on the place for mustering. In the early days, a lot of things were horse-drawn, like the scoops for dams before the war. My mum stuck to horses for a bit longer because she loved them. Mechanisation has changed a lot on the land, particularly since I left school in 1973. The price of equipment, such as tractors, has not gone up that much, yet wages have gone up, so you've got substitution between inputs (including workers' compensation premiums, superannuation, all the on-costs of labour). One example is a tipping tray on a Landcruiser – if you need gravel for the cattle yards. One man drives the Landcruiser utility down to the lagoon, walks back and gets the tractor and bucket on the tractor, loads the Landcruiser up with gravel, then drives it back with the tipping tray. Forty years ago you'd have three men with shovels trying to lift the load onto the trailer, coming back to then shovel it out again. Eighty years ago there was a huge percentage of workers and horses on the land and that was the workforce.

School days

In a way, you could think growing up here would have been idyllic, but then did you have a hard time at school?

I was home schooled until Year 4, which was a mistake. We should have gone straight to primary school. I spent Year 5 at the local primary school then jumped to Year 7 at high school. Mum didn't home school particularly well, she wanted to go skiing, or out in the bush instead. The lack of preparation impeded me all through my schooling. I got 42 per cent for Year 8 mathematics. My spelling was atrocious (I couldn't even spell atrocious), handwriting was slow and not terribly coordinated. The three R's weren't terribly good when I started university.

David: Did all four children [John's siblings] go to private school?

Four children going to private school made a fair dint in my parents' finances, they basically had no savings. My parents had 30 good years on the land. If you go back to 1984, the last 34 years have been a lot drier and the cattle market a lot

lower than the previous 34 years. I only put one child through private school, rather than four though.

In what ways do you think differently from other farmers?

I never follow the crowd in this world. I was different at school and I was different around here, so I'd get ostracized and picked on. A big thing at school was the bullying. I didn't hit six foot until two years after I left school. I was a small fella' and had different values from the rest of the boys and I was marginalized. Most were graziers' sons, when I was a politician's son, resulting in a lot of put-downs and condescending remarks. My body language was a bit funny and my speech was a bit twisted, so some people misunderstood my speech. I was pretty eccentric and, to put it this way, I was half mad.

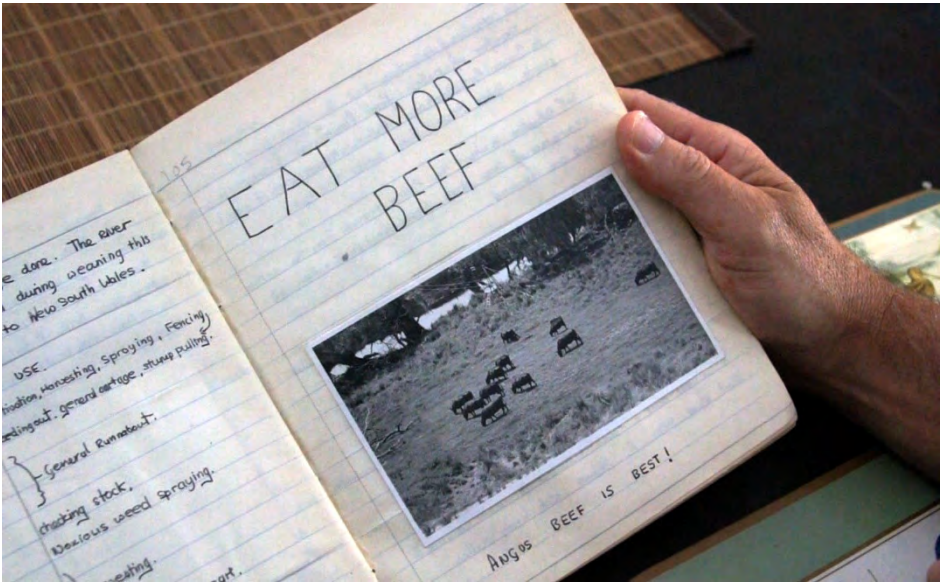
My elder brother was killed in 1972 at the age of twenty-two in a road accident. I was just about to sit my high school exams at Geelong [Grammar School] when this happened. Dad then said that I would be the one to take over the farm. I came in to dad with my high school certificate results with about three As, a B and a D, which was a pretty decent pass. Dad didn't say a thing and immediately changed the subject to the boy scouts, didn't give a damn about my high school results at all. I was going to the land: 'what use is going to university when you're going onto the land'.

My dad's and my own political beliefs are far-removed. I'm more left and am strong about fairness. Dad was a conservative politician but he wasn't that far right of centre for that matter. I have had a lifetime of helping other people and if you helped another boy at school other boys would call you a 'sucker' [makes the sucking noise that the other boys made]. During the 1972 elections, I would talk with the cleaning staff about [Labor politicians] Gough Whitlam and Jim Cairns and got in a fair amount of trouble. I had put an 'It's Time' [1972 Labor election] sticker on my study door and was ordered to take it off. When I went for an interview to study within the law faculty (before I left school), I found graffiti about my father all over the place at Melbourne University. I realised then that he was an unpopular politician amongst some people.

Studying agriculture[34]

Agricultural science classes in Years 11 and 12 taught me a lot, such as, if you keep grasses at a certain level, it acts as a solar panel and you have better photosynthesis. Over-grazing leads to reduced leaf area, reducing pasture growth and results in bare soil. I also learnt how to do basic bookkeeping and a business cash flow budget in Year 12 accounting.

From my school project in 1973 versus 2018, I calculated the index of cost had risen thirteen-fold, whereas the price of cattle had increased six-fold in relative terms, so we're only getting 40 per cent the price of cattle. In 1973, calf weaning weights were 220kg [based on weights noted in the agricultural project]. They were about 240kg by 1984 [when he began managing the property] and they are now 330kg. There have been big changes in terms of genetics, in dropping the stocking rate and the avoidance of large amounts of superphosphate in the soil. At the same time, livestock are produced with less labour, the cattle yards are better designed and there is better supplementary feeding equipment.



John Mitchell's school agricultural assignment with a photograph taken by John of cattle grazing near the Upper Murray River. (Photo: N. Fijn)

So you've taken the weaning weight up by 110kg in 40 years through a combination of better pastures, lower stocking rates and better breeding?

The algorithm is number x weight x price per kilogram. You can come out with 10-15 per cent less stock on a place, far heavier weights, times the price of stock, then come out with a better profit. On an over-grazed place, the organic matter goes and grasses get chewed out with bare patches. Without overburdening with stock, you don't have the shedding costs, the cost of silage or hay, cost of feeding out, labour and fuel, so input costs are much lower.

After secondary school

'Stockmen are born, not made'. Me? A sack of potatoes on horseback. When I was jackarooing, for a start I was wearing shorts, a target for the boss to belt you around the legs with the stockwhip, so I started to wear long pants. I was screamed and yelled at, most pay cheques thrown on the ground – a practice of docking wages, which is wage-theft. One boss got a police truncheon to clout me on the head with it. I just wasn't cut out for that kind of thing. The arrogance of the large landholders in those days, they thought they were above the law.

