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## Managing your bush



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## About this kit

This kit is designed to give you an overview of the principles of managing remnant native bush. However, as with all the recommendations in the **Tasmanian Bushcare Toolkit**, the guidelines are not meant to be followed rigidly. Rather, they are intended to give you some guiding principles for managing remnant bush. You can then modify the guidelines to suit your particular situation and needs.

The material covered in this kit includes:

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General principles of bush management

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Grazing management

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Fire management

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Weed and disease management

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Natural regeneration management.

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This kit only discusses the general principles of managing remnant native bush. It does not give specific guidelines for dealing with each particular bush type that may be found on your property. These are given in the kits dealing with the different bush types. Therefore, you will need to read this kit and the kit that discusses your bush type in order to decide on the best way to manage your patch of native bush.

You may also need to refer to parts of the following kits for specific information on weeds, revegetation and threatened species:

- **Kit 3 Weeds in Your Bush**
- **Kit 4 Revegetating Your Farm**
- **Kit 5 Threatened Plant Species in Your Bush.**



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# General principles of bush management

Native bush can be managed to make the most of its economic, nature conservation and land conservation values. Ten general principles for managing native bush are:

1. **DON'T CHANGE YOUR CURRENT MANAGEMENT PRACTICES UNLESS THERE IS AN OBVIOUS REASON TO DO SO.** If the bush is in good condition don't change your activities just to fit with what is seen as the 'best' method.
2. **DECIDE ON YOUR MANAGEMENT OBJECTIVES.** Determining the reason why you are managing the remnant bush helps you to decide what type of management is needed. Bush may be important for rough grazing, for shelter, or just because you like having bush on your property. You should be clear on the reasons why you are managing it.
3. **MANAGE TO PROTECT THREATENED SPECIES FIRST.** If you have threatened species in your bush, manage it to protect them first, to protect the threatened vegetation types second, and to maintain the bush in good condition third. Extinct threatened species cannot be resurrected. Vegetation types can reassemble themselves in the long term if all their species survive. Management that promotes good condition is not necessarily the management that promotes the survival of threatened species.
4. **VIEW THE BUSH ON YOUR PROPERTY FROM A BROADER PERSPECTIVE.** Don't just take a paddock-by-paddock approach. Rather, look at your farm as a whole unit, then consider where it fits in at a district level. Where bush or native pasture joins that of neighbouring properties a coordinated management approach will be more effective than an individual approach.
5. **MAINTAINING A VARIETY OF MANAGEMENT PRACTICES IS IMPORTANT.** If everyone followed the same management regime there would be far less diversity in the landscape. If you have a different management regime to surrounding farms, maintain it unless there is an obvious reason not to. For example, it is important that somewhere in the landscape we have bush that is never burned, bush that is burned regularly, bush that is burned in spring, and bush that is burned in autumn. Each farm will have a different mix of species as a result of the fire regime used.
6. **MANAGE BY NEED NOT FORMULAE.** The general recommendations for desirable burning and grazing regimes may not be appropriate for your bush and your aims. For example, decide when you need to burn or graze by looking at the size of the regenerating trees you want to keep. In particular, make sure they are large enough and tall enough to withstand a fire. In grassy bush keeping gaps between the tussocks is valuable for the regeneration of wildflowers, sedges and shrubs. Burning is needed when the gaps start closing up.
7. **THINK ABOUT THE IMPACT OF ANY NEW MANAGEMENT DECISION ON THE OVERALL VIABILITY OF YOUR BUSH.** In marginal rough grazing country it may be tempting to convert a small flat area to pasture but this could lead to gradual degradation of the area.
8. **MAINTAIN THE BUSH AS HABITAT FOR NATIVE ANIMALS AND BIRDS.** Older trees and dead trees should be left in place as they offer nesting hollows for birds and animals, especially parrots and owls, and provide a vantage spot or perching site for all birds of prey. If you are thinking of removing trees for fencing materials or firewood remember that coppicing and pollarding are more sustainable uses of trees. If you take firewood from the bush, ringbark some younger trees several years before you need the wood.

