

Control weeds like bridle
creeper before they
become a problem.
Photo taken at Beverley.



These WA Christmas trees have been fenced and wattles and other trees planted in the enclosure to create a larger clump for a windbreak and conservation. Mingeneew.

Managing bushland on the farm

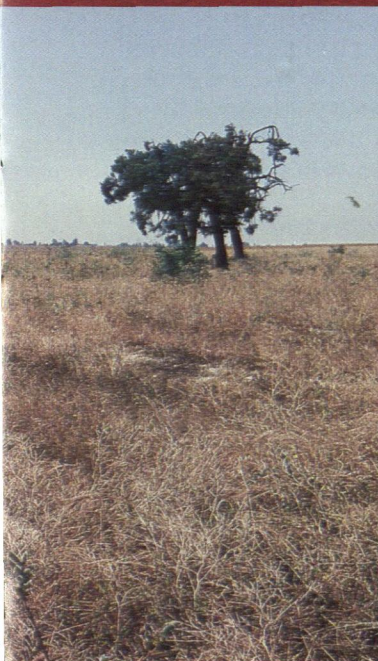
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All photos by Penny Hussey

Since the time of European settlement in Western Australia, the replacement of native vegetation with crops and pastures has led to problems for both agricultural production and nature conservation. The most obvious of these are hydrological changes leading to salinisation and waterlogging, and the extinction of some native plants and animals.

Protection of the remaining remnants of native bushland, together with revegetation, is increasingly seen as important ways of achieving sustainable agriculture and maintaining our unique wildlife.

Indeed, Australians are learning that nature conservation and sustainable land use are interdependent. However, such are the pressures acting on remnant bushlands isolated within farmland that management is essential to maintain and improve their value.



Try regeneration techniques on small areas first, to see if they work. Here, large old shrubs have been bulldozed, burnt, and the debris removed. A forest of seedlings is already visible. Esperance.



Sheep remove the ground layer including the leaf litter, ringbark shrubs, introduce weeds, trample the soil and leave it prone to erosion. They also open up the canopy; note the distinct browse line. Narembeen.

Fencing to control stock is a vital first stage, but it is not enough. Control of problem plants and animals, appropriate use of fire, and regeneration of the bush are some of the many management actions that may be required. Some landholders may also want to encourage particular animals – for example small bush birds to help control insects.

A new book *Managing Your Bushland* brings together knowledge from various sources and describes a range of management options that landholders may apply to their individual situation.

The book was produced by CALM in cooperation with the Department of Agriculture and CSIRO, under the Federal Government's "Save the Bush" scheme.

This article discusses one of the topics from the book, regeneration of degraded bushland.

No tree lives for ever. It is important to ensure that regeneration is occurring so that young plants can eventually replace the old. Gabalong.

To regenerate degraded bushland

1

Fence to control grazing

2

Treat soil so as to create seed and water traps

3

Control weeds

4

Introduce appropriate seed, if there is none left on site

5

Consider the careful use of fire to stimulate seed release and germination

6

Control insects if necessary

7

Monitor effects

Grazing

Young shoots and seedlings are highly attractive to grazing animals including stock, rabbits, kangaroos and insects. In many cases, the lack of regeneration in rural bushland can be attributed to grazing pressure. Fencing to exclude domestic stock is the first stage of bush management. It will also be necessary to exterminate rabbits so far as is possible, and in some cases to control kangaroos.

The location of fences, however, needs some thought. If you are regenerating a woodland clump, the fence should be put one to three tree heights out from existing trees. This is because many eucalypts are strongly competitive, and young plants will not survive under adult trees. Wandoo (white gums, *Eucalyptus wandoo*) and salmon gums (*E. salmonophloia*) are well known for their ability to suppress most other growth beneath their crowns, but most trees exert a similar effect.

Weeds

With some exceptions, native plant seedlings will not establish if there is competition from weeds. Common paddock weeds are able to extract so much of the available water and nutrients that native plant seedlings are not able to grow the deep roots that enable them to survive the first summer.