While I was a jackaroo, instead of just sitting down and watching television during the evenings, I did one course on economics applied to farm management and another on breeding and production. In a rather sinister workplace with all the bullying that went on, to put my mind to studying provided a complete distraction. On the weekend, in exchange for working on the petrol pumps at the local garage, I was taught a bit about steel fabrication and welding – that's how I fix a lot of things around here. Dad did pay for those correspondence courses and they were a lot of money at the time but he didn't want me to go to university. Mum thought universities were for bludgers too.

Natasha: I'm interested in what drove you to study an economics degree at ANU. Did you think you could apply it on the farm?

I had an interest in economics and I did want to get an education and use it on the farm. Studying elementary economics and accounting at school, I found I was interested in that sort of thing. Dad wanted me to learn how to train sheepdogs. He said to me 'Let the trustee company handle the finances and you get out in the

paddocks.' There would have been nothing left of the place if that had happened. His advice was badly informed. I didn't take his advice, luckily.

I came home one weekend [from work] and was admonished because the farm manager had given me a shocking report and dad was very annoyed. I then announced that I was going to university the following year. He said 'No, you're not going to university' and I replied 'Yes, I am dad'. 'If you go to university I will disinherit you and chuck you out with nothing'. It was a family ruled by threats, threatening this or that. As a young child, if you wouldn't do something, then he would threaten with a stock whip across the back. Dad would call me 'Farmer John' and [older brother] Harry 'Prof'. I was actually the academic and Harry was the farmer. I often wonder how life would have been if I had taken an academic career. Over the years, I have read hundreds and hundreds of books on finances, agricultural engineering, investing and environmental agriculture and economics. My interest in economics has taken me a long way. As my own boss, I don't have to deal with hierarchy.

University days

I got to The Australian National University and I only had 42 per cent in Year 8 maths. I was convinced I wouldn't get off square one. I was hospitalized for six weeks. I was strapped down onto the benches and given ECT without a general anesthetic. Because of depression, I didn't get very good grades at university either, yet I was able to apply my economics knowledge to invest in shares, rental properties and running a farm as a business. I still pull out my old economics books and my agricultural science notes, which is over 40 years ago now.

John Mitchell with his parents, after graduating with a degree in economics from ANU. (Supplied by John Mitchell)

Malthus was an economist. In 1810 he predicted in fifty years the world would face starvation. His prediction was based on the growth of agricultural output being arithmetic, while the world population growth was geometric. He predicted the two would diverge exponentially. I learnt this in my economics class at university in 1978. The lecturer at the time posed the question: do we now have the Malthus hypothesis, but in reverse? Was this the case in 1978 in Australia? Now, 40 years on, could the Malthus situation arise in the future? The population is continuing to grow, compounded by the decimation of good land into urban areas, a reduction in productivity, possibly resulting in chronic food shortages.

Instead of just learning for an exam, perhaps about compound interest, or investments, I would apply theories like this to what I planned to do. I learnt more about ruminants and digestion, soil profiles and chemistry with elementary agricultural science at high school.

I am a good number-cruncher. My grandfather Mitchell was apparently a very good mathematician and my great-grandfather was chairman of the Commercial Banking Company of Sydney, so it jumped a generation or two. As chairman, he had a list of pounds and pence in a book and he could run his finger down to the bottom – he was exact to the ha'penny. At university, the inquisitive economics students would sit around a table in the cafeteria. I tried that trick with an economics student who was excellent with figures. I wrote in straight lines twenty lots of pounds, shillings and pence and said 'Right, run your finger down to the bottom'. He ran his finger down to the bottom and his calculation was exact. I can't do that, but I'm not bad. I still have a maths tutor in advanced maths and methods – he comes every Thursday for an hour.

In 1975, my first year at university, the cattle industry crashed. My parents took me to a station between Canberra and Cooma. I was nineteen and most of the other graziers would have been about thirty. My parents would have been in their late sixties by that stage. I spoke up at the lunch table and said to them, "as graziers you need to have an alternative source of income, other than the land, because the seasons and the markets are too volatile to rely on a single income". The conversation ended up continuing for over an hour over lunch. Dad was going to retire from parliament at the next election but he hadn't told anyone that yet. The farm was making a substantial loss. The family and farm had basically

crashed. From that occasion I learnt, still as a teenager, that you had to watch money very carefully and you had to put money into other things [off-farm assets]. In a good season, you want to put some away into a parcel of shares and not sell them when things get tough.

In the 34 years I've been running this place, it's never run a cash deficit. In the early millennium, around 2003, there was a lot of structural maintenance and infrastructural repairs needed, the farm was only making about $30,000 a year, with private school fees to pay and it all didn't add up. Even during the Millennium Drought we were paying fairly steep interest on loans for rental properties and still putting money into shares. I could just afford a salary for [my wife] Sue and myself, which came out of net dividends and net rents. Fifteen years ahead, all rental properties have been paid off and more shares have been bought. I developed this scheme, while I was still at university, voicing my ideas already at that lunch with those graziers.

In 1976-77, as a University student, I had Labor Party stickers on my car. I actually put them on there to annoy the other graziers. I had hair down to my shoulders and a beard too. People would say, 'he's a university student, a commo you know. He wouldn't know how to run 'Towong Hill' – he wouldn't know how to work!' I got jack of this. Everyone was complaining how tough it was on the land. I said 'If farming is that tough, well sell up and find something more profitable!'

Taking over management of the farm (1984)

> I knew that John's understanding of economics and accountancy, the wide view and the long-term view, would benefit Towong Hill enormously – not just the family, but also the land itself. To me, the care of the land is a profound responsibility – a trust and one accepted with love. So we went into the third year after Tom's death with a lot of successful improvements done and a lot of plans.

Elyne Mitchell quote in 'Towong Hill: Fifty Years on an Upper Murray Cattle Station' [35]

When Dad died on February 4th 1984, I had a small farm and soon after the funeral I went back down there. The trustees said that 'Towong Hill' was in debt and in a run-down state of repair. None of the land had been sold but it was in a lot of debt. I didn't have a lot of experience at twenty-eight, but the biggest job

was to stamp out corruption, set up a decent budget and business plan, basically set up what I wanted to do within the next ten years.

So I planned to lower the stocking rate. The farm sheds and equipment were badly run down, there were not many subdividing fences, a fair few noxious weeds – in other words the property was in poor order. I had a date set for when it was going to be done and how much it would cost. I had those plans set in the winter of 1984. I had a look at where the place was at during that point in time and where it needed to be in ten years, basically broke a big goal into small parts. I had to look at the existing level of debt and work out what expenses could be cut. I marked tasks in terms of priorities. When should this fence be replaced? When should the gates be replaced?

