

# CASE STUDY

Northern Agricultural Catchments Council



## Salt, Dust and Desertification – Reversing the Trend

*David and Fiona Falconer,  
"Barokee", East of Coorow, WA.*

### Introduction

David and Fiona Falconer are partners in a family grain-growing enterprise east of Coorow in the locality of Waddy Forest. David's grandfather purchased the original farm property, "Barokee" in 1948. The Falconer family have farmed there ever since. Additional land has been purchased over the years. The total area of the property is 4,054 ha of which 749 ha comprises natural bush and revegetated land.



### Landscape

The landscape of the Falconer property is undulating and dissected with long, narrow valleys and rocky ridgelines with outcrops of granite-gneiss and dolerite dykes that cut across the slopes in a north-west to south-east alignment. Soils range from shallow soil over granite-gneiss, to sand over gravel, red sandy loam over clay, grey clay, crabholes, and brown alkaline clay.

### Back in the day

Land clearing on the property began in the 1920s – with the stands of Salmon Gum/Gimlet/York Gum woodlands and Jam growing on the fertile valley floors being the first to go. The woodlands were extensively cut down and burnt, such that today, only fragments remain. (David and Fiona have dug-up charcoal from all those years ago – when using a mechanical tree planter while revegetating salt-affected land in valley floor country once covered in woodland).

David and Fiona came to Coorow in 1977, and soon recognised that land degradation was threatening the long-term viability of the farm, with dryland salinity being the most obvious problem. Areas of the farm were becoming increasingly unsuitable to grow crops and pastures, bare salt scalds were appearing (favoured by sheep as camps), and there was a noticeable decline in the health of remnant vegetation. David and Fiona said there were a number of other problems impacting the farm landscape

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and production potential, including wind and water erosion, and soil acidification, but salt was the ‘big one’. They knew that dryland salinity had been caused by over-clearing the native vegetation for agriculture – under which the native, deep-rooted perennial trees and shrubs were replaced by shallow-rooted annual crops and pastures, resulting in changed hydrology.

Common sense suggested that revegetation would be a solution, but there was little knowledge available at the time as to where best to plant back, and what to plant. Their first revegetation planting was a grand total of 10 trees, hand-planted into a salt scald on a degraded creek–line, and protected from sheep by tree guards made from netting and steel posts. Miraculously the trees survived (including an attack by plague locusts). In subsequent years, more trees and shrubs were planted on this original site, and it was fenced-off from livestock. David and Fiona said the site began to get a ‘life of its own’ – with formation of biotic crust and natural regeneration from the original sparse trees and shrubs including York Gum (*Eucalyptus loxophleba*), Inland Bottlebrush (*Callistemon phoeniceus*), and *Melaleuca* sp.

## The Decade of Landcare and Beyond

In the late 1980s, land degradation was getting a lot of attention across WA and the rest of the nation as a serious issue. Landholders in the Waddy Forest Catchment embraced the concept of an integrated approach to catchment management, and the Waddy Forest Land Conservation District Committee (Waddy Forest LCDC) was formed (in 1989). David and Fiona joined the LCDC, saying “It was a game changer”

The Department of Agriculture put experts in the fields of hydrology, agronomy, remnant vegetation management, soils, etc. out and about to support LCDCs, to educate landholders, and to help assess what was happening in the landscape, and how to manage the impacts of land degradation. Field Days were held, and Technical Reports and other informative publications were produced.

## Putting Landcare into Practice

In order to address dryland salinity, David and Fiona installed a network of observation bores to monitor groundwater trends. They planted more than 200,000 biodiverse trees and shrubs, 10,000 oil mallees, and 30,000 SEARCH PROJECT *Melaleuca* species. (Early on, the Waddy Forest LCDC purchased a mechanical tree planter and made it available for hire. Large numbers of trees and shrubs were

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thereafter able to be planted with minimal labour, i.e., two people – one driving the tractor and the other sitting in the tree planter planting thousands of seedlings a day depending on conditions).