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However, the bush is much more than just trees. Birds such as wrens, robins, honeyeaters and pigeons need a diverse and healthy understorey. Once the understorey is degraded aggressive birds such as noisy miners move in and displace the bush birds. Keeping a diverse shrub and ground layer is fundamental to managing a bush remnant. Prickly plants like needlebushes and some wattles offer nesting sites, shelter and food. Shrubs such as bottlebrushes, tea-trees and prickly box also provide food for insects that help to control pest species. Logs, dead wood, rocks and stones on the ground provide shelter for animals, birds and insects so they should be left untouched.

9. DON'T USE THE BUSH AS A TIP OR SUMP. Avoid dumping rocks, earth, garden waste and rubbish in the bush as this eliminates native plants and allows weeds to flourish. The diversion of water into native bush leads to invasion by weeds, especially if it is rich in nutrients. Fertilising bush favours the growth of exotic annuals over native perennials.
10. REMEMBER IT IS ALWAYS CHEAPER TO MAINTAIN OR IMPROVE BUSH THAN TO RESTORE OR RECREATE IT. Clearing is an irreversible action in the medium term. The re-establishment of bush on improved pasture or crop land is usually a very expensive exercise, involving ground preparation, propagation or seed collection, planting or sowing, and continuing weed control. While it may be easy to establish individual trees or shrubs on cleared land they take many decades to mature, and the hundreds of other species found in native vegetation may not return for centuries.



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# Grazing management

Many of the native plants in lowland Tasmania have evolved in an environment where the prevailing management regime involved grazing by native animals and regular burning by Aborigines. There is a wide diversity of native herbs, grasses and wildflowers. Most of these are drought-tolerant, and adapted to variable rainfall and infertile soils. They have evolved in the presence of soft-footed grazing marsupials, such as the wallaby. Hard-footed, close-cropping stock are now the dominant grazers in most bush. Many bush types are not suited to stock grazing, including rainforest, wet eucalypt forest and alpine vegetation. However, stock are not necessarily bad for native bush. Stock grazing can be used as a tool for improving remnant bush but problems can arise with too little or too much grazing.

Overgrazing is the main management problem in bush. An area that is overgrazed is likely to have fewer native plant species as overgrazing degrades native pasture and prevents regeneration. Surface soil erosion may occur where there is an incomplete ground cover as a result of overgrazing. Soil erosion is most prevalent on slopes with light textured soils on sandstone and mudstone, on flats with sandy soils, and on steep slopes on dolerite hills. Sedimentation of streams and wetlands can result when stock have uncontrolled access to their banks.

Undergrazing can also lead to a reduction in the diversity of native species when it allows dense native grasses and shrubs to occupy the inter-tussock spaces normally occupied by smaller species. Undergrazing can also result in the dominance of weed species normally kept under control by stock. The use of fertiliser can promote the growth of weed species in bush managed for grazing. Top-dressing bush is best avoided as there are few situations where it is beneficial.

## Fencing off the bush

When fencing off areas of bush it is important to remember that at certain times of the year stock will be enticed by the greener grass on the other side. Be sure to use suitable materials in order to prevent collapsed fences and additional expenses. Fences should be strong enough to withstand damage from stock. Gates or other access points should be installed to allow for appropriate management practices such as crash grazing. In some cases fencing to stop rabbits destroying young plants will be necessary. It may be far more effective to rabbit-proof an area than to use stakes and bags to protect your plants. Consider the costs involved before making a decision.

## Priorities for fencing

Fencing may seem expensive. However, the cost of replacing vegetation is much more expensive and the result is never as good as the original native bush. The effectiveness of your fencing must be maximised. The highest priority should be to protect existing remnant native vegetation, including riparian bush. Fencing off larger areas is probably more useful than fencing small isolated remnants. Bush with threatened species is a high priority. Special habitats such as wetlands and rocky areas are usually not productive areas but they are important habitat and are therefore worth fencing.

## Type of fencing

The type of fencing will be determined by the situation and the type of animals to be excluded. You will probably be in the best position to know what type of fencing suits your property. *Farm Forestry Technical Information Sheet No. 18*, which can be obtained from Private Forests Tasmania, has information on fencing to exclude livestock and domestic animals, and the relative costs of different fencing options.

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Electric fencing may be a cheaper alternative in areas where you do not require a permanent fence but it requires regular maintenance. You can use electric fencing to achieve regeneration in a patch of bush or around paddock trees. When the saplings are tall enough to survive grazing you can remove the fence.