As manager in 1984, I knew the mathematics of livestock trading. I thought I'd sell extra stock to beef up the profit level within the first two years. Most people think that if you put more stock on the place then you'll make more money, but overstocking applies to the law of diminishing returns. Over-grazing leads to more damage to fencing, greater need for parasite control, more supplementary feed, which also results in more hired labour.

Tree plots

In the 1980s, a lot of tree planting was done at 'Towong Hill Station'. The tree blocks were partly my inspiration and partly my mother's. My mother had read a fair bit of the conservation literature at the time and wanted the trees planted. I got quite a few materials and leaflets from the Forestry Commission on planting trees. Government subsidies for preparing paddocks for tree lots, fencing materials, and the hiring of equipment at reasonable rates all helped. In total on the property, there would have been between 45 to 48 tree plots, encompassing 142 hectares of bushland. The trees were mainly planted along laneways or along paddock fences.

Instead of being 20 metres wide though, they should have been about 40 metres wide with more corridors, but in the late 1980s we didn't know that. If they were wider it would have provided more cover for birdlife. Trees look good, increase the value of the farm, improve bird and insect life and provide shade for the stock. Trees and bird life are good for the soul and the bank account.

Tree plots that were planted in the 1980s are now large canopy trees. (Photo: J. Laffan)

Financial troubles

'Towong Hill' was part of a Testamentary Trust, where the parent, children and the grandchildren are taken into account. The land goes straight to the grandchildren, but the income goes to the children for their lifetime. The Testamentary Trust was split three ways and will go to my child, less what the Testamentary Trust owes me personally. It's essentially my grandfather's estate and you can't contest a grandfather's estate in Victoria or New South Wales. So I received a share of my grandfather's estate and finished at The Australian National University with $30,000 dollars. I started an investment portfolio and reinvested the dividends.

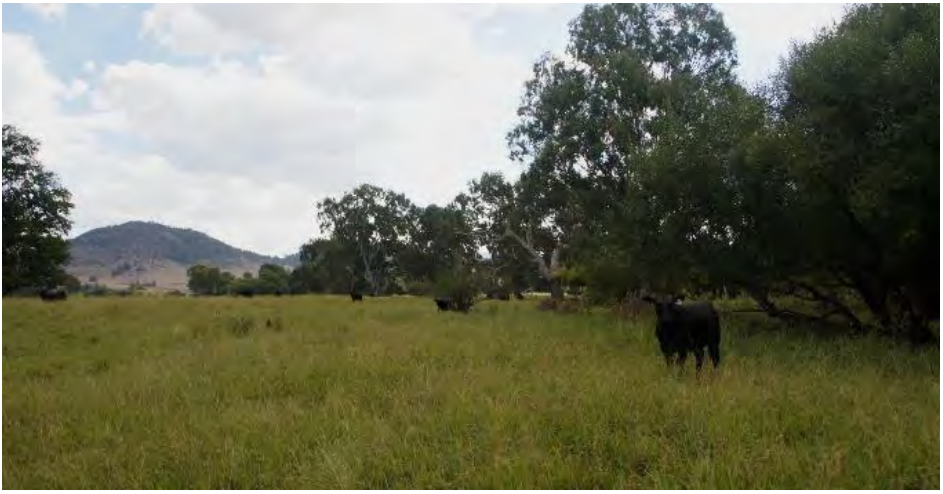
In 1988, the trustees commissioned an agricultural consultant to report on my management of the property. By that time I had been manager for five years. The consultant thought I had been wasting all the money on tree planting, had under-stocked the property, and wasted time working on environmental rectification. He gave me a damning report and thought I should be sacked. The trustee company decided to follow his advice, so I fought them with lawyers to prevent my dismissal as manager.

For a fair while, it looked like the Trustees were going to sell up the farm. I tried to remove myself from a spiritual attachment to the land, to look at the pragmatic and business side of it instead. Given my background, there was an inbuilt fear of poverty. I am obviously a high-income earner and I haven't gone without. In my late 20s and early 30s, the trustee company was waiting to pounce on the place, but mum's right of residence stopped them from selling it. I could see that I could get to 40 and have no job, or place to live. The trustee company had absolutely no interest in John Mitchell. While I ate my vegemite sandwiches and bottled water on the street in Melbourne, lawyers would be further up the street having $150 lunches. I have seen the worst of human nature and business ethics.

The property was in debt, so I kept my finances quarantined. I thought I would just play a very straight, careful bat and slowly get the debt paid off. It took about ten years to extinguish the inherited debt. With shares from dividends, I built up my portfolio quite substantially. I have turned this place around to make it profitable and an environmentally sustainable business, using the techniques and philosophy the consultant wanted me dismissed for in the first place.

The past twenty years

The farm traded as a deceased estate until 1999, so the whole place together was 4,200 acres. In 1998, we equally partitioned the estate so that my sisters had the neighbouring land and I had 2,200 acres in the middle, including the homestead. The trustee company was only looking at what they could make out of the asset [of the land] for themselves and charging fees. My interests were almost directly opposed to the trustee company: to keep the farm, have an income for myself and to look after my aged mother. In 1999, I had to re-orient the business to manage the property at half the size. The expenses weren't going to be reduced by half, so you lose the economy of scale.



Angus cattle in lush winter pasture with canopy trees providing both shade and increased biodiversity. (Photo: N. Fijn)

Mum had no interest in owning the property other than as a right of residence. She was independently wealthy after having written thirty-five books in her lifetime. She was granted an honorary doctorate of literature from Charles Sturt University and an Order of Australia medal too.

Mum had all the privileges but none of the responsibilities. I had all the responsibilities and few of the privileges. The same applied to my late wife. She died about ten years ago and she had all the privileges but didn't have to run the finances, plan the work, run the sales and deal with hacks trying to rip the place

off. The property is a business, buying and selling cattle and so forth. Stock agents, suppliers and contractors see the place as a business opportunity.

Post-Traumatic Stress Disorder is now past tense, it hit in the year 2000. I had just fizzled out from the stress over the years. My mum was my most loyal supporter. We looked after each other. It was a fair responsibility to keep the farm going so that she kept alive. Mum loved the homestead, she loved the land, she loved the mountains, she loved the cattle, the horses, everything. I didn't want to work sheep, cattle and tractors. As I said, a stockman is born, not made. I was born with a mathematical brain and an ability for economics. I bothered to learn something else, other than sheep and cattle. My mother had a brain tumour in 1997 and nearly died. I became her carer from that time, so for a few years the farm was a bit neglected. Mum died in 2002.

David: What made you stay at 'Towong Hill'?

Back in 1998 I was thinking of moving to a farm just out of Canberra and perhaps going back to ANU to do a doctorate in economics, but then I managed to pay the bills and I kept going. My mother was extremely attached to the land. It was a big responsibility to make sure the place didn't go under for mum's sake.

The word around the district is that John Mitchell inherited an awful lot of money from somewhere and that he's an idiot. The late Bruce Chisholm of Khancoban Station paid me a compliment once though. He said 'You bothered to learn something else other than farming'.

Where did your psychology come from that helped you through the Millennium Drought?