In order to protect biodiversity on the farm, David and Fiona implemented a range of actions, including:

- Fencing-off remnant vegetation from livestock.
- Conducting flora and fauna surveys.
- Undertaking fence setbacks, and revegetating adjoining road reserves.
- Protecting rare flora.
- Collecting seed on farm for propagation by a local nursery.
- Revegetating buffers or enlarging existing remnants to increase resilience to edge effects, and to improve wildlife habitat.
- Undertaking feral animal control such as fox- and rabbit-baiting, and opportunistic shooting of foxes and feral cats.
- Covenanted bushland to protect it under the Remnant Vegetation Protection Scheme (RVPS).
- Undertaking revegetation to connect isolated bush remnants.

Other key issues and associated land management practices implemented by David and Fiona included:

Wind erosion

- Stubble retention
- Revegetation-windbreaks

Water erosion

- Revegetation of creek lines
- Stubble retention

Soil degradation

- Application of lime
- Minimum till
- Soil mapping

Weeds were also prioritised for better land management practices. David and Fiona believe that weeds are a major threat to the long-term viability of the farm's cropping enterprise because of the economic and environmental costs of chemical control.

They have had some success in controlling the spread of Paterson's Curse by releasing biological agents Crown Boring Weevil (*Mogulones larvatus*), and Root Boring Weevil (*Mogulones geographicus*). Summer rain favours Caltrop (*Tribulus terrestris*) and infestations have worsened in recent times.

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Western Australian Blue Lupin (*Lupinus cosentinii*) which was trialled in the late 1950s for pasture improvement has since become a weed amongst some bushland on rocky ridge lines and around granite outcrops. Control of small infestations by hand during winter has produced some good results. Emerging weed threats, often to be found spreading along roadsides, include African Lovegrass (*Eragrostis curvula*), Stature (*Limonium lobatum*), Black Berry Nightshade (*Solanum nigrum*), and Kikuyu grass (*Pennisetum clandestinum*).

## Progress so far

### Comments from David and Fiona:

The primary motive of landcare works on the farm was to mitigate dryland salinity. We have also been driven by our strong interest and commitment to biodiversity conservation.

Comparing aerial photos taken at the beginning of the 1990s to how the farm looks today show native vegetation cover restored to areas previously laid bare by salt encroachment and erosion and the arrest of land being lost for agricultural production.

We have been thrilled to discover a rare plant species, Prostrate Flame Pea (*Chorizema humile*) on the property and cooperated with the state conservation agency to provide a site for translocation of the species to enhance seed stocks. We discovered populations of a vulnerable invertebrate, Shield-backed Trapdoor Spider (*Idiosoma nigrum*).



Spotted Jezebel Butterfly (*Delias aganippe*) laying eggs on planted sandalwood.

A recent bird survey in the Waddy Forest Catchment, funded by NACC and including our property, showed how revegetation work on farms in the area has been successful in creating/extending habitat (food, shelter, and breeding) for woodland and shrubland birds.

Unfortunately, we have not been able to gain any carbon farming opportunity from our plantings – as many do not qualify on the basis of age, but also because we stagger our plantings – on

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saltland starting from the outside and moving in over a period of years, and use a diverse species mix.

Our work could be easily undone in the future if the property changes hands. A bulldozer, some poison, and a match could wipe out years of work to revegetate and restore degraded land, as there are no adequate mechanisms in place to protect whole of property remnant and revegetation areas in perpetuity.

It takes a couple of hundred years for a tree like a Salmon Gum to form large hollows suitable for a cockatoo to nest, and it may take even longer in the years ahead as our climate dries and heats – we need to be thinking of the success or not of our work in the same timeframes – even though we won't be around!.

We will continue to plant trees, look after our bush, and learn more about how caring for nature can help our farm remain productive and healthy.

## Acknowledgements

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## For more information

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