### **Tax benefits**

The costs of fencing to prevent or treat land degradation are deductible for tax purposes under Subdivision 387-A of the *Income Tax Assessment Act 1997*. A new Landcare rebate was introduced in July 1998 to provide an alternative to the deductions available under the Tax Act. The scheme provides a rebate of 34 cents in the dollar for expenses related to Landcare operations. For more information call the Landcare Rebate Hotline on 1800 060 425.



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# Fire management

Fire is used as a bush management tool for a number of reasons. Fire plays a vital role in maintaining the diversity of plants that make up the bush. It is also used to help protect life and property, improve bush pasture productivity, and control some weeds. Much of Tasmania's flora has evolved in an environment where fire occurred regularly. Aborigines burned the landscape for tens of thousands of years before the Europeans arrived. Plants such as eucalypts, tea-trees and paperbarks are all adapted to fire. They have thick bark, their seeds are protected in thick woody capsules, and trees can often resprout from woody bases (lignotubers) after a fire. Different plant species and vegetation types require different fire regimes, that is, different frequencies and intensities of fire. Some vegetation types, such as riparian bush and rainforest, do not require fire for their regeneration. However, most bush would degrade in the long-term absence of fire.

## Protecting life and property

Bush fires can kill people and stock, and destroy property. A major aim of fire management is to reduce the chances of such disasters occurring.

- **FIREPROOF YOUR BUILDINGS.** Tasmania Fire Service can give you guidance on ways to fireproof your buildings. You can reduce the chances of losing your life and property during a bush fire by reducing the likelihood of sparks entering your buildings through not having flammable material in the roofs or under the floor boards, having clean gutters, and having water and other means of fighting fire on hand.
- Create a non-flammable space and/or a spark screen around your buildings. The traditional European-style garden of the Tasmanian countryside reduces the risk of fire spreading to buildings. However, if you prefer native trees and shrubs to exotics there are many species that resist burning and produce a good screen for sparks. These are mainly from the wetter forests of the state. They include musk (*Olearia argophylla*), blanket-leaf (*Bedfordia salicina*), sassafras (*Atherosperma moschatum*), leatherwood (*Eucryphia lucida*), and myrtle (*Nothofagus cunninghamii*). If you prefer dry country species try native oaks (*Allocasuarina* species) rather than eucalypts (*Eucalyptus* species) and make sure that you remove the needles from beneath the trees. It is important to have a large non-flammable space between your property and the more flammable bush.
- **REDUCE THE FUEL IN YOUR BUSH.** Low intensity bush fires seldom threaten property. You can control the intensity of a fire by manipulating the ground fuel levels. This can be done by low intensity burning, grazing, mechanical removal, or any combination of these measures. To protect life and property reduce the ground fuel levels within a 50 m radius of your house and buildings. If you have trees that you want to sell in the future keep the ground fuel levels around them low to prevent damage that may make them less valuable. Guidelines and other help in fuel reduction can be obtained from the Tasmania Fire Service.

## Using fire for healthy bush

When using fire as a management tool it can be useful to start by experimenting with a small area. A diversity of fire management practices is important as the effect of fire on many species is not known.

- **CHOOSE A FIRE REGIME TO SUIT THE DESIRED OUTCOME.** You need to be clear why you are burning your bush. It may be to protect threatened species, to reduce fuel loads, to encourage tree and shrub regeneration, for weed control, or to produce greenpick for stock. The reason for burning will affect the regime chosen. For example, if you are

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burning to reduce fuel loads then fires will need to be more frequent than if you were burning to promote tree regeneration.