Weed control should be started in the year before the main effort at regeneration and continued, if necessary, after seedling establishment.

Source of seed

Plants reproduce from seed or vegetative material such as mallee roots. For regeneration to happen, this material must be available at the site, or it must be introduced by the manager.

Existing healthy plants remaining on-site should mean there will be seed available, but eucalypts do not produce a good crop every year and some plants may need a stimulus, such as a fire, to release the seed. Some seeds have an astonishing ability to survive in the soil, and can re-appear long after the parent plants have died out. Wattles and peas often do this, as do fire ephemerals such as flannel flower (*Actinotus leucocephalus*) and boomer bush (*Solanum symonii*).

However, if grazing has removed most of the understorey, it is unlikely that much of this soil-stored seed will be left, especially if the site is on a slope and the soil has been compacted by stock hooves, leading to topsoil loss. In all cases, it is probably useful for the manager to add seed.

Collecting local seed and direct seeding onto a prepared seed bed can be a highly effective way of restoring understorey to a degraded woodland.

Site preparation

Hard-packed soil will not hold seed or water, nor will it be easy for seedling roots to penetrate. In a natural situation, native animals such as woylies, numbats and echidnas turn over the soil and leaf litter as they search for food, thus creating ideal sites for seed germination. Cultivation on the contour, including deep ripping, can achieve the same effect and is especially valuable where stock or machinery have severely compacted the soil. A rip-line alone can be effective, but in drier areas, creation of a crescent-shaped, water-holding bank can be useful.

Natural soil conditions

Western Australia is a very old landscape, with soils from which many of the nutrients have long been leached away. Our native plants are adapted to grow on these infertile soils and in some cases an increase in nutrients can be fatal. Plants of the banksia family will eventually die if given superphosphate. This is one of the reasons why banksia numbers have declined in shelterbelts around paddocks.

If you are planting into a heavily weed-infested area, such as a paddock, scalping off the top 6 cm of soil with a grader is an excellent method of preparing a seed bed for native plants. Scalping removes both the weed seeds and the fertiliser that have accumulated in the topsoil.

Brushing

Seed-bearing branches of desirable plants can be laid directly onto the prepared site, allowing seeds to fall from them. The branches protect the young seedlings – extremely valuable if wind erosion and sandblasting of seedlings might be a problem – and contribute leaf litter and humus to the soil. This technique is called brushing. It is a useful way to salvage seed from trees blown over during a wind storm or knocked down during road works, for example, provided it can be done at an appropriate time of year.



Use of fire

Before agricultural clearing, most plant communities in Western Australia were subject to periodic fires lit by lightning or Aboriginal people. The bush regenerated in a characteristic sequence, with different groups of plants dominating in succeeding years.

The type of plants that grow after fire depends on the frequency, intensity and season in which the fire occurred; wattles and peas, for example, germinate best after a hot autumn burn. Fire in isolated patches of remnant vegetation can be devastating, especially if the fauna has no bush corridors to escape into, so it is not recommended without consultation with knowledgeable persons. However, a manager can safely imitate a hot autumn burn in a small area of a remnant by creating a heap.

A long, narrow bonfire of debris – dead wattles, for example – will burn very hot and sterilise the ground beneath it, even when burnt just

after the break-of-season. The resultant ash-bed is an excellent site for seed germination and soil-stored seed will germinate around the edges. Heap burns are especially suitable for use as a regeneration tool in woodlands of wandoo, York gum (*E. loxophleba*), salmon gum and mallee.

Further information

More detail about all the points raised in this article, plus many others, can be found in the newly-published book *Managing Your Bushland* by B.M.J. Hussey and K.J. Wallace and published by the Department of Conservation and Land Management (CALM) for \$19.95.

There is a concession price for members of Land Conservation District Committees. Contact Penny Hussey for details. □

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 Watch for natural regeneration because it is a cheap way to increase the tree cover. After a wet summer, hundreds of York gum seedlings appeared in this paddock. A small number were fenced off and allowed to grow. Trees in this photo are one year old.
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