I soon worked out on my first small farm that there is a law of diminishing returns, learnt from economics courses. The second aspect is that an over-stocked farm is more work. I'm not lazy but I'm not good at physical work. Because I wasn't out stacking, cutting and baling hay, I had more time to read economics books, so I reckon I ended up making more money.

We had thirteen years of drought, from 1997 until 2010, and heavy expenditure on the buildings. They were tough years. My wife and I didn't draw any money out of the place for ten years, while we fixed the infrastructure up. Our low

stocking rates when we went into the drought, meant that there were no deaths from emaciation of stock, or a need to buy low quality stock feed at high prices. Each year during the drought, we ran at a surplus, not a big one, but a surplus nonetheless. How was this possible? If I had directed profits into buying other farms, the result would have been very different and unsustainable. We put all surplus back into maintenance of the property. Off-farm investments in property or shares mean sustainable farming.

Philanthropy

What are the different kinds of philanthropy you engage in?

I invested in a number of assets, properties and shares and now into philanthropy. My philanthropy is with The Australian National University, ACT Scouts, and the Australian Catholic University. I participated in scouts myself. With the Catholic University, I set up a memorial fund for nursing, in memory of my late wife Sue; The Australian National University, because I went there and because I received a Whitlam Scholarship. In my view, anyone who has done well and went through in the Gough Whitlam era (1972-1975) has a duty to give back the equivalent of what students are paying today.

Nobel Laureate and ANU Vice-Chancellor Professor Brian Schmidt with John Mitchell after the conferring of John's Honorary Doctorate, awarded for his exceptional contribution to the standing and reputation of the University.[36] *(Photo: S. Hay, ANU)*

Management Strategies

David: What do you attribute your ability to be where you are [financially]? How have you come through everything that's been thrown at you over the last 60 years?

Determination and perseverance… And using my brains, just keep on going – that's the answer.

Natasha: How did you develop your interests in farming and the land? Were you in alignment with your mother in terms of your environmental approach?

I'm passionate about the future of farms, the future of world food security and sustainable ecosystems. I'm also passionate about fairness. If you do something you're passionate about, then it's not work. I've been a farmer all my working life but have an interest in economics. I think of the future beyond my own life – the future of food security. With my mother, I agreed on sustainability, leaving things on the table for the next generation, both renewable and non-renewable resources. Mum and I could not bear the division of the land into smaller blocks because it becomes a waste of non-productive capital and food security.

How is your perspective on the farm similar or different from your mother's?

I wanted the farm to make a profit, so in good years I could invest in off-farm assets, some shares, or a rental property and pay it off. I was more into financial sustainability, whereas my mum was more into environmental sustainability. In recent years I've become more interested in the environmental side, particularly after meeting David Lindenmayer about two and a half years ago – focusing on planting tree plots, stopping erosion, not over-grazing. I leave the limbs of the trees on the ground now, which is one of the aspects I picked up from one of David's books. Cattle and sheep do better in terms of weight gain if they have shade and clean water. A fresh, well-maintained waterway, or trough system, promotes weight gain in livestock.

We have quite a few lizards, snakes are on the increase too, mainly eastern brown, some tiger and a few red-bellied black snakes, but not a lot compared to the stock on the place! The fallen logs would be good habitat for the snakes. I found a tiger in the bathroom one day. I would estimate its length was six-foot-six [2.2 m]. We have a few kangaroos and wombats up in the hill paddock but the numbers we have at the moment are not a worry.

Do you breed cattle on the property, or bring in breeding stock from other sources?

We breed the steers and the heifers here. We have fifteen bulls on the property, so one bull for every thirty-five cows. I look at the estimated breeding values in the stud catalogue, which is from a central computer system at the University of New England, which works out the length, the frame, milking ability and calving rates, pre- and post-weaning growth rates. The stud catalogues are about 70 per cent accurate but I would rather that than guessing by the seat of my pants with little information at all.

I get the impression that the homestead is your core property and that you would prefer to sell other assets before 'Towong Hill'. Do you feel attached to the land?

I love farms, going out into the mountains. The homestead has been an anchor point in life, although the house is enormous and it's hard to heat and cool. It's very expensive to maintain. It's haunted too, but that's never worried me in the slightest. It's big and cumbersome. With the service rooms out the back included, it's twenty-eight rooms for one person and a cat.

I'm attached to the homestead and the view of the mountains. I can get into the mountains very quickly. After a tough week, I take some vegemite sandwiches up to Clover Flat, have lunch and go for a short walk. I listen to the birds, the wind in the trees and the creek. I smell the mountain ash and snow gums, which is better than any French perfume. If you're up in the mountains for an hour, you can be ten thousand miles away from your troubles, smelling the mountain ash. I sit and read a book, if it's not too cold. I learnt such distractions early on as a means of coping.

David: You only have to look at one or two sheds on the farm to know whether it is doing well, or struggling.

A rural finance lender said, 'You can tell if a farm is credit-worthy just by driving up the front drive. If the gate is off its hinges and tied up with bailer-twine, if there's old broken cars, weeds and tumbling-down fences, you know whether it is a lending risk even before you look at the income statement and the balance sheet.' One of the principals from the accounting firm was up here the other day and he said that successive staff that have come out here for the past twenty years

say that this is the tidiest, best maintained farm that they'd been on and they go to a lot of farms. That was a big compliment.

What is it about the place? What do you think led them to say that?

The maintenance of farm structures, cattle yards and fences – the physical infrastructure – the tidiness of the sheds and standard of the homestead, decent pastures, tree plantations, condition of stock, means that they come to such a conclusion. The head contractor has been here for four years and he mainly looks after the stock side of things, but I wander around the place. The best fertilizer is the owner's footsteps! Yet I've got the softest hands of any farmer in New South Wales!

It could be that you're a smart farmer. You've blended an intimate knowledge of economics and finances with an understanding of how the property works, which is a rare combination of skills.

Low stocking levels, fallen timber left as habitat, scattered trees, and tree plots add to the biodiversity at 'Towong Hill Station'. (Photo: N. Fijn)

Managing finances

I have the mindset that you're a living tenant on the land and you should pass it on to the next landowner in a better condition than you had it. How much do you leave for the next generation and how much should this generation consume? A person who saves a lot of money and builds up their wealth, leaves more food on the plate for the next generation; whereas a person who inherits a fortune and spends the lot, leaves nothing on the plate. It's inter-temporal analysis. With a farm, leave the physical infrastructure and the ecological side in a far better state. Basically, leaving the property in far better condition than when you started.

Natasha: What advice would you have given to yourself when you were taking over the management of the farm?

People don't plan to fail, they fail to plan. Set budgets, set goals, dates that tasks need to be achieved by. List the jobs that need doing around the farm and costs next to them. Work out a farm development business plan and set retirement plans. Produce empirical figures and graphs relating to cutting down stocking rates, spending less on fertilizers and husbanding the land better. For example, the optimal stocking rate at 'Towong Hill Station' is 400 breeding cows and calves with replacement heifers.