- A DIVERSITY OF FIRE REGIMES IS USUALLY BEST. Maintaining biodiversity is best achieved by having a mixture of fire frequencies and intensities. This is partly because the requirements of many plants and animals are not known and having a mixture of fire frequencies lessens the risk of long-term damage. If you have an area of bush that has not been burned for many years it may be best to continue excluding fire.
- IF YOU HAVE THREATENED SPECIES CHOOSE A FIRE REGIME THAT SUITS THEIR NEEDS. Fire should favour the protection of threatened plant and animal species. In some cases the regimes needed by different species will conflict. For example, the fire frequency required to maintain the subterranean fungi that are the food source for bettongs may be at odds with the fire regime required to maintain some plant species. Seek expert help from the Threatened Species Unit of the Department of Primary Industries, Water and Environment.
- AUTUMN BURNS ARE PREFERABLE AS MOST OF THE PLANTS AND ANIMALS WILL HAVE COMPLETED THEIR LIFE CYCLE. Vegetation is likely to be fairly dry in autumn resulting in a good burn and the humidity at night will help to control the fire. An incomplete or unsuccessful burn, particularly in shrubby forests, may only provide more dry standing fuel for the next wildfire, thereby increasing its intensity.
- USE FIRE TO IMPROVE BUSH PASTURE PRODUCTIVITY. The burning of unpalatable older plants, such as silver tussock and gorse, produces palatable new shoots. **(See Kit 7 Grassy Bush.)**
- USE FIRE TO MANAGE TARGET WEED SPECIES. Some weed species are killed by fire or may be more easily controlled by other means after burning. For example, areas of established gorse can be burnt to remove impenetrable thickets. This allows easier access to the area so that the regrowth can be treated with chemicals. Burning weeds such as gorse and blackberry should take place when birds and animals have finished breeding.
- TREE SEEDLINGS NEED PROTECTION FROM FIRE TO ENABLE THEM TO GROW LARGE ENOUGH TO WITHSTAND LOW INTENSITY FIRES. You may need to avoid fire until the seedlings are tall enough to survive a fire.
- BURNING REDUCES THE DOMINANCE OF TUSSOCK GRASSES. Burning allows smaller grasses and herbs to grow. Some plants, including some rare and threatened species, need some form of disturbance such as grazing or burning to survive. These species would disappear in a thick grassy sward so burning can increase plant diversity.
- BURNING PROMOTES THE GROWTH OF PALATABLE NEW SHOOTS OF GRASSES, SAGGS AND SHRUBS. Fire creates a nutrient-rich ash bed that increases the palatability and nutritional value of new shoots and seedlings. However, it is important that burnt areas are not grazed too heavily or too soon after fire so that the new plants can regenerate.
- BURNING STIMULATES THE GERMINATION OF TREES, SHRUBS, GRASSES AND HERBS. The seed of some plants will only germinate after fire.

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## Fire intervals for different bush types

The fire regimes that best maintain the bush vary with the bush type and its condition. The following fire frequencies are recommended for the types of bush that are discussed in detail in **Kits 6-9**:

RIPARIAN BUSH	exclude fire
SALTMARSH	exclude fire
DRY COASTAL VEGETATION	exclude fire
LOWLAND GRASSLAND	2-5 years
BUTTONGRASS MOORLAND	5-20 years
SPHAGNUM BOG	exclude fire
HEATH	10-30 years
HIGHLAND GRASSLAND	5-20 years
ALPINE VEGETATION	exclude fire
GRASSY WOODLAND	4-10 years
GRASSY FOREST	6-18 years
GRASSY/HEATHY WOODLAND AND FOREST	8-20 years
HEATHY FOREST AND WOODLAND	10-30 years
SHRUBBY FOREST	20-40 years
WET FOREST	for regeneration after logging if needed
BANKSIA SCRUB AND WOODLAND	natural fires only
SHE-OAK WOODLAND AND FOREST	not necessary
OYSTER BAY AND SOUTH ESK	
PINE WOODLAND AND FOREST	exclude fire
DRY AND TEMPERATE RAINFOREST	exclude fire



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# Weed and disease management

Weed and disease management are major issues for maintaining the health of native vegetation. Weed management is covered in more detail in **Kit 3 Weeds in Your Bush**.

There are many diseases that occur in native vegetation, almost all of which predate European settlement. However, the root rot fungus (*Phytophthora cinnamomi*) is believed to have been introduced to Tasmania since settlement. The fungus has the potential to kill plants species and alter the ecology of susceptible bush types, such as buttongrass moorland, heath, and heathy woodland and forest.

