From wasteland to something special — The Kamarooka Project

Case study: Northern United Forestry Group
Location: Kamarooka in North Central Victoria
Property size: 1000 ha affected by dryland salinity
Mean annual rainfall: 460 mm but more like 300 mm in the past decade
Soils: Sodic duplex soils
Enterprises: Dryland cereals and sheep, farm forestry

An innovative approach to salinity management at Kamarooka in North Central Victoria is being developed and managed by a group of people who claim they are just interested in growing trees.

Members of the Northern United Forestry Group hosted Jo Curkpatrick in a visit to the Kamarooka and explained their aims for a patch of farming land affected by salinity.

The Northern United Forestry Group (NUFG) is a diverse group of people with an interest in the Kamarooka area and particularly farm forestry for low rainfall areas. They first formed in the late 1990s as local farmers from the northern plains and foothills came together to explore a common interest in farm forestry. Today the group has more than 40 members including farmers, families and small businesses from throughout North Central Victoria.

Their aim is to establish halophytic vegetation, largely saltbush on the most degraded salt-affected land, and salt-tolerant native trees, shrubs and grasses on adjacent land moderately affected by salinity. In the longer term they see added value from the trees, believing that farm forestry can be profitable.

Soil tests show that sub-soil salinity varies from about 2–4 decisiemens per metre (1:5 extracts), in soils that have an alkaline pH of around 8–9. The water table is quite saline and, between 0.5 and 2.5 m from the surface. In terms of dryland salinity, the site is as bad as you would find anywhere in Victoria.

With support from the National Landcare Program, the North Central CMA, and other sources, NUFG has been able to analyse the soils, prepare management strategies, prepare the land for re-vegetation, and start planting a 40 hectare demonstration site with more than 15,000 trees and shrubs.

Photo: J Curkpatrick

Kamarooka farmers Andy Hay and Lindsay Cail with hydrogeologist Phil Dyson getting a buzz out of saltbush

Key points

- Saltland pastures offer productivity opportunities
- Farm forestry is an option on some sites with correct species
- Planning, based on good site knowledge, is essential

The site belongs to the Hay family who are just as keen as their fellow NUFG members to increase the productive capacity, biodiversity and amenity of the land. With 400 ha severely affected and another 600 ha of private land surrounding the site affecting local farmers, there is potential for increasing farm productivity significantly. Additionally farm forestry presents an alternative to add to cropping and grazing enterprises.

Revegetation works began in early 2004 when the tree lines were sprayed, the soils deep ripped and rotary hoed, fertilised with pig manure and gypsum, and sown with tube stock.

The area on the Hay property has now been planted with native trees, shrubs and grasses. Rows of sugar gums (*Eucalyptus cladocalyx*) and flat-top yates (*E. occidentalis*) are growing alongside willow wattle (*Acacia*

salicina) and Eumong (*A. stenophylla*). In the next paddock a range of saltbush varieties are growing rapidly. In other parts of the site direct-drilled acacias and native grasses are becoming established.

There are 10 monitoring bores across the site, providing data on the water table under trees, saltbush and native grasses. Results from the groundwater monitoring program show isolated areas of remnant vegetation at the northern and southern extremities of the site sustain a much lower water table relative to adjacent saline land. As time goes on, the data will assist landholders in making judgements about their management.

According to landholder Andy Hay, the number one priority was to reclaim the salt-affected land.

"We have done that with saltbush on the worst of the salt-affected land and by growing trees on the better land.

"We were losing more and more land. In summer it blew and in winter it was mud. We couldn't crop it and it could only be grazed lightly.

Photo: J Curkpatrick

Trees thriving 12 months after planting

"The saltbush is already providing some grazing and it will only be a few years before we expect to see a big difference where the trees have been planted," says Andy Hay.

The Hays expect the saltbush to significantly increase their carrying capacity, "It will take capacity from virtually nothing to useful grazing."

The NUFG believe the Kamarooka project shows what you can do with land that has been basically useless for 50 years.

The project will provide information on the economics of growing hardwood species on the northern plains, both in terms of returns for wood products and integrating tree growing into an existing cropping and grazing enterprise for environmental rewards.

The group's hard work was rewarded in 2004 with a National Landcare Research Award. The award recognised NUFG's expertise in low-rainfall farm forestry and acknowledges the work of the group in promoting the benefits of trees and shrubs in improving farm productivity and biodiversity in the region.

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The science behind the story

By Phil Dyson

The Kamarooka region is 20 kilometres to the north of Bendigo in Central Victoria. It straddles the junction of the northern foothills of the Great Dividing Ranges with the vast alluvial Riverine Plains of the south-eastern sector of the Murray-Darling Basin.

Dryland salinity first became evident at Kamarooka in the mid 1950s. Prior to then, the water table along the interface between the weathered bedrock systems and the plains had been rising in response the clearing of native vegetation and the development of agriculture. Ultimately the site realised saline groundwater discharge at the land surface.

Given that the salinity problem at Kamarooka cannot be fixed in a timeframe acceptable to most people, there is a need to consider other options. Engineering options such as pumping to remove saline groundwater are sometimes possible where there is an aquifer that permits reasonable rates of groundwater extraction. Unfortunately geological and geomorphic conditions beneath saline land at Kamarooka are not suitable for groundwater pumping.

The most promising option remains the development of agricultural and ecological systems adapted to saline conditions. This strategy is unlikely to realise benefits in reducing salt loads to streams of the region, nevertheless it does mean that production from barren land is possible, as is greatly enhanced ecological function through the restoration of biodiversity.

For more than 40 years the trial site has experienced the terrible harshness of dryland salinity. Now the barren saline land is once again becoming productive both from an agricultural and an ecological perspective. The agricultural benefits come from salt-tolerant species, and low rainfall farm forestry, while the ecological benefits arise from the re-establishment of plantations and the re-introduction of native vegetation.

The renewal is immediately apparent and truly amazing to those familiar with the site. Thousands of saltbush seedlings, trees and shrubs are now springing from the ground, and the true potential of the previously degraded land is becoming readily apparent.

- *Phil Dyson is a hydrogeologist with expertise in salinity management. Formerly with the Centre for Land Protection Research, Phil now operates a private consultancy.*

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