I will give an example of the law of diminishing returns. If I increased the number of cattle breeders by 20 per cent, the extra capital tied up in livestock would be $200,000 with an opportunity cost of 7 per cent on how the capital could be invested elsewhere. Labour costs would increase by approximately $17,000, fertilizer by $8,000, drench and animal husbandry costs by $8,000 and supplementary feeding by $20,000. A total of input costs at $67,000. Weaning weights would fall by 20kg because of the higher stocking rate, resulting in only an increase of gross revenue of $54,700. This does not take into account the management time and added environmental damage, as well as vulnerability to drought and personal stress levels. Given my current low stocking rates, I can put more time and money into other areas, such as tree plots, or repairing stockyards, sheds and fencing.

David: What did you actually do that was fundamental to your success? How long did the planning process take you? Did the plan evolve much?

I drew up a cash flow budget, quarter-by-quarter and looked at where expenses could be cut back. I asked, 'where do we want to be in five years time, where do we want to be in ten years time and how are we going to get there?' People over-estimate what they can achieve in one year and completely underestimate what they can achieve in ten.

This planning process probably took me a year to think it all through. If you escape from jail and you've got no plan of where to run directly, then you'll be caught and sent back to jail, won't you? If you leave the jail, and go for bullock for it, then there's a chance that you won't be caught!

Farmers think that the number of acres you have is the level of status you have. If you buy the neighbour's property, with no investment off the farm in shares, then you're seriously at the whims of drought. An auction hammer falls on the neighbour's property. Everyone says 'congrats!' on their success, as they've added another thousand acres to their farm. They put some cash down at the bank, while the bank takes the title of both properties. They haven't done their sums on the mortgage repayments. A bad season, or bad prices strike, and they can't keep up the mortgage repayments. They have trouble feeding the family, their debt compounds out of control and the ecological health of both properties deteriorates. It's been a hell of a lot more work, a hell of a lot more worry. It affects their marriage, their children, their personal relationships and eventually one day they end up losing both farms to the bank.

Dad used to sit at this table, in that chair, and I would sit at the other end (because his chair had a stock whip lying over it). Dad would say 'mortgage one station to buy another, you lose both'. Financially, farming is a risky business. Becoming a farmer you are gambling with both types of capital. The stress of drought and low commodity prices has an effect on family relationships. Many farmers suffering from severe depression cannot run the farm and spend most of the day in bed.

All over New South Wales, there are homesteads that are half, or perhaps two-thirds the size of this place, that are tumbling down because there's no money to maintain them. You find them over-grazed, with monoculture crops and fences in disrepair, with water improvements not up-to-date. It costs money to dig up or spray noxious weeds, or to get rid of vermin. In just last year's accounts, spraying

thistles and blackberries on this property, the contract labour cost $45,000, exclusive of GST. After over forty years in the rural property industry, I have noticed that a well-maintained farm sells for at least a 25 per cent premium, in comparison to a neglected one.

Succession planning

There is little farm succession and financial service advice in regional Australia. A person who loses their farm, it breaks them. If you fail as a farmer, even if you don't kill yourself, you're a broken person. We need specialist rural industry estate planners to advise farmers; not just a local lawyer, who takes your instructions, writes up a will and gives you a big bill for it. It's well known these days that women have to stand on their own two feet financially. Women want an equal share. Do I blame them? No, I don't. Basically the only way to leave an estate is to divide it amongst all children equally, irrespective of gender.

View from Porcupine Hill looking towards the Upper Murray River and the Snowy Mountains. John Mitchell's house is behind the dark pines on the ridgeline. (Photo: N. Fijn)

John's example of a succession scenario

Parents, Bob and Gertrude, own a 4000-acre farm in Southern New South Wales. Adult sons, David and Phillip, together with their wives, live and work on the farm. There are three families living on the income of one farm. Adult daughters, Sarah and Judy, studied and now work in Sydney. There is not enough income to support the whole family, even though the farm makes a reasonable profit before interest, tax and depreciation. David and Phillip are hard workers, but only have a Year 10 education. Parents, Bob and Gertrude, never thought education was necessary for being on the land. Both sons occasionally work off the farm to supplement their income. Sarah in Sydney is single and struggles to pay the rent. Judy and her husband have trouble meeting mortgage repayments. A common rural farming scenario?

The farm is in debt by $500,000, a cash deficit of $80,000, adds to the debt each year for ten years. The loan calculations are as follows (at 8.5 per cent interest):

$500,000 x (1+r) n = $1,130,492
$80,000 x (1+r) n – 1/r + $1,186,807
Total debt after 10 years = $2,317,300

The value of the farm is $8 million with $2 million in stock and rehabilitated plantings. Net assets are $7,687,700. The family is asset rich but income poor. A big balance sheet of a wealthy family by Australian standards, but actually in a very weak financial position. The farm is in a debt tunnel. Physical structure and farm improvements are not maintained, while no environmentally sustainable methods are implemented. Overgrazing and crop rotations of monocultures with die-back of trees is resulting in serious environmental degradation, all because of a lack of surplus income.

The daughters in Sydney are becoming impatient for their share. Bob dies and the farm is left to the two brothers, inheriting a farm in serious debt. The daughters are left out of the will and take Supreme Court action against the estate at $7.7 million. All individuals are represented by separate law firms, including one firm acting on behalf of the estate. None of the lawyers are interested in the welfare of family members, only in charging fees, enjoying numerous lunches on Pitt Street and legal costs reaching to $2 million.

The bank forecloses on the farm, stock and equipment. All is to be sold on a mortgagee auction. The bank charges a $500,000 fee on foreclosure costs. The farm accountant happily accepts fees but is negligent in her duties. Gertrude struggles on government support. David has a serious nervous breakdown. Philip is an itinerant worker and struggles to survive. David never recovers and takes his own life. A happy, salt-of-the-earth family scenario? Ultimately, a disaster for the family from an emotional and financial perspective and a disaster for the land.

John's concluding remarks

Succession planning occupies a fair bit of my thoughts lately. Bad succession planning leads to debt, personal destruction, family fracturing and environmental destruction to the land. Succession planning starts while the father is still the head of the table. A will is only one document in a whole range of succession planning strategies on a farm. Most people hand over the management first, but hand over the farm later. If a farmer wants the property left within the family, they have got to have something else off the property for the non-farming members of the family.

Some of the methods I've put in place have gone against traditional farm management. You don't follow the crowd in this world, the crowd is always wrong. If you've got surplus cash, you invest it into something that has no relation to the profitability of the farm, like property in Sydney or Canberra, or shares.

The place is now half the size through family divisions, so we're not comparing apples with apples, but in a given season, with rainfall, it's just as profitable as it was during the good cattle prices of 1973. The productivity improvements have been exponential – we produce more with less labour and material. There will be new ways of doing things in the next 10-15 years. With new approaches, the productivity should continue to rise.