The presence of root rot is characterised by the following:

- **DEATH OR DISEASE IN SUSCEPTIBLE SPECIES.** Species that are susceptible to the root rot fungus include members of the heath family such as swamp heath (*Sprengelia incarnata*) and the urn heaths (*Astroloma* species), many of the *Epacris* species with the exception of common heath (*Epacris impressa*), bush peas (*Pultenaea* species and *Aotus ericoides*), parrot pea (*Dillwynia glabberima*), guinea-flowers (*Hibbertia* species), grass trees (*Xanthorrhoea* species), and Christmas bells (*Blandfordia punicea*).
- **DISCOLOURATION OF THE FOLIAGE OF DISEASED PLANTS.** The leaves and branches turn red or yellow.
- **RESISTANT SPECIES REMAIN HEALTHY.** Species that are resistant to the root rot fungus include wattles (*Acacia* species), she-oak and bull-oak (*Allocasuarina* species), blanket leaf (*Bedfordia salicina*), dolly bush (*Cassinia aculeata*), native cherry (*Exocarpos cupressiformis*), cutting grass (*Gahnia grandis*), buttongrass (*Gymnoschoenus sphaerocephalus*), manuka (*Leptospermum scoparium*), saggs (*Lomandra* species), scented paperbark (*Melaleuca squarrosa*), daisy bush (*Olearia* species), rice flower (*Pimelea* species), dogwood (*Pomaderris apetala*), dusty miller (*Spyridium* species), and stinkwood (*Zieria arborescens*).
- **EVIDENCE OF DEATH OF PLANTS OVER TIME.** This will help to distinguish between death due to a natural event such as drought and death due to disease. A natural event such as drought is more likely to result in trees that appear to have died at about the same time. In contrast, root rot fungus generally results in a mix of plants that are dying, have recently died, and have been dead for a number of years.
- **SHARP BOUNDARIES BETWEEN HEALTHY AND DISEASED VEGETATION.**

Root rot fungus requires warm moist soils if it is to reproduce and spread. This generally limits its distribution in Tasmania to areas below 700 m and prevents it occurring in low rainfall areas such as the Midlands. Root rot may be spread by the transport of infected soil or plant material by people or animals. It may also be transported by water percolating through soil or in creeks. People can transport the fungus to new areas through dirt on their vehicles, farm machinery and footwear. As root rot fungus is widespread in Tasmania it is important that any disease-free susceptible vegetation remains free of disease. Once root rot is introduced to a site there is no way of completely removing it. The guidelines given below will help to prevent the spread of root rot fungus:

- Wash off any dirt on vehicles, machinery and footwear if you are travelling from an infected area to an uninfected area.
- Ensure that all gravel and soil brought onto your property come from uninfected areas (including soil associated with plants for revegetation). If in doubt do not bring it in.

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# Natural regeneration management

Natural regeneration is the process by which old trees and shrubs replace themselves without intervention. It is by far the best form of regeneration. Natural regeneration arises from seeds that have fallen from existing plants or from vegetative recovery such as sprouting from stumps or roots. Many bush species regenerate primarily from resprouting rather than seed.

Natural regeneration is a cheap and effective method of re-establishing or rehabilitating the bush on your property, particularly on a larger scale. It is cheaper to fence off and manage existing stands of bush than to re-establish trees for shelter or other purposes. There are many other advantages too. Natural regeneration occurs from plant material that is already present so it will be best suited to your environment and it will help to protect the genetic make-up of the bush on your property. Planting with seeds or seedlings collected from outside your property may introduce genetic traits that are not desirable in your bush.

This section refers only to natural regeneration. Information about revegetation can be found in **Kit 4 Revegetating Your Farm**.

## Causes of poor natural regeneration

There are many reasons why there may be no successful regeneration in your bush. Some of the possibilities are:

- **STOCK LEVELS ARE TOO HIGH.** In many cases natural regeneration does occur but stock subsequently graze the young seedlings.
- **COMPETITION FROM GRASSES AND OTHER WEEDS.** Dense mats of grass prevent the germination of native seeds. They also compete for resources and suppress young seedlings. Recent research has shown that when grasses become dense the established plants of other species are often incapable of flowering and setting seed because of the competition.
- **COMPETITION FROM NATIVE SPECIES.** Some native species including eucalypts, she-oaks and bull-oaks produce chemicals that inhibit the germination of other species. This is called plant allelopathy. The area affected is generally the area that lies beneath the tree crown.
- **LACK OF A REGENERATING FIRE.** Fire plays an important role in natural regeneration though the role varies between vegetation types. For many species fire is almost essential for regeneration. However, some species, including hard-seeded species such as banksia, can regenerate in the absence of fire.
- **SOIL COMPACTION.** The heavy hooves of stock, particularly cattle and horses, compact the soil and destroy its structure. The use of heavy machinery or vehicles has the same effect, particularly if the soil is wet. It is more difficult for seedlings to germinate in compacted soils, and if they do they are more likely to die as less water penetrates the soil. It is also more difficult for plants to establish roots in compacted soil.
- **ABSENCE OF THE CRYPTOGAMIC MAT.** Healthy soils have a fine layer of cryptogams (mosses and lichens) that provide an important environment for seed germination, particularly in grassy vegetation.
- **PREDATION OF YOUNG PLANTS.** Plants may germinate only to be eaten by hares, rabbits, wildlife and stock. They can also be eaten by caterpillars, beetles, nematodes and other invertebrates. Red-legged earth mites are a particular problem.

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- **SEED HARVESTING BY ANTS AND PREDATION BY OTHER INVERTEBRATES.** Ants can harvest almost all the seed fall from some species, particularly wattles and bush peas. However, ants are also beneficial as they play an important role in germination by dispersing and burying a huge range of seeds.
  - **POOR CONDITIONS FOR SEEDLING SURVIVAL.** Seedling mortality is naturally high in many species. Many species require several wet winters in succession to germinate and survive. In addition, inappropriate management can lead to a high mortality of the few seedlings that establish. For example, the seedlings may be grazed, burned or trampled.
  - **LACK OF VEGETATIVE MATTER AND AN EXHAUSTED SEED BANK.** Some plants produce a large amount of long-lived seed. However, many others do not and regeneration may rely on vegetative spread (i.e. sprouting from roots or stumps).
  - **NATURAL SEED PRODUCTION IS LOW.** Many species produce little seed in most years and have occasional years of high seed production that results in mass regeneration. These years occur only a few times each century. Management should focus on protecting the seedlings that establish following a mass seeding event.

## **Techniques to help natural regeneration**

A number of techniques that can be used to achieve natural regeneration are listed below. The appropriate method to use will depend on the health of your bush. If fencing is not an option try reducing your stocking rate in combination with some of the other techniques. It is recommended that you initially test the techniques over a small area.

### **Grazing**

Fencing bush allows you to control the level of stock grazing. If regeneration has occurred, exclude stock until the young trees are out of their reach. This may take 3-5 years or longer. Leave dead branches on the ground as they form a 'cage' that protects young seedlings from browsing animals. If you see a young seedling in the bush place some old branches over it to protect it. If a dense grassy sward is limiting regeneration, crash grazing a mob of sheep for a short period can promote regeneration by reducing competition.

### **Fire**

Experiment with fire to encourage regeneration. Burn a small patch of bush and see if any regeneration occurs. Autumn is probably the best time of the year to burn but experiment with burning in other seasons. Hard seeds stored in cones such as banksia and needle bush or eucalypt seed stored in gum nuts will be released after a fire. Fire will also create an ash bed for many species. Be aware that an intense fire may kill many of the old trees.

### **Weed control**

Weed control may aid the regeneration of native species. Refer to **Kit 3 Weeds in Your Bush** for further information.

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## **Soil preparation**

In some cases scarification or light raking of the soil at the time of seed fall may be needed to help create a seedbed and bury or hide seed so that it is not harvested by ants.

## **Fertilising**

Do not fertilise your bush or the area you are rehabilitating unless the topsoil has been removed. Bush plants are adapted to low levels of soil nutrients. Weedy species such as annual grasses are adapted to higher levels of nutrients and they will thrive and offer greater competition to the regenerating species if fertilised.

## **Record your activities**

Don't be afraid to experiment and don't be disheartened if you don't get good results first time. Regenerating the bush can be difficult and there is much to learn about it. Document your activities. Take photographs. Record the species present, the methods used, the time of the year, the weather conditions, how long it took, and how long before germination occurred. All these details help to build up a picture of success and failure, both of which are equally important. This information can later be shared so that others can learn from your experience.