A lot of people want it now but you have to be patient and wait. People put everything on a plastic credit card. I want to leave a bit on the plate for the next generation. Traditionally in regional Australia there's been a lot of heartbreak where meals have been taken off the table, rather than put on the table. At the end of the day, I'm still here 34 years later and I've been highly successful financially. I had some serious challenges to confront. I want to leave the farm for future generations and not treat the farm as a mine.

*White-browed woodswallow (*Artamus superciliosus*) eggs on the Geddes' property (Photo: M. Crane)*

Conclusion

Natasha Fijn and David Lindenmayer

The oral histories in the chapters in this book showcase the different journeys each landholder has taken in working the land. It is clear that all of them have solved major problems in unique ways. In many respects, this demonstrates a very high level of innovation among farmers. While each story is different there are some common themes, which we briefly describe in the remainder of this concluding chapter.

For many of the property owners that feature in this book, Landcare has been an important social institution for fostering the exchange of key ideas around improved land management. As a grassroots organisation, Landcare has played a particularly significant role as an intermediary between farmers and government funding bodies, as well as liaising with educational institutions and research, such as the ANU Fenner School of Environment & Society. Landcare, through a range of grants offered at regional, state and federal levels, has also been a key means of supporting investments to improve natural assets, like shelterbelts and riparian areas on farms.

Paul Trevethan (Chapter 6) was particularly engaged with Landcare and associated regional and state government organisations throughout the 1990s. He describes how, in his view, the grassroots organisational structure of Landcare has shifted to a new paradigm focusing on agricultural production, which he perceives as being mirrored on his farm by the new practices being put in place by his sons.

Facilitators and coordinators working for Local Land Services (LLS) are often important intermediaries for farmers in undertaking conservation initiatives and in assisting with obtaining government funding to support restoration projects. Both Paul Graham (Chapter 1) and John Hopkins (Chapter 4) emphasised how important it was to collaborate with a facilitator to help with the initiation of projects, particularly in relation to the contractual and administrative side of government funding.

There have been considerable changes in other institutions over time, in relation to how research on Australian wildlife has occurred in both a university setting and within the Commonwealth Scientific and Industrial Research Organisation (CSIRO). The CSIRO of today has changed radically since the time when Kent Keith (Chapter 7) was employed there. He conducted wildlife surveys during a particularly exciting era when many new discoveries were being made. He and his colleagues at CSIRO helped lay some of the foundations for new generations of ecological researchers and the tools they use. An example is the wildlife trap Kent Keith helped to design and implement, which is now

used by ecologists and wildlife rangers across Australia. It is heartening that Kent has been able to conserve areas of land through covenants. The ANU team working on the Sustainable Farms project is continuing field survey work on the farmland formerly owned by Kent and Marion Keith to continue this legacy.

Many of the farms featured in this book have been in the same family for generations and have undergone changes in management practices and approaches to farming over time. The composition of wildlife and levels of diversity on those farms has also changed over time. Tony and Vicky Geddes (Chapter 5) provided a good example of this changing composition. Tony's grandparents spent considerable amounts of time controlling rabbits, and Tony related an old family story about how sighting one kangaroo was an experience of note. Now, there are few rabbits but a growing population of kangaroos and wombats. Vicky noted short-term changes in invertebrate diversity, based on observations of spider webs in paddocks. It is these detailed, incidental observations of changes to a place over time that may reorient the focus of a farmer towards more sustainable farming practices.

Flame robin (Petroica phoenicea)*. (Photo by P. Kavanagh)*

Birds are often the most visible species in a landscape. In terms of biodiversity conservation on their properties, many of the farmers focused on the presence or absence of birds, with less emphasis on marsupials and reptiles. Ecologists, too, have tended to focus more on birds than other fauna. John Hopkins and Kent Keith described how they enjoy observing bird species that are seen only rarely on their farms, or that arrive only seasonally, such as the mountain duck, brolga or flocks of pelicans. Some farmers were negative about the increasing populations of kangaroos and wombats and the potential impact that these marsupials could have in the future, especially in cropping and riparian areas.

Both Bimbi Turner (Chapter 3) and Vicky Geddes emphasised that although the increase in biodiversity, such as marsupials, mattered to them, they were equally concerned with the health and wellbeing of their sheep. Many of the farmers related

how the control of introduced weeds and pests, such as the removal of Paterson's curse or foxes, were important tasks on the farm, in terms of maintaining a balance of species on the land.

All of the farmers and graziers in this book have experienced adversity in relation to their farming enterprises in some form – financial, environmental, or emotional. Life on the land is not for the faint-hearted. Australia is not an easy place to farm or graze animals, with periods of drought, as well as devastating floods and fires. In Chapter 4, John Hopkins states, 'I don't think I will ever fully recover' from two devastating fires. His emotional scars are evident, and his land is also scarred from the extreme heat of the fire – John observed that the soil is still not as healthy as it could to be. Yet his story is an example of how to survive adversity and make the best of changed circumstances. After the second fire, he started a revegetation plan as if his property layout was a clean slate, taking the opportunity to think about soil composition and watercourses in the redesign of paddocks and tree plantings. The Johnson family (Chapter 2) was interviewed during a period of drought in the autumn and winter of 2018, but were confident that they would survive due to their careful farm planning and management strategies, by moving the stock between paddocks frequently and de-stocking early. In recent years they have opted not to make hay or buy in lucerne, as they are confident they have enough groundcover as a consequence of their ongoing regenerative grazing practices.

All of the property owners interviewed in this book survived the Millennium Drought in the 2000s, but acknowledge it was a difficult time. Such devastating environmental incidents underscore the importance of making sure that appropriate mental health support is available to all Australians on the land. This is especially important given that droughts are predicted to become more frequent. The *Sustainable Farms* project has a strong mental health research component. Ensuring that people in rural and remote Australia have access to the same resources as their city counterparts is a major equity issue for this nation. Farmers interviewed for this book spoke about how natural assets – such as native vegetation, healthy pastures and habitat for a range of different birds – had a positive effect on their overall wellbeing.

Paul Trevethan emphasised the need to not only work *in* the business but *on* the business; in other words, not only working hard on fencing and planting crops but also working out cash flows and the current state of the farm's finances. Both John Mitchell (Chapter 8) and Paul Trevethan put in place 10-year management plans for their properties, including planting trees and improving infrastructure, and also taking into account the expenses that might arise during times of hardship, such as drought.

Paul Graham (Chapter 1) plans conservation projects on a yearly basis, in conjunction with Local Land Service facilitators, and also based on insights passed on by Mason Crane, an ecologist with the *Sustainable Farms* team. He and other *Sustainable Farms* ecologists have extensive knowledge of the many different farm sites across the *Sustainable Farms* project region, gained through numerous visits and ongoing scientific monitoring and analysis of changes in these landscapes. The *Sustainable Farms* team can provide farmers involved in the project with ideas on how to enhance the natural assets and increase the biodiversity on their properties, particularly through its program of field days held on farms throughout the woodlands of southeastern Australia.

Field day held at 'Fairview' near Holbrook, NSW, led by Sustainable Farms staff. (Photo: A. Marzano)

Another issue that was raised in various ways by most of the farmers in this volume was succession. These properties have stayed in the family, through generations, with inevitable changes over time. Yet the families featured within this book have successfully retained relatively large properties, managing to sustain themselves economically, all while improving the biodiversity and overall condition of their land. Succession is a huge issue – some researchers have estimated that over 80% of Australian family farms will be subject to some kind of succession in the coming decade, especially given the aging demographic profile of farmers. The vast majority of landowners (and not just the individuals featured in this book) want to leave the land in a better condition than it was when they took ownership.

Several farmers were concerned about the land being further subdivided with each successive generation, or eventually sold off altogether. Will the next generation continue to improve the environmental condition of the land, or will they embark on a journey with a different environmental trajectory? The story of Paul Trevethan illustrates the concern that this can create. In Chapter 8, John Mitchell discusses succession issues from a financial perspective, the manifold problems that can result from the division of assets, and his fraught experience of dealing with the complexities of a testamentary trust.

Bimbi Turner (Chapter 3) noted that as a woman in farming, she never felt marginalised by other farmers at local community meetings, or in the breeding and sale of livestock. It was only when it came to who would inherit the family farm that she felt her gender made a difference, as her father followed tradition and chose Bimbi's brother when Bimbi felt she had put just as much time and energy into the farm while growing up. However, her father helped her out in other ways and she now manages a successful farm on another property.

Succession also includes passing on knowledge to the next generations of farmers. Examples in this book include the Grahams, who connect with the local school to help with planting vegetation as part of the Adjungbilly Creek Project (Chapter 1); the Hopkins, whose teenage daughters help by planting seedlings during their school holidays (Chapter 4); and Sid Johnson, who returned from the city to manage the farm with the energy and vision of the next generation (Chapter 2).

Kent Keith's approach to farming changed within his lifetime. In his early years, the use of insecticides and chemical sprays in his workplace was extremely detrimental to his health and wellbeing, so when he retired to the farm he decided to avoid the use of excessive chemicals on his own land. For Bimbi Turner, the use of chemicals involved a tricky balance between needing them to combat invasive species, or to treat livestock for worms and parasites, but without overuse that could lead to negative consequences.

The Johnsons emphasised the importance of providing incomes for the next generation on the land. They have achieved this by diversifying their business, establishing a butchery onsite and implementing different marketing strategies. Sam Johnson's management approach did not align with his father's management strategy, but his son Sid's farm management is consistent with Sam and Claire's approach, including their focus on direct marketing to customers.

Vicky Geddes noted how her husband Tony's values about sustaining the land were inherited from his grandparents' attitudes, then influenced by his parents' continuation of similar measures to ameliorate the damage done by historical land management

practices. An inherited interest in birds is also part of the family culture. Paul Trevethan has a very different approach to the land in comparison to his sons, which Paul attributes to quite different educational backgrounds and differing influences from peers within the farming community.

The stories told by the family farmers in this book are a part of Australian culture that is rarely captured, especially in terms of how the land can be restored through improved management. The current and upcoming generation of landowners will build on or change the land stewardship ethic illustrated in this book. Their approach will have a major impact on the resilience of this woodland region, and on sustaining the balance of farming, grazing, and biodiversity for decades to come.

Farm dam and large old trees at the Hopkins' property, 'Allawah'. (Photo: A. Marzano)

Appendix: List of common and scientific names

Common name	Scientific name
Plants	
Blakely's red gum	*Eucalyptus blakelyi*
Bottlebrush	*Callistemon spp.*
Grey box	*Eucalyptus macrocarpa*
Kangaroo Grass	*Themeda triandra*
Native hop bush	*Dodonaea spp.*
Paterson's curse	*Echium plantagineum*
Red box	*Eucalyptus polyanthemos*
Red stringybark	*Eucalyptus macrorhyncha*
Rock isotome	*Isotoma axillaris*
She-oak	*Casuarina spp.*
Spotted gum	*Corymbia maculata*
St John's wort	*Hypericum perforatum*
White box	*Eucalyptus albens*
Yellow box	*Eucalyptus melliodora*
Mammals	
Black wallaby (swamp wallaby)	*Wallabia bicolor*
Common wombat	*Vombatus ursinus*
Koala	*Phascolarctos cinereus*
Naked-tailed rat	*Melomys littoralis*
New Holland mouse	*Pseudomys novaehollandiae*
Red-necked wallaby	*Macropus rufogriseus*
Squirrel glider	*Petaurus norfolcensis*
Sugar glider	*Petaurus breviceps*
Wallaroo	*Macropus robustus*
Reptiles	
Box-patterned gecko	*Lucasium steindachneri*
Eastern blue-tongue lizard	*Tiliqua scinoides*
Eastern brown snake	*Pseudonaja textilis*
Eastern stone gecko	*Diplodactylus vittatus*
Olive legless lizard	*Delma inornata*
Red-bellied black snake	*Pseudechis porphyriacus*
Southern rainbow skink	*Carlia tetradactyla*
Southern spiny-tailed gecko	*Strophurus intermedius*
Spotted-back ctenotus	*Ctenotus orientalis*
Tiger snake	*Notechis scutatus*

Birds

Australian magpie	*Cracticus tibicen*
Australian pelican	*Pelecanus conspicillatus*
Black swan	*Cygnus atratus*
Black-chinned honeyeater	*Melithreptus gularis*
Brolga	*Grus rubicunda*
Brown treecreeper	*Climacteris picumnus*
Crested shrike-tit	*Falcunculus frontatus*
Currawong	*Strepera spp.*
Diamond firetail	*Stagonopleura guttata*
Flame robin	*Petroica phoenicea*
Galah	*Eolophus roseicapilla*
Grey-crowned babbler	*Pomatostomus temporalis*
Hooded lapwing	*Vanellus miles*
Hooded robin	*Melanodryas cucullata*
Little eagle	*Hieraaetus morphnoides*
Magpie goose	*Anseranas semipalmata*
Mountain duck (Australian shelduck)	*Tadorna tadornoides*
Noisy miner	*Manorina melanocephala*
Red-rumped parrot	*Psephotus haematonotus*
Regent honeyeater	*Xanthomyza phrygia*
Rufous whistler	*Pachycephala rufiventris*
Scarlet robin	*Petroica boodang*
Speckled warbler	*Pyrrholaemus sagittatus*
Superb fairy-wren	*Malarus cyaneus*
Superb parrot	*Polytelis swainsonii*
Swift parrot	*Lathamus discolor*
Turquoise parrot	*Neophema pulchella*
Varied sittella	*Daphoenositta chrysoptera*
Wandering albatross	*Diomedea exulans*
Wedge-tailed eagle	*Aquila audax*
Weebill	*Smicrornis brevirostris*
Whistling kite	*Haliastur sphenurus*
White-browed woodswallow	*Artamus superciliosus*
White-plumed honeyeater	*Lichenostomus penicillatus*
Yellow-rumped thornbill	*Acanthiza chrysorrhoa*
Zebra Finch	*Taeniopygia guttata*

Other

Booroolong frog	*Litoria booroolongensis*
Macquarie perch	*Macquaria australasica*
Murray River turtle	*Emydura macquarii*
Pink-tailed worm-lizard	*Aprasia parapulchella*
Redlegged earth mite	*Halotydeus destructor*

Endnotes

1 For further information, see the Sustainable Farms website: https://www.sustainablefarms.org.au/
2 For the history of this Demonstration Farm Project, see 'On Borrowed Time' featured by the Ian Potter Foundation channel: https://www.youtube.com/watch?v=H9MWDwnd5Ak
3 White box, yellow box, Blakely's red gum woodland and Coolac-Tumut Serpentinite shrubby woodland were also identified along the Adjungbilly Creek system.
4 'Saving our Species at Adjungbilly Creek', see: https://riverina.lls.nsw.gov.au/resource-hub/media-releases/2017/saving-our-species-in-adjungbilly-creek
5 For a video with Paul Graham talking about the willows and riparian restoration, see: https://vimeo.com/349787182
6 Claire Johnson refers to the Savory Institute website, available at: https://www.savory.global/. The book Claire and Sam Johnson mention is: Savory, A. & Butterfield, J. (1999) [1988] *Holistic Management: A new framework for decision making.* Island Press, Washington D.C.
7 For a video showing the moving of the pigs to fresh pasture at 'Windermere', see: https://vimeo.com/349785234
8 https://boxgumgrazing.com.au
9 For a video segment of Bimbi Turner out on the property at 'Silverdale', see: https://vimeo.com/371068866
10 For an ABC Rural piece on the Junee bushfire in 2006, see: http://www.abc.net.au/news/rural/2006-02-03/junee-fires-one-month-on/6256676
11 New South Wales was experiencing a drought at the time of the interviews, so many farmers had their stock in containment areas, or were spending time every day supplementary feeding.
12 For a video segment of John Hopkins listening to the diversity of birdsong beside some tree plots, see: https://vimeo.com/349784277
13 See Ridsdill-Smith, T., et al. (2008) Strategies for control of the redlegged earth mite in Australia. *Australian Journal of Experimental Agriculture,* 48, 1506-1513. https://doi.org/10.1071/EA08020
14 For a video of Tony Geddes describing this, see: https://vimeo.com/349789272
15 For an account about Bev Geddes by Tony Geddes and recorded by Year 6 children at Holbrook Public School, see 'The Story of my Granny: Bev Geddes': https://www.envirostories.com.au/wp-content/uploads/pdf/2013059BevGeddes.pdf
16 For a video of Tony Geddes on 'Yallock' and explaining their economic reasoning, see: https://vimeo.com/349789272
17 For Vicky Geddes' perspective on sheep genetics see: https://www.farmonline.com.au/story/4217094/geddes-growing-gains/?cs=4846
18 The family in this chapter are related to Tony Geddes in Chapter 5. Beverley Geddes was Tony's grandmother and Paul's mother-in-law. Beverley Geddes was influential in the sustainable management practices of three separate farming families in the district. Independently, each family has been engaged in the ANU long-term ecological research on their properties.
19 For further information on dryland salinity, see: https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/309381/Dryland-salinity-causes-and-impacts.pdf
20 See https://davidsuzuki.org/expert/david-suzuki/

21 For more information on Joan Kirner's contribution, see: https://theconversation.com/joan-kirner-united-farmers-and-conservationists-to-care-for-the-land-42746
22 The Ian Potter Foundation are continuing this legacy in collaboration with the *Sustainable Farms Project*, see: https://www.ianpotter.org.au/news/blog/transforming-the-farming-landscape/
23 For a video of Paul Trevethan talking about this particular tree block, see: https://vimeo.com/372279813
24 For a short biography on David Fleay, see: http://adb.anu.edu.au/biography/fleay-david-howells-18625
25 The Fenner School of Environment and Society at the ANU is named after Frank Fenner. The Fenner School is where the Sustainable Farms project is based. For more details on Frank Fenner's life, refer to the Australian Academy of Science website at: https://www.science.org.au/learning/general-audience/history/interviews-australian-scientists/professor-frank-fenner
26 Attenborough, D. (1963, film) 'The Artists of Arnhem Land' In *Quest Under Capricorn*, BBC2, Bristol. See: https://www.bbc.co.uk/programmes/p00zw1jd
27 Keith, K. (1970) Occurrence of a second species of Naked-tailed rat, genus Melomys, in New South Wales. *CSIRO Wildlife Research,* 15(1), 19-26.
28 For a video of Kent Keith talking with ANU researchers while driving around 'Ballanda Park', see: https://vimeo.com/372280721
29 For more details on Thomas Walter Mitchell's life, see: http://adb.anu.edu.au/biography/mitchell-thomas-walter-tom-14976. For Elyne Mitchell's life, see: http://oa.anu.edu.au/obituary/mitchell-sibyl-elyne-18137
30 Mitchell, E. (1989) *Towong Hill: Fifty Years on an Upper Murray Cattle Station.* Angus & Robertson, Sydney. p. 242.
31 Mitchell, E. (1945) *Speak to the Earth.* Angus & Robertson, Sydney. p. 3.
32 For more details on the racehorse Trafalgar, see: http://monumentaustralia.org.au/themes/culture/animals/display/30909-trafalgar
33 Mitchell, E. (1942) *Australia's Alps.* Angus & Robertson, Sydney; (1945) *Speak to the Earth*. Angus & Robertson, Sydney; (1946) *Soil and Civilization*. Angus & Robertson, Sydney.
34 For a video of John Mitchell pointing out some features within this school assignment, see: https://vimeo.com/372577979
35 Mitchell, E. (1989) *Towong Hill: Fifty Years on an Upper Murray Cattle Station.* Angus & Robertson, Sydney. p. 220.
36 For further details of the award of this Honorary Doctorate, see https://www.anu.edu.au/news/all-news/honorary-degree-citation-mr-john-mitchell

The eight stories in this book are from farmers connected with Sustainable Farms, an interdisciplinary project at The Australian National University that is working collaboratively with farmers, Landcare, NRM agencies, industry groups, and policy makers.

The farms featured are dotted across the South West Slopes region of New South Wales and the Upper Murray of Victoria, areas that have been heavily modified by agricultural practices. The landscape was formerly dominated by temperate eucalypt woodland but 85 per cent is now intensively grazed, cropped and cultivated as agricultural land. The stories are from farmers seeking to find a balance between productivity and biodiversity, and to retain or increase the natural capital on their properties.

Each property is different, and the individuals, families and generations interviewed for this book varied in their approaches to living productively on the land. From the diverse stories in this book, we hope that others might glean ideas and strive for more sustainable farming practices on their land.

For information on Sustainable Farms, see
www.sustainablefarms.org.au